Progold.

progold®
master alloys

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“THE VALUE OF ACHIEVEMENT LIES IN THE ACHIEVING”

Albert Einstein 1879 - 1955

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PROGOLD

Companies that sell services and goods to other companies deal with professional, competent and well-informed buyers who can properly evaluate different offers. This is why Progold chose to develop its core business, focus on a continuous search for quality, technology and improvement. Our core value is professionalism as competenze to meet your expectations and respond to market challenges.
Our evolution is in the sign of innovation and oneness. We don't limit ourselves to reproduce what exists but as pioneers we think and produce what's to come.

MISSION

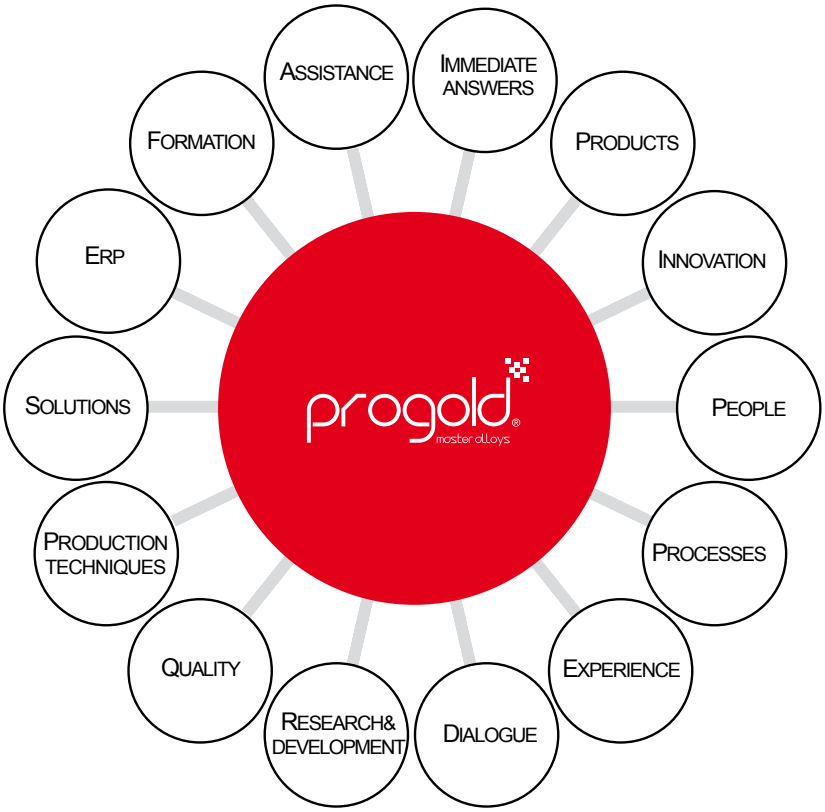
Research is the engine of our business. In the product, aiming to achieve the highest quality standard. In the service, exporting all over the world our before and after sales assistance model. All is manufactured and developed exclusively in Italy.
We seek to be an authoritative beacon for the supply of master alloys for gold and silver jewellery while expressing topquality and technology. We give constant attention to the continuous evolution of our customers' needs while pursuing excellence and innovation thanks to a constant dialogue between passion and experience.
This is what has always distinguished us. Excellent quality. Careful research and raw material selection. Total control of all production stages. Wide and diversified offer of products. Flexibility and efficiency. Sourcing management, aiming to achieve the highest quality of the product. Continuity and innovation. Use of new advanced techniques for new product development. Continuous internal and external training of our human resources for the best skills and professionalism. Integrity, fairness and transparency in the relationships established with the sales network. Customer focus bearign always in mind the importance of assistance.

VALUES

Passion: the catalyst of our job.
Identity: distinguish ourselves, being holders of innovation and liti ourselves to simply copy.
Honesty: transparent relationships with our entire sales network. Your victory is our win.
Professionalism: high competence for being always up to your expectations.

VISION

Notice the excellence of Progold in at least one jewel of each single production on worldwide basis.
Become a symbol of excellence within metallurgy and noble metal sector.



RESEARCH &DEVELOPMENT

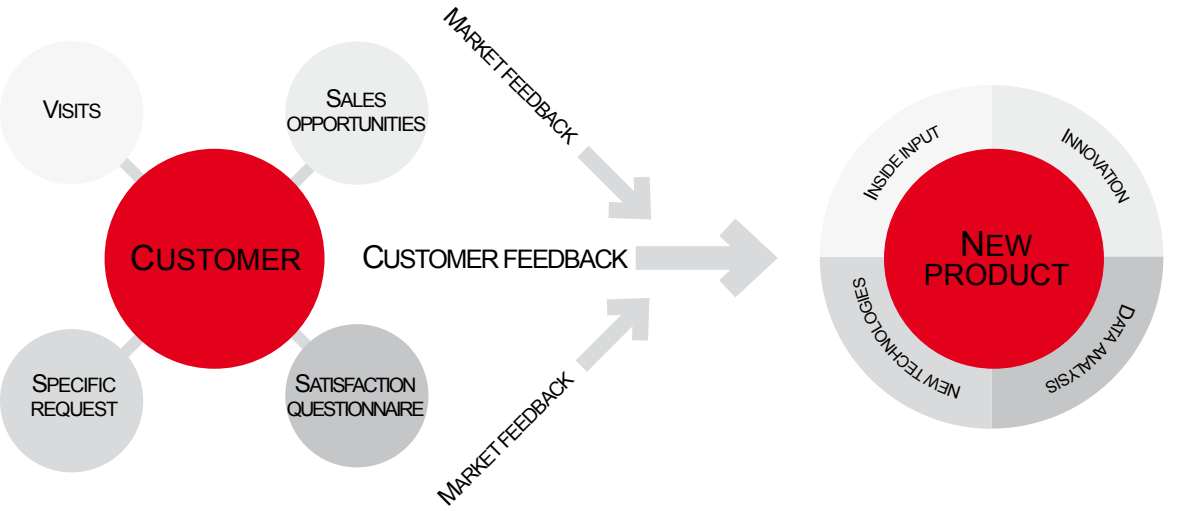
R&D is as rare as fundamental in the goldsmith's sector. In is commonly thought that the R&D department has a theoretical and not at all practical nature. Progold's R&D purposely wanted to place itself on another level and it reveals a totally different orientation: we've developed and we keep doing it with your support. We are firmly convinced that projects arise and are possible thanks to sharing your reality with our experience.

Visits are paramount: most of our research is generated by real needs and only the exchange of information with the final user helps us to start it off. Our interaction system supplies us with other useful material: the detailed analysis of the data collected and duly registered in CRM (Customer Relationship Management) during our assistance service enables us to identify and focus on the most frequent problems.

Collecting information, gathering as much as possible from the list of publications, constantly comparing our job with external boards and universities, exploiting our experience coupled with a quest for perfection, all mean we are 100% commited to our target as can be seen with the research carried out inside Progold's highly sophisticated laboratories. Our work features both simple and complex production stages: internal production of the prototype so that production standards are fully respected and can be repeated, methodology set up to evaluate validation parameters, internal and large scale tests carried out directly in the production cycle of the final user.

Dynamism is the keyword of our mission and therefore we wanted to increase the chances of finding new inspirations: not only missions and data analysis, but also a reserved area of Progold's Website (www.progold.com, Product Development section) where you can enter the product development cycle. By filling in a form you may give the input for a new research.

Progold can constantly look after all its clients in the world thanks to its dealers and our CRM software which cuts distances and time and, with continuous feedback, puts our clients' needs before anything else. All our feedback evolves constantly thanks to targeted visits, sales opportunities, specific requests of the client and customer satisfaction questionnaires. All through our CRM software: feedback is collected and then analysed to understand specific requests for a new product. This structure allows our R&D department to answer any request from the Progold market.



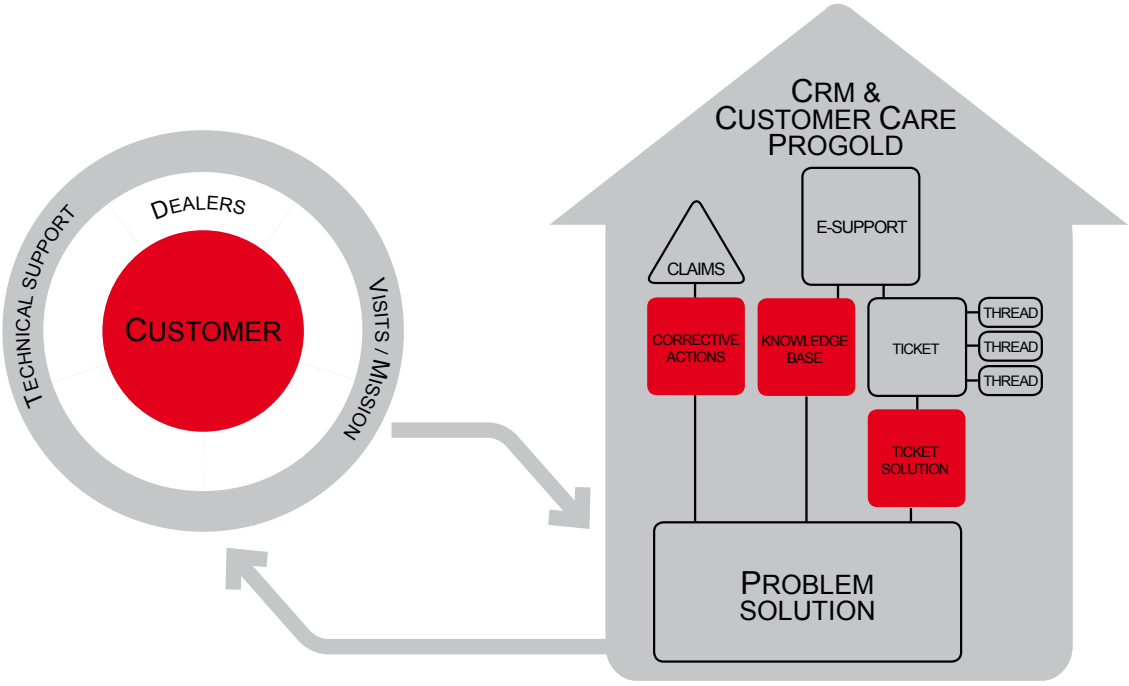
PRODUCTION

Quality, control, traceability, optimization. This is our philosophy.
In order to keep and improve the high quality standards of our master alloys we use a perfectly managed process, which is the result of a strict and constant control of the production line. Our excellence is the result of careful attention given to each stage of production: raw materials are subject to continuous and strict quality controls to ensure high quality standards and are solely supplied by certified sources. This strictness can be seen in the production parameters by castings made at 25 kilograms max to ensure eveness. Casting tools are different for each master alloy produced. Production management has been connected to an ERP IT system which ensures continuity and product reproduction. Constant check and component control of every article guide us in our daily production cycle up to the finishing/polishing process.
A series of traces lets us classify and follow the product anytime. This allows us to proceed with specific recalls should we suspect failure to comply with our strict standards.
Our IT system also allows us to manage production and optimize storage.
An added value we offer is the constant availability of the product. This is why we use MRP (Materials Requirements Planning), a software that allows us to optimize storage based on an analysis of market demand and our supplies.
Technological innovation is paramount because it allows us to continuously improve production and raw material supply but especially their production and management.
We treasure the experiences made in various fields. We apply our knowledge, our experiece and direct feedback from our customers to ensure a continuous customization of our know-how.
We also value experiences in different sectors to find new elements for our processes because we want to be the first ones to give you the best possible.

ASSISTANCE
(CUSTOMER SERVICE)

For Progold "assistance" is indissolubly linked to CRM.
We depend on our customers. To completely follow your present and future needs we adopted a cutting-edge system based on a mutual exchange of information.
Thanks to a new and dynamic CRM system, in fact, we are proud to offer an excellent before and after sales assistance service, which ensures compliance of our retail trade network to our working methods.
Wherever they are, our customers' needs are stored in our database by the dealers and, thanks to an advanced IT exchange system, they are sent, analyzed and customized directly by our team.
Progold's assistance is not limited to one aspect: on a technical basis, thanks to a customized on-line E-SUPPORT service, distance stops being an issue.
Our customers are not just a code, but they have an active role to play: with a real-time dialogue between them and the Italian office they may find assistance, suggestions and to avoid practical mistakes and defects in the realization of the final product.
The most common and interesting problems are at everybody's disposal in a sort of virtual library (called KNOWLEDGE BASE) where they can find lots of useful information and solutions to problems affecting their daily work.
From a commercial point of view, your needs are brought to our attention thanks to a complex registration system which involves all our divisions: dealers, Italian sales and technical office work together to supply you with the best solutions possible.
Information is constantly and accurately stored, based on a model common to all the areas where Progold is present: each action, word, idea is analysed in real-time by the Italian home company. This ensures your needs, wishes and expectations become essential information for our missions.
A calendar of carefully planned missions will make sure your needs are safeguarded: on-line assistance becomes on-site assistance thanks to our technical and sales Italian staff which can understand your problems, needs and find proper solutions. A two-side assistance model: local but also virtual.
Visit our website often: you will find all the necessary information on our technicians in your country or at the most important fairs of the gold and silver sector.

Progold is always at the disposal of anyone who wants to use this service . You can also request a visit from our technicians by simply filling in an online form. Your request will be swiftly dealt with by our operators and the dealer in your area. By registering on our website, available in several languages, you can establish a preferential channel with Progold: collecting information, discussing and sharing our experiences is extremely simple and useful.
We can offer you even more: the most significant issues are stored in a virtual library and put at your disposal. Each case study is classified and thanks to some keywords, a fast search could not be easier.
Knowledge base is the source of available answers because your time matters. But our assistance doesn't end here. If the problem is more complex and there is no evidence of it in our archive, this is where the real **E-Support** area comes into play.
The assistance request starts from Progold's Reserved Area. It is essential to register on the website in order to access the assistance area: once you finish registering, you will be granted a personal login ID and password, which are sent to the email address you specified.
By following a guided path, you may insert your **ticket** and specify technical and production-specific parameters with the possibility to attach files, photos and images.
With the help of a series of messages and **threads**, we communicate and interact to solve your problem.
We are aware of the importance of suggestions from our customers, so to improve our products we have a specific complaint form you can use to notify us of any complaints or poor service. All you need to do is to insert your login ID and password and fill-in a form.
We value **claims** because they allow us to improve our products and our service. A two-way communication: immediate Q&A, photos, images and further in-depth analysis lead to a higher interaction between you and Progold.
E-Support: to complete, improve and upgrade standard assistance methods while ensuring better and real-time replies. Despite the distance.



MARKET

Selling top quality products. But not only. Our added value is in our people. Catalogue, price list, sales terms are all useful tools but our mission is to provide you with what is missing: ensure you have the best from the very beginning until the end and much more. Our keywords are: experience, skills and communication.

Progold aims at customizing the exchange of information between you and us as much as possible: our management can be considered widespread and efficient only if our eyes, words and skills are completely at your disposal.

On worldwide basis, our idea finds its utmost expression thanks to an extensive net of local dealers who are trained to filter the information, re-elaborate your requests and use our communication method.

The dealer represents Progold's first interface, so we care to equip him with the experience and knowledge we've collected and create highly skilled and competent profiles.

We invest our resources and our time in continuous training so our dealers can develop the technical and sales skills required, both from a commercial and human point of view.

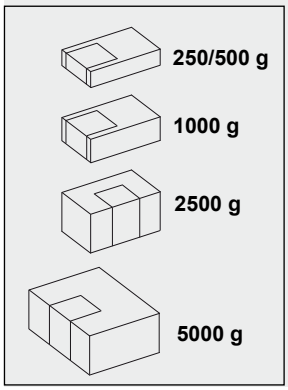
Thanks to a universal information exchange system (CRM), communication issues and oversights are overcome enabling us to focus on our real purpose: your satisfaction.

PACKAGING

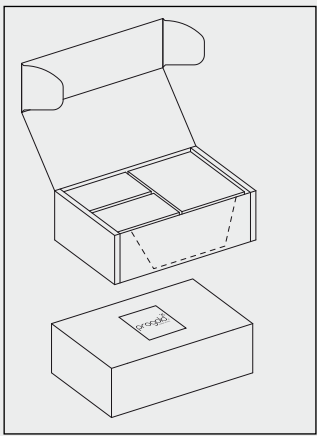
We believe that quality must be displayed in any aspect of the product. We have therefore adopted completely recyclable packaging: the environmental impact is reduced and waste disposal is easier. We decided to focus on quality, resistance, functionality and environment care. The external cardboard material protects from bumps, whilst the 500 grams semi-transparent packaging with inert gas preserves the content from reacting with oxygen and keeps its unaltered.

As a precaution, a little bag of hygroscopic salts is added to absorb any humidity and keep the product dry. Each product comes with a technical data sheet. All parameters are the result of our experience in the laboratory and match our clients' processing needs. Value approximations are clearly stated.

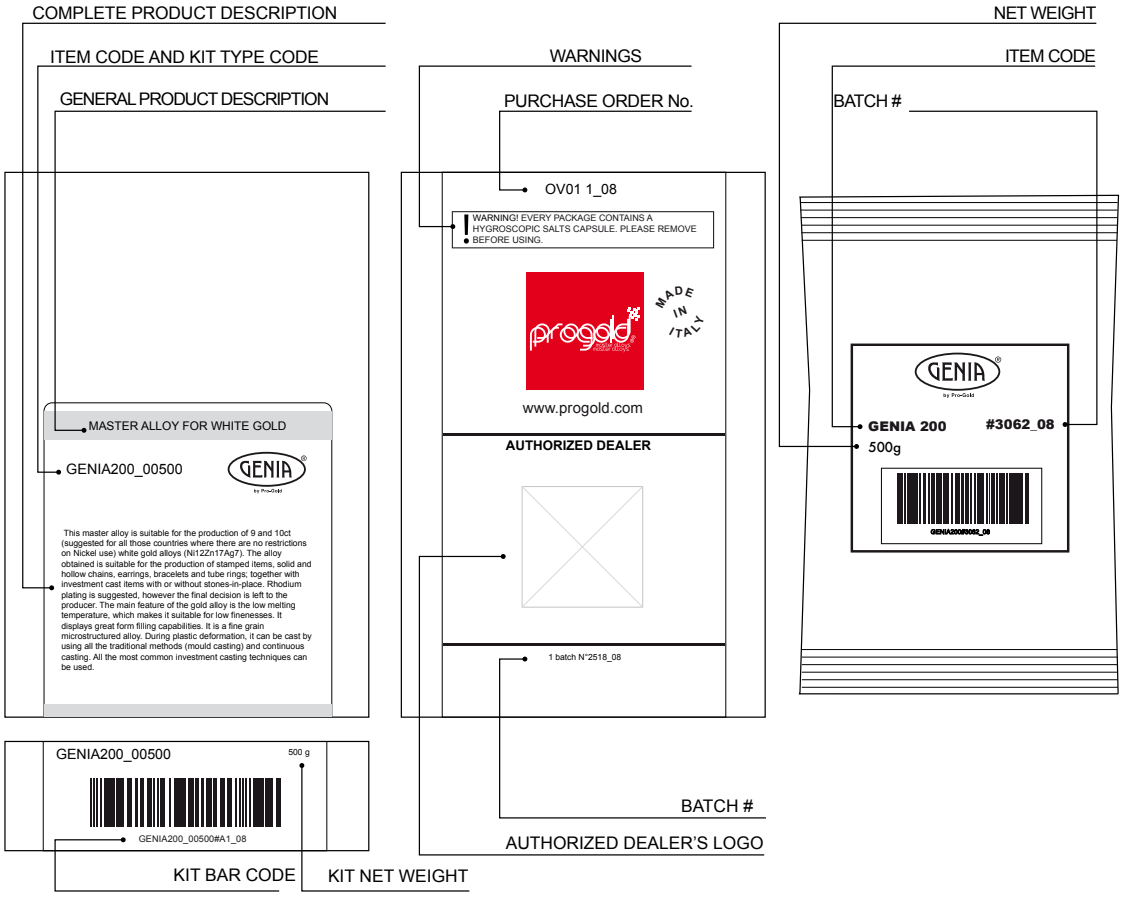
Progold products are available in the following packagings: 250 (only for Platina) 500, 1000, 2500 and 5000 grams.



Example of a complete packaging




05
PP
recyclable
recyclable


COMPLETE PRODUCT DESCRIPTION
ITEM CODE AND KIT TYPE CODE
GENERAL PRODUCT DESCRIPTION
MASTER ALLOY FOR WHITE GOLD
GENIA200_00500
GENIA
by ProGold
This master alloy is suitable for the production of 9 and 10ct (suggested for all those countries where there are no restrictions on Nickel use) white gold alloys (Ni12Zn17Ag7). The alloy obtained is suitable for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; together with investment cast items with or without stones-in-place. Rhodium plating is suggested, however the final decision is left to the producer. The main feature of the gold alloy is the low melting temperature, which makes it suitable for low finenesses. It displays great form filling capabilities. It is a fine grain microstructured alloy. During plastic deformation, it can be cast by using all the traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.
GENIA200_00500
500 g
GENIA200_00500#A1_08
KIT BAR CODE
KIT NET WEIGHT
WARNINGS
PURCHASE ORDER No.
OV01 1_08
WARNING! EVERY PACKAGE CONTAINS A HYGROSCOPIC SALTS CAPSULE. PLEASE REMOVE BEFORE USING.
progold
MADE IN ITALY
www.progold.com
AUTHORIZED DEALER
1 batch N°2518_08
BATCH #
AUTHORIZED DEALER'S LOGO
NET WEIGHT
ITEM CODE
BATCH #
GENIA
by ProGold
GENIA 200
#3062_08
500g
GENIA200#3062_08

TECHNICAL DATA SHEET

The data refer to the alloy produced using Progold articles.

PRODUCT CODE AND FINENESS OF USE

VALUE USED TO CALCULATE THE CORRECT QUANTITY OF MATERIAL TO CAST AS A FUNCTION OF THE WEIGHT OF THE WAX TREE OR TO DETERMINE THE WEIGHT OF A PROFILE, A SEMI-FINISHED OR A FINISHED PRODUCT WHERE ITS VOLUME IS KNOWN

SOLIDUS – IMPORTANT FOR HEAT TREATMENTS OR FOR SOLDERING PROCESSES

LIQUIDUS – IMPORTANT FOR CASTING PROCESSES

PHYSICAL CHARACTERISTICS STATED ON ALL TECHNICAL SHEETS, THE MINIMUM DATA TO PROPERLY USE THE ALLOY

MECHANICAL CHARACTERISTICS SHOWED ONY IF SPECIFIC TESTS WERE CARRIED OUT FOR THE DESIRED FEATURE

THIS SECTION IS SHOWN ONLY IF THE ALLOW IS FOR INVESTMENT CASTING

INSTRUCTIONS FOR CASTING AND FLASK TEMPERATURE

A COOLING TIME RANGE IS ADVISED FOR THE FLASKS

A SOLUTION IS SUGGESTED FOR THE COMPLETE REMOVAL OF INVESTMENT RESIDUALS

HOW TO CARRY OUT A POSSIBLE HEAT TREATMENT TO REDUCE RESIDUAL TENSIONS ON ITEMS AFTER INVESTMENT CASTING

A SOLUTION IS SUGGESTED TO REMOVE THE POSSIBLE OXIDATION OF THE ITEMS AFTER HEAT TREATMENT

GENIA156 - (750)

Technical and usage details

Tab.1 PHYSICAL CHARACTERISTICS

Colour	WHITE
Density [g/cm^3]	14.70
Melting range [°C] Solidus - Liquidus	885 ÷ 925
Colour coordinates	L*= 87.04
	a*= 2.43
	b*= 12.49

Tab.2 MECHANICAL CHARACTERISTICS

Condition	As cast	Annealed	Hardened
Tensile strength [MPa]	519	702	
Yield strength [MPa]	373	468	
Elongations [%]	39	29	
Hardness [HV]	186	192	281

INVESTMENT CASTING

CASTING

Put the alloy¹ inside a cold crucible. Reach a temperature of 100 ÷ 150 °C more than Liquidus, (as per Tab.1), then pour the metal inside the stabilized flasks at a temperature between 500 ÷ 700 °C. Choose temperatures among this range as a function of the dimension of the castings (for heavy pieces it is advisable a low temperature value, for lighter pieces it is advisable a higher one); each one of these temperatures has to be optimized in function to everyone's own manufacturing cycle.

COOLING

After casting, let the cast flask rest in air for about 5 ÷ 20 minutes before quenching in water. The best time choice depends on the sort of pieces to be cast: a slow cooling can draw the piece to oxidise; a quick cooling increases the risk for the piece to break. For cooling flasks cast with stones, follow the instructions supplied by the producer of the stones.

CLEANING

Once the tree is obtained, clean it with an high pressured water jet, subsequently dip the tree in a 5 ÷ 10% hydrofluoric acid solution at 50 ÷ 60°C (122 ÷ 140°F), in order to remove investment residues. A stronger action of the hydrofluoric acid can be obtained by using an ultrasonic tank to combine the mechanical and the chemical action together.

SOLUTION ANNEALING

The solution annealing should be carried out on the cast pieces. The aim is to reduce or eliminate all the tensions accumulated by the casting itself, during cooling inside the flask, and consequently to increase the mechanical resistance of the cast pieces. Heat the castings in a furnace (if possible in a protected atmosphere) at a temperature of 75÷ 80% of the Solidus value (as per Tab. 1) for a time between 10 ÷ 20 minutes. Cooling can be done in these three different ways: slowly in air at almost 500°C and then in water, or abruptly in oil or alcohol (these last two guarantee a very reduced presence of cooling tensions).

PICKLING

Use a 10 ÷ 15% sulphuric acid solution at 50 ÷ 60°C for a normal pickling. A stronger pickling action is obtained by adding small amounts of hydrogen peroxide (1 ÷ 5 ml/l) to the solution before use. Renew the sulphuric acid solution frequently.

SCRAPS REUSAGE

The scraps of this alloy can be reused. It is advisable to use a percentage of not more than 50% of scraps and sprues. The choice of the quantity of scraps to reuse depends on their grade of cleanliness, on the casting techniques applied and subsequently to the state of oxidation of the material and the grade of defection tolerated by the items to produce. It is recommended to clean very carefully the sprues from each investment remaining, which presence reduces the number of recasting the scraps can endure.

FILLING CAPABILITY

This value indicates the percentage of sample the alloy was able to fill during the casting test. The sample used is a small net of 70 x 75 mm and 0,58 mm thick. The working steps are referring to an internal ProGold procedure where the form filling percentage is evaluated as follows: less than 10% poor, 10 to 25% sufficient, 25 to 50% fair, 50 to 75% good and grater then 75% excellent

65 %

MOULD CASTING

CASTING

Place the alloy¹ into the crucible. Cover the surface of the metal with boric acid. While heating, protect the metal with a reducing flame (yellow colour) of methane gas or propane (both very suitable for protecting the metal), argon or forming gas. Heat the mould to 250 ÷ 350°C. Heat the metal at 100 ÷ 150°C more than Liquidus (as per Tab.1) and slowly pour the metal into the mould. It is advisable to prefer a hot mould and a slow pouring rather than a cold mould and fast pouring.

COOLING

Right after casting open the mould and cool the metal immediately.

CONTINUOUS CASTING

MELTING

If the alloy¹ is in solid pieces (rolled pieces or drops), continue by putting it inside the cold crucible; if the alloy is liquid then heat the crucible of the continuous casting until reaching the Liquidus temperature (Tab. 1). If the casting machine does not measure the temperature when quenching the metal, please make sure the temperature taken outside the crucible corresponds to the real one of the metal in its inside. In case this should not happen, ask for the casting temperature to the supplier of the casting machine, by giving the Solidus and Liquidus temperatures of the alloy (Tab. 1). While casting, protect the metal with a reducing flame (yellow) of methane or propane gas (both very suitable for the protection of metal), argon or forming gas.

CASTING

The die should reach an adequate temperature without overheating the metal inside the crucible, by acting on the water cooling flow or on the number of thermal exchange steps (eventually please contact the machine supplier). Use the highest speed to let the profile result defectless: this advice allows the alloy to cool faster and consequently to have a finer grain. In case there are some resting moments while pulling, the profile which will longer remain inside the die has a bigger grain structure due to a slow cooling, and cause a change in the behaviour during the next cold working.

PLASTIC DEFORMATION

COLD WORKING

After casting the alloy has to undergo cold working, starting with a 50 ÷ 60% section reduction. After an appropriate recrystallization annealing, proceed with 70 ÷ 80% cold section reductions and subsequent annealing stages, until the final size

IT DISPLAYS HOW EASILY THE ALLOY CAN FILL IN COMPLEX SHAPES

THIS SECTION IS SHOWN ONLY IF THE ALLOY IS SUITABLE FOR MOULD CASTING

SUGGESTIONS FOR THE CASTING TEMPERATURE OF THE ALLOY AND HEATING TEMPERATURE OF THE MOULD

SUGGESTIONS ON HOW TO COOL THE INGOT AFTER CASTING

THIS SECTION IS SHOWN ONLY IF THE ALLOY IS SUITABLE FOR CONTINUOS CASTING

HOW TO CAST BY CONTINUOUS CASTING

HOW TO OPTIMIZE THE CONTINOUS CASTING

THIS SECTION IS SHOWN ONLY IF THE ALLOY IS SUITABLE FOR MECHANICAL WORKING

MINIMUM PERCENTAGE OF COLD WORKING TO APPLY TO THE ALLOY

THE QUANTITY OF SCRAPS TO USE TO AVOID A DETERIORATION OF THE CHARACTERISTICS OF THE ALLOY IS ADVISED

HOW TO DO THE ANNEALING HEAT TREATMENT TO RESTORE THE MICROSTRUCTURE OF THE ALLOY

A PICKLING SOLUTION IS SUGGESTED TO ELIMINATE REMOVE OXIDATION AFTER HEAT TREATMENT

ADVICE ON THE QUANTITY OF SCRAPS TO REUSE TO AVOID A DETERIORATION OF THE CHARACTERISTICS OF THE ALLOY

THIS SECTION IS REPORTED ONLY IN CASE OFINFORMATION REGARDING THE CHEMICAL CHARACTERISTICS OF THE ALLOY

THIS IS THE VALUE OF NICKEL RELEASE OF THE ALLOY

is obtained. It is important to carry out cold reductions of a minimum of 50% to avoid the tendence of the grain growth in the next annealing.

RECRYSTALIZATION ANNEALING

Place the rolled sheets or drafts in a furnace with protective atmosphere heated at a temperature of 75 ÷ 80% of the Solidus value (as per Tab. 1). Leave the material in the furnace for an effective time length of 15 ÷ 20 minutes. Subsequently cooling can be done in these three different ways: slowly in air at almost 500°C and then in water, or abruptly in oil or alcohol (these last two guarantee a very reduced presence of colling tensions).

PICKLING

Use a 10 ÷ 15% sulphuric acid solution at 50 ÷ 60°C (122 ÷ 140°F) for a normal pickling. A stronger pickling action is obtained by adding small amounts of hydrogen peroxide (1 ÷ 5 ml/l) to the solution before use. Renew the sulphuric acid solution frequently.

SCRAPS REUSAGE

The scraps of this alloy can be reused. It is advisable to use a percentage of not more than 50% of scraps. The choice of the quantity of scraps to reuse depends on their grade of cleanliness, on the casting techniques applied and subsequently to the state of oxidation of the material and the grade of defection tolerated by the items to produce. It is recommended to clean very carefully the sprues from each remaining of oils and greases, which presence reduces the number of recasting the scraps can endure.

HEAT TREATMENTS

HARDENING

Age hardening can be done on finished items, after having taken to conclusion all the deformation steps to produce the piece itself. This heat treatment allows to increase the piece resistance to plastic deformation, which will have, as a consequence, a higher fragility. You have to proceed by heating the pieces to 275°C, keeping them under this temperature for a time between 60 and 180 minutes in function of the hardness value to be reached (please contact ProGold to ask for hardness values). 180 minutes guarantee to obtain a hardness close to the highest value the alloy can reach. Further on proceed by cooling the pieces very slowly inside the furnace (when a furnace with protected atmosphere is available). In case of problems due to oxidation, the heat treatment can be done by quenching the pieces in molten salts or oil.

CHEMICAL FEATURES

NICKEL RELEASE

This value was obtained by following the UNI EN 1811 Direction. The trial was made on objects made by ProGold. The data can't be therefore taken as an absolute reference, but only as an indicative value. This is because Nickel release is influenced not only by its percentage but also by the homogeneity of the gold alloy, by the shape of the item and by the state of the surface finish; these features are parameters not under control by the master alloy producer, this is the reason why it is not certifiable the value of Nickel release. It is therefore suggested to do the test on everyone's own pieces to verify the observance of the norms 94/27/EC and 2004/96/EC.

0.02 µg/cm^2/week

NOTES

1. In order to guarantee the correct functioning of the product it is advisable to use exclusively 99.99% pure gold. It is suggested to do a pre-melting (under protected atmosphere) of the alloy before using by putting inside the crucible, in a sequence, first the master alloy and then pure gold. If the shotmaker is not available it is advisable to put the alloy into the ingot mould, roll and then cut the sheet into small pieces.

2. All the data of this technical sheet refer to 18K alloyed gold. If the alloy is used for different finesses from those suggested, please contact ProGold for further information. All data presented in this technical sheet have been obtained from samples produced and tested in ProGold laboratories, with specific procedures and in compliance with the ASTM standards. ProGold preserves the right to rectify the data of this sheet anytime by updating this publishment.

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CONTACT NAME AND DETAILS OF THE AREA SUPERVISOR OR OFFICIAL DEALER

CONTACT NAME AND DETAILS OF THE REFERENCE TECHNICAL SUPERVISOR

THIS SECTION IS SHOWN ONLY IF THE ALLOY CAN BE HARDENED WITH PROPER HEAT TREATMENT

THE TIME AND TEMPERATURE IS ADVISED FOR OBTAINING THE HIGHEST HARDNESS VALUES FROM THE ALLOY

PROGOLD OFFICIAL DEALERS

Progold strongly believes in training its representatives all around the world. For this reason we invest a lot on specific and sector knowledge training to create professional and expert profiles capable of offering the most in-depth knowledge on any Progold product suitable for any specific use. Our Credo, our Mission and our Vision are extensively shared amongst our dealers allowing us to reach our targets successfully.

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PROGOLD PRODUCTS RANGES

Progold's products are divided in nine lines of alloys and master alloys with different specifications and chemical, physical, mechanical and technological characteristics.

The alloying elements that mark each product line are the same ones which make our products unique. This is where Progold's uniqueness lies.

GENIA® by Progold

PURA™ by Progold

Unika® by Progold

FLEXIA® by Progold

LUX® by Progold

unibrax® by Progold

blank® by Progold

Xilver®

PLATINA™ by Progold

progold® master alloys

THE CERTAINTY OF EXCELLENCE PROGOLD'S LEADING PRODUCT: GENIA®

GENIA® is a guarantee which helped Progold to become known all over the world

GENIA® is anything simple and consisten a company may need

GENIA® was introduced on the market several years ago with a revolutionary group of **MASTER ALLOYS FOR WHITE GOLD**, later expanding to include master alloys for all workings, colours and finenesses. For the last eight years, GENIA® **HAS UNDOUBTEDLY BEEN THE QUEEN** of Progold's master alloys. It is successful all over the world, also in those markets where it is hard to convince producers to invest a lot on special master alloys.

Nothing can be so performing in any possible working condition. Every year, GENIA® is enriched by new products maintaining unaltered and undisputed the philosophy of this family: **GREAT MECHANICAL RESISTANCE, EXCELLENT CASTABILITY FEATURES, ALMOST INEXISTENT SHRINKAGE DEFECTIVENESS**. These are the features which have built up the reputation of GENIA® during the years.

The absolute **TRUSTWORTHINESS in the CONTINUOUS CASTING PROCESSES** is the jewel in the crown of GENIA®. The guarantee of stability of the mechanical properties is provided by the perfect structure of GENIA®.

This family of master alloys is the top for anyone looking for a master alloy **THE LEAST SENSITIVE POSSIBLE to the QUANTITY OF SCRAPS USED**.
Probable impurities contained may in fact have a noxious effect on the mechanical features of the carat gold alloys made using GENIA®. It can therefore be recast a **BIGGER NUMBER OF TIMES** with consequent saving.
During plastic deformation, **VERY COMPACT AND SMOOTH SIDES** are guaranteed. The rolling steps can be harder. **ANNEALINGS can be REDUCED**. The grain growth during these last stages is **CONTROLLED BY GRAIN REFINERS. THE ORANGE PEEL is**, therefore, **ONLY A MEMORY. CASTINGS DO NOT BREAK**.
As far as yellow and white carat gold alloys are concerned, the **WAY FLASKS ARE QUENCHED DOES NOT INFLUENCE THE BASIC RESISTANCE of GENIA®**. **EXCELLENT FILLING CAPABILITIES AND EXCELLENT COMPACTNESS** make GENIA® a product definitely suitable for investment casting.

In case of hand made jewellery, thanks to its fantastic resistance, we offer an alloy **RESISTENT TO ANY TORSION, CONTINUOUS HEATING AND OVERHEATING**. The hardest bench workings can be easily overcome by GENIA®, something which will please even the most demanding goldsmith's.
During casting **NO "ANNOYING" FILM COVERS THE MOLTEN ALLOY**. The metal appears always as a mirror, very liquid and **NO RESIDUALS REMAIN AFTER CASTING** into the crucible.
As far as silver is concerned, GENIA® offers alloys with a comprehensive and definite **SOLUTION TO THE FIRESTAIN PROBLEM**.

You will no longer have surprises once the workings are over. You can count on a certain output of the items produced.
With GENIA®, **COLD WORKINGS HIGHER THAN 90% CAN BE REACHED**. GENIA® does not break and is is compact. GENIA® ensures brightness, because fine grain and compact structure are the main requisites for this kind of effect. GENIA® allows to produce very thin wires which are not possible with other alloys.
GENIA® enables castings with less shrinkage problems. GENIA® is not easily influenced by the way flasks are quenched.
In terms of consistence and versatility GENIA® is the best available on the market.

GENIA® is available for white, yellow, red gold and silver.
It is sold in 500, 1000, 2500 and 5000 gram boxes.

All classifications on the fields of application of GENIA® mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: i**nfo@progold.com**.

GENIA®plus

GENIA®plus, specific answer
to specific needs

GENIA®plus: ultimate performances
for universal use

Its main feature is
THE FINE GRAIN STRUCTURE
which ensures excellent
behaviour stability.

No product can match GENIA®

During the years, the **GENIA®** range has repeatedly proved how a fine grain structure can ensure considerable advantages both in investment casting and mechanical working. **GENIA®plus** maintains all the specific features of the **GENIA®** range and specializes even further. When the production needs of an item become a priority as to the correct placement of the feeders, then **GENIA®plus** represents a guarantee for the final result. An incorrect feeder setting will no longer display shrinkage porosity on the surface layer of the piece.

The gold alloy produced using **GENIA®plus**, thanks to the **PARTICULAR ALLOYING ELEMENTS** used, has the capacity to push, and consequently hide, all the defects into the item core, whilst preserving the final quality high.
The resulting quality is unmatchable and the surfaces are compact and without defects with consequent saving in the polishing and finishing steps.
GENIA®plus ensures the gold alloy produced has a lower casting temperature than usual: a reduced interaction of the metal with the investment generates a lack of gas porosity.
The specific composition of **GENIA®plus** promotes the **EXTREME FLUIDITY** of the alloy with **HIGHER FILLING OF THE CASTS**.
During plastic deformation, **GENIA®plus** improves the weldability of the alloy and after heat treatments, even in controlled atmosphere, the annealed materials display reduced oxidation.
The initial research of Progold followed market needs in terms of gold alloys with more fluidity, an absolute guarantee of **LACK OF GAS POROSITY AND DEOXIDATION**.

GENIA®plus is available for white gold and silver.
GENIA®plus is sold in 500, 1000, 2500 and 5000 gram boxes.

All classifications on the fields of application of **GENIA®plus** mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: **info@progold.com**.

THE FINAL STAGE OF PURITY IN A MASTER ALLOY. THE GUARANTEE OF THE UTMOST SURFACE QUALITY: PURA™

The analysis conducted revealed extraordinary qualities, an extremely HIGH LEVEL OF CHEMICAL PURENESS OF THE MASTER ALLOY ITSELF

PURA™ was developed to achieve the maximum level of pureness possible thanks to a careful selection of raw materials. All of this to safeguard PURA™ from any contaminating agent which could impair its final features.
PURA™ product range is subject to a series of meticulous analysis thanks to instruments which ensure the preset pureness standard is matched in all master alloy drops produced. Our mission is to improve constantly and the answer is only one: PURA™! The new Progold range of products.

Our journey starts from very far: first of all from a **SELECTION OF THE RAW MATERIALS TAKEN TO EXTREMES**. Then, thanks to a specific process, **WE MANAGED TO STOP CONTAMINATING ELEMENTS FROM IMPAIRING THE CHARACTERISTICS OF THE FINAL PRODUCT**.

This difference may be noticed in the items produced: **HIGH SURFACE QUALITY AND DEFECTIVENESS ALMOST CUT TO ZERO**.

It is well known how impurities present in the alloy are the main cause of problems and their concentration generate several types of defects.

With PURA™ we managed to ensure this **QUALITATIVE STABILITY** is always granted: we put all our efforts in carrying out extra inspections on the product. Thanks to extremely sensitive instruments we can check every single drop of product produced.

PURA™ is available for white gold.
PURA™ is sold in 500, 1000, 2500 and 5000 gram boxes.

All classifications on the fields of application of PURA™ mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: **info@progold.com**.

THE PURENESS OF PURA™ IS SYNONYM OF CONSTANCE AND BEHAVIOUR REPRODUCIBILITY

PURA™ PRODUCTION CYCLE

The main feature of PURA™ lies in the extremely high pureness of the master alloy which ensures superior quality of the final objects.

Pureness is guaranteed thanks to a differentiated production cycle that is continuously supervised with chemical analysis made by sample.

Raw materials used must pass Progold's strict quality standards so that our products offer a unique constance of behavior that gives an excellent **PERFORMANCE**. With PURA™, inspections carried out on raw materials are stricter so that its main feature can be safeguarded and better expressed: pureness.

ADVANCED TECHNOLOGY FOR ALL WORKINGS PROGOLD PRESENTS UNIKA® THE NEW SERIES OF MASTER ALLOYS UNIKA®

The market, at the current state of research, does not offer products with the same technological content.
UNIKA® is an ACHIEVEMENT of our R&D labs

UNIKA® product range comes from Progold's research and test laboratories and the discovery of revolutionary grain refiners used for the first time in the production of mater alloys for goldsmith's. UNIKA® is the perfect combination of LUX® and GENIA® peformances, while offering at the same time the advantages of deoxidized castings with a fine grain structure. It represents an evolution of GENIA®, enriched by the possibility to obtain **DEOXIDIZED CASTINGS AFTER CASTING, together with an OPTIMAL MECHANICAL RESISTANCE**.

UNIKA® makes it possible to **QUENCH FLASKS, WITHOUT PAYING PARTICULAR ATTENTION** to the time after casting. The changes, for the different waiting times, are so little they will not influence the mechanical-technological features of the castings. Every producer will therefore be free to decide the most suitable time to his production needs.

The UNIKA® family master alloys feature **REVOLUTIONARY GRAIN REFINERS**, used for the very first time in the production of alloys for goldsmith's. These elements guarantee absolute **IMPROBABILITY TO MAKE COMPOUNDS** with contaminating elements coming from the reuse of scraps or from raw materials. All the most common alloys suitable for investment casting, i.e. those which guarantee deoxidized castings and low reactivity with the investment, make it very hard to obtain fine grain microstructures. If such structures limiting the shrinkage defects and breakings, like UNIKA® alloys are able to do, arise they lead to imperfections totally unwanted such as the "hard spots" on the surface and the "comet effect" after the polishing steps.
The use of UNIKA® ensures a more superficial distribution of the shrinkage cavities in investment casting processes, and also a reduction of the required annealings, thanks to the **SOLIDIFICATION in** a **FINE POLYCRYSTALLINE STRUCTURE**. As a consequence, you can improve the percentage of workability during cold working.
ANNEALING steps will be less troublesome when time is longer: the excessive **GRAIN GROWTH** is **KEPT UNDER CONTROL** by the elements contained in UNIKA® too. The undesired effects of orange peel, by deep stamping, in the short radius bending and in big diameters chains, are going to be **ONLY MEMORIES**. UNIKA® alloys are planned to face specifically these kind of problems.

UNIKA® behaves very well when **SCRAPS** are reused, but if the castings are always very well protected by the oxidizing action of Oxygen.
This is an alloy that allows a **LIMITED REACTIVITY WITH THE INVESTMENT**. It is very viscous at the liquid state and therefore eventual gassy formations between the cavity wall of molten metal/investment **FIND IT HARDER TO "PENETRATE" IT** and produce surfaces with gas porosities.
Thanks to its viscosity and the high superficial tension of UNIKA® alloys, their **PERCENTAGE LOSS OF WEIGHT** during casting is **VERY LITTLE**. It is enough to refer to the tests carried on that evidenced how the **REAL REDUCTION OF WEIGHT LOSS REACHES 90%**. It is usually known how gold alloys containing zinc are subjected, during melting, to evaporation of this last one. Once this phenomenon takes place, the final casting weight is inferior to the beginning weight, with a consequent increase of the fineness of the alloy at issue. Thanks to their elevate superficial tension, UNIKA® alloys produce a sort of "**CAP**" on the molten surface, almost working as pressure cooker, **KEEPING INSIDE THE GASSY FORMATIONS** of the elements of the alloy, avoiding the evaporation and the formation of oxides. It is normal, in fact, that the melt surface of the alloys produced using UNIKA® is not mirror; this effect is desired to meet the goals described above.
The multi-valence of the UNIKA® alloys consists in the possibility to have, at the same time, the advantages of deoxidized castings and a fine grain microstructure. This is made possible thanks to the discovery of a technique purposely studied to vanish the unwanted effects caused by the presence of silicon. It is **PURE INNOVATION** for the price to pay, with the alloys available up to now, has always been quite high: the breakings of castings were always in ambush.

UNIKA® alloys do not require particular working conditions which may impede to be **USED LIKE ANY OTHER MASTER**

UNIKA®plus

Thanks to their particular CHEMICAL COMPOSITION and the ADVANCED TECHNOLOGY USED FOR THEIR PRODUCTION UNIKA® master alloys can be used, with excellent results, in all the goldsmith's workings for the production of jewellery

ALLOY.
Their physical, mechanical and technological characteristics made them usable, by the production process' point of view, likewise the way you use any other master alloy of the same colour and finesses is used. Today UNIKA® alloys vanish this problem.

UNIKA® is produced and sold not in the traditional shape in drops but, for the particular chemical composition and the working cycle necessary for its production, in **SMALL CHIPS** of 8x8mm dimension and thick around 3mm.

UNIKA® is available for white, yellow and red gold and silver gold.
UNIKA® is sold in 500, 1000, 2500 and 5000 gram boxes.

All classifications on the fields of application of UNIKA® mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: i**nfo@progold.com**.

UNIKA®, the revolutionary family of Progold alloys adorns itself of UNIKA®plus

The polyvalence of the last-born UNIKA® is enriched by a new branch distinguished by the adjective Plus.

When the production needs of an item become a priority with respect to the correct placement of the feeders, then **UNIKA®plus** represents a guaranty for the final result. An incorrect feeders' setting will no longer display like shrinkage porosity onto the superficial layer of the piece.

The gold alloy produced using **UNIKA®plus**, thanks to the **PARTICULAR ALLOYING ELEMENTS USED**, has the capacity to push, and consequently **HIDE, ALL THE DEFECTS IN THE ITEM'S CORE**. Due to this, it is possible to achieve a high final quality. The quality obtainable is full and the **SURFACES** are **COMPACT AND WITHOUT DEFECTS** with a consequent saving in the usual time required by the polishing and finishing steps.

Thanks to the peculiar composition, **UNIKA®plus** helps the alloy to achieve a lower melting temperature if compared with the standards. This makes possible to reduce the interaction between the metal and the investment and, as a consequence, to notice an **ABSENCE OF GAS POROSITY**. If the production of pieces by investment casting is complex, **UNIKA®plus** grants a much better behaviour than its respective traditional range, increasing this way the filling capability without compromising the usual high mechanical resistance.

UNIKA®plus is available for red gold.
UNIKA®plus is sold in 500, 1000, 2500 and 5000 gram boxes.

All classifications on the fields of application of **UNIKA®plus** mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: **info@progold.com**.

A SOLUTION TO THE SPECIALISTIC WORKINGS PROGOLD OFFERS BRAND NEW AND SPECIFIC FORMULAS WITH FLEXIA®

Semi-finished products made using FLEXIA® are the starting point for the production of more beautiful, brighter and more time resistant jewels

FLEXIA® are used in not excessively hard plastic deformation workings. They are often chosen by producers who have **VERY STABLE AND SET-UP PRODUCTION PROCESSES**.

Their price is also lower compared to other Progold master alloys, due to the fact that their technological content and chemical composition are not at the same sophisticated levels as UNIKA® or GENIA® family products.

FLEXIA® is available for white, yellow and red gold.
FLEXIA® is sold in 500, 1000, 2500 and 5000 gram boxes.

All classifications on the fields of application of FLEXIA® mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: **info@progold.com**.

FLEXIA®plus

FLEXIA®plus achieving the maximum excellence

FLEXIA®plus,
SPECIALIZATION
marks FLEXIA® again!

FLEXIA® is the top for rolled sections, drawn wires, deep-drawn,
blockings and machined pieces

The master alloys of FLEXIA® family became way more performing and specific, for their composition was enriched by some new elements: this is how **FLEXIA®plus** master alloys were born. All the knowledge and specialization, achieved along the years for GENIA® master alloys, were used to create a new evolution of FLEXIA® family. The efforts were focused on plastic deformation, aiming to achieve forefront performances and behaviours.
The composition of **FLEXIA®plus** was **ENRICHED BY GRAIN REFINERS** which help it to be more performing if compared to a traditional alloy. Each type of **FLEXIA®plus** was planned, developed and specified as far as plastic deformation field is concerned.
The **FINE GRAIN** formula is able to grant the highest plasticity obtainable together with an extreme resistance to corrosion, the quality necessary for the production of hollow jewels. The hardest applications such as the **PRODUCTION OF ULTRA-LIGHT TUBES and HOLLOW ULTRA-LIGHT CHAINS** are the daily bread of the new generation of **FLEXIA®plus**. The master alloys for **ULTRA-HARDENING** belong to the new **FLEXIA®plus** generation. Difficult products like obtaining enough yellowish carat gold alloys for the production of 14 ct **HOLLOW CHAIN BY IRON CORE** (memorable problem for the experts of this production) are a new and recent enrichment of the **FLEXIA®plus** family.

FLEXIA®plus is available for white, yellow and red gold and silver.
FLEXIA®plus is sold in 500, 1000, 2500 and 5000 gram boxes.

All classifications on the fields of application of **FLEXIA®plus** mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: **info@progold.com**.

THE MODERN SOLUTION FOR INVESTMENT CASTING PROGOLD PRESENTS THE TRUSTHWORTHINESS OF ITS LUX® MASTER ALLOYS

THE BEST ITALIAN AND WORLD-KNOWN JEWELLERS, use LUX® for their production, confirming the great qualities and features it can ensure.

Widely known as the product for investment casting by Progold, LUX® earned, during the years, a place of primary importance in the goldsmith's world.
The main characteristic of gold alloyed with master alloys belonging to LUX® family is **DEOXIDATION**. The castings are, after casting, particularly deoxidized and clean, a fundamental feature, for example, for the castings with stones in place. But it is in this inner quality where is hidden the most important effect LUX® is able to guarantee: the elements responsible for deoxidation produce, on the surface of the molten alloys, a very stable compound which prevents the products of the reaction with the investment, in contact with the alloy during the flask's filling step, to be embedded into the alloy itself giving birth to the so-called **GAS POROSITIES**. This crucial feature had been deeply studied by Progold's Lab along the years and has been crowned with a research job presented at the most important **TECHNOLOGICAL CONGRESSES** of the field worldwide.
The **FILLING** capabilities of LUX® are another one of the quality this family has. The compositions are specifically set to have the best of the filling capabilities of the castings themselves. Even though, apparently, as cast they seem and actually are more viscous, the golden alloys produced using LUX® master alloys are able to get where the others don't and totally at **DEFINITELY INFERIOR TEMPERATURES**, with a consequent saving in terms of quality. In fact, lower temperatures mean less interactions between the alloy and the crucible, in case between the alloy and the environment and, as already stressed, between the alloy and the investment too. They are mostly master alloys which leave a little residual inside the crucible after casting, this is due to the particular chemical composition. Besides it may be seen as an "annoying" behaviour, it is actually necessary to grant the physical and technical characteristics of LUX®. The high viscosity allows LUX®, in fact, to produce a **BETTER LAMINAR MOTION** during the flask's filling step and consequently to vanish all those problems aroused by a turbulent motion, like a higher abrasion of the investment and its consequent inclusion. We are also sure that LUX®, in presence of highly pure raw materials, is able to grant the **TOTAL ABSENCE OF HARD SPOTS**, a common inconvenient among alloys for investment casting.

LUX®plus

LUX®plus, the continuous research of Progold Lab for lost-wax casting

LUX®plus, new master alloys for investment casting

New elements have been added to the reliable compositions of LUX® master alloys: this is how **LUX®plus** master alloys were born.
The alloys obtained using LUX® master alloys have been always able to display optimal castability features for lost-wax casting. The lower melting temperature achievable using **LUX®plus** reduces the interaction between the metal and the investment and as a consequence an absence of gas porosity.

When the production needs of an item become a priority with respect to the correct placement of the feeders, then **LUX®plus** represents a guaranty for the final result. An incorrect feeders' setting will no longer display like shrinkage porosity onto the superficial layer of the piece.

The gold alloy produced using **LUX®plus**, thanks to the particular alloying elements used, has the capacity to push, and consequently hide, all the defects into the item's core. Due to this, it is possible to achieve a high final quality. The quality obtainable is full and the surfaces are compact and without defect with a consequent saving in the usual time required by the polishing and finishing steps. The products of the new **LUX®plus** family are comparable, as far as their performances are concerned, with the products of GENIA®plus family, but they are exclusively released for investment casting.
Differently from the traditional family range, some modern grain refiners which enable a fine grain structure have been added to **LUX®plus**.

LUX®plus is available for white, yellow and red gold.
LUX®plus is sold in 500, 1000, 2500 and 5000 gram boxes.

All classifications on the fields of application of **LUX®plus** mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: **info@progold.com.**

The ratios of elements which make of LUX® an excellent master alloy for casting are perfectly set and strictly checked by the quality-check systems inside Progold's Lab. This means trustworthiness and LUX® **IS TRUSTWORTHY**.

LUX® is available for white, yellow and red gold.
LUX® is sold in 500, 1000, 2500 and 5000 gram boxes.

All classifications on the fields of application of LUX® mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address **info@progold.com**.

MASTER ALLOYS FOR SOLDERING PROGOLD PRESENTS: UNIBRAX®

UNIBRAX® FAMILY MASTER ALLOYS: the best available on the market today

UNIBRAX® range features products with **DIFFERENT CASTING TEMPERATURES** and, in some cases, with the same colour shade of the base alloys on which the solderingbrazing operations are carried on.

THE SOLDERING OF HOLLOW CHAINS, where the brazing wire is required to be resistant to the stressing torsion and bending cycles, finds in UNIBRAX® the solution purposely studied with high mechanical features.

UNIBRAX® are suitable both for the **PRODUCTION OF WIRES AND SHEETS**.

It is known that soldering containing higher percentages of low melting elements are the most critical for the transformation of wires and due to this, Progold puts on disposal a table for the choice of the most suitable product for each one's working. It is also true that this is not a rule valid for all producers. It is stated that it is possible to use the same UNIBRAX® for **BOTH THE PRODUCTIONS**, should they be either wires or sheets. Moreover, it is possible to use some **ULTRA LOWMELTING** UNIBRAX® for the transformation into wires, when the right and precise attention is paid to what Progold's Lab suggests in its **TECHNICAL CHARTS**, regarding the **ROLLING, ANNEALING AND DRAWING** cycles.

Some UNIBRAX® alloys are particularly suitable for **FILLING HAND-MADE CHAINS**. These operations are very critical, because during the phase after filling, when the chain is finished by diamond tool and polished, all the blow-holes arise due to presence of too many elements vaporizing at low temperatures. UNIBRAX® solved this problem.
The absence of cadmium grants to **AVOID WEIGHT LOSSES**, the main problem caused by this kind of element. No difficult may compromise the process during melting and casting phase caused by the vapours of the molten metal.
UNIBRAX® alloys **DO NOT GENERATE VAPOURS** of elements which come to the boil more than any other carat gold alloy usually employed for daily production.

THEY ARE COMPLETELY NOT TOXIC AND ALL COMPLETELY CADMIUM-FREE, UNIBRAX® ALLOYS ARE AVAILABLE FOR ALL FINENESSES AND COLOURS

UNIBRAX® is available for white, yellow and red gold and silver.
UNIBRAX® is sold in 500, 1000, 2500 and 5000 gram boxes.

All classifications on the fields of application of UNIBRAX® mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: **info@progold.com**.

NEW ULTRA-WHITE RANGE OF MASTER ALLOYS PROGOLD PRESENTS: BLANK®

THE ULTRA-WHITE RANGE OF PROGOLD MASTER ALLOYS WHICH CAN REALLY BE CALLED WHITE GOLD

THANKS TO THE COMBINATION OF NICKEL AND PALLADIUM, BLANK® is unique, much better than the alloys currently available on the market in terms of BRIGHTNESS and COLOUR

Progold launched on the market BLANK®, a line of master alloys for white gold with a **COLOUR VERY CLOSE TO RHODIUM**.

BLANK® was developed for all those producers aiming to obtain two great advantages:

- Study a line of jewels that may be offered to the public with the guaranty to lose never the brightness and the colour, the dark side of rhodium plated white gold items
- Continue to carry on the rhodium plating but on a very white base and avoid, once this last one is scratched away by wear abrasion, the item to be considered of poor quality for the great difference of rhodium and the colour underneath. It has to be underlined that rhodium plating made on a very white base grants a better result, in terms of brightness and colour.

BLANK® does not aim to avoid the rhodium plating process for the producers.

It was born, in fact, to be a **QUALITATIVE ALTERNATIVE TO RHODIUM OR AS AN ASSISTANT TO RHODIUM**. Besides, it is widely known how the rhodium film is not eternal and how, after a short amount of time, it leaves the jewels' surface.

BLANK® is a family of master alloys which combines together both the **"WHITENING EFFECTS"** of nickel and palladium, i.e. of both the elements usually employed in white gold alloys.
On the contrary of what is commonly thought, an excessive concentration of palladium does not lead white gold to be more similar to rhodium, but it makes it greyer; the brightness of white gold palladium-based alloys is very low and the perception at naked eye is of a darker colour, so exactly the opposite of what is the visual "message" provided by rhodium.

It has been therefore added nickel, which, in addition to increasing the brightness of the alloy, makes it closer to the rhodium colour.
By the tests carried on in Progold's Lab, the colour of BLANK100 - (750) and BLANK105 - (750) is considerably better than the alloys with a lot of palladium or with a lot of nickel.
They totally differ, in fact, from the typical alloys used for the common productions of white gold.

BLANK® requires, in any case, some compromises for its use. The hardness is high, but, at the same time, also the resistance reaches high values. During its development, Progold Lab's researchers found unpredictable technological qualities in BLANK®.
It owns, in fact, **EXCELLENT CASTABILITY** quality with **SO REDUCED SHRINKAGE FACTORS** making it being similar to the common yellow gold alloys which, as known, are precious alloys with the less contraction factor. Therefore BLANK® guarantees fantastic castings.

BLANK® has been tested also in the plastic deformation workings and, despite of the high hardness, is able to grant an **EXCELLENT COLD WORKABILITY** combined with **AN OPTIMAL PLASTICITY**.
THE MELTING AND CASTING TEMPERATURES ARE DEFINITELY LOWER than the traditional alloys for white gold palladium-based where, the resistance of the best investments in lost-wax casting and the castability in the common continuous casting machines, are hardly tested. During casting, BLANK® behaves exactly like the most diffused white gold nickel-based

VISUAL COMPARISON BETWEEN BLANK® ALLOYS AND TRADITIONAL ALLOYS

Alloy	YI	Yellowness index value	Grade	Explanation
Blank100 (750)	14,93	<19,0	Grade 1	The material does not require rhodium plating
Blank105 (750)	16,57	<19,0	Grade 1	The material does not require Rhodium plating
White gold alloy (750) with 12,5% Pd	21,12	19,0 - 24,5	Grade 2	Rhodium plating: optional
White gold alloy (750) with 7,5% Ni	23,12	19,0 - 24,5	Grade 2	Rhodium plating: optional

alloys.

According to the tables classifying the necessity for rhodium plating of a white gold jewel provided by the World Gold Council, BLANK® does not need rhodium plating for the excellent colour grade, as it can be understood by the table reported in this page.

BLANK® is available for white gold.
BLANK® is sold in 500, 1000, 2500 and 5000 gram boxes.

All classifications on the fields of application of BLANK® mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: **info@progold.com.**

BLANK100 - (750)

BLANK105 - (750)

White gold alloy - (750)
12,5% Pd

White gold alloy - (750)
7,5% Ni

THE MODERN ALTERNATIVE TO SILVER ALLOYS XILVER®: THE RESISTANCE TO TARNISH BY PROGOLD

XILVER® is an alloy to be used not only for the resistance to tarnish, BUT ALSO FOR THE TECHNOLOGICAL CHARACTERISTICS HIGHLY SUPERIOR TO THE TRADITIONAL SILVER ALLOYS

THE TRUST IN XILVER® IS WIDELY PAID BACK BY AN EXCELLENT QUALITY in the castings produced by using the lost-wax casting technique

XILVER® is Progold's "**ANTI-TARNISH**" range of silver alloys. More than two years were necessary to research and determine THE CHEMICAL COMPOSITION of this family and to set up a **TRUSTWORTHY SYSTEM** to quantify the resistance to tarnish, i.e. the goal Progold Lab was actually striving to achieve. The whole research has been crowned by a very important publication in the largest and most famous congresses of the field and by the deposit of the industrial patent regarding the chemical composition, but most of all the technique used to produce it.

XILVER® is a family of alloys counting today a series of important **"ANTI-TARNISH"** products.
This is an alloy that makes of the **RESISTANCE TO SULPHURATION AND TO OXIDATION** its main quality.
After all the tests carried on, we may say, without any doubt, that anti-tarnish to Progold Lab actually means to resist at least **THREE TIMES MORE** than the traditional alloys for Sterling silver (925Ag75Cu).
The tests were actually made in different conditions and, for a precise normative is not available to rule them, **PILOT METHODS** have been set up to simulate, the closer the possible, the daily conditions a jewel may face. The figure contained in these pages offer an example of the samples' state after a sulphuration test in an atmosphere rich of sulphur vapours made on pieces produced using different alloys, including XILVER®100. **NO NEED TO ADD ANY COMMENT AT ALL.**
XILVER® is not longing for resisting like the common silver plating's layers do, applied by galvanic processes to the silver items, which may contain elements inhibiting the reaction with Sulphur and therefore the tarnishing by sulphuration.
It actually wants to give a new vision of the possibilities you have:

- Use XILVER®, carry on the silver plating and with this last one put yourself in the conditions to have a maximum resistance, but with the certainty that, when the layer leaves the jewel's surface, the base alloy is the one able to give the best of the resistance to the atmospheric action

- Use XILVER® without any superficial silver plating aiming to appreciintensity of silver alloy

It has to be taken into consideration that the silver plating process is able to be more resistant than the anti-tarnish silver alloys present nowdays on the market, but it hides some limits which, instead of lengthening the life of the silver jewels, they shorten it for the undesired chemical reactions activating if the silver plating phase is not precisely carried on.
No alloy, though, is up-to XILVER® in terms of castability.

THE FACTOR OF CONTRACTION OF THIS ALLOY IS VERY LOW. Someone chose it not for its resistance to tarnish, but to this last reason.
The **VERY WHITE COLOUR** of XILVER® does not make you look back with nostalgia to the colour of pure silver. The **HARDNESS** it may reach, after a proper heat treatment, is identical to the common silver alloys, such as the **MECHANICAL CHARACTERISTICS**.
The **ANTI-AESTHETICAL FIRESTAINS** (Copper oxides) always in ambush, during the production of silver Jewelry, are **ONLY MEMORIES** using XILVER®. The problem has to be understood as totally solved.
XILVER® is an alloy to be used not only for the resistance to tarnish, but also for the technological characteristics highly superior to the traditional silver alloys.
The stability is another quality of XILVER® for being sold only as ready alloy. The main advantage is to grant **VERY HIGH PURENESS AND A VERY LOW CONTENT OF OXYGEN** in the alloy, which is physiologically always present inside the pure silver available on the market.
XILVER® is available for silver.
XILVER® is sold in 500, 1000, 2500 and 5000 gram boxes.
All classifications on the fields of application of XILVER® mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: **info@progold.com.**

The concentration of Oxygen of XILVER® is always less thanto

SOME TENS PPM'S, differently from the HUNDREDS PPM'S you usually have in silver alloys

XILVER100 **pure silver** silver-copper anti-tarnish competitor

THE NEW MASTER ALLOY FOR PLATINUM CASTING WITH AND WITHOUT STONES-IN-PLACE: PLATINA™

Platinum can be easily scratched, but thanks to PLATINA™100 hardness, after casting, is 200HV, which, after heat treatment, reaches 300 HV.
As a consequence the final item is more resistant to scratches and dents

PLATINA™100 has been formulated purposely to act, at first, on the temperature:
THE MELTING RANGE IS GREATLY DECREASED
with a consequent gain in terms of quality

PLATINA™100 was created for 950 ‰ platinum products thanks to the joint efforts of Progold Lab and Hubert Schuster (1952 - 2010), a man with an in-depth knowledge of this sector and widely recognized as one of the top experts for platinum casting with or without stones in place.
Progold's platinum master alloy represents an innovation on the market thanks to its quality and ability to be easily sold on a global scale. PLATINA™100 enables deoxidized castings and high surface quality thanks to inferior casting temperature compared to standard platinum. Casting with stones in place was made possible following specific steps to prepare and realize the model and thanks to the possibility to create thin pieces which are non-deformable.
The innovation in this master alloy makes it possible to keep the jewel shiny longer. Difficulties in removing the natural layer and polish are eliminated once and for all.

This product represents a clear innovation on the market; several platinum alloys exist that can give good results from a quality perspectice, but are difficult to suggest due to possible import restrictions.

The difficulty of working Platinum is undeniable and stones setting in the jewel is made even harder by the physical characteristics of the pure metal. PLATINA™100 guarantees a casting temperature lower than standard Platinum one.

Lower temperatures make possible to give place to less interactions between the alloy and the crucible and between the alloy and the investment.
The results are evident: **DEOXIDIZED CASTINGS AND HIGH SURFACE QUALITY**.
As a consequence, **USING PLATINA™100, IT IS POSSIBLE TO CAST WITH STONES IN PLACE, FOLLOWING SOME PRECISE STEPS FOR PREPARING THE MODEL AND ITS REALIZATION.**

Pure Platinum has a scarce mechanical resistance which is usually compensated by increasing the thickness of the jewel, of course compromising the final aesthetic appearance.

Progold has created PLATINA™100, a master alloy which offers unique possibilities of expression:
ITS PARTICULAR COMPOSITION ENSURES THE BEST RESULTS BY INVESTMENT CASTING BOTH WITH AND WITHOUT STONES IN PLACE

THANKS TO PLATINA™100, IT IS POSSIBLE TO FACE THIS PROBLEM AND CAST VERY THIN PIECES WHICH ARE EVEN NON DEFORMABLE.

PLATINA™100 guarantees the permanence of the jewel brightness for a longer time. In addiction, the difficulties in removing the natural layer and polish are automatically eliminated.

PLATINA™100 is available for platinum.
PLATINA™100 is sold in 250, 500, 1000 and 5000 gram boxes.

All classifications on the fields of application of PLATINA™100 mentioned above are provided purely as an indication. For further information, please contact Progold S.p.A. at the following email address: **info@progold.com.**

HOW TO SUGGEST THE CORRECT PRODUCT

TOOLS FOR READING AND UNDERSTANDING THE PHYSICAL, CHEMICAL, MECHANICAL AND TECHNICAL PROPERTIES OF THE GOLD, SILVER AND PLATINUM ALLOYS MADE USING PROGOLD MASTER ALLOYS.

Progold alloys are available for all the production application and for many colors. Here follows a brief introductory guide to facilitate the interpretation of the values on the tables, allowing the comparison and the choice of an article.
The parameters regarding the application field of each alloy are reported on the tables by means of a specific numbering sequence (increasing from 1 to 5). This way the application level of each alloy produced using Progold master alloys is represented.

HOW TO READ THE CODE

e.g. **CODE OF MASTER ALLOY** — GENIA116 - (917) — **MILLESIMAL FINENESS OF PRECIOUS METAL TO ADD TO THE MASTER ALLOY**

MILLESIMAL FINENESS OF PRECIOUS METAL CONTAINED IN THE ALLOY

HOW TO READ THE COLOUR ICONS

Au	**IT INDICATES THE YELLOW COLOUR OF THE GOLD ALLOY**
Au	**IT INDICATES THE GREEN COLOUR OF THE GOLD ALLOY**
Au	**IT INDICATES THE RED COLOUR OF THE GOLD ALLOY**
Au	**IT INDICATES THE PINK COLOUR OF THE GOLD ALLOY**

Au	**IT INDICATES THE WHITE COLOUR OF THE GOLD ALLOY**
Ag	**IT INDICATES THE TYPE OF PRECIOUS ALLOY (SILVER)**
Pt	**IT INDICATES THE TYPE OF PRECIOUS ALLOY (PLATINUM)**

ALLOYS TEST CONDITION

The values reported on the tables of the physical, mechanical and technological properties were outlined on following specimens:
- As cast
- Annealed (recrystallization)
- Hardened
- Wrought

Values of different physical and mechanical properties were outlined after casting and after annealing. Those values are reported on following tables. After annealing and after hardening were outlined only the hardness values were obtained. Those values are plotted on the graphs with best fit curves.

AS CAST STATE
The state of the material after casting regards the material cast into flasks quenched in water after different times of wait in the air:
- 6 minutes for alloys with a refined grain microstructure (grain smaller than 250 µm), that are quenched in water at a temperature of 20-30°C.
- 20 minutes for alloys with a big grain microstructure (grain above µ250 m), that are quenched in water at a temperature of 20-30°C.

ANNEALED (RECRYSTALLIZATION) STATE
Annealing parameters change only as function of the composition of the alloy, according to following table:

Caratage/Color	Temperature [°C]	Time [min]	Cooling
375/417/585 white gold	725	18	Fast in oil
750 white gold	700	18	Fast in oil
375/417/585 yellow, green, red, pink gold	675	18	Fast in water
750 yellow, green, red, pink gold	650	18	Fast in water
875/917 yellow, green, red, pink gold	650	18	Fast in water
925 silver	700	18	Fast in water
950 platinum	950	18	Fast in water

HARDENED STATE
Hardening heat treatment is carried out after a solubilization annealing. Parameters are reported on following table:

Caratage/Color	Temperature [°C]	Time [min]	Cooling
375/417/585 white gold	750	30	Fast in oil
750 white gold	725	30	Fast in oil
375/417/585 yellow, green, red, pink gold	700	30	Fast in water
750 yellow, green, red, pink gold	675	30	Fast in water
875/917 yellow, green, red, pink gold	675	30	Fast in water
925 silver	700	30	Fast in water
950 platinum	950	30	Fast in water

Afterwards, a hardening heat treatment is carried out, as reported on following table. For all the alloys, independently from their composition, a hardening heat treatment was carried out at three different temperatures (250-300-350°C), at different times as well (60-120-180 minutes).

Caratage/Color	Temperature [°C]	Time [min]	Cooling
375/417/585 white gold	250-300-350	60-120-180	Fast in oil
750 white gold	250-300-350	60-120-180	Fast in oil
750 palladium based white gold	400-500-600	60-120-180	Fast in water
375/417/585 yellow, green, red, pink gold	250-300-350	60-120-180	Fast in water
750 yellow, green, red, pink gold	250-300-350	60-120-180	Fast in water
875/917 yellow, green, red, pink gold	250-300-350	60-120-180	Fast in water
925 silver	500-300-350	60-120-180	Fast in water
950 platinum	400-500-600	60-120-180	Fast in water

Following graphs report the optimum hardness values, chosen as function of the variable time at one of the three tested temperatures.

WROUGHT STATE
The state of the wrought specimens considers the casting of the alloys into a mold at 350°C, with subsequent quenching in water and rolling with specific reduction of 40%, 60%, 80%, 90%.
After each reduction, the hardness of the specimen was measured, so to get the work hardening curve. Parameters are plotted as a best fit curve on the graphs.

PHYSICAL AND MECHANICAL PROPERTIES

DENSITY
This is a useful physical characteristic for determining the weight of the objects to be produced. In the case of equal volumes (considering two equal objects), a higher density alloy will determine a higher weight of the object produced; a lower density alloy will determine a lower weight of the object produced. Density is also useful to calculate the capacity of a ingot mold, a flask, a crucible, to calculate the semi-finished weight of a precious object and, however, in any calculation related to the mass.

ELONGATION
This mechanical characteristic is really important: the higher the elongation value shown in the tables, the higher the deformation on the object before breaking off.
On the contrary, it should be remembered that precious alloys with higher elongation usually have lower resistance
For hand made processing or for deep stamping, it is recommended to use alloys with high elongation value, taking general resistance into careful consideration, too.

DEEP DRAWING
This technological property is useful to evaluate the drawing depth that a metal sheet achives before breaking. It enables to choose a metallic alloy to be stamped, where a sheet is pressed by a punch inside a mold to give it the required shape. The higher the depth, the more the alloy is suitable for this working phase. It should be taken into account that the higher zinc concentration increases the deep drawing property of the gold alloys.

GRAIN SIZE
Each metallic alloy has a very own structure that depends mainly on its chemical composition and on its solidification and cooling conditions. All these factors give birth to a distinguishing characteristic among the different alloys: the grain size. The single crystals composing the crystalline building, that is the structure of alloys, are called grains. Grains define many chemical, mechanical and technological features, such as:

- Resistance to corrosion
- Ultimate tensile strength (UTS)
- Percent elongation to rupture (E%)
- Yield strength (YS)
- Resistance to hot tearing
- Deep drawing
- Scraps recasting capability
- Shrinkage porosity arrangement
- Surfaces reflectivity

All these features are ameliorative in alloys with a very well refined grain microstructure. But this phenomenon can not always be promoted, because the chemical composition is not suitable for the addition of this quality.

MELTING RANGES
This chart contains the melting ranges, the solidus and liquidus temperature, of all the gold and silver alloys you may possibly produce using the master alloys by Progold. Its aim is to provide a sight to this important information avoiding to go deeper into the reading of the technical charts of each product.
It should be taken into consideration that these are data detected with the help of scientific instruments (in this case the differential thermal analysis or better known as DTA) suitable for this kind of investigation and therefore way more sensitive of any other tool for the temperature detection in the common casting machines. Due to this, these values may never be compared to what is visible at naked eye by the operator, when the casting step is under observation. Phenomena such as thermal inertia may take to lead to overhasty and often wrong conclusions, regarding the data detectable in the casting machine during the passage between solid to liquid, compared to what is written in these pages or in the technical charts of the product. The data here reported are a mirror of the real physical behaviour of the alloy. It is a true and objective value totally independent from the type of casting machine used. In fact, as everyone knows, the sensation regarding the casting temperature of an alloy changes in function to the machine used and the quantity cast. This proves that, using the same quantity of alloy, two different machines may have different detections regarding the casting temperature. This is almost unacceptable for the same master alloy. The casting temperature of an alloy is an inner feature independent from the machine used. Therefore, if the comparison is made, the reference value has to be always the data reported in the tables here following or in the technical chart of the product itself. The values here indicated must not be confused with the casting temperatures of the alloys produced using Progold alloys. Usually, in fact, the casting tem-

perature of an alloy should be contained inside a range between +100°C up to +150°C with reference to the liquidus temperature of the alloy. It is certain that the machine used and the aim of the casting process do influence the temperature choice in-between this range.

HARDNESS

This is a fundamental mechanical characteristic in the choice of an alloy. The higher the hardness value shown in the tables (hardness Vickers [HV]), the higher the hardness of alloy is.
In stone casting, as well for products in which you have to set stones and for hand made objects, it is recommended to use alloys with low hardness; for the production of empty objects, it is recommended to use alloys with similar hardness to support shapes materials; in the case of very thin, slight or super-light products, it is recommended to use alloys that can e hardened with heat treatment. The tables indicate the hardness values after casting, after annealing and after hardening. However it is important to remember that high hardness does not necessarily mean brittleness. White gold alloys of the Genia family are, for example, more resistant than the Flexia family ones. This is not due to lower hardness (indeed, in some cases this value is also higher), but it is due to a completely different structure.

YIELD STRENGHT

In order to understand the valency of the yield strength value, it is helpful to make this type of consideration: the higher the value is, the higher the elastic field of the precious alloy is (and, consequently, its elasticity).
This mechanical characteristic is closely tied to all the others (hardness, elongation %, tensile strength and yield strength). For the production of springs it is recommended to use alloys with high yield strength. For manual processing it is recommended to use alloys with low yield strength.

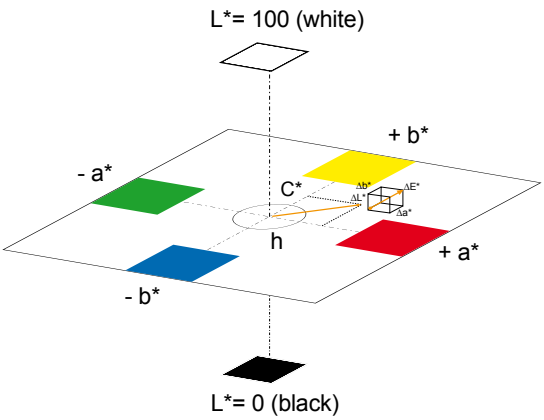
TENSILE STRENGHT

This is another mechanical characteristic which is very important fr the choice of an alloy: if tensile strength is increased, alloy resistance is also enhanced; greater force is required to break it off. This mechanical characteristic, too, is closely tied to the others and depends on them.
If strong drawing passages must be executed, it is recommended to use alloys with high tensile strength, which are able to ensure high resistance during drawing efforts.

COLOUR

Colour is one of the main requirements a master alloy has to grant. This brief text is aimed to clarify the modalities of reading and interpretation of the chromatographic coordinates.
The tables are reporting the values of the 3 chromatographic coordinates (L*, a*, b*) which, if compared, outline even unperceivable differences among the alloys with the same colour tone. The diagram over here provides, instead, a graphic support which facilitates the comprehension.
Letter “L*” defines the brightness of the colour: the higher is its value, the higher is the reflection of the light supplied by the metal and, as a consequence, the brightness and brilliance of the surfaces.
Letter “a*” indicates the chromatographic coordinate which goes, with a negative sign towards green colour, with a positive sign towards red colour. For example, comparing the value “a*” for the items GENIA109 - (750) a*=5,35 and GENIA110 - (750) a*=3,14, both for yellow gold, it can be deduced that the use of GENIA109 - (750) is advised for a colour tending to red when compared to GENIA110 - (750).
Letter “b*” identifies the chromatographic coordinate which goes, with a negative sign towards blue, with a positive sign towards yellow. For example, comparing the values “b*” for the items GENIA109 - (750) b*=22,85 and GENIA110 - (750) =24,56, both for yellow gold, it can be understood that the use of GENIA110 - (750) is suggested for a colour closer to yellow than GENIA109 - (750). If you compare the values “b*” for the items GENIA104 - (750) and GENIA106 - (750), both for white gold, it can be realized that the use of GENIA104 - (750) is suggested to have a result closer to blue (i.e. less yellow and in small words whiter) than GENIA106 - (750).
Such comparison is valid for all the alloys and whatsoever application.

CIELab COLOUR SPACE



APPLICATION FIELD

MOULD CASTING

For this sort of production, the most suitable master alloys have the following characteristics: a chemical composition which does not contain certain high percentages of elements that evaporate at low temperature, thus avoiding blowings in the single ingots produced or that evaporating may modify the characteristics of the alloy itself; a Liquidus temperature inferior than 1000°C for avoiding a premature solidification during the passage of the crucible towards the casting area; a chemical composition which promotes the formation of a grain refined structure even with slow-cooling conditions during the casting process; a chemical composition which reacts the less the possible with the oxygen present in the atmosphere.

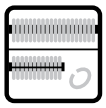
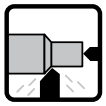
CONTINUOUS CASTING WITHOUT COOLING SYSTEM

For this sort of production, the most suitable master alloys have the following characteristics: a Liquidus temperature inferior to 1025°C to easy the drawing of the pieces during the casting phase; a chemical composition which promotes the formation of a grain refined structure even in slow-cooling conditions during the casting process; a chemical composition which helps to reduce the friction and gripping effects of the bar on the die during the casting process; a chemical composition which does not promote the formation of secondary phases with a slow cooling; these last ones influence the microstructural features of the alloy and, consequently, the behaviour of the same during cold working.

CONTINUOUS CASTING WITH COOLING SYSTEM 	For this sort of production, the most suitable master alloys have the following characteristics: a Liquidus temperature inferior to 1025°C to easy the drawing of the pieces during the casting phase; a chemical composition which promotes the formation of a grain refined structure even in improper cooling conditions during the casting process; a chemical composition which helps to reduce the friction and gripping effects of the bar on the die during the casting process; a chemical composition which does not promote the formation of secondary phases (due to an improper cooling), these last ones influence the microstructural features of the alloy and, consequently, the behaviour of the same during cold working
CENTRIFUGAL CASTING 	For this sort of production, the most suitable master alloys have the following characteristics: a chemical composition with an adequate concentration of refining elements; a chemical composition able to confer the alloy the required viscosity in order to be affected, the less the possible, by turbulence during the pouring step.
CASTING BY OPEN SYSTEMS 	For this sort of production, the most suitable master alloys have the following characteristics: a Liquidus temperature inferior to 1000°C for avoiding a premature solidification during the passage of the crucible towards the casting area; a chemical composition which favours an elevate fluidity and the alloy's form filling capability; a chemical composition with an adequate concentration of deoxidizing elements; a chemical composition which reacts the less the possible with the oxygen present in the atmosphere.
CASTING BY VACUUM SYSTEMS 	For this sort of production, the most suitable master alloys have the following characteristics: a chemical composition which favours an elevate fluidity and the flask's form filling capability; a chemical composition which guarantees a reduced quantity of residuals in the crucible; a chemical composition with the lesser concentration the possible of elements which evaporate at low temperatures especially in depressurized conditions; a chemical composition with a reduced concentration of deoxidizing elements which excess may favour an undesired brittleness.

CASTING WITHOUT STONES IN PLACE 	For this sort of production, the most suitable master alloys have the following characteristics: a casting range the stricter the possible to help reducing the noticeability of shrinkage defects; a chemical composition which promotes the formation of a grain refined structure to help avoiding the presence of shrinkage defects; a chemical composition with an adequate concentration of deoxidizing elements; a chemical composition which does not promote the formation of low-melting phases even in case of slow cooling – this last one is causing breakings during the assembling phases or deformations of the pieces.
CASTING WITH STONES IN PLACE 	For this sort of production, the most suitable master alloys have the following characteristics: a Liquidus temperature inferior to 1000°C for reducing the thermal impact on the stones; a casting range the stricter the possible to reduce the pressure the alloy is making onto the stones during the cooling step; a chemical composition which promotes the formation of a grain refined structure to help shrinkage being well-distributed and a consequent reduced pressure on the stones during cooling into the flask, together with a decreased presence of shrinkage defects; a chemical composition with an adequate concentration of deoxidizing elements which helps to preserve the surfaces underneath from oxidation.
HANDWORKING 	For this sort of production, the most suitable master alloys have the following characteristics: dimension of the grain – this is not too fine to reduce the stress necessary for the hand deformation; a low hardness value aiming to easy the deformation the goldsmith has to hand make on the alloy; an elevate percentage stretching for adapting to any shape during deformation.
FLAT-BOTTOM STAMPATO 	For this sort of production, the most suitable master alloys have the following characteristics: a chemical composition which promotes the formation of a grain refined structure to reduce as much as possible the formation of the "orange peel" defect during the stamping step; high drawing; the capability of the alloy to be hardeneable most of all for the flat part of the item thus avoiding the dipping problem during the cutting step; a chemical composition which does not promote the formation of low-melting phases even in case of slow cooling – this last one is causing breakings during next stamping steps.
DOUBLE STAMPATO 	For this sort of production, the most suitable master alloys have the following characteristics: a chemical composition which promotes the formation of a grain refined structure to reduce as much as possible the formation of the "orange peel" effect during the stamping step; high drawing; the capability of the alloy to be hardeneable especially when producing very thin items.

HANDMADE SOLID CHAIN 	For this sort of production, the most suitable master alloys have the following characteristics: a chemical composition which promotes the formation of a grain refined structure to reduce as much as possible the formation of the “orange peel” defect during the chain’s production; a low hardness aiming to avoid a too elastic behaviour of the alloy and as a consequence, granting a constant distance between the strips of the chain itself favouring a good soldering; a an elevate percentage’s stretching for adapting to any shape during deformation without too much hard manual stresses.
MACHINE MADE SOLID CHAIN 	For this sort of production, the most suitable master alloys have the following characteristics: a Solidus temperature (beginning of melting) inferior to 1000°C to ease the powder soldering process; a chemical composition which promotes the formation of a grain refined structure to reduce as much as possible the formation of the “orange peel” defect during the chain’s production; a chemical composition which avoids or at least does not promote the formation of oxides layers or superficial compounds impeding the weldability of the chains by powder soldering; for nickel-based white gold the concentrations of this very last element are low for avoiding a too elastic behaviour of the alloy and, as a consequence, granting a constant distance between the strips of the chain itself favouring its soldering; the lowest hardness the possible to avoid the phenomenon described above; zinc concentration enough to grant stretching at best.
HANDMADE HOLLOW CHAIN 	For this sort of production, the most suitable master alloys have the following characteristics: a chemical composition which promotes the formation of a grain refined structure to reduce as much as possible the formation of the “orange peel” defect during the chain’s production and to increase the resistance to acid during the emptying process; a silver concentration able to improve much further the resistance to corrosion during the emptying process; the ability to be hardenable in case of ultra-light hollow chains.
MACHINE MADE HOLLOW CHAIN 	For this sort of production, the most suitable master alloys have the following characteristics: a Solidus temperature (beginning of melting) higher than 850°C in order to grant the weldability of the core, when this is made of Iron; a chemical composition which promotes the formation of a grain refined structure to reduce as much as possible the formation of the “orange peel” defect during the chain’s production and to increase the resistance to acid during the emptying process; a silver concentration able to improve much further the resistance to corrosion during the emptying process; the ability to be hardenable in case of ultra-light hollow chains.

ITEMS BY SOLDERED TUBE 	For this sort of production, the most suitable master alloys have the following characteristics: a chemical composition which promotes the formation of a grain refined structure to reduce as much as possible the formation of the “orange peel” defect during the tube’s coiling and to increase at best the resistance to the acid’s attack during the emptying out; a silver concentration able to increase further the resistance to corrosion during the emptying out process; the capability of being hardened when dealing with very thin tubes; a not too high Solidus temperature which grants a sort of “plating” of the alloy with the core and preserves from the formation of “wrinkles” during the tube’s coiling steps.
MACHINE TOOL PRODUCTION 	For this sort of production, the most suitable master alloys have the following characteristics: a hardness which may preserve the lasting time of the tools; a chemical composition which promotes the formation of a grain refined structure granting a higher brightness of the surfaces.
SOLDERING SHEET 	For this sort of production, the most suitable soldering master alloys have the following characteristics: a higher concentration of low-melting elements (% of In, Ga and Zn); generally, a lower Liquidus temperature and a better flowability.
SOLDERING WIRE 	For this sort of production, the most suitable soldering master alloys have the following characteristics: a chemical composition (% of In, Ga and Zn) which does not promote the formation of secondary phases due to a slow cooling. This last one is the cause of the alloy’s hardening and a consequent difficulty in cold working; generally, a higher Liquidus temperature and a reduced flowability.

COLOUR DESIGNATION: EUROPEAN DIRECTIVE

Colour designation	Chemical composition [‰]		
	Au	Ag	Cu
0N	585	300 to 340	Balance
1N	585	240 to 265	Balance
2N	750	150 to 160	Balance
3N	750	120 to 130	Balance
4N	750	85 to 95	Balance
5N	750	45 to 55	Balance

NICKEL: EUROPEAN DIRECTIVE

Progold made tests for nickel release at some credited chemical laboratiories, as amended by the European Directive 94/27/EC.
The samples used for the above mentioned tests are purposely made in the Progold's laboratories following an internal methodology which simulates, but not fully reproduces, the working cycle carried out when making the finished pieces.
The use of nickel should be limited, in fact its presence in certain items which come into direct and long contact with the skin, may cause sensitization of human bodies to product and might lead to allergic reactions.
Progold would like to stress that these results are making reference only to our samples. nickel release is influenced, in fact, by a large number of factors.
The Directive 94/27/EC amends that the resellers or the producers of finished pieces must grant the conformity by sampling tests on its production batches.

From the Eropean Directive
From the European Directive 76/796/CEE, modify by the European Directive 94/27/CE, subsequently modify by the European Directive 2004/96/CE.
Nickel may not be used:
1) in post assemblies which are inserted into pierced ears and other pierced parts of the human body, unless nickel release of the abovementioned metallic assemblies is less than 0.2 µg/cm2/week (limit of migration)."
2) in products intended to come into direct and prolonged contact with the skin such as:
- earrings,
- necklaces, bracelets and chains, anklets, finger rings,
- wrist-watch cases, watch straps and tighteners,
- rivet buttons, tighteners, rivets, zippers and metal marks, when these are used in garments.

3) In products listed in point 2 above where these have a non-nickel coating unless such coating is sufficient to ensure that the rate of nickel release from those parts of such products coming into direct and prolonged contact with the skin will not exceed 0.5 µg/cm²/week for a period of at least two years of normal use of the product.
Furthermore, products which are the subject of points 1, 2 and 3 above, may not be placed on the market unless they conform to the requirements set out in those points.
4) If the rate of nickel release from the parts of these products coming into direct and prolonged contact with the skin is greater than 0.5 µg/cm²/week;

HOW TO READ THE APLLICATION

The parameters regarding the application field of each alloy are reported on the tables by means of a specific numbering sequence (increasing from 1 to 5). This way the application level of each alloy produced using Progold master alloys is represented.

1	NOT SUGGESTED. WHEN DECIDED TO USE IT, PLEASE CONTACT PROGOLD'S TECHNICAL DEPARTMENT FOR FURTHER SIDE EFFECTS
2	PRODUCT FAIRLY SUITABLE FOR THIS SORT OF APPLICATION OR PRODUCTION STEP
3	PRODUCT WELL SUITABLE FOR THIS SORT OF APPLICATION OR PRODUCTION STEP
4	PRODUCT EXCELLENTLY SUITABLE FOR THIS SORT OF APPLICATION OR PRODUCTION STEP
5	PRODUCT ABSOLUTELY SUITABLE FOR THIS SORT OF APPLICATION OR PRODUCTION STEP

917/875 Gold/Yellow

GENIA116
Master alloy suitable for the production of 9, 10, 14, 21 and 22 ct yellow gold alloys (Ag5Zn10). The resulting alloy is for the production of hollow chains. Gold plating is recommended. This gold alloy does not lend itself for hardening. Its melting temperature is high, therefore it enables melting of the soldering within the support section of hollow chains. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

GENIA146
Plus-category master alloy suitable for the production of 21 and 22 ct yellow gold alloys (Ag6Zn6Ga12). The gold alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with or without stones in place. Its main feature is high hardening following proper heat treatment. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

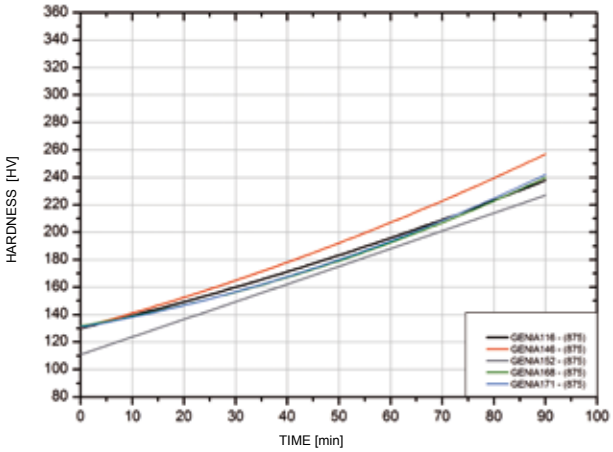
GENIA152
Plus-category master alloy suitable for the production of 21 ct yellow gold alloys (Ag40Zn4Ga6). The gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with or without stones in place. Its main features are very high hardening following proper heat treatment and a very intense and warm colour. During plastic deformation it can be cast and melted with both traditional casting methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

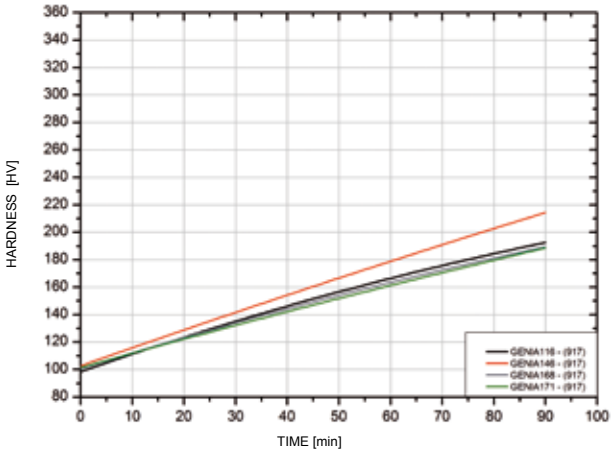
GENIA168
Master alloy suitable for the production of 21 and 22 ct yellow gold alloys (Ag14Zn6). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with and without precious stones. This gold alloy does not lend itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA171
Master alloy suitable for the production of 21 and 22 ct yellow gold alloys (Ag18Zn5). The resulting alloy is for the production of solid and hollow chains, earrings, bracelets and tube rings; investment cast items with and without stones in place. This gold alloy does not lend itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

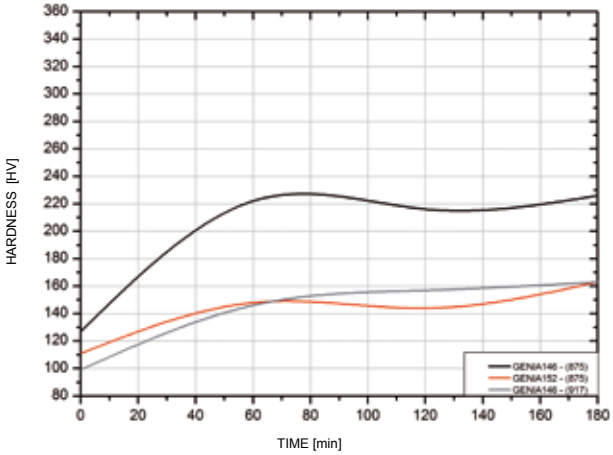
	Au		GENIA146 - (917)	GENIA168 - (917)	GENIA171 - (917)	GENIA116 - (875)	GENIA146 - (875)	GENIA152 - (875)	GENIA168 - (875)	GENIA171 - (875)
Physical and mechanical properties	Density [g/cm³]	17,4	17,39	17,3	17,35	16,64	16,6	16,9	16,5	16,6
	Temperature Solidus [°C]	926	801	939	942	899	787	772	912	915
	Temperature Liquidus [°C]	948	936	960	961	912	893	940	926	929
	Colour coordinates [L*]	86,85	86,9	86,05	86,55	87,37	87,03	88,24	86,28	87,1
	Colour coordinates [a*]	8,61	5,57	9,95	8,91	8,29	4,71	4,11	9,28	8,9
	Colour coordinates [b*]	24,46	22,57	23,15	24,01	21,68	19,2	24,19	22,6	21,8
	Grain size as cast [µm]	93	125	99	98	284	197	191	150	140
	Deep drawing test after annealing [mm]	9,3	9,4	9,3	9,3	9,8	9,3	9,2	9,8	9,8
	Ultimate tensile strenght after annealing [MPa]	325	339	330	329	389	420	374	385	388
	Yield strenght after annealing [MPa]	157	178	152	155	221	245	195	215	220
	Percent elongation after annealing [%]	27	32	28	28	37	35	32	37	37
	Ultimate tensile strenght as cast [MPa]	320	327	319	318	363	348	345	355	358
	Yield strenght as cast [MPa]	137	154	135	136	162	163	141	160	158
	Percent elongation as cast [%]	42	46	42	42	55	48	48	52	53
	Hardness as cast [HV]	92	97	94	95	120	128	112	118	119
	Hardnessafter annealing [HV]	89	99	95	95	123	127	111	120	120
Application field	Mould casting	4	4	4	4	4	4	4	4	4
	Continuous casting without cooling system	4	4	4	4	4	4	4	4	4
	Continuous casting with cooling system	4	4	4	4	4	4	4	4	4
	Handworking	3	3	3	3	3	3	3	3	3
	Flat-bottom stampato	2	2	2	2	2	2	2	2	2
	Double stampato	2	3	2	2	2	3	3	2	2
	Handmade solid chain	3	4	3	3	3	4	4	3	3
	Machine made solid chain	5	5	5	5	5	5	5	5	5
	Handmade hollow chain	3	5	3	3	3	5	5	3	3
	Machine made hollow chain	3	5	3	3	3	5	5	3	3
	Items by soldered tube	3	5	3	3	3	5	5	3	3
	Machine tool production	3	3	3	3	3	3	3	3	3
	Centrifugal casting	3	3	3	3	3	3	3	3	3
	Casting by open systems	3	3	3	3	3	3	3	3	3
	Casting by vacuum systems	4	4	4	4	4	4	4	4	4
	Casting without stones in place	4	4	4	4	4	4	4	4	4
	Casting with stones in place	3	3	3	3	3	3	3	3	3

COLD WORKING GRAPHS





HARDENING GRAPH



FLEXIA106
Master alloy suitable for the production of 9, 10, 14 and 18 ct red gold alloys (Cu78.5Zn4.5). The resulting alloy is for the production of stamped items and solid chains. The colour of the 18 ct gold alloy corresponds to 5N, as defined by the EN28654 standard (when 5,5% of silver is added). The colour of the 14 ct gold alloy is widely known as "Russian Red". Only the 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA107
Master alloy suitable for the production of 9, 10, 14 and 18 ct red gold alloys (Cu87Zn3). The resulting alloy is for the production of stamped items and solid chains. Only the 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA108
Master alloy suitable for the production of 9, 10, 14 and 18 ct red gold alloys (Cu92Zn3). The resulting alloy is for the production of stamped items and solid chains. Only the 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA112
Master alloy suitable for the production of 9, 10, 14 and 18 ct red gold alloys (Cu81Zn1). The resulting alloy is for the production of stamped items and solid chains. The colour of the 18 ct gold alloy corresponds to 5N, as defined by the EN28654 standard. The colour of the 14 ct gold alloy is widely known as "Russian Red". The 18 ct gold alloy lends itself well for hardening and fairly well for other finenesses. Use of traditional mould casting methods is recommended.

FLEXIA126
Master alloy suitable for the production of 9, 10, 14 and 18 ct red gold alloys (Cu96Zn2). The resulting alloy is for the production of stamped items and solid chains. The red hue is the most intense among the entire range of Progold red gold alloys. Only the 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA150
Plus-category master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu83Zn6). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. This gold alloy is not suitable for hardening. Its main feature is high plasticity which enables wrought and pressed chains. This gold alloy has a fine grain microstructure. It can be used with all casting methods (mould casting and continuous casting).

FLEXIA161
Plus-category master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu83Zn6). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. This gold alloy does not lend itself for hardening. Its main feature is high plasticity which enables wrought and pressed chains. This gold alloy has a fine grain microstructure. It can be used with all casting methods (mould casting, continuous casting).

GENIA100
Master alloy suitable for the production of 9, 10 and 14 ct red alloys (Cu81Zn1). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with or without precious stones. The 14 ct gold alloy hue is commonly known as "Russian Red". This gold alloy lends itself quite well for hardening. During plastic deformation it can be cast and melted using both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA101
Master alloy suitable for the production of 9, 10 and 14 red gold alloys (Cu92Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without stones in place. This gold alloy does not lend itself for hardening. Casting using traditional methods (mould casting) is suggested during plastic deformation; during investment casting it can be cast with all the most common techniques.

GENIA103
Master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu87Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without precious stones. This gold alloy does not lend itself for hardening. Casting using traditional methods (mould casting) is suggested during plastic deformation. It can be cast with all the most common investment casting methods during investment casting.

GENIA148
Master alloy suitable for the production of 18 ct red gold alloys (Cu81Zn1). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, investment cast items with and without stones in place. The colour is 5N according to EN 28654 standards. The gold alloy lends itself for hardening. During plastic deformation it can be cast with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA149
Master alloy suitable for the production of 18 ct red gold alloys (Cu93Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with and without stones in place. The gold alloy lends itself very well for hardening. During plastic deformation it can be cast with traditional methods (mould casting); all the most common investment casting techniques can be used.

GENIA150
Master alloy suitable for the production of 18 ct red gold alloys (Cu87Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with and without stones in place. The gold alloy lends itself very well for hardening. During plastic deformation it can be cast with traditional methods (mould casting); all the most common investment casting techniques can be used.

GENIA162
Master alloy suitable for the production of red gold alloys (Cu94Zn3.5) in 9, 10 and 14 ct. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets, tube rings and investment cast articles with or without stones in place. This gold alloy does not lend itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all themost common investment casting techniques can be used.

GENIA164
Master alloy suitable for the production of 9, 10 and 14 red gold alloys (Cu81Zn1). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with and without stones in place. The 14 ct gold alloy hue is commonly known as "Russian Red". This gold alloy lends itself quite well for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA165
Master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu87Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without stones in place. This gold alloy does not lend itself for hardening. During plastic deformation it can be cast and melted with both

traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA166
Master alloy suitable for the production of 9, 10 and 14 red gold alloys (Cu92Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without stones in place. This gold alloy does not lend itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA169
Master alloy suitable for the production of 18 ct red gold alloys (Cu81Zn1). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with and without stones in place. The colour is a 5N according to the EN 28654 normative. The gold alloy lends itself for hardening. During plastic deformation it can be cast both using traditional methods (mould casting) and continuous casting: it is especially recommended with continuous casting. All the most common investment casting techniques can be used.

GENIA172
Master alloy suitable for the production of 18 ct red gold alloys (Cu87Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without stones. The alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting; it is especially recommended with continuous casting. All the most common investment casting techniques can be used.

GENIA173
Master alloy suitable for the production of 18 ct red gold alloys (Cu93Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without stones. The alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting; it is especially recommended with continuous casting. All the most common investment casting techniques can be used.

GENIA192
Plus-category master alloy suitable for the production of 18 ct red gold alloys (Cu83Zn1). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, investment cast items with and without stones in place. The colour is 5N, according to the EN 28654 normative. The gold alloy lends itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. The gold alloy displays an excellent resistance to oxidation at high temperatures.

GENIA193
Master alloy suitable for the production of 18 ct red gold alloys (Cu89Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with and without stones in place. The gold alloy lends itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. The gold alloy displays an excellent resistance to oxidation at high temperatures.

LUX134
Master alloy suitable for the production of 9, 10 e 14 ct red gold alloys (Cu82Zn5). The resulting alloy is for the production of investment cast items with or without precious stones. The 14 ct gold alloy hue is commonly known as “Russian Red”. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX150
Plus-category master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu82Zn4). The resulting alloy is for the production of investment cast items with or without stones in place. This gold alloy does not lend itself for hardening. The 14 ct alloy hue is commonly known as “Russian Red”. It is particularly recommended for complex pieces with flat surfaces, which may have shrinkage porosity. All the most common investment casting techniques can be used.

LUX158
Plus-category master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu84Zn1.2). The resulting alloy is for the production of investment cast items with and without stones in place. This gold alloy does not lend itself for hardening. The 14 ct gold alloy hue is commonly known as “Russian Red”. It is especially recommended for the production of complex items with flat surfaces, which may display shrinkage porosity. All the most common investment casting techniques can be used.

LUX159
Plus-category master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu82Zn4). The resulting alloy is for the production of investment cast items with and without stones in place. This gold alloy does not lend itself for hardening. The 14 ct gold alloy hue is commonly known as “Russian Red”. It is particularly suggested for the production of complex items with flat surfaces, which may display shrinkage porosity. All the most common investment casting techniques can be used.

LUX167
Master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu96Zn2). The resulting alloy is for the production of investment cast items with or without precious stones. The red hue is the most intense among the entire range of Progold red gold alloys. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

UNIKA100
Master alloy suitable for the production of red gold alloys (Cu81Zn5) in 9, 10 and 14 ct. The resulting gold alloy is for the production of stamped items, handmade solid and hollow chain, earrings, bracelets, tube rings and investment cast items with and without stones in place. This gold alloy does not lend itself for hardening. The 14 ct gold hue is commonly known as “Russian Red”. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. Its use is recommended only when casting takes place in casting machines under controlled atmosphere (reducing flame, inert atmosphere, boric acid).

UNIKA101
Master alloy suitable for the production of red gold alloys (Cu80Zn2.4) in 9, 10 and 14 ct. The resulting alloy is for the production of stamped items, handmade solid and hollow chain, earrings, bracelets, tube rings and investment cast articles with or without stones in place. This gold alloy does not lend itself for hardening. The 14 ct gold hue is commonly known as “Russian Red”. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. However its use is recommended only when casting takes place in casting machines under controlled atmosphere (reducing flame, inert atmosphere, boric acid).

UNIKA110
Plus-category master alloy suitable for the production of red gold alloys (Cu82Zn4) in 14 ct. The resulting gold alloy is for the production of stamped items, handmade solid and hollow chain, earrings, bracelets, tube rings and investment cast items with and without stones in place. This gold alloy does not lend itself for hardening. The 14 ct gold hue is commonly known as “Russian Red”. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; during investment casting it is suggested for the production of complex items with flat surfaces, which may display shrinkage porosity, and it can be cast using all the most common methods. However its use is recommended only when casting takes place in casting machines under controlled atmosphere (reducing flame, inert atmosphere, boric acid).

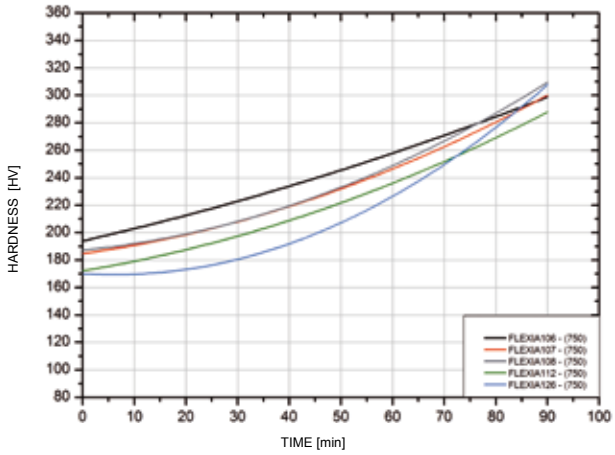
750/585 **Gold**/Red

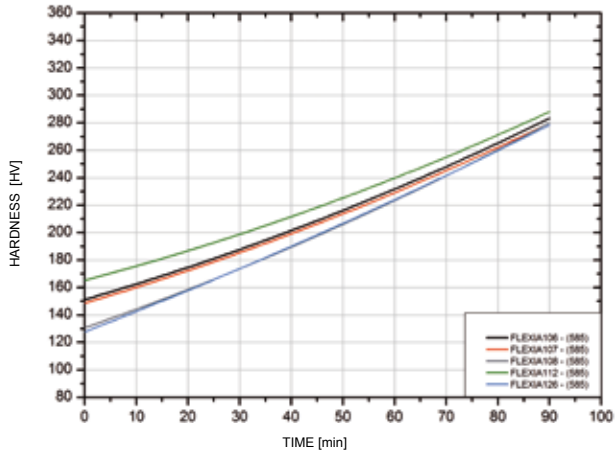
	Au	FLEXIA106 - (750)	FLEXIA107 - (750)	FLEXIA108 - (750)	FLEXIA112 - (750)	FLEXIA126 - (750)	GENIA148 - (750)	GENIA149 - (750)	GENIA150 - (750)	GENIA169 - (750)	GENIA172 - (750)	GENIA173 - (750)	GENIA192 - (750)	GENIA193 - (750)	FLEXIA106 - (585)	FLEXIA107 - (585)	FLEXIA108 - (585)	FLEXIA112 - (585)	FLEXIA126 - (585)
Physical and mechanical properties	Density [g/cm³]	14,91	14,86	14,77	14,94	14,77	14,96	14,79	14,84	14,93	14,84	14,79	14,89	14,8	12,81	12,96	12,87	13,06	12,86
	Temperature Solidus [°C]	885	896	895	885	912	890	900	891	890	891	900	849	852	865	897	925	872	940
	Temperature Liquidus [°C]	896	905	903	892	918	896	906	899	896	899	906	886	891	899	926	942	906	953
	Colour coordinates [L*]	86,67	85,77	85,61	86,12	85,06	85,7	85,48	86,11	86,47	86,11	85,48	87,31	87,06	88,54	83,91	85,92	87,27	85,11
	Colour coordinates [a*]	7,98	9,06	9,31	8,69	9,6	9,04	9,44	9,12	8,88	9,12	9,44	8,42	8,52	7,3	9,24	8,78	8,42	9,37
	Colour coordinates [b*]	18,57	16,43	16,26	17,6	15,13	17,52	16,02	16,92	17,67	16,92	16,02	17,49	16,98	16,97	15,02	14,38	15,89	13,16
	Grain size as cast [µm]	1060	1334	1955	1523	787	124	129	132	124	130	125	135	140	822	988	1926	943	989
	Deep drawing test after annealing [mm]	9	8,8	8,7	8,6	8,9	8,3	8,1	8,3	8,7	8,3	8,1	8,7	8,3	9,7	9,1	10,6	9,2	9,7
	Ultimate tensile strenght after annealing [MPa]	494	501	506	502	486	546	584	562	503	562	584	479	491	508	584	492	550	567
	Yield strenght after annealing [MPa]	327	334	363	350	340	350	374	361	336	361	374	327	332	293	323	234	328	296
	Percent elongation after annealing [%]	33	35	27	29	27	33	28	27	32	27	28	35	32	43	31	40	36	30
	Ultimate tensile strenght as cast [MPa]	...	...	...	...	...	471	467	458	460	458	467	415	422	...	...	...	...	...
	Yield strenght as cast [MPa]	...	...	...	...	...	334	330	316	331	316	330	243	240	...	...	...	...	...
	Percent elongation as cast [%]	...	...	...	...	...	46	46	47	46	47	46	43	45	...	...	...	...	...
	Hardness as cast [HV]	...	...	...	...	...	196	219	203	202	203	219	175	178	...	...	...	...	...
	Hardnessafter annealing [HV]	183	204	218	186	205	205	226	210	209	210	225	161	162	147	151	127	152	131
Application field	Mould casting	3	3	3	3	3	4	4	4	4	4	4	4	4	3	3	2	3	2
	Continuous casting without cooling system	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2
	Continuous casting with cooling system	3	3	3	3	2	4	4	4	5	5	5	5	5	3	3	3	3	3
	Handworking	3	3	3	3	3	2	2	2	2	2	2	2	2	3	4	5	3	5
	Flat-bottom stampato	2	2	2	2	2	4	4	4	4	4	4	4	4	2	2	2	2	2
	Double stampato	2	2	2	2	2	4	4	4	4	4	4	4	4	2	2	2	2	2
	Handmade solid chain	3	3	3	3	3	4	4	4	4	4	4	4	4	2	3	4	2	4
	Machine made solid chain	2	2	2	2	2	4	4	4	4	4	4	4	4	2	2	3	2	3
	Handmade hollow chain	2	2	2	2	2	5	5	5	5	5	5	5	5	2	2	2	2	2
	Machine made hollow chain	2	2	2	2	2	5	5	5	5	5	5	5	5	2	2	2	2	2
	Items by soldered tube	2	2	2	2	2	5	5	5	5	5	5	5	5	2	2	2	2	2
	Machine tool production	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	4	2	4
	Centrifugal casting	...	...	...	...	...	3	3	3	3	3	3	3	3	...	...	...	...	...
	Casting by open systems	...	...	...	...	...	3	3	3	3	3	3	4	4	...	...	...	...	...
	Casting by vacuum systems	...	...	...	...	...	4	4	4	4	4	4	4	4	...	...	...	...	...
	Casting without stones in place	...	...	...	...	...	4	4	4	4	4	4	4	4	...	...	...	...	...
	Casting with stones in place	...	...	...	...	...	2	2	2	2	2	2	3	3	...	...	...	...	...

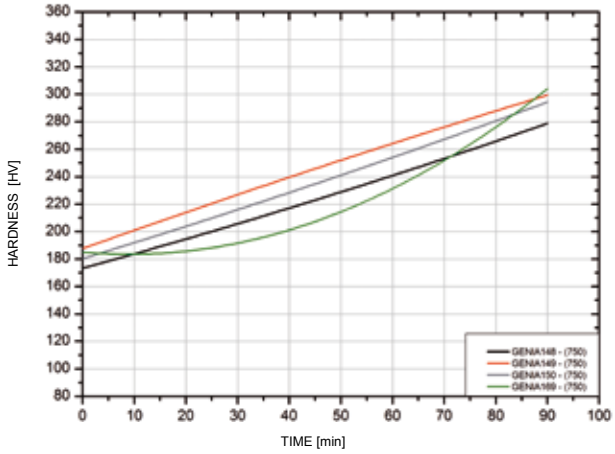
FLEXIA150 - (585)	FLEXIA161 - (585)	GENIA100 - (585)	GENIA101 - (585)	GENIA103 - (585)	GENIA162 - (585)	GENIA164 - (585)	GENIA165 - (585)	GENIA166 - (585)	LUX134 - (585)	LUX150 - (585)	LUX158 - (585)	LUX159 - (585)	LUX167 - (585)	UNIKA100 - (585)	UNIKA101 - (585)	UNIKA110 - (585)		
12,96	12,96	13,07	12,88	12,95	12,85	12,89	12,95	12,88	12,94	12,93	12,95	12,93	12,83	12,95	12,98	12,95	Density [g/cm³]	Physical and mechanical properties
879	878	867	921	894	824	868	894	921	870	854	856	854	917	835	836	840	Temperature Solidus [°C]	
912	913	902	936	919	940	901	919	936	905	900	905	900	944	898	896	899	Temperature Liquidus [°C]	
86,41	86,63	87,17	86,68	87,43	85,12	87,29	85,17	85,43	82,76	84,93	84,13	87,33	81,49	88,42	88,67	87,64	Colour coordinates [L*]	
7,64	7,8	8,69	9,72	8,89	9,58	8,6	8,9	9,59	8,51	7,81	8,45	7,31	10,31	7,03	7,83	7,05	Colour coordinates [a*]	
16,32	16,75	16,02	15,51	15,67	14,73	15,98	14,87	14,33	15,52	16,45	15,55	17,3	13,32	16,65	16,74	17,33	Colour coordinates [b*]	
47	50	44	75	60	62	171	59	74	1002	151	854	820	2209	238	244	251	Grain size as cast [µm]	
9,3	9,4	9,3	10,8	10,4	10,9	9,8	10,4	10,8	...	...	...	...	...	10,1	10,6	9,7	Deep drawing test after annealing [mm]	
620	621	615	535	534	522	545	530	533	...	...	...	...	...	561	555	544	Ultimate tensile strenght after annealing [MPa]	
383	385	399	268	284	262	329	286	269	...	...	...	...	...	299	293	290	Yield strenght after annealing [MPa]	
27	26	27	35	39	37	38	39	35	...	...	...	...	...	41	40	38	Percent elongation after annealing [%]	
...	...	506	441	461	435	476	460	440	356	430	386	431	285	385	435	380	Ultimate tensile strenght as cast [MPa]	
...	...	299	203	239	194	284	238	202	199	210	182	211	134	229	260	192	Yield strenght as cast [MPa]	
...	...	51	58	56	61	53	57	61	48	56	52	57	49	50	52	51	Percent elongation as cast [%]	
...	...	151	114	129	113	156	129	114	131	123	121	123	111	132	132	121	Hardness as cast [HV]	
136	136	159	114	128	119	152	128	114	...	...	...	...	...	137	140	133	Hardnessafter annealing [HV]	
4	4	4	3	4	3	4	4	3	...	...	...	...	...	4	4	4	Mould casting	Application field
4	4	4	4	4	4	4	4	4	...	...	...	...	...	3	3	3	Continuous casting without cooling system	
4	4	4	4	4	4	4	4	4	...	...	...	...	...	3	3	3	Continuous casting with cooling system	
4	4	2	4	3	5	2	3	4	...	...	...	...	...	2	2	2	Handworking	
3	3	3	2	2	2	3	2	2	...	...	...	...	...	2	2	2	Flat-bottom stampato	
4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3	3	Double stampato	
4	4	3	5	4	5	3	4	5	...	...	...	...	...	3	3	3	Handmade solid chain	
5	5	4	5	4	5	4	4	5	...	...	...	...	...	1	1	1	Machine made solid chain	
4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3	3	Handmade hollow chain	
4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3	3	Machine made hollow chain	
4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3	3	Items by soldered tube	
5	5	3	4	3	4	3	3	4	...	...	...	...	...	3	3	3	Machine tool production	
...	...	2	2	2	2	2	2	2	4	4	4	4	4	5	5	4	Centrifugal casting	
...	...	2	2	2	2	2	2	2	4	5	5	5	4	4	4	5	Casting by open systems	
...	...	3	3	3	3	3	3	3	4	5	5	5	4	4	4	5	Casting by vacuum systems	
...	...	4	3	4	3	4	4	3	3	5	5	5	3	4	4	5	Casting without stones in place	
...	...	2	1	1	1	2	1	1	3	5	5	5	3	4	4	5	Casting with stones in place	

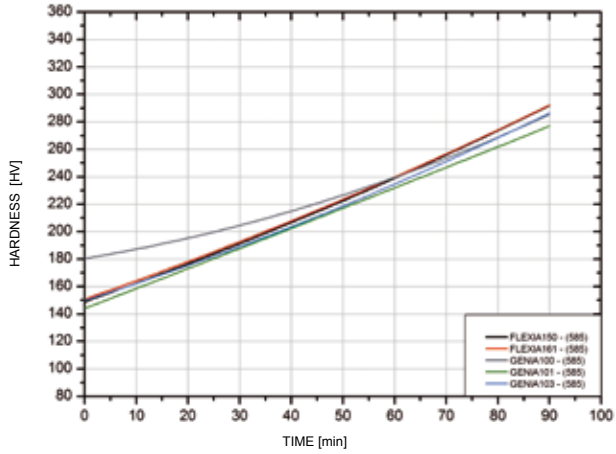
750/585 Gold/Red

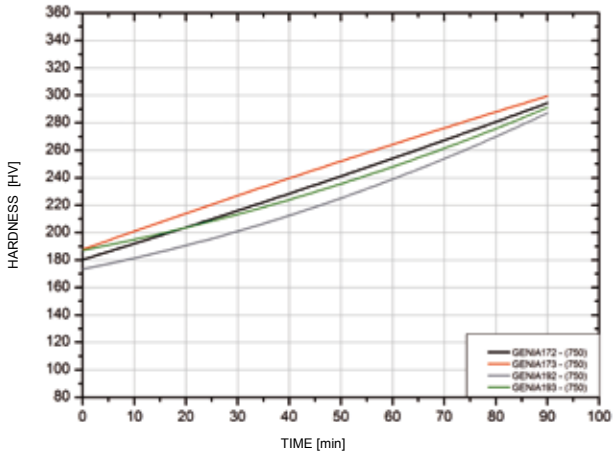
COLD WORKING GRAPHS

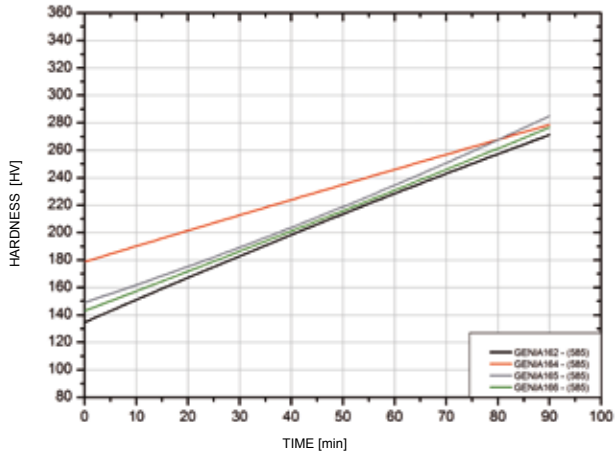




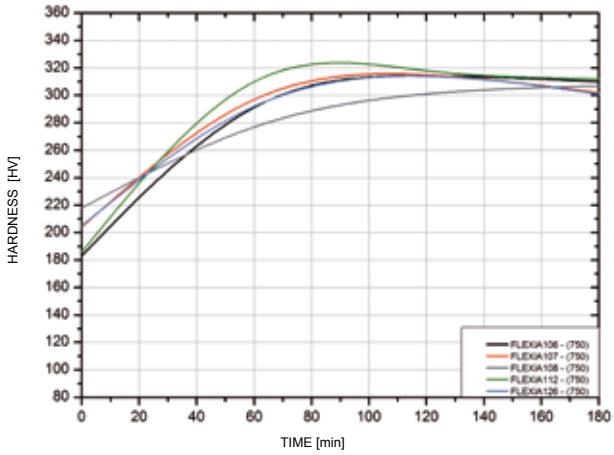


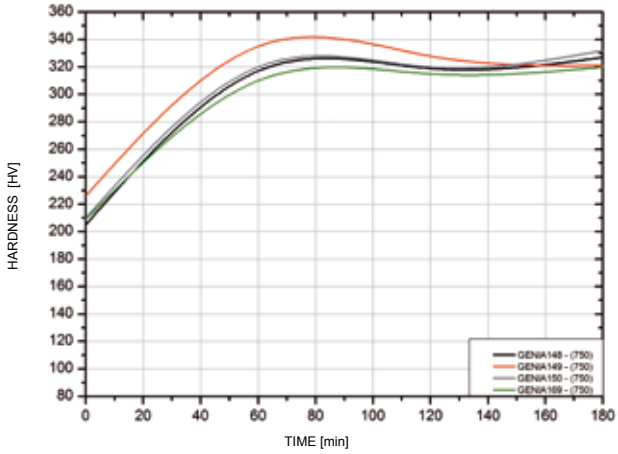


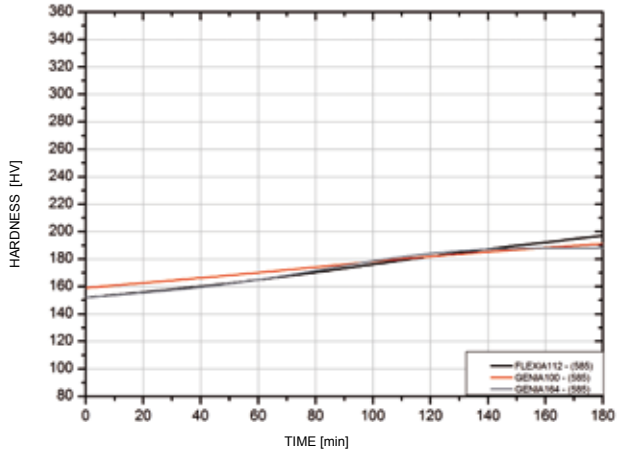




HARDENING GRAPHS







750/585 Gold/Pink

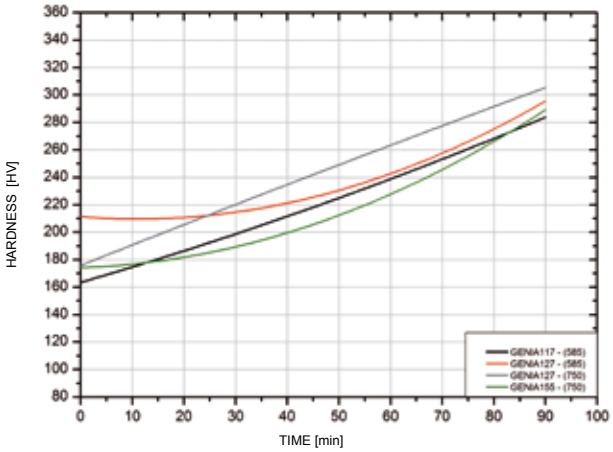
GENIA127
Master alloy suitable for the production of 14 and 18 ct pink gold alloys (Ag32Zn2). The gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items without stones in place. The colour of the 18 ct gold alloy corresponds to 4N, as defined by the EN28654 standard. The gold alloy lends itself for hardening. During plastic deformation, this gold alloy can be cast with both mould and continuous casting. All the most common investment casting techniques can be used.

GENIA155
Master alloy suitable for the production of 18 ct pink alloys (Ag18Zn5). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items with and without stones in place. The hue is a very intense pink. The gold alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional casting methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

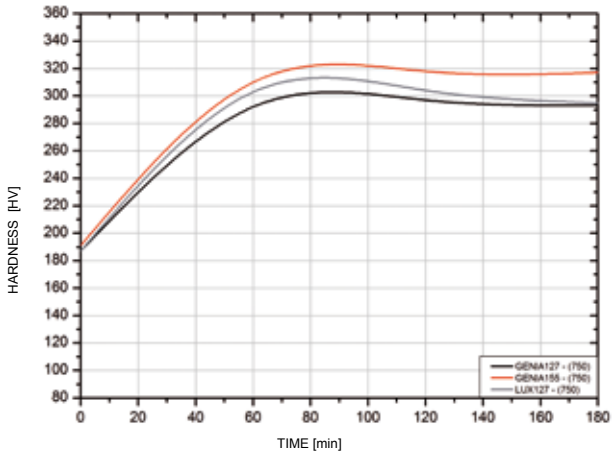
LUX127
Master alloy suitable for the production of 14 and 18 ct pink gold alloys (Ag29Zn3). The resulting alloy is for the production of investment cast items with or without stones in place. The colour of the 18 ct gold alloy corresponds to 4N, as defined by the EN28654 standard. The gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

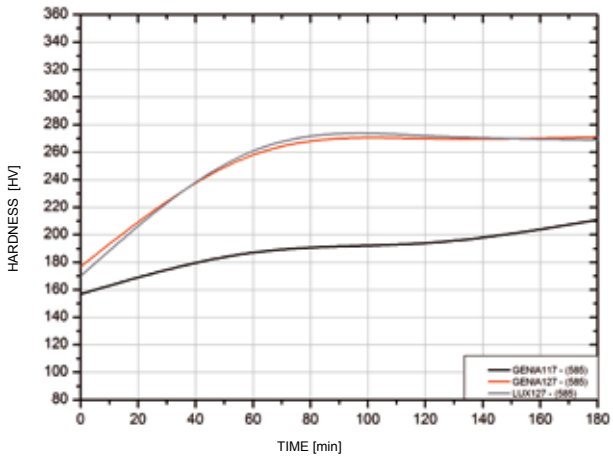
	Au	GENIA127 - (750)	GENIA155 - (750)	LUX127 - (750)	GENIA117 - (585)	GENIA127 - (585)	LUX127 - (585)
Physical and mechanical properties	Density [g/cm³]	15,08	14,89	15,03	13,06	13,23	13,28
	Temperature Solidus [°C]	878	879	849	852	836	821
	Temperature Liquidus [°C]	884	888	881	888	865	865
	Colour coordinates [L*]	87,16	86,64	87	87,88	88,5	87,58
	Colour coordinates [a*]	7,33	7,77	7,15	7,06	6,31	6,48
	Colour coordinates [b*]	19,83	18,6	19,72	17,3	18,5	18
	Grain size as cast [µm]	130	114	920	55	184	870
	Deep drawing test after annealing [mm]	9,5	8,8	...	9,5	8,8	...
	Ultimate tensile strenght after annealing [MPa]	520	542	...	598	564	...
	Yield strenght after annealing [MPa]	340	346	...	384	377	...
	Percent elongation after annealing [%]	32	33	...	29	33	...
	Ultimate tensile strenght as cast [MPa]	447	475	311	491	474	401
	Yield strenght as cast [MPa]	332	361	264	298	335	303
	Percent elongation as cast [%]	44	41	29	51	50	38
	Hardness as cast [HV]	203	217	187	153	170	170
	Hardnessafter annealing [HV]	187	191	...	157	177	...
Application field	Mould casting	4	4	...	4	4	...
	Continuous casting without cooling system	1	1	...	4	2	...
	Continuous casting with cooling system	4	4	...	4	4	...
	Handworking	2	2	...	2	2	...
	Flat-bottom stampato	4	4	...	4	4	...
	Double stampato	4	4	...	4	4	...
	Handmade solid chain	4	4	...	2	2	...
	Machine made solid chain	4	4	...	4	3	...
	Handmade hollow chain	5	5	...	4	5	...
	Machine made hollow chain	5	5	...	4	5	...
	Items by soldered tube	5	5	...	4	5	...
	Machine tool production	3	3	...	2	2	...
	Centrifugal casting	3	3	5	3	3	5
	Casting by open systems	3	3	5	3	3	5
	Casting by vacuum systems	4	4	3	3	3	3
	Casting without stones in place	4	4	5	4	4	5
	Casting with stones in place	2	2	3	2	2	3

COLD WORKING GRAPH



HARDENING GRAPHS





FLEXIA101
Master alloy suitable for the production of 18 ct yellow gold alloys (Ag60Zn4.5). The resulting alloy is for the production of stamped items and solid chains. This alloy lends itself quite well for hardening. Use of traditional mould casting methods is recommended.

FLEXIA115
Master alloy suitable for the production of 18 ct yellow gold alloys (Ag47Zn2). The resulting alloy is for the production of stamped items and solid chains. Its colour corresponds to 3N, as defined by the EN28654 standard. The 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA139
Plus-category master alloy suitable for the production of 18 ct yellow gold alloys (Ag48.5Zn2.5). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. The colour of 18 ct gold alloy corresponds to the 3N colour, as defined by the EN28654 standard. The gold alloy lends itself for hardening. It can be cast and melted using both traditional methods (mould casting) and continuous casting.

FLEXIA151
Plus-category master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag31Zn10). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Its main feature is high hardening following proper heat treatment. It is an alloy with a fine grain microstructure. It can be used with all casting methods (mould casting and continuous casting).

GENIA109
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag47Zn2). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without precious stones. The colour of 18 ct gold alloys corresponds to 3N, as defined by the EN28654 standard; the 14 ct gold alloy ensures more similarity to the 3N colour obtained in 18 ct. The gold alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA110
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag56.5Zn3.5). The gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. The colour of the 18 ct gold alloy corresponds to 2N, as defined by the EN28654 standard; the 14 ct gold alloy corresponds to 1N, as defined by the same standard. The 14 ct gold alloy lends itself well for hardening, the 18 ct lends itself quite well. During plastic deformation, it can be cast using both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA111
Master alloy suitable for the production of 14 and 18 ct yellow alloys (Ag45Zn10). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items without precious stones. This gold alloy is particularly plastic and well suitable when high malleability and ductility are required. This gold alloy lends itself very well for hardening. During plastic deformation, it can becast using both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA113
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag64Zn3.5). This gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. The 18 ct gold alloy hue is commonly known as “Valenzan Yellow”, the 14 ct gold alloy is a 0N colour as per EN28654 standard. Only the 14 ct gold alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA138
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag55Zn7). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. The gold alloy is very plastic and well suitable when high malleability and ductility are required. The 14 ct gold alloy lends itself well for hardening, the 18 ct lends itself quite well for hardening. It can be cast with all casting methods (mould casting and continuous casting).

GENIA145
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag30Zn25). The gold alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings. The colour of the 18 ct alloy corresponds to 1N, as defined by the EN28654 standard (a colour which usually belongs to a 14 ct gold alloy). Therefore, its use is recommended only when this particular colour is strictly required. The gold alloy lends itself well for hardening. It can be used with all casting methods (mould casting and continuous casting).

GENIA151
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag62Zn1.5). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with and without precious stones. The colour of 18 ct gold alloys corresponds to 2N, as defined by the EN28654 standard. The alloy lends itself for hardening. During plastic deformation, it can be cast using both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA154
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag44Zn2). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with and without precious stones. The 18 ct gold alloys are slightly redder than 3N, as defined by the EN28654 standard; on the other hand, the 14 ct gold alloy is of a very warm yellow colour. The gold alloy lends itself for hardening. During plastic deformation, the gold alloy can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA159
Master alloy suitable for the production of 14 and 18 ct yellow gold stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items without precious stones (Ag47.5Zn11.5). This gold alloy is particularly plastic and suitable when high malleability and ductility are required. The gold alloy also lends itself well for hardening. During plastic deformation, it can be cast and melted with both both mould and continuous casting. All the most common investment casting techniques can be used.

GENIA167
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag15Zn11). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without precious stones. Only the 18 ct gold alloy lends itself well for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA174
Master alloy suitable, for the production of 14 and 18 ct yellow gold alloys (Ag63Zn0.2). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings, watch-cases and investment cast items with and without precious stones. The colour of the 18 ct gold alloys corresponds to 2N, as defined by the EN 28654 standard. The 18 ct gold alloy does not lend itself for hardening. During plastic deformation, the gold alloy can be cast and melted using both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA182
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag41Zn7.5). The resulting alloy is for the production of stamped iems, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without precious stones. The gold alloy lends itself well for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

LUX104
Master alloy suitable for the production of 18 ct yellow gold alloys (Ag64Zn3.5). The resulting alloy is for the production of investment cast items with or without precious stones. The gold alloy hue is commonly known as “Valenzan yellow”. The gold alloy is not suitable for hardening. Use in casting machines without controlled atmosphere is recommended.

LUX107
Master alloy suitable for the production of 18 ct yellow gold alloys (Ag46Zn3.5). The resulting alloy is for the production of investment cast items with and without precious stones. The colour of the gold alloy corresponds to 3N, as defined by the EN28654 standard. The gold alloy lends itself for hardening. Use in casting machines without controlled atmosphere is recommended.

LUX123
Plus-category master alloy suitable for the production of 18 ct yellow gold alloys (Ag57Zn3). The resulting alloy is for the production of investment cast items with or without precious stones. The colour of the gold alloy corresponds to 2N, as defined by the EN28654 standard. This gold alloy lends itself quite well for hardening. Use in vacuum assisted investment casting machines is recommended.

LUX131
Master alloy suitable for the production of 18 ct yellow gold alloys (Ag50Zn10). The resulting alloy is for the production of investment cast items with or without precious stones. This gold alloy lends itself quite well for hardening and its use is recommended in machines without vacuum assisted investment casting.

LUX140
Plus-category master alloy suitable for the production of 18 ct yellow gold alloys (Ag48Zn8). The resulting gold alloy is for the production of investment cast items with or without precious stones. The gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

LUX142
Master alloy suitable for the production of 18 ct yellow gold alloys (Ag47Zn2). The resulting alloy is for the production of investment cast items with or without precious stones. The colour of the 18 ct alloy corresponds to 3N, as defined by the EN28654 standard. The gold alloy lends itself very well for hardening. Use in vacuum assisted investment casting machines is recommended.

LUX145
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag30Zn25). The resulting alloy is for the production of investment cast items with or without precious stones. The colour of the 18 ct gold alloy corresponds to 1N, as defined by the EN28654 standard (a colour which usually belongs to a 14 ct gold alloy). The use of this alloy is advisable when this particular colour is strictly required. The gold alloy lends itself for hardening and it should be used in machines without vacuum assisted investment casting.

LUX147
Plus-category master alloy suitable for the production of 18 ct yellow gold alloys (Ag49Zn3.5). The resulting alloy is for the production of investment cast items with or without precious stones. The colour of the 18 ct gold alloy corresponds to 3N, as defined by the EN28654 standard (when a 13% silver content is considered). This gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

LUX166
Master alloy suitable for the production of 18 ct yellow gold alloys (Ag41Zn7.5). The resulting alloy is for the production of investment cast items with or without precious stones. The gold alloy lends itself very well for hardening. Use in vacuum assisted investment casting machines is recommended.

LUX168
Master alloy suitable for the production of 18 ct yellow gold alloys (Ag47Zn2). The resulting alloy is for the production of investment cast items with or without precious stones. The colour of the 18 ct alloy corresponds to 3N, as defined by the EN28654 standard. This gold alloy lends itself very well for hardening. Use in vacuum assisted investment casting machines is recommended.

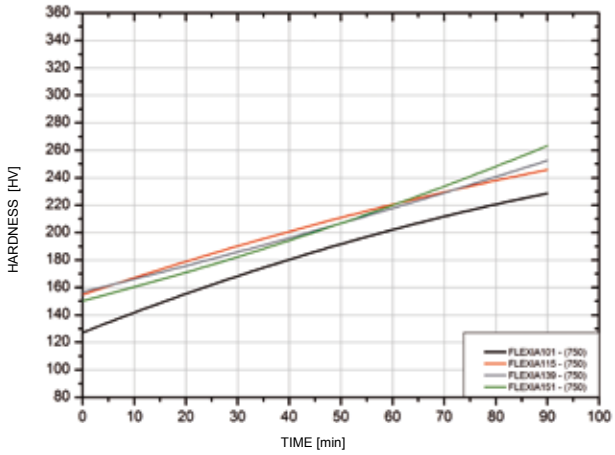
UNIKA108
Master alloy suitable for the production of yellow gold alloys (Ag32Zn10) in 18 ct. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets and tube rings, investment cast items with and without stones in place. The 18 ct alloy colour is close to 3N, as per the EN28654 standards. The alloy lends itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. Its use is recommended only when casting takes place in a protected atmosphere (reducing flame, inert atmosphere, boric acid).

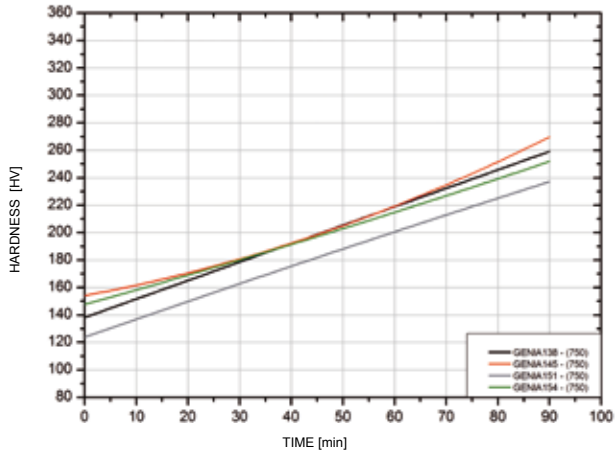
750 Gold/Yellow

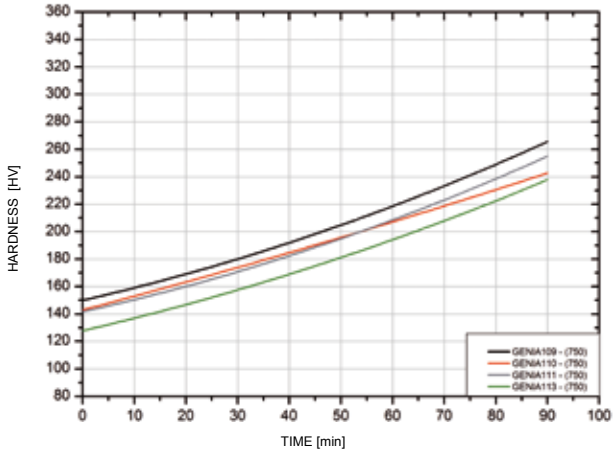
	Au	FLEXIA101 - (750)	FLEXIA115 - (750)	FLEXIA139 - (750)	FLEXIA151 - (750)	GENIA109 - (750)	GENIA110 - (750)	GENIA111 - (750)	GENIA113 - (750)	GENIA138 - (750)	GENIA145 - (750)	GENIA151 - (750)	GENIA154 - (750)	GENIA159 - (750)	GENIA167 - (750)	GENIA174 - (750)	GENIA182 - (750)	LUX102 - (750)	LUX104 - (750)
Physical and mechanical properties	Density [g/cm³]	15,38	15,28	15,27	15	15,25	15,35	15,17	15,44	15,28	14,85	15,43	15,19	15,17	14,82	15,45	15,13	15,31	15,43
	Temperature Solidus [°C]	876	879	869	852	876	876	849	888	870	805	893	879	849	862	903	861	828	846
	Temperature Liquidus [°C]	906	887	887	864	885	897	867	912	894	825	915	888	871	876	927	875	901	911
	Colour coordinates [L*]	89,81	88,27	88,75	88,92	88,49	89,89	90,09	90,78	89,92	90,17	89,76	87,61	90,2	87,44	90,45	88,8	90,06	89,95
	Colour coordinates [a*]	2,11	5,31	4,49	4,59	4,96	3	2,66	1,51	2,28	0,94	2,9	5,9	1,88	6,42	3	4,64	2,9	1,71
	Colour coordinates [b*]	24,63	22,31	22,71	21,34	22,63	24,06	23,22	25,28	24,09	22,06	24,69	22,13	23,65	19,36	24,55	22,24	24,12	25
	Grain size as cast [µm]	550	970	161	211	127	89	116	95	124	152	83	152	126	313	100	130	787	960
	Deep drawing test after annealing [mm]	9,3	9,5	9	9,2	9	8,4	9,9	9,2	9,8	9,6	9,1	8,7	9,8	9,2	9	9,2	...	...
	Ultimate tensile strenght after annealing [MPa]	429	460	454	485	482	456	450	440	462	491	453	459	441	465	430	457	...	...
	Yield strenght after annealing [MPa]	251	297	288	301	302	267	295	244	269	326	254	295	272	313	235	293	...	...
	Percent elongation after annealing [%]	36	38	35	34	34	33	34	32	34	31	31	35	37	37	32	35	...	...
	Ultimate tensile strenght as cast [MPa]	...	...	...	...	447	439	436	415	429	435	426	428	411	372	410	434	363	348
	Yield strenght as cast [MPa]	...	...	...	...	289	247	282	218	267	343	225	282	258	300	215	228	215	209
	Percent elongation as cast [%]	...	...	...	...	50	49	49	48	51	37	47	50	51	29	46	50	39	40
	Hardness as cast [HV]	...	...	...	...	151	138	158	125	134	180	126	153	143	191	128	176	139	122
	Hardnessafter annealing [HV]	132	148	146	156	147	133	143	124	140	190	132	152	150	198	127	172	...	...
Application field	Mould casting	4	4	4	4	4	4	4	4	4	2	4	4	4	4	4	4	...	...
	Continuous casting without cooling system	2	2	3	3	3	3	3	3	3	2	3	3	3	2	3	2	...	...
	Continuous casting with cooling system	3	3	4	4	4	4	4	4	4	2	4	4	4	4	4	4	...	...
	Handworking	3	3	2	3	2	2	3	2	3	3	2	2	3	3	2	3	...	...
	Flat-bottom stampato	2	3	4	5	4	3	5	2	5	5	3	4	5	5	3	5	...	...
	Double stampato	3	3	4	5	4	4	5	4	5	5	4	4	5	5	4	5	...	...
	Handmade solid chain	5	4	3	5	3	4	5	4	5	5	4	3	5	5	4	5	...	...
	Machine made solid chain	3	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	...	...
	Handmade hollow chain	2	2	5	5	5	4	5	4	5	4	4	5	5	5	4	5	...	...
	Machine made hollow chain	2	2	5	5	5	4	5	4	5	4	4	5	5	5	4	5	...	...
	Items by soldered tube	2	2	5	5	5	4	5	4	5	4	4	5	5	5	4	5	...	...
	Machine tool production	4	4	3	4	3	5	4	5	5	3	5	3	4	4	5	4	...	...
	Centrifugal casting	...	...	...	...	2	2	1	2	1	1	2	2	1	1	2	1	4	4
	Casting by open systems	...	...	...	...	2	2	1	2	1	1	2	2	1	2	2	2	4	4
	Casting by vacuum systems	...	...	...	...	3	3	1	3	1	1	3	3	1	2	3	2	4	4
	Casting without stones in place	...	...	...	...	4	4	1	4	1	1	4	4	1	2	4	2	4	4
	Casting with stones in place	...	...	...	...	2	2	1	2	1	1	2	2	1	1	2	1	4	4

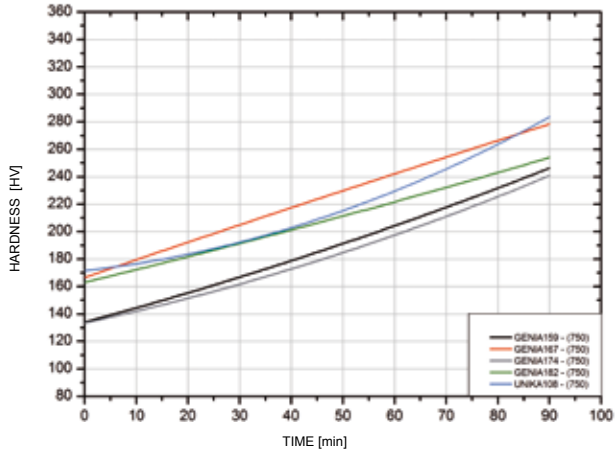
LUX107 - (750)	LUX123 - (750)	LUX131 - (750)	LUX140 - (750)	LUX142 - (750)	LUX145 - (750)	LUX147 - (750)	LUX166 - (750)	LUX168 - (750)	UNIKA108 - (750)		
15,18	15,31	15,32	15,17	15,33	14,87	15,24	15,12	15,33	14,99	Density [g/cm³]	Physical and mechanical properties
821	871	823	818	875	798	838	834	875	848	Temperature Solidus [°C]	
884	903	900	873	890	823	889	869	890	866	Temperature Liquidus [°C]	
88,6	89,42	89,78	88,79	88,09	90,39	88,79	88,97	88,09	88,57	Colour coordinates [L*]	
4,61	2,85	1,91	3,08	5,3	0,88	4,29	4,36	5,3	4,51	Colour coordinates [a*]	
22,28	23,77	23,32	22,92	22,19	22,57	22,84	22,55	22,19	21,4	Colour coordinates [b*]	
894	946	989	947	890	1169	1158	1500	890	1244	Grain size as cast [µm]	
...	...	...	...	...	...	...	...	...	9,8	Deep drawing test after annealing [mm]	
...	...	...	...	...	...	...	...	...	441	Ultimate tensile strenght after annealing [MPa]	
...	...	...	...	...	...	...	...	...	281	Yield strenght after annealing [MPa]	
...	...	...	...	...	...	...	...	...	41	Percent elongation after annealing [%]	
338	321	295	286	348	266	317	300	348	319	Ultimate tensile strenght as cast [MPa]	
237	209	210	219	245	243	228	182	245	275	Yield strenght as cast [MPa]	
36	41	39	36	39	16	39	34	39	27	Percent elongation as cast [%]	
151	122	132	145	148	155	146	153	148	184	Hardness as cast [HV]	
...	...	...	...	...	...	...	...	...	191	Hardnessafter annealing [HV]	
...	...	...	...	...	...	...	...	...	3	Mould casting	Application field
...	...	...	...	...	...	...	...	...	2	Continuous casting without cooling system	
...	...	...	...	...	...	...	...	...	3	Continuous casting with cooling system	
...	...	...	...	...	...	...	...	...	2	Handworking	
...	...	...	...	...	...	...	...	...	3	Flat-bottom stampato	
...	...	...	...	...	...	...	...	...	3	Double stampato	
...	...	...	...	...	...	...	...	...	3	Handmade solid chain	
...	...	...	...	...	...	...	...	...	2	Machine made solid chain	
...	...	...	...	...	...	...	...	...	2	Handmade hollow chain	
...	...	...	...	...	...	...	...	...	2	Machine made hollow chain	
...	...	...	...	...	...	...	...	...	2	Items by soldered tube	
...	...	...	...	...	...	...	...	...	2	Machine tool production	
4	4	3	3	3	2	4	3	2	4	Centrifugal casting	
4	4	3	3	3	2	4	3	2	4	Casting by open systems	
3	4	3	3	4	2	4	4	3	4	Casting by vacuum systems	
4	5	4	4	4	2	5	4	4	4	Casting without stones in place	
4	5	4	3	4	2	5	4	3	3	Casting with stones in place	

COLD WORKING GRAPHS

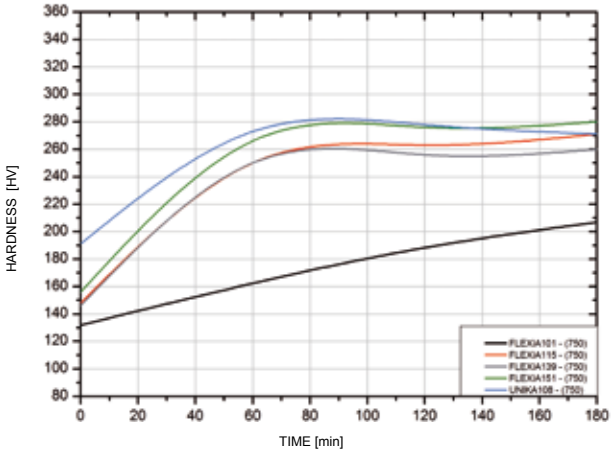


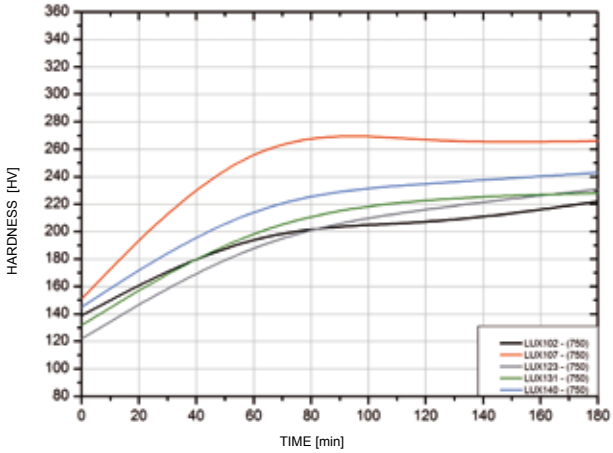


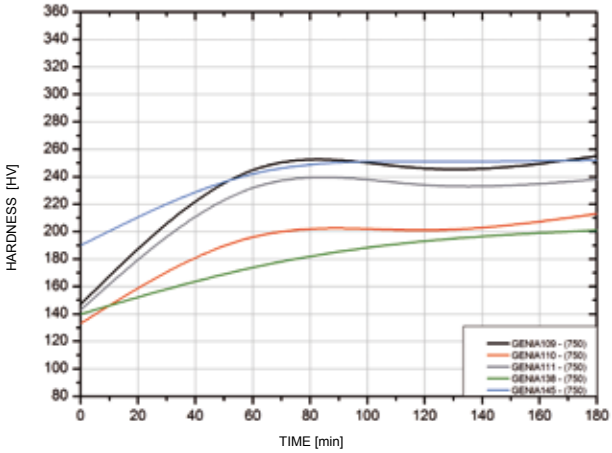


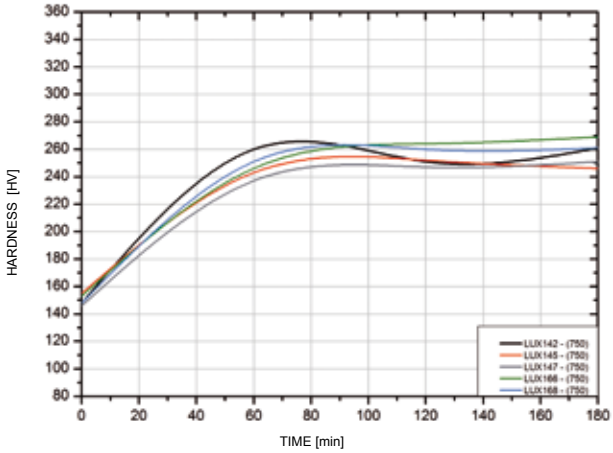


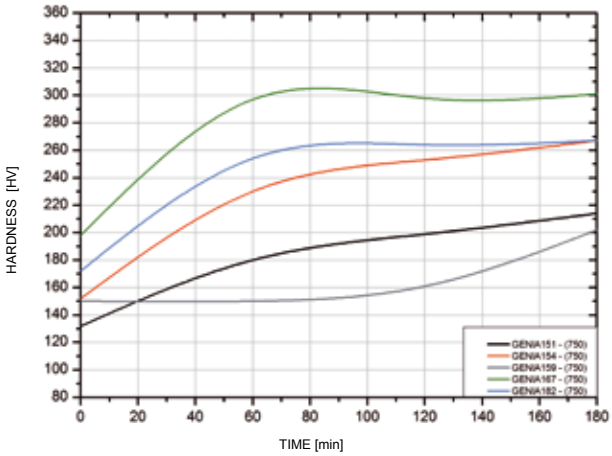
HARDENING GRAPHS









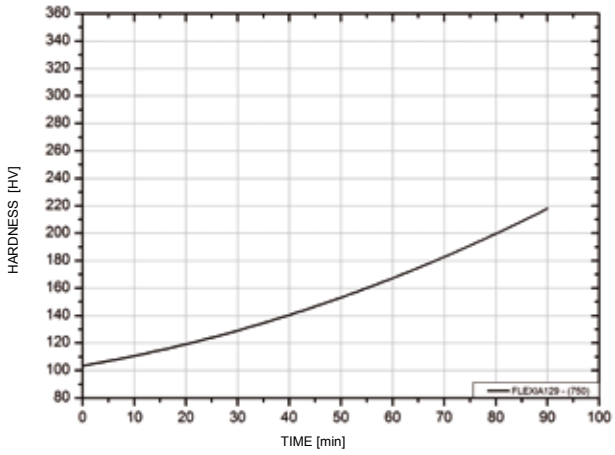


750 **Gold**/Green

FLEXIA129
Master alloy suitable for the production of 18 ct green gold alloys (Ag76Zn2). The resulting alloy is for the production of stamped items and solid chains. This gold alloy is not suitable for hardening. Use of traditional mould casting methods is recommended.

LUX108
Master alloy suitable for the production of 18 ct green gold alloys (Ag76Zn1,5). The resulting alloy is for the production of investment cast items with and without precious stones. This gold alloy does not lend itself for hardening. Use in casting machines without controlled atmosphere is recommended.

COLD WORKING GRAPH



	Au	FLEXIA129 - (750)	LUX108 - (750)
Physical and mechanical properties	Density [g/cm³]	15,62	15,6
	Temperature Solidus [°C]	922	920
	Temperature Liquidus [°C]	961	959
	Colour coordinates [L*]	90,84	90,84
	Colour coordinates [a*]	0,51	0,51
	Colour coordinates [b*]	26,54	26,54
	Grain size as cast [µm]	1151	1100
	Deep drawing test after annealing [mm]	9,1	...
	Ultimate tensile strenght after annealing [MPa]	385	...
	Yield strenght after annealing [MPa]	189	...
	Percent elongation after annealing [%]	29	...
	Ultimate tensile strenght as cast [MPa]	...	328
	Yield strenght as cast [MPa]	...	189
	Percent elongation as cast [%]	...	31
	Hardness as cast [HV]	...	102
	Hardnessafter annealing [HV]	109	...
Application field	Mould casting	3	...
	Continuous casting without cooling system	2	...
	Continuous casting with cooling system	3	...
	Handworking	4	...
	Flat-bottom stampato	2	...
	Double stampato	3	...
	Handmade solid chain	5	...
	Machine made solid chain	3	...
	Handmade hollow chain	2	...
	Machine made hollow chain	2	...
	Items by soldered tube	2	...
	Machine tool production	5	...
	Centrifugal casting	...	3
	Casting by open systems	...	3
	Casting by vacuum systems	...	3
	Casting without stones in place	...	3
	Casting with stones in place	...	3

BLANK100
Master alloy suitable for the production of 18 ct white gold palladium based alloys. The resulting alloy is for the production of stamped items, tube rings and investment cast items without stones in place. Blank100 main feature is the extreme intensity of white. When alloyed to 18 ct it is classified as Grade 1 as per WGC standards. Rhodium plating is, therefore, not necessary. Its colour is not only comparable with rhodium, but it also allows higher quality surfaces. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

BLANK105
Master alloy suitable for the production of 18 ct white gold alloys. The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without stones in place. Blank105 main feature is the extremely intensity of white. Rhodium plating is, therefore, not necessary. Its colour is comparable with rhodium, but Blank 105 allows higher quality surfaces. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

FLEXIA102
Master alloy suitable for the production of 18 ct white gold alloys (Ni25Zn15). The resulting alloy is for the production of stamped items. Rhodium plating is not advisable thanks to good intensity of white; however, final decision is left to the producer. This gold alloy lends itself quite well for hardening. Use of traditional mould casting methods is recommended.

FLEXIA103
Master alloy suitable for the production of 18 ct white gold alloys (Ni30Zn14). The resulting alloy is for the production of stamped items. Rhodium plating is not advisable thanks to excellent intensity of white; however, final decision is left to the producer. This gold alloy does not lend itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA104
Master alloy suitable for the production of 18 ct white gold alloys (Ni35Zn15). The resulting alloy is for the production of stamped items. Rhodium plating is not required thanks to the excellent intensity of white; however, final decision is left to the producer. This alloy is advisable only when a very intense white is required. Use of traditional mould casting methods is recommended.

FLEXIA111
Master alloy suitable for the production of 18 ct white gold alloys (Ni48Zn18). The resulting alloy is for the production of stamped items and springs. Rhodium plating is not required, thanks to the excellent intensity of white. This gold alloy lends itself quite well for hardening. Use of traditional mould casting methods is recommended.

FLEXIA113
Master alloy suitable for the production of 9, 10, 14 e 18 ct white gold alloys (Ni15Zn15). The resulting alloy is for the production of stamped items and solid chains. Rhodium plating is recommended; however, final decision is left to the producer. Only the 18 ct gold alloy lends itself for hardening. It can be used to produce also 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. Use of traditional mould casting methods is recommended.

FLEXIA116
Master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni20Zn12). The resulting alloy is for the production of stamped items and solid chains. Rhodium plating is recommended for the 18 ct gold alloy; however, final decision is left to the producer. The 18 ct gold alloy lends itself for hardening. It can be used to produce also 9 and 10ct white gold items which can be sold only in countries with no restrictions on nickel use. Use of traditional mould casting methods is recommended.

FLEXIA123
Master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni10Zn10). The resulting alloy is for the production of stamped items and solid chains. Compliance with the EU Nickel Directive for the 9-10 ct gold alloys is not guaranteed. Rhodium plating is required; however, final decision is left to the producer. Only the 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA124
Master alloy suitable for the production of 18 ct white gold alloys (Ni25Zn10). The resulting alloy is for the production of stamped items. Rhodium plating is not advisable, thanks to the good intensity of its white colour; however, final decision is left to the producer. The 18 ct alloy remains deoxidized during heat treatments. Use of traditional mould casting methods is recommended.

FLEXIA128
Plus-category master alloy suitable for the production of 14 and 18 ct white gold palladium based alloys (Pd35). The resulting alloy is for the production of items by machine tools, stamped items and solid chains. Rhodium plating is recommended; however, final decision is left to the producer. This gold alloy is nickel-free. Only the 18 ct gold alloy lends itself quite well for hardening. It can be used with all casting methods (mould casting and continuous casting).

FLEXIA134
Plus-category master alloy suitable for the production of 18 ct white gold palladium based alloys. The resulting alloy is for the production of machine tool, stamped items and solid chains. This alloy is nickel-free and it can be used only after adding 8 to 13% palladium. Rhodium plating is recommended only when a small quantity of palladium is added; however, final decision is left to the producer. This alloy lends itself to hardening. It can be used with all casting methods (mould casting, continuous casting).

FLEXIA141
Plus-category master alloy suitable for the production of 18 ct white gold alloys (Ni25Zn7). The resulting alloy is for the production of stamped items, hollow chains, earrings, bracelets and tube rings. Rhodium plating is not required, thanks to the good intensity of white; however, final decision is left to the producer. The gold alloy lends itself very well for hardening. The gold alloy displays a fine grain microstructure and excellent mechanical features. It is especially recommended for continuous casting.

FLEXIA147
Plus-category master alloy suitable for the production of 18 ct white gold palladium based alloys (Pd50). The resulting alloy is for the production of items by machine tools, stamped items and solid chains. Rhodium plating is not recommended; however, final decision is left to the producer. The gold alloy is nickel-free. The gold alloy lends itself for hardening. It can be used with all casting methods (mould casting and continuous casting).

FLEXIA162
Plus-category master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni15Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Rhodium plating is recommended; however, final decision is left to the producer. This 18 ct gold alloy lends itself

very well for hardening. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. It can be cast and melted with both traditional casting methods (mould casting) and continuous casting.

FLEXIA163
Plus-category master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni20Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Rhodium plating is recommended for the 18 ct gold alloy; however, final decision is left to the producer. The 18 ct gold alloy lends itself for hardening. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries wtih no restrictions on nickel use. It can be cast and melted with both traditional casting methods (mould casting) and continuous casting.

FLEXIA164
Plus-category master alloy suitable for the production of 18 ct white gold alloys (Ni25Zn14). The resulting alloy is for the production of stamped items, hollow chains, earrings, bracelets and tube rings. Rhodium plating is not required thanks to good intensity of white; however, final decision is left to the producer. It has excellent mechanical features and a fine grain microstructure. This gold alloy lends itself quite well for hardening. It can be cast and melted with both traditional casting methods (mould casting) and continuous casting.

FLEXIA165
Plus-category master alloy suitable for the production of 18 ct white gold alloys (Ni30Zn14). The resulting alloy is for the production of stamped items and tube rings. Rhodium plating is not required thanks to the good intensity of white; however, final decision is left to the producer. It has excellent mechanical features and a fine grain microstructure. It can be cast and melted with both traditional casting methods (mould casting) and continuous casting.

GENIA104
Master alloy suitable for the production of 18 ct white gold alloys (Ni30Zn14). The resulting alloy is for the production of stamped items, tube rings and investment cast items with or without precious stones. Rhodium plating is not required thanks to the excellent intensity of white; however, final decision is left to the producer. During plastic deformation, it can be cast using both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA105
Master alloy suitable for the production of 18 ct white gold alloys (Ni25Zn12). The resulting alloy is for the production of stamped items, hollow chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. Rhodium plating is not required thanks to the good intensity of white; however, final decision is left to the producer. This gold alloy lends itself quite well for hardening. During plastic deformation, it can be cast using both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA106
Master alloy suitable for the production of 18 ct white gold alloys (Ni20Zn12). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. Rhodium plating is advisable; however, final decision is left to the producer. This gold alloy lends itself very well for hardening. During plastic deformation, it can be cast using both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA108
Master alloy suitable for the production of 18 ct white gold alloys (Ni15Zn15). The resulting alloy is for the production of stamped items, hollow and solid chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. Rhodium plating is suggested; however, final decision is left to the producer. During plastic deformation, it can be cast using both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA156
Plus-category master alloy suitable for the production of 18 ct white gold alloys (Ni20Zn12Ag2). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items with or without stones in place. Rhodium plating is recommended; however, final decision is left to the producer. The alloy lends itself quite well for hardening. During plastic deformation, it can be cast and melted with both traditional casting methods (mould casting) and continuous casting. All the most common investment casting techniques can be used. The alloy also displays high filling properties and resistance to oxidation at high temperatures.

GENIA158
Master alloy suitable for the production of 18 ct white gold alloys (Ni40Zn10). The resulting alloy is for the production of stamped items, tube rings and investment cast items without stones in place. Rhodium plating is not required thanks to the good intensity of white: however the final decision is left to the producer. During plastic deformation it can be cast and melted with both traditional casting methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA161
Plus-category master alloy suitable for the production of 18 ct white gold alloys (Ni30Zn14). The resulting alloy is for the production of stamped items, tube rings, investment cast items with or without stones in place. Rhodium plating is not required thanks to the excellent intensity of white; however, final decision is left to the producer. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used. The main features of this product are high filling capability and extremely reduced defectiveness.

GENIA176
Master alloy suitable for the production of 14 and 18 ct white gold alloys (Ni15Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. Rhodium plating is recommended; however, final decision is left to the producer. The 18 ct gold alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA177
Master alloy suitable for the production of 14 and 18 ct white gold alloys (Ni20Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. Rhodium plating is recommended; however, final decision is left to the producer. Only the 18 ct gold alloy lends itself quite well for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA178
Master alloy suitable for the production of 18 ct white gold alloys (Ni25Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. Rhodium plating is not necessary thanks to the excellent intensity of white; however, final decision is left to the producer. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA179
Master alloy suitable for the production of 18 ct white gold alloys (Ni30Zn14). The resulting alloy is for the production of stamped items, tube rings, investment cast items with or without precious stones. Rhodium plating is not required thanks to the excellent intensity of white; however, final decision is left to the producer. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA183
Plus-category master alloy suitable for the production of 18 ct white gold palladium based alloys (Pd50). The resulting alloy is for the production of stamped items, solid chains, earrings, bracelets and tube rings, investment cast items without precious stones. Its main feature is the ability to increase its hardness following proper heat treatment. Rhodium plating is not necessary; however, final decision is left to the producer. The gold alloy is nickel free. It can be used with all casting methods (mould casting and continuous casting).

GENIA196
Plus-category master alloy suitable for the production of 18 ct white gold palladium based alloys (Pd52). The resulting alloy is for the production of stamped items, solid chains, earrings, bracelets and tube rings, investment cast items without precious stones. Its main feature is the ability to increase its hardness following proper heat treatment. Rhodium plating is not necessary; however, final decision is left to the producer. The gold alloy is nickel free. It can be used with all casting methods (mould casting and continuous casting).

GENIA198
Plus-category master alloy suitable for the production of 18 ct white gold palladium based alloys (Pd61). The resulting alloy is for the production of stamped items, solid chains, earrings, bracelets and tube rings, investment cast items without precious stones. Its main feature is the ability to increase its hardness following proper heat treatment. Rhodium plating is not necessary; however, final decision is left to the producer. The gold alloy is nickel free. It can be used with all casting methods (mould casting and continuous casting).

LUX105
Master alloy suitable for the production of 14 and 18 ct white gold alloys (Ni20Zn18). The resulting alloy is for the production of investment cast items without stones in place. Rhodium plating is suggested only for the 18 ct gold alloy, while it is not strictly required for the 14 ct gold alloy, thanks to the good intensity of white; however, final decision is left to the producer. Only the 18 ct gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

LUX106
Master alloy suitable for the production of 18 ct white gold alloys (Ni35Zn16). The resulting alloy is for the production of investment cast items without precious stones in place. Rhodium plating is not required, thanks to the excellent intensity of white; however, final decision is left to the producer. Its use is recommended only when the intensity of the white colour is extremely important. All the most common investment casting techniques can be used.

LUX110
Master alloy suitable for the production of 18 ct white gold palladium based alloys (Pd35). The resulting alloy is for the production of investment cast items with or without precious stones. Rhodium plating is not necessary; however, final decision is left to the producer. This gold alloy is nickel-free and it lends itself for hardening. All the most common investment casting techniques can be used.

LUX111
Master alloy suitable for the production of 18 ct white gold palladium based alloys (Pd50). The resulting alloy is for the production of investment cast items with or without precious stones. Rhodium plating is not necessary; however, final decision is left to the producer. This gold alloy is nickel-free and it lends itself for hardening. All the most common investment casting techniques can be used.

LUX129
Master alloy suitable for the production of 18 ct white gold alloys (Ni48Zn18). The resulting alloy is for the production of investment cast items without precious stones. Rhodium plating is not necessary thanks to the good intensity of white: however, final decision is left to the producer. It is suggested for countries with no restrictions on nickel use. All the most common investment casting techniques can be used. Its use is recommended only when the intensity of white is extremely important.

LUX132
Master alloy suitable for the production of 18 ct white gold alloys (Ni25Zn14). The resulting alloy is for the production of investment cast items without precious stones. Rhodium plating is not necessary, thanks to the good intensity of white; however, final decision is left to the producer. All the most common investment casting techniques can be used.

LUX135
Master alloy suitable for the production of 18 ct white gold alloys (Ni30Zn14). The resulting alloy is for the production of investment cast items without precious stones. Rhodium plating is not necessary, thanks to the excellent intensity of white; however, final decision is left to the producer. All the most common investment casting techniques can be used.

LUX139
Master alloy suitable for the production of 18 ct white gold palladium based alloys. The gold alloy lends itself for the production of investment cast items with or without precious stones. The gold alloy is nickel-free and must be used only after adding 8 to 13% palladium. Rhodium plating is recommended only if a small quantity of palladium is added; however, final decision is left to the producer. The gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

LUX149
Plus-category master alloy suitable for the production of 18 ct white gold alloys (Ni30Zn16Ag10). The resulting alloy is for the production of investment cast items with or without precious stones. It is especially recommended for complex items with flat surfaces, which may display shrinkage porosity. The gold alloy is particularly resistant to oxidation caused by torch soldering. This gold alloy lends itself quite well for hardening. All the most common investment casting techniques can be used.

LUX154
Master alloy suitable for the production of 9, 10, 14 and 18 ct white gold investment cast items with or without precious stones (Ni15Zn15). Rhodium plating is recommended; however, final decision is left to the producer. The gold alloy lends itself for the production of 9, 10 ct items which are sold in countries with no restrictions on nickel use. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

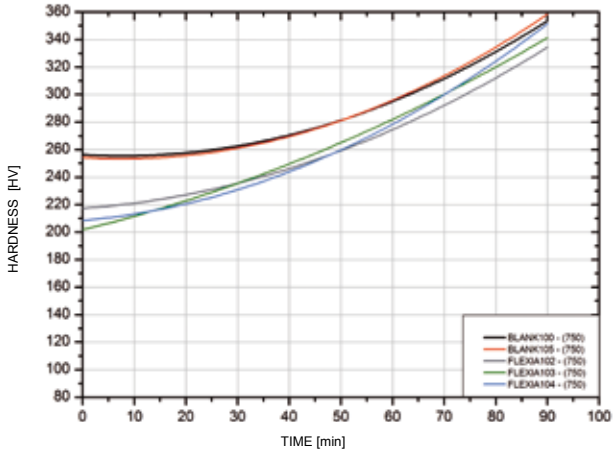
750 Gold/White

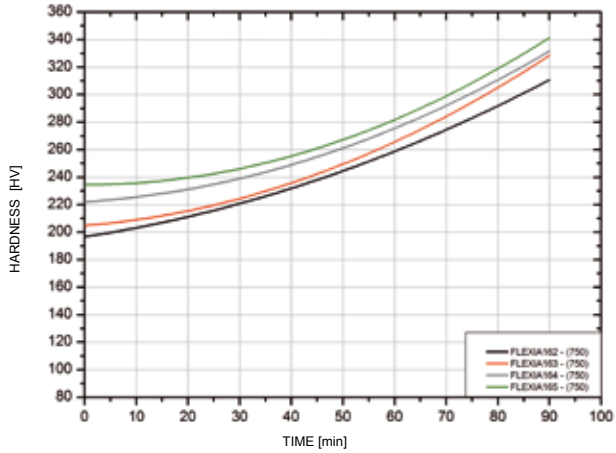
Au	BLANK100 - (750)	BLANK105 - (750)	FLEXIA102 - (750)	FLEXIA103 - (750)	FLEXIA104 - (750)	FLEXIA111 - (750)	FLEXIA113 - (750)	FLEXIA116 - (750)	FLEXIA123 - (750)	FLEXIA124 - (750)	FLEXIA128 - (750)	FLEXIA134 - (750)- (130)	FLEXIA134 - (750) - (80)	FLEXIA141 - (750)	FLEXIA147 - (750)	FLEXIA162 - (750)	FLEXIA163 - (750)	FLEXIA164 - (750)	FLEXIA165 - (750)	GENIA104 - (750)	GENIA105 - (750)	GENIA106 - (750)
Physical and mechanical properties																						
Density [g/cm³]	14,98	14,77	14,67	14,67	14,61	14,63	14,67	14,67	14,7	14,71	15,91	10,06	15,91	14,66	16,06	14,66	14,67	14,68	14,68	14,63	14,68	14,66
Temperature Solidus [°C]	985	954	914	913	915	914	898	912	904	878	984	912	984	929	912	897	903	908	912	909	913	908
Temperature Liquidus [°C]	1009	982	934	941	935	933	919	931	921	929	1063	1116	1063	944	1116	916	927	934	941	939	938	932
Colour coordinates [L*]	83,82	84,7	86,36	86,27	86,18	86,17	86,74	86,09	86,18	86,28	82,12	80,99	82,12	85,6	80,99	86,57	86,59	86,3	86,09	86,15	86,17	86,3
Colour coordinates [a*]	0,84	0,84	2,68	1,78	1,28	0,25	3,52	3,06	5,18	2,32	2,94	2,23	2,94	2,91	2,23	3,65	2,88	2,43	1,88	1,88	2,29	3,1
Colour coordinates [b*]	6,16	6,72	12,4	10,75	9,95	7,69	14,02	12,44	14,59	11,87	12,01	9,34	12,01	11,22	9,34	13,82	12,72	11,93	11,09	11,05	11,33	12,67
Grain size as cast [µm]	109	114	743	554	372	262	996	899	1366	568	57	60	55	109	74	174	161	102	90	89	96	97
Deep drawing test after annealing [mm]	8,2	8,2	9,2	8,6	8,6	8	9,4	9,2	8,6	8,5	10,2	10	10,2	7,9	10	8,4	8,2	8	7,9	8,3	8	8,4
Ultimate tensile strenght after annealing [MPa]	693	711	560	583	599	654	535	556	572	577	354	363	354	739	363	545	573	591	606	716	708	704
Yield strenght after annealing [MPa]	500	524	397	425	419	462	409	402	455	437	172	178	172	520	178	386	419	426	438	495	488	454
Percent elongation after annealing [%]	30	30	27	28	28	30	12	23	13	26	36	29	36	24	29	32	24	23	31	24	25	24
Ultimate tensile strenght as cast [MPa]	575	594	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	519	501	513
Yield strenght as cast [MPa]	438	414	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	400	375	369
Percent elongation as cast [%]	7	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	33	39	46
Hardness as cast [HV]	258	243	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	205	198	192
Hardnessafter annealing [HV]	240	240	189	198	204	224	186	188	183	190	105	104	105	207	104	196	193	191	211	211	203	199
Application field																						
Mould casting	3	3	2	2	2	2	3	3	3	3	3	3	3	4	3	4	4	3	3	3	3	4
Continuous casting without cooling system	1	1	1	1	1	1	1	1	1	1	2	2	2	4	2	4	4	3	2	2	3	4
Continuous casting with cooling system	2	2	1	1	1	1	1	1	1	1	2	2	2	5	2	4	4	4	3	3	4	4
Handworking	1	1	2	2	1	1	4	4	5	2	5	5	5	2	5	3	3	2	1	1	2	3
Flat-bottom stampato	2	2	2	2	2	2	3	3	3	2	2	2	2	3	2	5	4	3	2	2	3	4
Double stampato	2	2	2	2	2	2	3	3	3	2	5	5	5	3	5	5	4	3	2	2	3	4
Handmade solid chain	1	1	1	1	1	1	4	4	5	1	4	5	4	1	5	4	3	1	1	1	1	3
Machine made solid chain	1	1	1	1	1	1	3	3	4	1	1	1	1	1	1	5	4	1	1	1	1	4
Handmade hollow chain	1	1	1	1	1	1	3	3	3	1	1	1	1	3	1	5	4	3	1	1	3	4
Machine made hollow chain	1	1	1	1	1	1	3	3	3	1	1	1	1	3	1	5	4	3	1	1	3	4
Items by soldered tube	1	1	1	1	1	1	3	3	3	1	1	1	1	3	1	5	4	3	1	1	3	4
Machine tool production	3	3	2	1	1	1	3	3	3	3	5	5	5	4	5	5	5	4	4	4	4	5
Centrifugal casting	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	3	3
Casting by open systems	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	4	4
Casting by vacuum systems	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	4	4
Casting without stones in place	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	4	4
Casting with stones in place	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	3	3

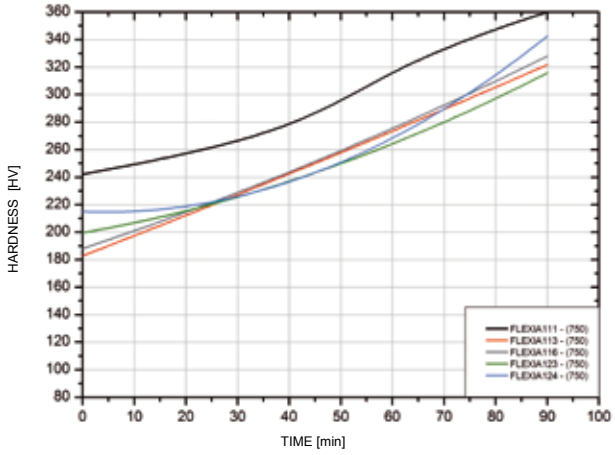
GENIA108 - (750)	GENIA156 - (750)	GENIA158 - (750)	GENIA161 - (750)	GENIA176 - (750)	GENIA177 - (750)	GENIA178 - (750)	GENIA179 - (750)	GENIA183 - (750)	GENIA196 - (750)	GENIA198 - (750)	LUX105 - (750)	LUX106 - (750)	LUX110 - (750)	LUX111 - (750)	LUX129 - (750)	LUX132 - (750)	LUX135 - (750)	LUX139 - (750) - (125)	LUX139 - (750) - (87,5)	LUX149 - (750)	LUX154 - (750)		
14,65	14,7	14,66	14,64	13,88	14,66	14,65	14,66	15,68	15,91	15,92	14,69	14,61	15,7	16,06	14,6	14,66	14,65	16,06	15,7	14,69	14,6	Density [g/cm³]	Physical and mechanical properties
897	882	928	873	893	900	904	908	966	975	980	889	905	980	925	901	905	911	925	980	847	864	Temperature Solidus [°C]	
919	927	957	920	915	926	932	937	1044	1066	1075	915	932	1065	1112	928	932	937	1112	1065	897	895	Temperature Liquidus [°C]	
86,49	86,24	85,98	85,8	86,43	86,49	85,86	86,54	80,99	82,7	81,5	86,81	86,62	86,85	80,86	86,23	86,36	86,66	80,86	86,85	86,77	87,45	Colour coordinates [L*]	
3,28	2,76	1,16	1,92	3,31	2,76	2,55	1,76	2,94	2,2	2,3	2,35	1,39	0,95	2,33	0,61	2,54	2,06	2,33	0,95	1,32	2,16	Colour coordinates [a*]	
13,77	12,92	8,9	11,3	12,96	12,89	12,19	10,65	8,31	9,55	9,1	12,91	10,61	14,2	9,16	9,29	12,02	11,74	9,16	14,2	12,19	14,76	Colour coordinates [b*]	
108	93	91	283	279	129	89	76	31	65	60	823	159	250	124	143	360	645	160	250	170	709	Grain size as cast [µm]	
8	8,2	7,1	4,4	8,3	7,9	7,6	7,5	8	8	8	...	...	...	...	...	...	...	...	...	...	...	Deep drawing test after annealing [mm]	
659	658	819	921	593	632	656	679	557	540	530	...	...	...	...	...	...	...	...	...	...	...	Ultimate tensile strenght after annealing [MPa]	
463	464	583	737	398	419	446	446	381	370	360	...	...	...	...	...	...	...	...	...	...	...	Yield strenght after annealing [MPa]	
28	25	22	7	28	29	27	24	14	14	14	...	...	...	...	...	...	...	...	...	...	...	Percent elongation after annealing [%]	
481	492	559	563	470	506	535	559	569	555	549	440	546	367	387	623	460	467	387	367	586	393	Ultimate tensile strenght as cast [MPa]	
314	364	425	453	330	343	376	398	306	298	295	337	384	184	204	459	353	370	204	184	445	290	Yield strenght as cast [MPa]	
44	42	27	27	43	47	46	45	31	30	30	27	28	14	10	32	27	28	10	14	30	29	Percent elongation as cast [%]	
184	185	219	250	198	196	195	210	194	178	180	185	213	130	160	226	205	210	160	130	211	187	Hardness as cast [HV]	
189	192	225	257	182	186	196	209	171	177	175	...	...	...	...	...	...	...	...	...	...	...	Hardnessafter annealing [HV]	
4	4	2	3	4	4	3	3	3	3	3	...	...	...	...	...	...	...	...	...	...	...	Mould casting	Application field
4	4	1	2	3	3	2	2	2	2	2	...	...	...	...	...	...	...	...	...	...	...	Continuous casting without cooling system	
4	4	2	3	4	4	4	3	3	3	3	...	...	...	...	...	...	...	...	...	...	...	Continuous casting with cooling system	
3	4	1	1	3	3	2	1	4	4	4	...	...	...	...	...	...	...	...	...	...	...	Handworking	
5	5	2	2	5	4	3	2	4	4	4	...	...	...	...	...	...	...	...	...	...	...	Flat-bottom stampato	
5	5	2	2	5	4	3	2	5	5	5	...	...	...	...	...	...	...	...	...	...	...	Double stampato	
4	4	1	1	3	3	1	1	5	5	5	...	...	...	...	...	...	...	...	...	...	...	Handmade solid chain	
5	5	1	1	4	3	1	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	Machine made solid chain	
5	5	1	1	4	4	2	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	Handmade hollow chain	
5	5	1	1	4	4	2	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	Machine made hollow chain	
5	5	1	1	4	4	2	1	2	2	2	...	...	...	...	...	...	...	...	...	...	...	Items by soldered tube	
5	5	2	4	5	5	4	4	5	5	5	...	...	...	...	...	...	...	...	...	...	...	Machine tool production	
3	3	3	3	4	4	4	4	2	2	2	3	3	2	2	3	3	3	2	2	3	3	Centrifugal casting	
4	5	3	5	4	4	4	4	2	2	2	3	2	2	2	2	3	3	2	2	5	3	Casting by open systems	
4	4	3	4	4	4	4	4	3	3	3	3	2	3	3	2	3	3	3	3	4	3	Casting by vacuum systems	
4	5	3	5	4	4	4	4	3	3	3	3	2	3	3	2	3	3	3	3	5	3	Casting without stones in place	
4	5	1	3	4	3	3	3	1	1	1	1	1	3	3	1	1	1	3	3	3	3	Casting with stones in place	

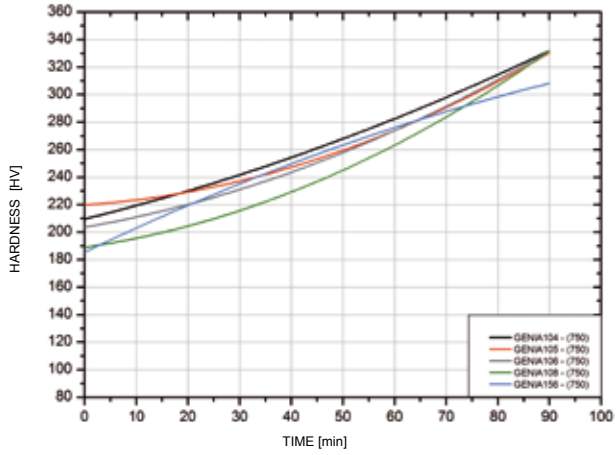
750 Gold/White

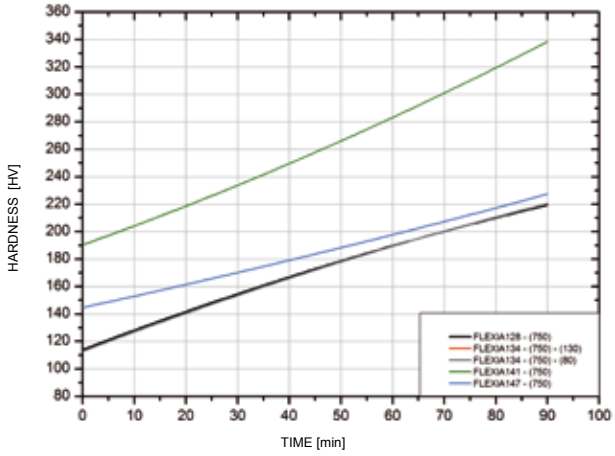
COLD WORKING GRAPHS

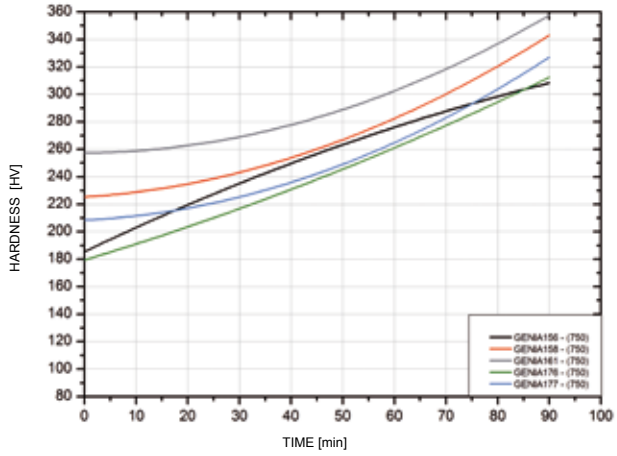


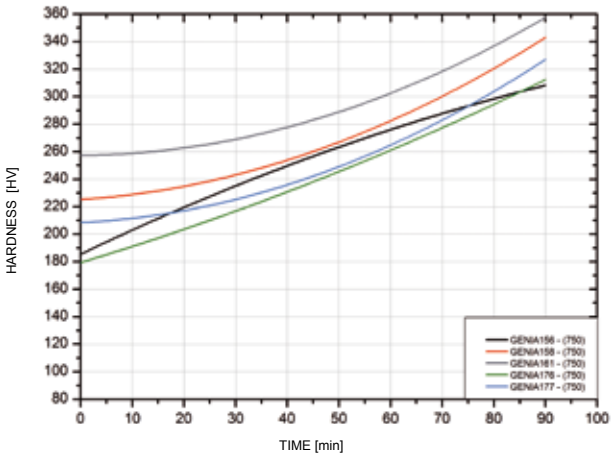




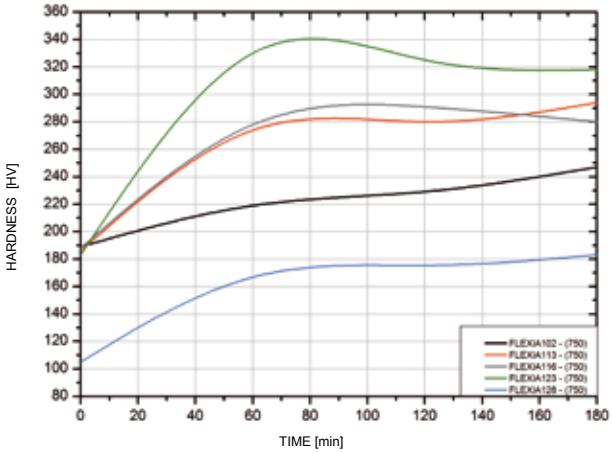


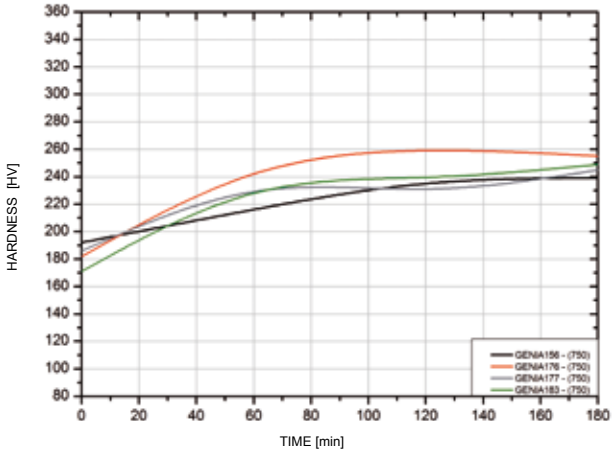


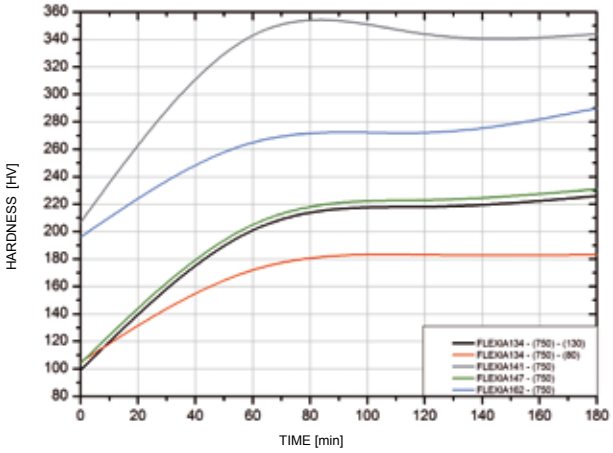


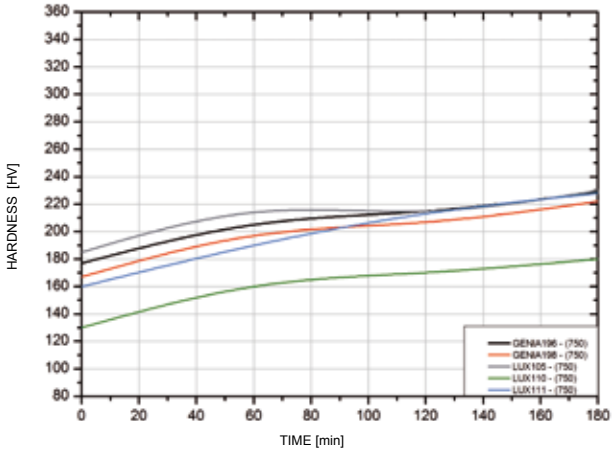


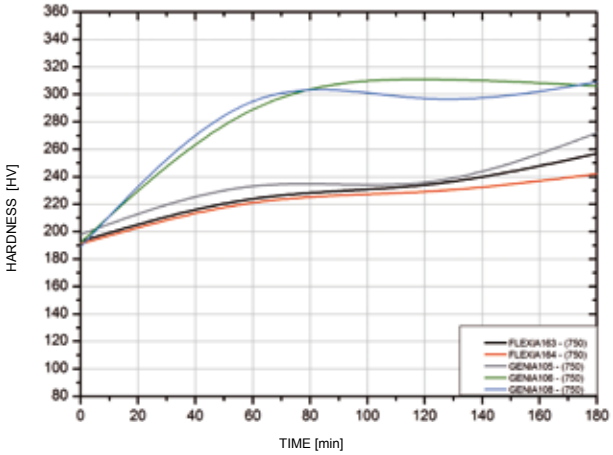
HARDENING GRAPHS

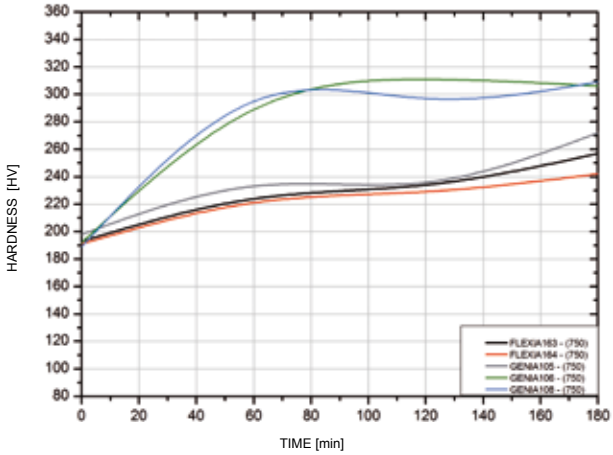












FLEXIA110
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag5Zn23). The resulting alloy is for the production of stamped items and solid chains. This gold alloy is not suitable for hardening. It can be cast both using traditional methods (mould casting) and continuous casting.

FLEXIA117
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag13Zn23). The resulting alloy is for the production of stamped items and solid chains. This gold alloy is not suitable for hardening. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

FLEXIA133
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag10Zn14). The resulting alloy is for the production of stamped items and solid chains. This gold alloy is not suitable for hardening. Use of traditional mould casting methods is recommended.

FLEXIA151
Plus-category master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag31Zn10). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Its main feature is high hardening following proper heat treatment. It is an alloy with a fine grain microstructure. It can be used with all casting methods (mould casting and continuous casting).

FLEXIA156
Plus-category master alloy suitable for the production of 14 ct yellow gold alloys (Ag5Zn16). The resulting alloy is for the production of hollow chains. This gold alloy does not lend itself for hardening. Its melting temperature is specifically planned to perfectly adapt to production processes made using an iron core. It can be cast and melted using both traditional methods (mould casting) and continuous casting.

FLEXIA157
Plus-category master alloy suitable for the production of 14 ct yellow gold alloys (Ag5Zn14). The resulting alloy is for the production of hollow chains. This gold alloy does not lend itself for hardening. Its temperature is specifically planned to perfectly adapt to production processes made using an iron core. It can be cast and melted using both traditional methods (mould casting) and continuous casting.

FLEXIA160
Plus-category master alloy suitable for the production of 14 ct yellow gold alloys (Ag29Zn11). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Its main feature is high hardening following proper heat treatment and also a higher resistance to oxidation during common heat treatments (annealing, hardening and soldering). It can be cast with traditional casting methods (mould casting), but also with continuous casting.

GENIA102
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag25Zn15). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. This gold alloy lends itself very well for hardening. It can be used with all casting methods (mould and continuous casting).

GENIA107
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag20Zn15). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Its hue is commonly known as “Hamilton yellow”. This gold alloy lends itself very well for hardening. It can be cast using all casting methods (mould casting and continuous casting).

GENIA109
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag47Zn2). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without precious stones. The colour of 18 ct gold alloys corresponds to 3N, as defined by the EN28654 standard; the 14 ct gold alloy ensures more similarity to the 3N colour obtained in 18 ct. The gold alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA110
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag56.5Zn3.5). The gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. The colour of the 18 ct gold alloy corresponds to 2N, as defined by the EN28654 standard; the 14 ct gold alloy corresponds to 1N, as defined by the same standard. The 14 ct gold alloy lends itself well for hardening, the 18 ct lends itself quite well. During plastic deformation, it can be cast using both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA111
Master alloy suitable for the production of 14 and 18 ct yellow alloys (Ag45Zn10). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items without precious stones. This gold alloy is particularly plastic and well suitable when high malleability and ductility are required. This gold alloy lends itself very well for hardening. During plastic deformation, it can be cast using both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA113
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag64Zn3.5). This gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. The 18 ct gold alloy hue is commonly known as “Valenzan Yellow”, the 14 ct gold alloy is a 0N colour as per EN28654 standard. Only the 14 ct gold alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA114
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag10Zn20). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. This gold alloy does not lend itself well for hardening, therefore its use is recommended only when high hardness (>150HV) is not required in the final product. It can be used with all casting methods (mould and continuous casting).

GENIA116
Master alloy suitable for the production of 9, 10, 14, 21 and 22 ct yellow gold alloys (Ag5Zn10). The resulting alloy is for the pro-

duction of hollow chains. Gold plating is recommended. This gold alloy does not lend itself for hardening. Its melting temperature is high, therefore it enables melting of the soldering within the support section of hollow chains. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

GENIA120
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag5Zn23). The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets and tube rings. Its use is recommended only when high hardness (>150HV) is not required in the final product; this alloy is not suitable for hardening. It can be used with all casting methods (mould casting and continuous casting).

GENIA135
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag15Zn15). The gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. This gold alloy does not lend itself for hardening. It can be cast with all casting methods (mould casting and continuous casting).

GENIA136
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag20Zn10). The gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. This gold alloy lends itself very well for hardening. It can be cast with all casting methods (mould casting and continuous casting).

GENIA138
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag55Zn7). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. The gold alloy is very plastic and well suitable when high malleability and ductility are required. The 14 ct gold alloy lends itself well for hardening, the 18 ct lends itself quite well for hardening. It can be cast with all casting methods (mould casting and continuous casting).

GENIA145
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag30Zn25). The gold alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings. The colour of the 18 ct alloy corresponds to 1N, as defined by the EN28654 standard (a colour which usually belongs to a 14 ct gold alloy). Therefore, its use is recommended only when this particular colour is strictly required. The gold alloy lends itself well for hardening. It can be used with all casting methods (mould casting and continuous casting).

GENIA151
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag62Zn1.5). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with and without precious stones. The colour of 18 ct gold alloys corresponds to 2N, as defined by the EN28654 standard. The alloy lends itself for hardening. During plastic deformation, it can be cast using both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA154
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag44Zn2). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with and without precious stones. The 18 ct gold alloys are slightly redder than 3N, as defined by the EN28654 standard; on the other hand, the 14 ct gold alloy is of a very warm yellow colour. The gold alloy lends itself for hardening. During plastic deformation, the gold alloy can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA159
Master alloy suitable for the production of 14 and 18 ct yellow gold stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items without precious stones (Ag47.5Zn11.5). This gold alloy is particularly plastic and suitable when high malleability and ductility are required. The gold alloy also lends itself well for hardening. During plastic deformation, it can be cast and melted with both both mould and continuous casting. All the most common investment casting techniques can be used.

GENIA167
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag15Zn11). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without precious stones. Only the 18 ct gold alloy lends itself well for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA174
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag63Zn0.2). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings, watch-cases and investment cast items with and without precious stones. The colour of the 18 ct gold alloys corresponds to 2N, as defined by the EN 28654 standard. The 18 ct gold alloy does not lend itself for hardening. During plastic deformation, the gold alloy can be cast and melted using both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA182
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag41Zn7.5). The resulting alloy is for the production of stamped iems, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without precious stones. The gold alloy lends itself well for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

LUX100
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag10Zn17). The resulting gold alloy is for the production of investment cast items with or without precious stones. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX101
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag20Zn16). The resulting gold alloy is for the production of investment cast items with or without precious stones. The 14 ct alloy hue is commonly known as “Hamilton yellow”, while the 9 ct alloy hue is known as “English yellow”. The gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

LUX116
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag5Zn23). The resulting alloy is for the production of investment cast items with or without precious stones. This gold alloy does not lend itself for hardening. It can be used with all the most common investment casting machines. In low pressure systems the weight loss is above average (due to the high concentration of zinc).

LUX120
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag15Zn15). The resulting alloy is for the production of investment cast items with or without precious stones. Only the 9 and 10 ct gold alloys lend themselves quite well for hardening. All the most common investment casting techniques can be used.

LUX130
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag32Zn10). The resulting alloy is for the production of investment cast items with or without precious stones. The gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

LUX133
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag10Zn23). The resulting alloy is for the production of investment cast items with or without precious stones. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX137
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag23Zn13). The resulting alloy is for the production of investment cast items with or without precious stones. The gold alloy lends itself for hardening with all fineness and especially with 9 and 10 ct. All the most common investment casting techniques can be used.

LUX144
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag12.5Zn12.5). The resulting alloy is for the production of investment cast items with or without precious stones. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX145
Master alloy suitable for the production of 14 and 18 ct yellow gold alloys (Ag30Zn25). The resulting alloy is for the production of investment cast items with or without precious stones. The colour of the 18 ct gold alloy corresponds to 1N, as defined by the EN28654 standard (a colour which usually belongs to a 14 ct gold alloy). The use of this alloy is advisable when this particular colour is strictly required. The gold alloy lends itself for hardening and it should be used in machines without vacuum assisted investment casting

LUX146
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag25Zn20). The resulting alloy is for the production of investment cast items with or without precious stones. The resulting hue is commonly known as “Holland Yellow”. This gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

LUX148
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag23Zn9). The resulting alloy is for the production of investment cast items with or without precious stones. The 14 ct gold alloy hue is widely known as “Hamilton Yellow”; the 9 ct gold alloy hue is known as “English Yellow”. The gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

UNIKA103
Master alloy suitable for the production of yellow gold alloys (Ag5-Zn23) in 14 ct. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets and tube rings, investment cast items with and without stones in place. The alloy lends itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. Its use is recommended only when casting takes place in a protected atmosphere (reducing flame, inert atmosphere, boric acid).

UNIKA104
Master alloy suitable for the production of yellow gold alloys (Ag10Zn17) in 14 ct. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets and tube rings, investment cast items with and without stones in place. The alloy lends itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. Its use is recommended only when casting takes place in a protected atmosphere (reducing flame, inert atmosphere, boric acid).

UNIKA105
Master alloy suitable for the production of yellow gold alloys (Ag15Zn15) in 14 ct. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets and tube rings, investment cast items with and without stones in place. The alloy is not suitable for hardening. During plastic deformation it can be cast and melted using both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. Its use is recommended only when casting takes place in a protected atmosphere (reducing flame, inert atmosphere, boric acid).

UNIKA106
Master alloy suitable for the production of yellow “Hamilton” gold alloys (Ag20Zn16) in 14 ct. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets and tube rings, investment cast items with and without stones in place. The alloy lends itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. Its use is recommended only when casting takes place in a protected atmosphere (reducing flame, inert atmosphere, boric acid).

UNIKA107
Master alloy suitable for the production of yellow “Hamilton” gold alloys (Ag23Zn9) in 14 ct. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets and tube rings, investment cast items with and without stones in place. The alloy lends itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. Its use is recommended only when casting takes place in a protected atmosphere (reducing flame, inert atmosphere, boric acid).

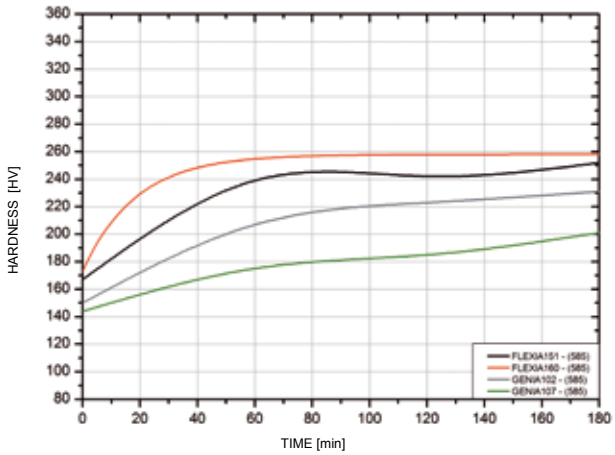
585 Gold/Yellow

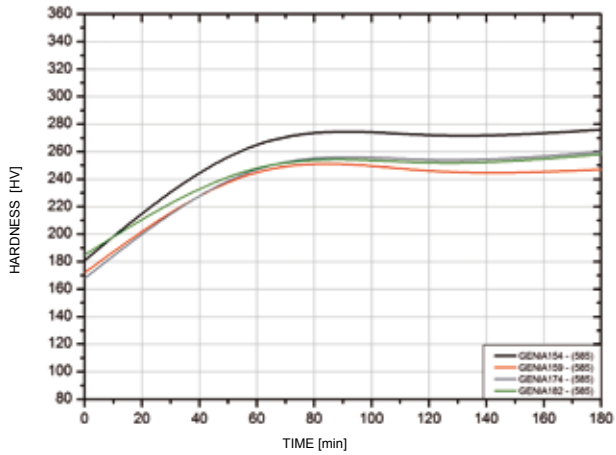
Au		FLEXIA110 - (585)	FLEXIA117 - (585)	FLEXIA133 - (585)	FLEXIA151 - (585)	FLEXIA156 - (585)	FLEXIA157 - (585)	FLEXIA160 - (585)	GENIA102 - (585)	GENIA107 - (585)	GENIA109 - (585)	GENIA110 - (585)	GENIA111 - (585)	GENIA113 - (585)	GENIA114 - (585)	GENIA116 - (585)	GENIA120 - (585)	GENIA135 - (585)	GENIA136 - (585)	GENIA138 - (585)	GENIA145 - (585)	GENIA151 - (585)
Physical and mechanical properties	Density [g/cm³]	12,67	12,75	12,83	13,12	12,75	12,76	13,08	12,98	12,94	13,43	13,57	13,31	13,63	12,77	12,81	12,67	12,88	12,99	13,5	12,93	13,67
	Temperature Solidus [°C]	853	822	854	815	877	882	795	810	824	827	824	805	825	842	894	852	838	839	815	772	832
	Temperature Liquidus [°C]	889	863	894	846	907	910	840	848	865	838	834	819	839	879	916	888	878	877	823	804	843
	Colour coordinates [L*]	90,2	90,83	89,63	90,36	89,66	89,57	90,16	90,52	90,52	90,17	92,17	91,79	92,28	89,95	88,31	90,52	88,58	90,1	92,24	91,89	91,96
	Colour coordinates [a*]	2,53	1	4,28	2,95	4,56	5,1	2,39	2,01	3,02	3,99	1,29	0,83	0,16	2,88	6,73	2,17	4,12	4,65	0,39	-0,85	1,17
	Colour coordinates [b*]	19,12	19,69	18,57	19,14	18,23	18,1	18,61	19,55	18,99	19,91	20,51	19,47	20,83	18,97	16,77	19,27	18,78	18,34	20,24	19,18	20,98
	Grain size as cast [µm]	1323	1420	1895	99	76	91	60	189	169	83	143	163	75	219	115	121	195	182	165	175	132
	Deep drawing test after annealing [mm]	12	11,7	11,4	9,6	11,4	11,2	8,9	10,8	11,1	8,3	8,4	9,3	8,2	11,9	11,5	11,4	11,2	10,5	8,9	10,7	8,2
	Ultimate tensile strenght after annealing [MPa]	421	430	446	581	477	475	665	466	466	682	614	562	629	444	473	499	462	482	602	443	651
	Yield strenght after annealing [MPa]	195	221	227	367	230	227	410	289	271	470	430	400	414	226	231	245	251	283	425	285	437
	Percent elongation after annealing [%]	47	46	44	31	42	41	26	39	43	19	22	24	21	43	43	38	43	43	24	36	20
	Ultimate tensile strenght as cast [MPa]	...	...	...	...	...	...	...	...	...	559	550	...	499	...	...	...	...	...	...	...	508
	Yield strenght as cast [MPa]	...	...	...	...	...	...	...	...	...	459	465	...	342	...	...	...	...	...	...	...	394
	Percent elongation as cast [%]	...	...	...	...	...	...	...	...	...	32	27	...	41	...	...	...	...	...	...	...	39
	Hardness as cast [HV]	...	...	...	...	...	...	...	...	...	216	237	...	178	...	...	...	...	...	...	...	203
	Hardnessafter annealing [HV]	106	117	122	167	117	115	173	150	144	182	182	171	168	115	121	108	128	147	179	150	168
Application field	Mould casting	2	2	2	4	3	3	3	3	3	4	4	4	4	3	4	3	3	4	4	3	4
	Continuous casting without cooling system	2	2	2	3	3	3	2	3	3	2	2	2	2	2	4	2	3	4	2	2	2
	Continuous casting with cooling system	2	2	3	3	3	3	3	3	3	3	3	3	3	2	4	2	3	4	3	2	3
	Handworking	4	4	3	2	2	2	1	3	3	2	2	2	2	3	1	3	3	2	2	3	2
	Flat-bottom stampato	2	2	2	5	2	2	4	4	4	5	5	5	5	2	1	2	2	4	5	5	5
	Double stampato	3	3	3	3	2	2	2	5	5	3	3	3	3	3	1	3	3	4	3	5	3
	Handmade solid chain	3	3	2	2	3	3	1	3	3	2	2	2	2	5	3	5	3	3	2	3	2
	Machine made solid chain	3	3	3	3	4	4	2	4	5	2	2	2	2	5	5	5	5	5	2	3	2
	Handmade hollow chain	2	2	2	5	3	3	4	5	5	3	3	3	3	3	3	2	3	5	3	3	3
	Machine made hollow chain	2	2	2	2	3	4	2	2	2	2	2	2	2	2	5	3	2	2	2	2	2
	Items by soldered tube	2	2	2	5	3	3	4	5	5	3	3	3	3	3	3	2	3	5	3	3	3
	Machine tool production	3	3	3	2	3	3	2	3	3	2	2	2	2	4	2	4	3	3	2	2	2
	Centrifugal casting	...	...	...	...	...	...	...	...	...	3	3	...	3	...	...	...	...	...	...	...	3
	Casting by open systems	...	...	...	...	...	...	...	...	...	3	3	...	3	...	...	...	...	...	...	...	3
	Casting by vacuum systems	...	...	...	...	...	...	...	...	...	3	3	...	3	...	...	...	...	...	...	...	3
	Casting without stones in place	...	...	...	...	...	...	...	...	...	4	4	...	4	...	...	...	...	...	...	...	4
	Casting with stones in place	...	...	...	...	...	...	...	...	...	2	2	...	2	...	...	...	...	...	...	...	2

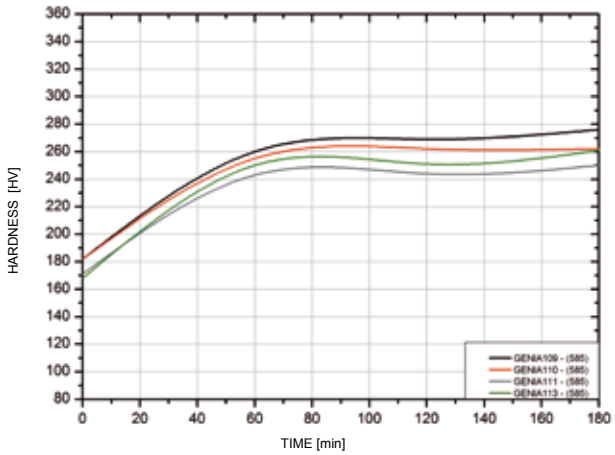
GENIA154 - (585)	GENIA159 - (585)	GENIA167 - (585)	GENIA174 - (585)	GENIA182 - (585)	LUX100 - (585)	LUX101 - (585)	LUX116 - (585)	LUX120 - (585)	LUX130 - (585)	LUX133 - (585)	LUX137 - (585)	LUX144 - (585)	LUX145 - (585)	LUX146 - (585)	LUX148 - (585)	UNIKA103 - (585)	UNIKA104 - (585)	UNIKA105 - (585)	UNIKA106 - (585)	UNIKA107 - (585)		
13,42	13,3	12,8	13,6	12,85	12,74	12,88	12,62	12,81	13,1	12,7	12,94	12,82	12,92	12,9	12,99	12,63	12,76	12,84	12,88	12,99	Density [g/cm³]	Physical and mechanical properties
825	806	845	828	840	825	795	821	810	781	804	794	827	754	761	798	822	830	815	795	798	Temperature Solidus [°C]	
835	818	885	845	886	875	849	871	865	835	857	849	878	794	819	858	873	881	867	850	858	Temperature Liquidus [°C]	
87,94	90,85	90	91,65	90,5	90,23	90,75	90	90,29	90,62	90,64	90,67	90,12	91,49	90,9	89,54	90,94	90,29	89,35	89,48	89,14	Colour coordinates [L*]	
4,98	0,65	4	1,35	5	3,11	2,13	2,14	3,03	2,56	1,25	2,74	3,93	-1	0,65	4,47	1,95	3,59	3,7	2,44	4,48	Colour coordinates [a*]	
19,19	20,6	19	21,3	19,5	18,61	19,02	19,11	18,68	19,01	19,37	18,87	18,3	19,01	19,2	18,23	20,06	19,02	19,27	19,47	18,66	Colour coordinates [b*]	
85	150	500	85	90	898	621	1036	1000	848	795	558	734	823	987	695	245	241	256	239	232	Grain size as cast [µm]	
8,4	9,3	11	8,2	10,4	...	...	...	...	...	...	...	...	...	...	...	11,9	11	10,9	10,6	10,4	Deep drawing test after annealing [mm]	
680	560	450	635	542	...	...	...	...	...	...	...	...	...	...	...	442	448	460	476	482	Ultimate tensile strenght after annealing [MPa]	
460	401	240	410	329	...	...	...	...	...	...	...	...	...	...	...	221	229	250	262	271	Yield strenght after annealing [MPa]	
20	24	44	20	35	...	...	...	...	...	...	...	...	...	...	...	41	42	43	41	41	Percent elongation after annealing [%]	
554	...	...	505	522	304	330	284	318	401	287	356	316	311	332	368	284	360	318	334	368	Ultimate tensile strenght as cast [MPa]	
454	...	...	345	374	163	211	143	190	297	152	235	183	241	231	222	143	184	190	211	250	Yield strenght as cast [MPa]	
33	...	...	41	38	51	46	55	48	39	51	44	49	36	44	42	55	55	48	44	45	Percent elongation as cast [%]	
190	...	...	175	182	106	137	96	125	163	112	131	118	162	142	153	104	118	130	127	147	Hardness as cast [HV]	
181	172	133	168	185	...	...	...	...	...	...	...	...	...	...	...	115	121	129	135	149	Hardnessafter annealing [HV]	
4	4	4	4	4	...	...	...	...	...	...	...	...	...	...	...	3	3	3	3	3	Mould casting	Application field
2	2	2	2	2	...	...	...	...	...	...	...	...	...	...	...	2	3	3	3	4	Continuous casting without cooling system	
3	3	3	3	3	...	...	...	...	...	...	...	...	...	...	...	2	3	3	3	4	Continuous casting with cooling system	
2	2	2	2	2	...	...	...	...	...	...	...	...	...	...	...	3	3	3	3	3	Handworking	
5	5	3	5	3	...	...	...	...	...	...	...	...	...	...	...	2	2	2	4	4	Flat-bottom stampato	
3	3	3	3	3												3	3	3	4	4	Double stampato	
2	2	2	2	2	...	...	...	...	...	...	...	...	...	...	...	4	4	3	3	3	Handmade solid chain	
2	2	4	2	4	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	1	Machine made solid chain	
3	3	3	3	3	...	...	...	...	...	...	...	...	...	...	...	2	3	3	4	4	Handmade hollow chain	
2	2	2	2	2	...	...	...	...	...	...	...	...	...	...	...	2	2	2	2	2	Machine made hollow chain	
3	3	3	3	3	...	...	...	...	...	...	...	...	...	...	...	2	3	3	4	4	Items by soldered tube	
2	2	3	2	3	...	...	...	...	...	...	...	...	...	...	...	4	4	3	3	3	Machine tool production	
3	...	...	3	...	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	Centrifugal casting	
3	...	...	3	...	3	4	3	3	4	3	4	3	4	4	4	3	3	3	4	4	Casting by open systems	
3	...	...	3	...	4	4	3	4	3	3	4	4	2	3	4	3	4	4	4	4	Casting by vacuum systems	
4	...	...	4	...	3	3	3	3	3	3	3	3	2	3	3	4	4	4	4	4	Casting without stones in place	
2	...	...	2	...	4	4	4	4	4	4	4	4	2	4	4	5	5	5	5	5	Casting with stones in place	

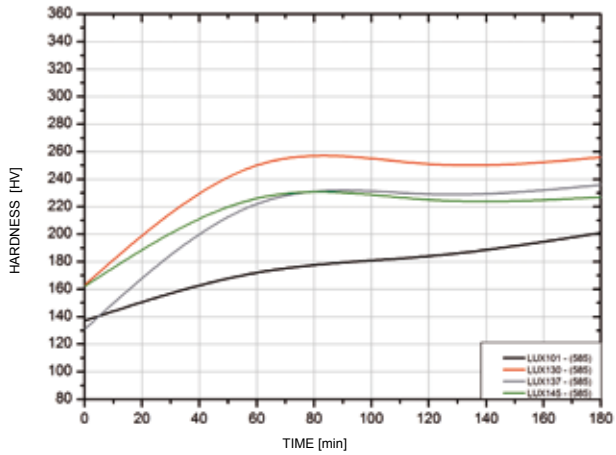
585 Gold/Yellow

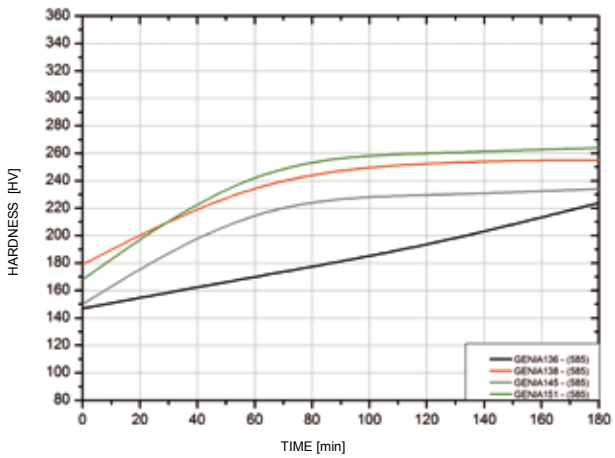
COLD WORKING GRAPHS

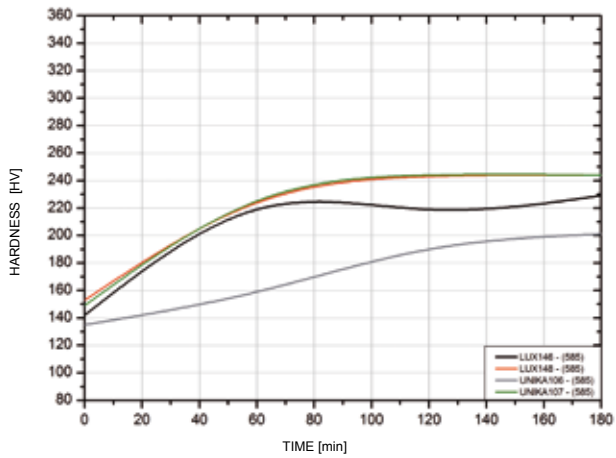




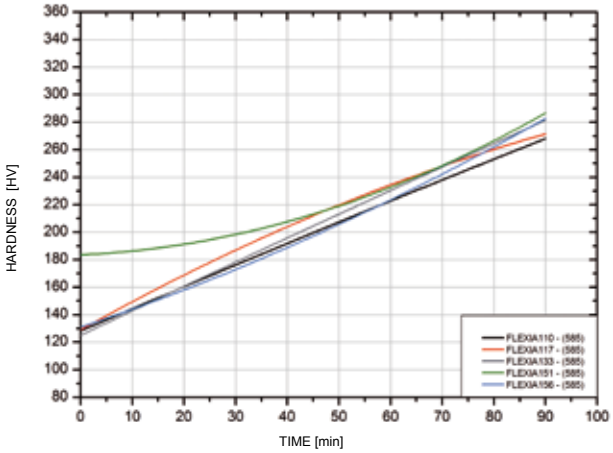


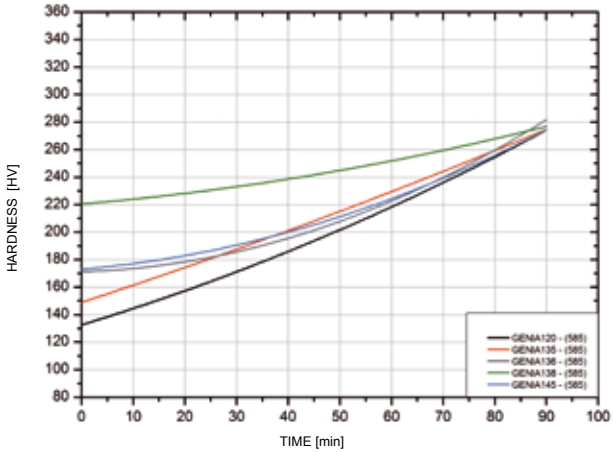


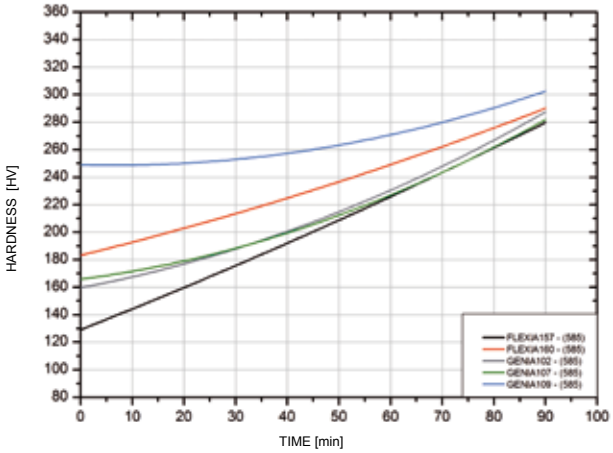


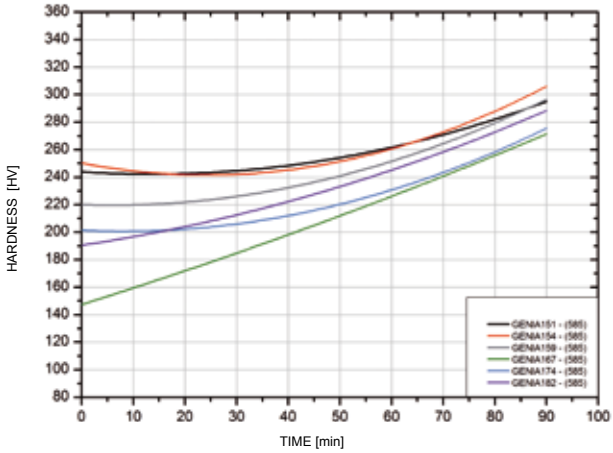


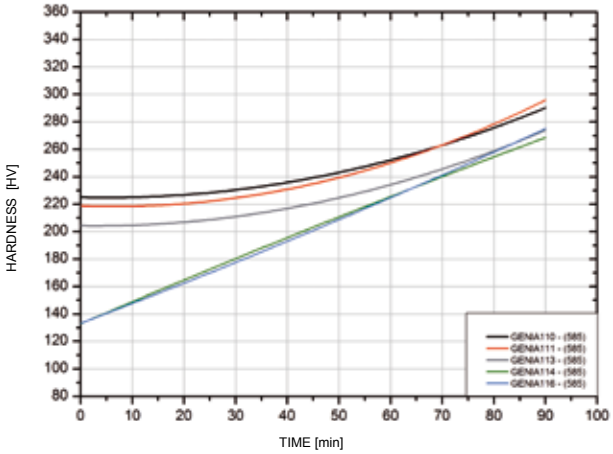
HARDENING GRAPHS

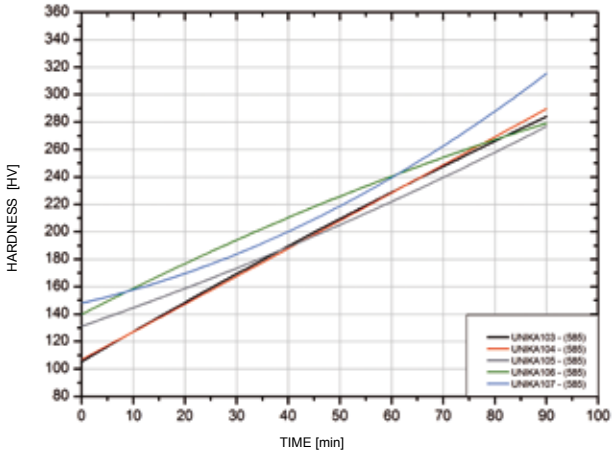












585 Gold/White

FLEXIA113
Master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni15Zn15). The resulting alloy is for the production of stamped items and solid chains. Rhodium plating is recommended; however, final decision is left to the producer. Only the 18 ct gold alloy lends itself for hardening. It can be used to produce also 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. Use of traditional mould casting methods is recommended.

FLEXIA116
Master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni20Zn12). The resulting alloy is for the production of stamped items and solid chains. Rhodium plating is recommended for the 18 ct gold alloy; however, final decision is left to the producer. The 18 ct gold alloy lends itself for hardening. It can be used to produce also 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. Use of traditional mould casting methods is recommended.

FLEXIA123
Master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni10Zn10). The resulting alloy is for the production of stamped items and solid chains. Compliance with the EU Nickel Directive for the 9-10 ct gold alloys is not guaranteed. Rhodium plating is required; however, final decision is left to the producer. Only the 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA128
Plus-category master alloy suitable for the production of 14 and 18 ct white gold palladium based alloys (Pd35). The resulting alloy is for the production of items by machine tools, stamped items and solid chains. Rhodium plating is recommended; however, final decision is left to the producer. This gold alloy is nickel-free. Only the 18 ct gold alloy lends itself quite well for hardening. It can be used with all casting methods (mould casting and continuous casting).

FLEXIA155
Plus-category master alloy suitable for the production of 9, 10 ct (for the production of items that can be sold only in countries with no restrictions on nickel use) and 14 ct white gold alloys (Ni15Zn8Ag10). The resulting alloy is for the production of stamped items, hollow chain, earrings, bracelets and tube rings. Rhodium plating is recommended; however, final decision is left to the producer. It has a fine grain microstructure alloy and it is suitable for continuous casting in low finenesses.

FLEXIA162
Plus-category master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni15Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Rhodium plating is recommended; however, final decision is left to the producer. This 18 ct gold alloy lends itself very well for hardening. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. It can be cast and melted with both traditional casting methods (mould casting) and continuous casting.

FLEXIA163
Plus-category master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni20Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Rhodium plating is recommended for the 18 ct gold alloy; however, final decision is left to the producer. The 18 ct gold alloy lends itself for hardening. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries wtih no restrictions on nickel use. It can be cast and melted with both traditional casting methods (mould casting) and continuous casting.

GENIA134
Master alloy suitable for the production of 14 ct white gold alloys (Ni20Zn18). The gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with and without precious stones. Rhodium plating is not necessary thanks to the good intensity of white; however, final decision is left to the producer. This gold alloy does not lend itself for hardening. During plastic deformation, it can be cast with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA157
Master alloy suitable for the production of 14 ct white gold alloys (Ni20Zn18). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items with and without stones in place. Rhodium plating is not necessary thanks to the good intensity of white; however, final decision is left to the producer. This gold alloy does not lend itself for hardening. During plastic deformation, the alloy can be cast and melted with both mould and continuous casting. All the most common investment casting techniques can be used.

GENIA176
Master alloy suitable for the production of 14 and 18 ct white gold alloys (Ni15Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. Rhodium plating is recommended; however, final decision is left to the producer. The 18 ct gold alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA177
Master alloy suitable for the production of 14 and 18 ct white gold alloys (Ni20Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without precious stones. Rhodium plating is recommended; however, final decision is left to the producer. Only the 18 ct gold alloy lends itself quite well for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

LUX105
Master alloy suitable for the production of 14 and 18 ct white gold alloys (Ni20Zn18). The resulting alloy is for the production of investment cast items without stones in place. Rhodium plating is suggested only for the 18 ct gold alloy, while it is not strictly required for the 14 ct gold alloy, thanks to the good intensity of white; however, final decision is left to the producer. Only the 18 ct gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

LUX112
Master alloy suitable for the production of 9, 10 and 14 ct white gold alloys (Ni15Zn25). The resulting alloy is for the production of items without precious stones. Rhodium plating is recommended; however, final decision is left to the producer. It can be used

to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX121
Master alloy suitable for the production of 9, 10 and 14 ct white gold alloys (Ni12Zn20). The resulting alloy is for the production of items with or without precious stones. Rhodium plating is recommended; however, final decision is left to the producer. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. It can be used for casting with stones only if the surface area in contact with the stones is small. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX154
Master alloy suitable for the production of 9, 10, 14 and 18 ct white gold investment cast items with or without precious stones (Ni15Zn15). Rhodium plating is recommended; however, final decision is left to the producer. The gold alloy lends itself for the production of 9, 10 ct items which are sold in countries with no restrictions on nickel use. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX160
Plus-category master alloy suitable for the production of 9, 10 and 14 ct white gold alloys (Ni15Zn10Ag15). The resulting alloy is for the production of investment cast items with or without precious stones in place. Rhodium plating is suggested; however, final decision is left to the producer. The main feature of this product is its high filling capability. The gold alloy lends itself for hardening. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. All the most common investment casting techniques can be used.

LUX161
Plus-category master alloy suitable for the production of 9, 10 and 14 ct white gold alloys (Ni15Zn15Ag15). The resulting alloy is for the production of investment cast items with or without precious stones in place. Rhodium plating is suggested; however, final decision is left to the producer. The main features of this product are good filling capability and reduced defectiveness of the pieces cast. This gold alloy lends itself well for hardening. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. All the most common investment casting techniques can be used.

PURA100
Master alloy suitable for the production of 14 ct white gold alloys (Ni20Zn18). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items with and without stones in place. Rhodium plating is not necessary thanks to the good intensity of white; however, final decision is left to the producer. This gold alloy does not lend itself for hardening. Its main feature is the extreme pureness of the master alloy which ensures superior quality of finished items. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

PURA101
Master alloy suitable for the production of 9, 10 and 14 ct white gold alloys (Ni10Zn15). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items with and without stones in place. Rhodium plating is suggested; however, final decision is left to the producer. This gold alloy does not lend itself for hardening. Its main feature is the extreme pureness of the master alloy which ensures superior quality of finished items. It is particularly recommended when low hardness values are fundamental. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

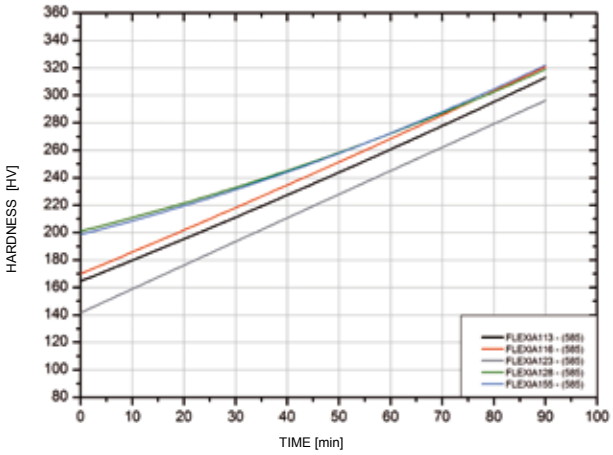
UNIKA109
Master alloy suitable for the production of white gold alloys (Ni19Zn17Ag7) in 9, 10 and 14 ct. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets and tube rings, investment cast items with and without stones in place. Rhodium plating is not necessary thanks to the good intesity of white, however final decision is left to the producer. The alloy does not lend itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. Its use is recommended only when casting takes place in a protected atmosphere (reducing flame, inert atmosphere, boric acid).

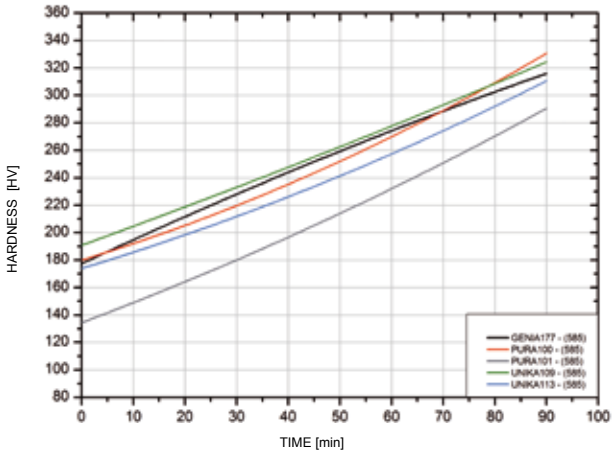
UNIKA113
Master alloy suitable for the production of white gold alloys (Ni15Zn14) in 14 ct. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets and tube rings, investment cast items with and without stones in place. Rhodium plating is recommended; however, final decision is left to the producer. The alloy is not suitable for hardening. Its main feature is the high surface quality achieved in the casting process. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. Its use is recommended only when casting takes place in a protected atmosphere (reducing flame, inert atmosphere, boric acid).

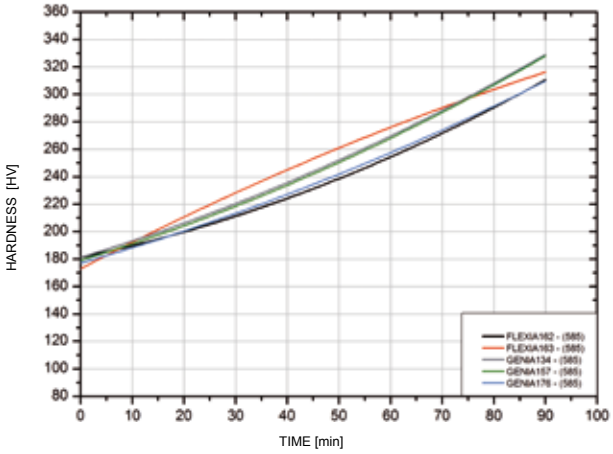
585 Gold/White

	Au	FLEXIA113 - (585)	FLEXIA116 - (585)	FLEXIA123 - (585)	FLEXIA128 - (585)	FLEXIA155 - (585)	FLEXIA162 - (585)	FLEXIA163 - (585)	GENIA134 - (585)	GENIA157 - (585)	GENIA176 - (585)	GENIA177 - (585)	LUX105-(585)	LUX112 - (585)	LUX121 - (585)	LUX154 - (585)	LUX160 - (585)	LUX161 - (585)	PURA100 - (585)	PURA101 - (585)	UNIKA109 - (585)	UNIKA113 - (585)
Physical and mechanical properties	Density [g/cm³]	12,73	12,76	12,77	13,5	12,91	12,75	12,74	12,7	12,7	12,72	12,73	12,69	12,63	12,66	12,63	12,93	12,87	12,7	12,72	12,76	12,7
	Temperature Solidus [°C]	930	951	938	1005	890	932	947	926	927	922	928	923	890	903	891	855	827	926	916	878	916
	Temperature Liquidus [°C]	964	972	963	1098	964	968	973	974	975	957	969	964	949	941	949	938	912	975	953	929	961
	Colour coordinates [L*]	87,44	86,36	87,33	81,15	87,24	87,25	86,64	86,8	86,4	87,43	87,28	86,61	87,65	88,11	88,01	87,86	87,35	87,19	88,01	87,69	87,1
	Colour coordinates [a*]	2,02	1,95	3,83	2,21	2,6	2,22	1,63	1,24	1,4	2,17	1,53	1,25	0,62	1,73	0,59	1,89	1,12	1,19	3,05	1,08	1,2
	Colour coordinates [b*]	10,99	9,64	12,16	9,75	11,14	11,12	9,66	9,88	10,72	10,98	9,51	9,94	11,76	12,71	11,63	11,6	12	9,85	13,11	10,52	10
	Grain size as cast [µm]	396	210	1052	105	38	161	163	46	58	155	151	744	1150	486	1118	169	141	55	110	171	990
	Deep drawing test after annealing [mm]	11	10,4	11	9,5	9,3	10,8	10,4	9,5	9,7	9,8	9,4	...	...	...	...	...	...	9,6	9,8	8,8	10,2
	Ultimate tensile strenght after annealing [MPa]	507	546	486	610	669	519	565	687	677	643	687	...	...	...	...	...	...	689	589	654	520
	Yield strenght after annealing [MPa]	257	291	234	505	420	263	307	424	412	385	416	...	...	...	...	...	...	429	313	411	260
	Percent elongation after annealing [%]	47	44	44	33	32	42	43	29	30	30	29	..	..	..	..	..	..	29	31	33	37
	Ultimate tensile strenght as cast [MPa]	...	...	...	...	...	...	...	463	425	457	498	418	301	395	326	508	533	464	439	470	320
	Yield strenght as cast [MPa]	...	...	...	...	...	...	...	261	211	194	216	247	182	200	200	346	354	265	174	302	180
	Percent elongation as cast [%]	...	...	...	...	...	...	...	45	54	54	54	37	44	40	41	45	38	49	57	43	50
	Hardness as cast [HV]	..	..	..	..	..	..	..	149	148	140	149	155	135	125	135	181	184	149	142	158	142
	Hardnessafter annealing [HV]	126	136	124	185	171	133	140	150	158	156	159	...	...	...	...	...	...	158	149	164	145
Application field	Mould casting	3	3	3	3	4	4	4	4	4	4	4	...	...	...	...	...	...	4	4	4	4
	Continuous casting without cooling system	2	2	2	3	5	3	3	3	3	3	3	...	...	...	...	...	...	3	3	3	3
	Continuous casting with cooling system	2	2	2	3	5	3	3	3	3	3	3	...	...	...	...	...	...	3	3	3	3
	Handworking	3	2	3	2	4	3	2	2	2	3	2	...	...	...	...	...	...	2	4	3	3
	Flat-bottom stampato	2	3	2	4	3	2	4	4	4	2	4	...	...	...	...	...	...	4	2	3	3
	Double stampato	2	3	2	4	3	2	4	4	4	2	4	...	...	...	...	...	...	4	2	3	3
	Handmade solid chain	3	2	3	2	5	3	2	2	2	2	2	...	...	...	...	...	...	2	2	3	3
	Machine made solid chain	3	3	3	2	5	3	2	2	2	2	2	...	...	...	...	...	...	2	2	2	3
	Handmade hollow chain	3	3	3	3	5	4	4	4	4	4	4	...	...	...	...	...	...	4	3	4	4
	Machine made hollow chain	3	3	3	3	5	4	4	4	4	4	4	...	...	...	...	...	...	4	3	4	4
	Items by soldered tube	2	2	2	3	5	3	3	3	3	3	3	...	...	...	...	...	...	3	3	3	3
	Machine tool production	3	3	3	3	4	3	3	2	2	2	2	...	...	...	...	...	...	2	3	4	3
	Centrifugal casting	...	...	...	...	...	...	...	4	4	4	4	3	3	3	4	4	4	4	4	4	4
	Casting by open systems	...	...	...	...	...	...	...	3	3	3	3	3	4	4	5	5	5	3	3	4	4
	Casting by vacuum systems	...	...	...	...	...	...	...	3	3	3	3	3	2	2	5	4	3	3	3	4	4
	Casting without stones in place	...	...	...	...	...	...	...	5	5	5	5	2	2	2	3	3	3	5	5	4	4
	Casting with stones in place	...	...	...	...	...	...	...	3	3	3	3	1	1	1	4	5	3	3	4	5	5

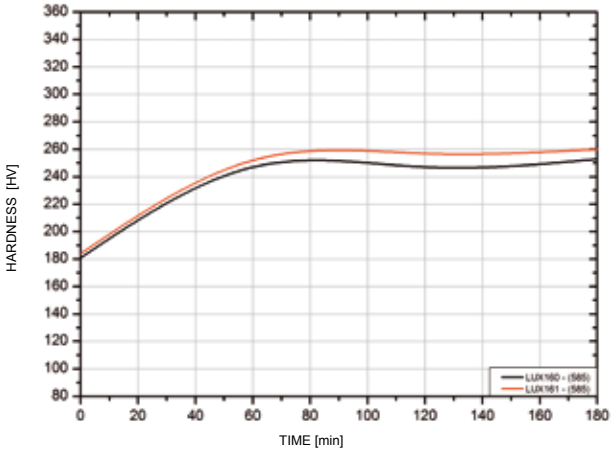
COLD WORKING GRAPHS







HARDENING GRAPH



FLEXIA106
Master alloy suitable for the production of 9, 10, 14 and 18 ct red gold alloys (Cu78.5Zn4.5). The resulting alloy is for the production of stamped items and solid chains. The colour of the 18 ct gold alloy corresponds to 5N, as defined by the EN28654 standard (when 5.5% of silver is added). The colour of the 14 ct gold alloy is widely known as “Russian Red”. Only the 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA107
Master alloy suitable for the production of 9, 10, 14 and 18 ct red gold alloys (Cu87Zn3). The resulting alloy is for the production of stamped items and solid chains. Only the 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA108
Master alloy suitable for the production of 9, 10, 14 and 18 ct red gold alloys (Cu92Zn3). The resulting alloy is for the production of stamped items and solid chains. Only the 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA112
Master alloy suitable for the production of 9, 10, 14 and 18 ct red gold alloys (Cu81Zn1). The resulting alloy is for the production of stamped items and solid chains. The colour of the 18 ct gold alloy corresponds to 5N, as defined by the EN28654 standard. The colour of the 14 ct gold alloy is widely known as “Russian Red”. The 18 ct gold alloy lends itself well for hardening and fairly well for other finenesses. Use of traditional mould casting methods is recommended.

FLEXIA126
Master alloy suitable for the production of 9, 10, 14 and 18 ct red gold alloys (Cu96Zn2). The resulting alloy is for the production of stamped items and solid chains. The red hue is the most intense among the entire range of Progold red gold alloys. Only the 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA150
Plus-category master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu83Zn6). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. This gold alloy is not suitable for hardening. Its main feature is high plasticity which enables wrought and pressed chains. This gold alloy has a fine grain microstructure. It can be used with all casting methods (mould casting and continuous casting).

FLEXIA161
Plus-category master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu83Zn6). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. This gold alloy does not lend itself for hardening. Its main feature is high plasticity which enables wrought and pressed chains. This gold alloy has a fine grain microstructure. It can be used with all casting methods (mould casting, continuous casting).

GENIA100
Master alloy suitable for the production of 9, 10 and 14 ct red alloys (Cu81Zn1). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with or without precious stones. The 14 ct gold alloy hue is commonly known as “Russian Red”. This gold alloy lends itself quite well for hardening. During plastic deformation it can be cast and melted using both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA101
Master alloy suitable for the production of 9, 10 and 14 red gold alloys (Cu92Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without stones in place. This gold alloy does not lend itself for hardening. Casting using traditional methods (mould casting) is suggested during plastic deformation; during investment casting it can be cast with all the most common techniques.

GENIA103
Master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu87Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without precious stones. This gold alloy does not lend itself for hardening. Casting using traditional methods (mould casting) is suggested during plastic deformation. It can be cast with all the most common investment casting methods during investment casting.

GENIA162
Master alloy suitable for the production of red gold alloys (Cu94Zn3.5) in 9, 10 and 14 ct. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets, tube rings and investment cast articles with or without stones in place. This gold alloy does not lend itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA164
Master alloy suitable for the production of 9, 10 and 14 red gold alloys (Cu81Zn1). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with and without stones in place. The 14 ct gold alloy hue is commonly known as “Russian Red”. This gold alloy lends itself quite well for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA165
Master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu87Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without stones in place. This gold alloy does not lend itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA166
Master alloy suitable for the production of 9, 10 and 14 red gold alloys (Cu92Zn3). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items without stones in place. This gold alloy does not lend itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

LUX134
Master alloy suitable for the production of 9, 10 and 14 ct red

gold alloys (Cu82Zn5). The resulting alloy is for the production of investment cast items with or without precious stones. The 14 ct gold alloy hue is commonly known as “Russian Red”. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX150
Plus-category master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu82Zn4). The resulting alloy is for the production of investment cast items with or without stones in place. This gold alloy does not lend itself for hardening. The 14 ct alloy hue is commonly known as “Russian Red”. It is particularly recommended for complex pieces with flat surfaces, which may have shrinkage porosity. All the most common investment casting techniques can be used.

LUX158
Plus-category master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu84Zn1.2). The resulting alloy is for the production of investment cast items with and without stones in place. This gold alloy does not lend itself for hardening. The 14 ct gold alloy hue is commonly known as “Russian Red”. It is especially recommended for the production of complex items with flat surfaces, which may display shrinkage porosity. All the most common investment casting techniques can be used.

LUX159
Plus-category master alloy suitable for the production of 9, 10 and 14 ct white gold alloys (Ni15Zn10Ag15). The resulting alloy is for the production of investment cast items with or without precious stones in place. Rhodium plating is suggested; however, final decision is left to the producer. The main feature of this product is its high filling capability. The gold alloy lends itself for hardening. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. All the most common investment casting techniques can be used.

LUX167
Master alloy suitable for the production of 9, 10 and 14 ct red gold alloys (Cu96Zn2). The resulting alloy is for the production of investment cast items with or without precious stones. The red hue is the most intense among the entire range of Progold red gold alloys. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

UNIKA100
Master alloy suitable for the production of red gold alloys (Cu81Zn5) in 9, 10 and 14 ct. The resulting gold alloy is for the production of stamped items, handmade solid and hollow chain, earrings, bracelets, tube rings and investment cast items with and without stones in place. This gold alloy does not lend itself for hardening. The 14 ct gold hue is commonly known as “Russian Red”. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. Its use is recommended only when casting takes place in casting machines under controlled atmosphere (reducing flame, inert atmosphere, boric acid).

UNIKA101
Master alloy suitable for the production of red gold alloys (Cu80Zn2.4) in 9, 10 and 14 ct. The resulting alloy is for the production of stamped items, handmade solid and hollow chain, earrings, bracelets, tube rings and investment cast articles with or without stones in place. This gold alloy does not lend itself for hardening. The 14 ct gold hue is commonly known as “Russian Red”. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. However its use is recommended only when casting takes place in casting machines under controlled atmosphere (reducing flame, inert atmosphere, boric acid).

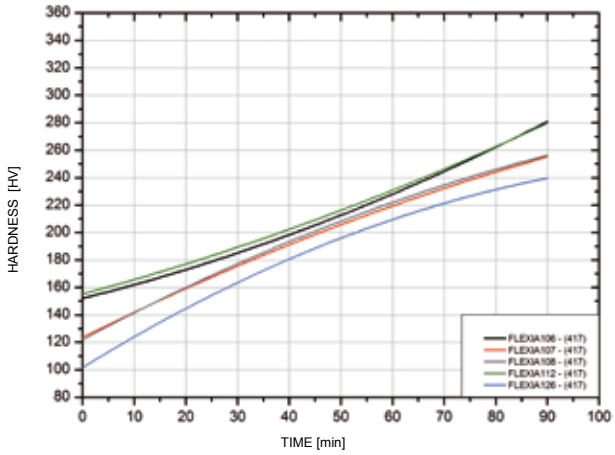
417/375 Gold/Red

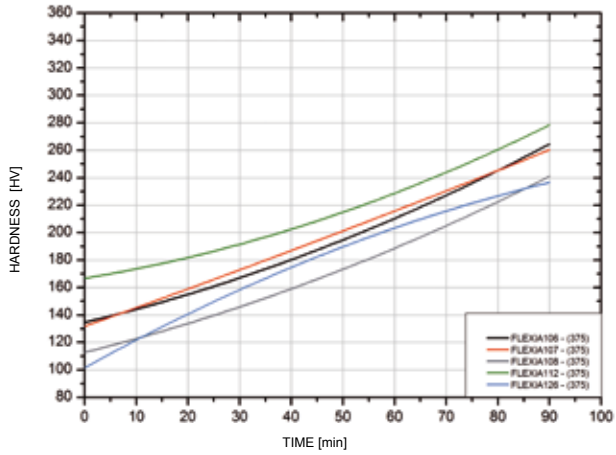
	Au	FLEXIA106 - (417)	FLEXIA107 - (417)	FLEXIA108 - (417)	FLEXIA112 - (417)	FLEXIA126 - (417)	FLEXIA150 - (417)	FLEXIA161 - (417)	GENIA100 - (417)	GENIA101 - (417)	GENIA103 - (417)	GENIA162 - (417)	GENIA164 - (417)	GENIA165 - (417)	GENIA166 - (417)	LUX134 - (417)	LUX150 - (417)	LUX158 - (417)	LUX159 - (417)	LUX167 - (417)	UNIKA100 - (417)	UNIKA101 - (417)
Physical and mechanical properties	Density [g/cm³]	11,54	11,4	11,39	11,59	11,38	11,47	10,47	11,59	11,43	11,42	11,38	11,59	11,42	11,43	11,48	11,45	11,45	11,45	11,38	11,49	11,88
	Temperature Solidus [°C]	842	871	875	839	965	849	849	838	927	872	951	835	872	927	848	849	850	849	965	836	815
	Temperature Liquidus [°C]	919	934	936	929	985	942	942	922	965	941	975	923	941	965	925	923	925	924	985	925	909
	Colour coordinates [L*]	88,5	88,1	88,2	88,2	85,34	88,91	88,91	87,91	87,4	88,06	88,05	88,23	88,06	87,4	89,13	89,21	89,15	89,1	85,35	88,86	88,62
	Colour coordinates [a*]	7,9	8,9	9,23	8,27	10,11	7,14	7,14	8,59	9,48	8,85	9,26	8,55	8,85	9,48	7,09	6,35	6,4	6,45	10,15	7,05	7,61
	Colour coordinates [b*]	16,1	15,5	15,08	15,24	14,2	16,43	16,43	15,22	14,54	15,28	14,72	15,27	15,28	14,58	16,66	16,66	16,92	16,7	14,2	16,65	15,48
	Grain size as cast [µm]	600	650	630	600	730	130	130	110	120	115	135	115	120	125	1200	500	750	750	2100	192	195
	Deep drawing test after annealing [mm]	8,9	9,4	9,4	8,9	9,9	10,3	10,3	9,4	9,7	9,6	9,8	9,4	9,6	9,7	...	...	...	...	...	9,4	9,4
	Ultimate tensile strenght after annealing [MPa]	552	462	461	594	471	468	468	548	491	501	477	548	501	491	...	...	...	...	...	458	455
	Yield strenght after annealing [MPa]	309	221	222	353	234	228	228	304	274	282	236	304	282	274	...	...	...	...	...	202	206
	Percent elongation after annealing [%]	23	22	22	23	27	38	38	30	28	29	29	30	29	28	...	...	...	...	...	35	35
	Ultimate tensile strenght as cast [MPa]	...	...	...	...	...	...	...	480	390	430	385	480	430	430	346	357	349	352	336	362	361
	Yield strenght as cast [MPa]	...	...	...	...	...	...	...	212	140	175	144	212	175	175	142	143	141	140	139	153	152
	Percent elongation as cast [%]	...	...	...	...	...	...	...	49	57	53	57	49	53	53	46	45	44	43	45	42	42
	Hardness as cast [HV]	...	...	...	...	...	...	...	134	101	116	98	134	116	101	110	111	103	102	99	102	102
	Hardnessafter annealing [HV]	134	118	116	144	102	119	112	135	102	115	103	135	115	102	...	...	...	...	...	101	101
Application field	Mould casting	3	3	2	3	2	4	4	4	3	4	3	4	4	3	...	...	...	...	...	4	4
	Continuous casting without cooling system	2	2	2	2	2	4	4	4	4	4	4	4	4	4	...	...	...	...	...	3	3
	Continuous casting with cooling system	3	3	3	3	3	4	4	4	4	4	4	4	4	4	...	...	...	...	...	3	3
	Handworking	3	4	5	3	5	4	4	2	4	3	5	2	3	4	...	...	...	...	...	2	2
	Flat-bottom stampato	2	2	2	2	2	3	3	3	2	2	2	3	2	2	...	...	...	...	...	2	2
	Double stampato	2	2	2	2	2	4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3
	Handmade solid chain	2	3	4	2	4	4	4	3	5	4	5	3	4	5	...	...	...	...	...	3	3
	Machine made solid chain	2	2	3	2	3	5	5	4	5	4	5	4	4	5	...	...	...	...	...	1	1
	Handmade hollow chain	2	2	2	2	2	4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3
	Machine made hollow chain	2	2	2	2	2	4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3
	Items by soldered tube	2	2	2	2	2	4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3
	Machine tool production	2	3	4	2	4	5	5	3	4	3	4	3	3	4	...	...	...	...	...	3	3
	Centrifugal casting	...	...	...	...	...	...	...	2	2	2	2	2	2	2	4	4	4	4	4	5	5
	Casting by open systems	...	...	...	...	...	...	...	2	2	2	2	2	2	2	4	5	5	5	4	4	4
	Casting by vacuum systems	...	...	...	...	...	...	...	3	3	3	3	3	3	3	4	5	5	5	4	4	4
	Casting without stones in place	...	...	...	...	...	...	...	4	3	4	3	4	4	3	3	5	5	5	3	4	4
	Casting with stones in place	...	...	...	...	...	...	...	2	1	1	1	2	1	1	3	5	5	5	3	4	4

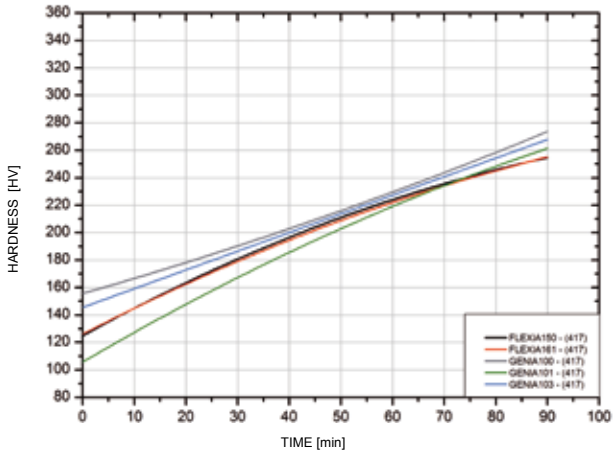
FLEXIA106 - (375)	FLEXIA107 - (375)	FLEXIA108 - (375)	FLEXIA112 - (375)	FLEXIA126 - (375)	FLEXIA150 - (375)	FLEXIA161 - (375)	GENIA100 - (375)	GENIA101 - (375)	GENIA103 - (375)	GENIA162 - (375)	GENIA164 - (375)	GENIA165 - (375)	GENIA166 - (375)	LUX134 - (375)	LUX150 - (375)	LUX158 - (375)	LUX159 - (375)	LUX167 - (375)	UNIKA100 - (375)	UNIKA101 - (375)		
11,27	11,17	11,27	11,26	11,12	11,13	11,19	11,29	11,11	11,18	11,07	11,29	11,18	11,11	11,16	11,14	11,15	11,15	11,05	11,1	11,62	Density [g/cm³]	Physical and mechanical properties
838	899	948	827	979	874	875	828	949	894	957	828	894	949	821	849	865	867	964	835	810	Temperature Solidus [°C]	
942	968	976	931	995	951	952	933	978	959	984	931	959	978	935	932	942	937	992	930	931	Temperature Liquidus [°C]	
86,87	88,08	87,47	88,67	86,58	89,31	88,73	88,26	85,85	87,65	87,81	88,5	87,65	85,85	89,26	89,21	87,7	87,37	87,07	89,81	88,62	Colour coordinates [L*]	
4,84	8,63	9,37	8,18	10,08	7,06	7,47	8,96	10	8,97	9,49	8,66	8,97	10	6,99	6,54	7,93	7,07	9,98	6,6	7,76	Colour coordinates [a*]	
17,3	14,76	15,35	15,02	14,05	16,48	16,89	17,1	16,02	15,67	14,83	15,11	15,67	16,02	16,78	16,58	16,74	18,23	14,1	16,99	15,59	Colour coordinates [b*]	
580	580	620	486	680	136	135	121	110	116	112	122	116	110	1406	550	760	765	2397	198	196	Grain size as cast [µm]	
9	9,1	9	8,9	9,1	9,9	9,9	9,5	9,7	9,6	9,7	9,6	9,6	9,7	...	...	...	...	...	9,6	9,6	Deep drawing test after annealing [mm]	
530	545	463	586	457	452	452	537	464	495	455	537	495	464	...	...	...	...	...	448	445	Ultimate tensile strenght after annealing [MPa]	
320	314	244	360	239	215	214	310	240	262	241	311	262	240	...	...	...	...	...	206	208	Yield strenght after annealing [MPa]	
24	25	24	24	26	38	38	27	28	27	27	27	27	28	...	...	...	...	...	36	37	Percent elongation after annealing [%]	
...	...	...	...	...	...	...	468	375	415	380	468	415	375	360	373	371	368	238	362	358	Ultimate tensile strenght as cast [MPa]	
...	...	...	...	...	...	...	195	135	162	138	196	162	135	144	153	151	150	102	154	152	Yield strenght as cast [MPa]	
...	...	...	...	...	...	...	46	50	48	52	46	48	50	43	42	42	42	43	39	39	Percent elongation as cast [%]	
...	...	...	...	...	...	...	132	93	108	87	131	108	93	114	112	103	99	92	101	101	Hardness as cast [HV]	
120	112	104	137	94	115	112	130	95	105	95	138	105	95	...	...	...	...	...	104	104	Hardnessafter annealing [HV]	
3	3	2	3	2	4	4	4	3	4	3	4	4	3	...	...	...	...	...	4	4	Mould casting	Application field
2	2	2	2	2	4	4	4	4	4	4	4	4	4	...	...	...	...	...	3	3	Continuous casting without cooling system	
3	3	3	3	3	4	4	4	4	4	4	4	4	4	...	...	...	...	...	3	3	Continuous casting with cooling system	
3	4	5	3	5	4	4	2	4	3	5	2	3	4	...	...	...	...	...	2	2	Handworking	
2	2	2	2	3	3	3	3	2	2	2	3	2	2	...	...	...	...	...	2	2	Flat-bottom stampato	
2	2	2	2	4	4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3	Double stampato	
2	3	4	2	4	4	4	3	5	4	5	3	4	5	...	...	...	...	...	3	3	Handmade solid chain	
2	2	3	2	3	5	5	4	5	4	5	4	4	5	...	...	...	...	...	1	1	Machine made solid chain	
2	2	2	2	4	4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3	Handmade hollow chain	
2	2	2	2	4	4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3	Machine made hollow chain	
2	2	2	2	4	4	4	4	3	3	3	4	3	3	...	...	...	...	...	3	3	Items by soldered tube	
2	3	4	2	4	5	5	3	4	3	4	3	3	4	...	...	...	...	...	3	3	Machine tool production	
...	...	...	...	...	...	...	2	2	2	2	2	2	2	4	4	4	4	4	5	5	Centrifugal casting	
...	...	...	...	...	...	...	2	2	2	2	2	2	2	4	5	5	5	4	4	4	Casting by open systems	
...	...	...	...	...	...	...	3	3	3	3	3	3	3	4	5	5	5	4	4	4	Casting by vacuum systems	
...	...	...	...	...	...	...	4	3	4	3	4	4	3	3	5	5	5	3	4	4	Casting without stones in place	
...	...	...	...	...	...	...	2	1	1	1	2	1	1	3	5	5	5	3	4	4	Casting with stones in place	

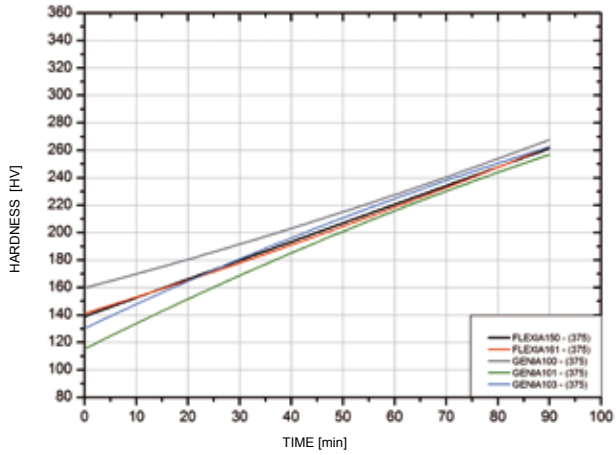
417/375 Gold/Red

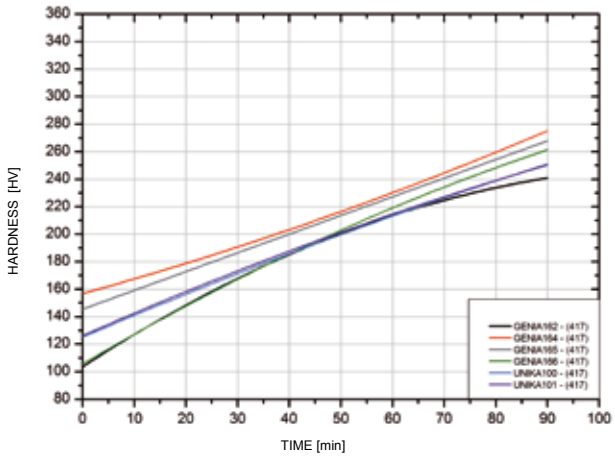
COLD WORKING GRAPHS

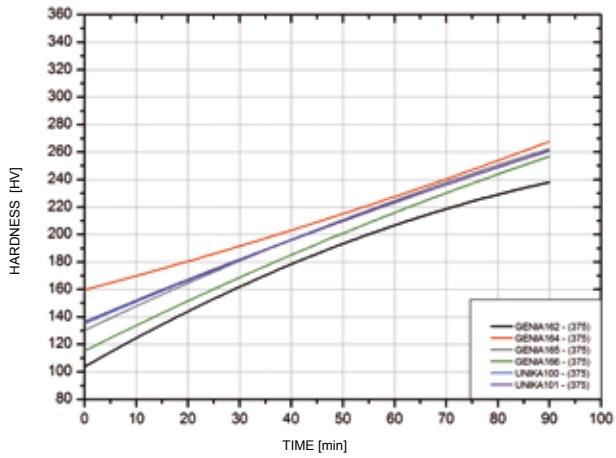




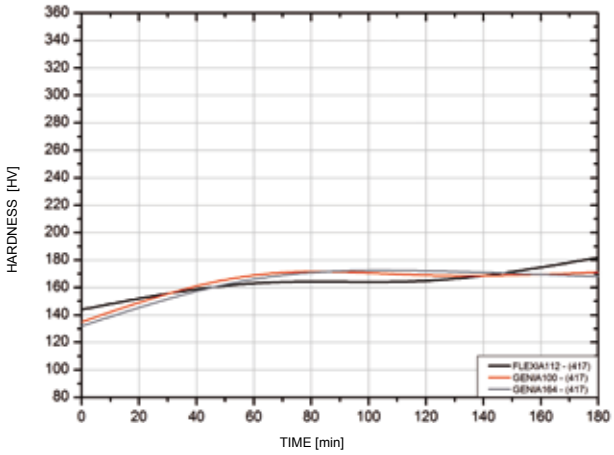


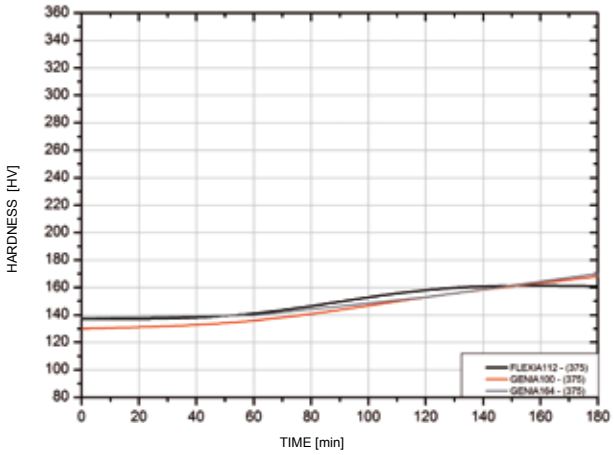






HARDENING GRAPHS





FLEXIA117
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag13Zn23). The resulting alloy is for the production of stamped items and solid chains. This gold alloy is not suitable for hardening. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

FLEXIA133
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag10Zn14). The resulting alloy is for the production of stamped items and solid chains. This gold alloy is not suitable for hardening. Use of traditional mould casting methods is recommended.

FLEXIA148
Plus-category master alloy suitable for the production of 9 and 10 ct yellow gold alloys (Ag22.5Zn12.5). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Its main feature is that the gold alloy can be considerably hardened after a proper heat treatment. It can be used with all casting methods (mould casting and continuous casting).

FLEXIA149
Plus-category master alloy suitable for the production of 9 and 10 ct yellow gold alloys (Ag24Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Its main feature is high hardening following proper heat treatment. It can be used with all casting methods (mould casting and continuous casting).

GENIA116
Master alloy suitable for the production of 9, 10, 14, 21 and 22 ct yellow gold alloys (Ag5Zn10). The resulting alloy is for the production of hollow chains. Gold plating is recommended. This gold alloy does not lend itself for hardening. Its melting temperature is high, therefore it enables melting of the soldering within the support section of hollow chains. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

GENIA119
Master alloy suitable for the production of 9 and 10 ct yellow gold alloys (Ag10Zn19). This gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. It is not suitable for hardening, therefore its use is recommended only when high hardness (>150HV) is not required in the final product. It can be used with all casting methods (mould casting and continuous casting).

GENIA121
Master alloy suitable for the production of 9 and 10 ct yellow gold alloys. This gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. The gold alloy is not suitable for hardening, therefore its use is recommended only when high hardness is not required in the final product. This alloy is not suitable for hardening. It can be used with all casting methods (mould casting and continuous casting).

GENIA123
Master alloy suitable for the production of 9 and 10 ct yellow gold alloys (Ag15Zn15). The gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. This gold alloy lends itself quite well for hardening. It can be used with all casting methods (mould casting and continuous casting).

GENIA124
Master alloy suitable for the production of 9 and 10 ct yellow gold alloys (Ag12Zn13). The gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. This gold alloys is not particularly suitable for hardening, therefore its use is recommended only when high hardness (>150HV) is not required in the final product. It can be used with all casting methods (mould casting and continuous casting).

LUX100
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag10Zn17). The resulting gold alloy is for the production of investment cast items with or without precious stones. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX101
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag20Zn16). The resulting gold alloy is for the production of investment cast items with or without precious stones. The 14 ct alloy hue is commonly known as “Hamilton yellow”, while the 9 ct alloy hue is known as “English yellow”. The gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

LUX120
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag15Zn15). The resulting alloy is for the production of investment cast items with or without precious stones. Only the 9 and 10 ct gold alloys lend themselves quite well for hardening. All the most common investment casting techniques can be used.

LUX133
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag10Zn23). The resulting alloy is for the production of investment cast items with or without precious stones. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX137
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag23Zn13). The resulting alloy is for the production of investment cast items with or without precious stones. The gold alloy lends itself for hardening with all fineness and especially with 9 and 10 ct. All the most common investment casting techniques can be used.

LUX144
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag12.5Zn12.5). The resulting alloy is for the production of investment cast items with or without precious stones. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX146
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag25Zn20). The resulting alloy is for the production of investment cast items with or without precious stones. The resulting hue is commonly known as “Holland Yellow”. This gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

LUX148
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag23Zn9). The resulting alloy is for the production of investment cast items with or without precious stones. The 14 ct gold alloy hue is widely known as “Hamilton Yellow”; the 9 ct gold alloy hue is known as “English Yellow”. The gold alloy lends itself for hardening. All the most common investment casting techniques can be used.

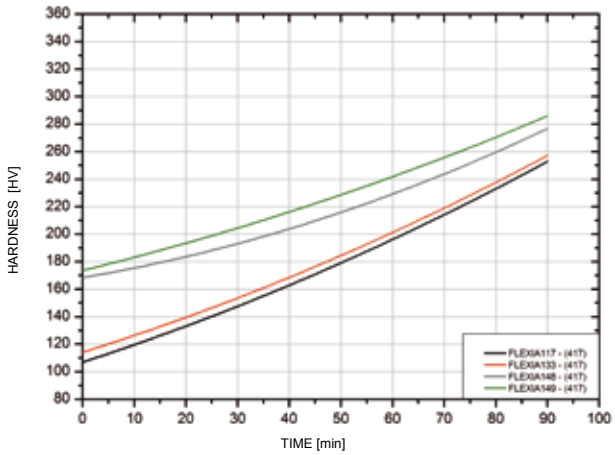
417/375 Gold/Yellow

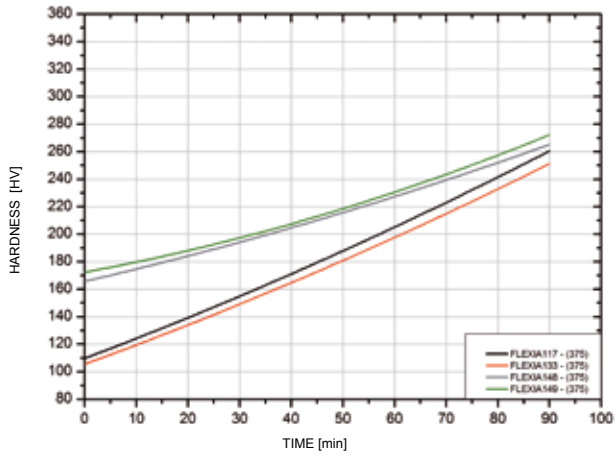
	Au	FLEXIA117 - (417)	FLEXIA133 - (417)	FLEXIA148 - (417)	FLEXIA149 - (417)	GENIA116 - (417)	GENIA119 - (417)	GENIA121 - (417)	GENIA123 - (417)	GENIA124 - (417)	LUX100 - (417)	LUX101 - (417)	LUX120 - (417)	LUX133 - (417)	LUX137 - (417)	LUX144 - (417)	LUX146 - (417)	LUX148 - (417)
Physical and mechanical properties	Density [g/cm³]	11,24	11,35	11,52	11,51	11,32	11,27	11,31	11,38	11,37	11,28	11,41	11,35	11,19	11,37	11,35	11,4	11,53
	Temperature Solidus [°C]	816	832	799	778	909	844	809	819	894	785	778	806	812	775	833	744	801
	Temperature Liquidus [°C]	884	912	882	869	951	911	885	904	918	899	863	884	880	861	902	825	877
	Colour coordinates [L*]	91,8	90,2	90,69	91,62	89,47	91,21	91,8	91,19	90,3	90,48	91,45	91,01	91,1	90,9	90,4	92,01	90,55
	Colour coordinates [a*]	0,15	3,7	2,74	1,73	6,25	1,46	0,8	2,32	3,75	2,35	1,06	1,99	0,37	1,9	3,5	-0,62	3,45
	Colour coordinates [b*]	20,1	19,5	18,34	18,46	17,15	19,63	20,1	18,61	19,5	18,86	18,41	18,6	19,46	18,2	19,32	18,42	17,7
	Grain size as cast [µm]	560	590	110	115	85	99	90	101	94	750	900	1100	1200	940	950	250	550
	Deep drawing test after annealing [mm]	11,2	11,1	10,1	10,1	10,8	10,8	11	10,9	11	...	...	...	...	...	...	...	...
	Ultimate tensile strenght after annealing [MPa]	511	501	522	520	475	507	531	511	508	...	...	...	...	...	...	...	...
	Yield strenght after annealing [MPa]	264	251	304	315	225	258	277	268	266	...	...	...	...	...	...	...	...
	Percent elongation after annealing [%]	32	33	33	32	33	35	30	34	32	...	...	...	...	...	...	...	...
	Ultimate tensile strenght as cast [MPa]	...	...	...	...	...	...	...	...	...	307	352	337	307	367	324	363	382
	Yield strenght as cast [MPa]	...	...	...	...	...	...	...	...	...	126	157	143	132	169	134	178	173
	Percent elongation as cast [%]	...	...	...	...	...	...	...	...	...	53	47	53	57	42	45	47	42
	Hardness as cast [HV]	...	...	...	...	...	...	...	...	...	96	118	99	90	131	101	131	131
	Hardnessafter annealing [HV]	101	101	140	141	93	101	102	120	102	...	...	...	...	...	...	...	...
Application field	Mould casting	2	2	3	3	4	3	2	3	3	...	...	...	...	...	...	...	...
	Continuous casting without cooling system	2	2	4	4	4	2	2	3	3	...	...	...	...	...	...	...	...
	Continuous casting with cooling system	2	3	4	4	4	2	2	3	4	...	...	...	...	...	...	...	...
	Handworking	4	3	2	2	1	3	3	3	2	...	...	...	...	...	...	...	...
	Flat-bottom stampato	2	2	5	5	1	2	2	2	2	...	...	...	...	...	...	...	...
	Double stampato	3	3	5	5	1	3	3	3	3	...	...	...	...	...	...	...	...
	Handmade solid chain	3	2	3	3	3	5	5	3	3	...	...	...	...	...	...	...	...
	Machine made solid chain	3	3	4	4	5	5	5	5	5	...	...	...	...	...	...	...	...
	Handmade hollow chain	2	2	5	5	3	3	3	3	3	...	...	...	...	...	...	...	...
	Machine made hollow chain	2	2	2	2	5	2	2	2	2	...	...	...	...	...	...	...	...
	Items by soldered tube	2	2	5	5	3	3	3	3	3	...	...	...	...	...	...	...	...
	Machine tool production	3	3	3	3	2	4	4	3	3	...	...	...	...	...	...	...	...
	Centrifugal casting	...	...	...	...	...	...	...	...	...	4	4	4	4	4	4	4	4
	Casting by open systems	...	...	...	...	...	...	...	...	...	3	4	3	3	4	3	4	4
	Casting by vacuum systems	...	...	...	...	...	...	...	...	...	4	4	4	3	4	4	3	4
	Casting without stones in place	...	...	...	...	...	...	...	...	...	3	3	3	3	3	3	3	3
	Casting with stones in place	...	...	...	...	...	...	...	...	...	4	4	4	4	4	4	4	4

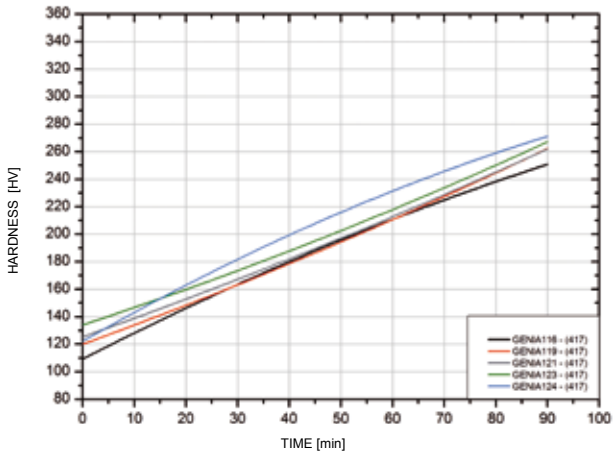
FLEXIA117 - (375)	FLEXIA133 - (375)	FLEXIA148 - (375)	FLEXIA149 - (375)	GENIA116 - (375)	GENIA119 - (375)	GENIA121 - (375)	GENIA123 - (375)	GENIA124 - (375)	LUX100 - (375)	LUX101 - (375)	LUX120 - (375)	LUX133 - (375)	LUX137 - (375)	LUX144 - (375)	LUX146 - (375)	LUX148 - (375)		
10,98	11,08	11,21	11,2	11,01	10,96	10,97	11,06	11,04	10,94	11,08	11,04	10,87	11,23	11,08	11,1	11,21	Density [g/cm³]	Physical and mechanical properties
811	849	785	777	914	845	812	819	848	838	777	814	820	768	829	752	767	Temperature Solidus [°C]	
894	923	885	874	959	906	899	908	925	909	869	897	886	867	909	838	871	Temperature Liquidus [°C]	
89,64	89,67	92,13	91,74	89,86	89,3	91,78	91,48	89,24	91,18	91,68	91,05	91,68	89,5	89,88	91,95	90,72	Colour coordinates [L*]	
-1,6	3,91	2,07	1,6	5,91	2,93	0,2	2,06	3,98	1,65	1,09	1,93	-0,15	-2,32	3,39	-0,64	3,48	Colour coordinates [a*]	
17,12	19,8	17,9	18,19	17,37	22,03	19,58	18,64	19,81	19,04	18,55	18,63	19,77	18,2	18,91	18,45	17,31	Colour coordinates [b*]	
650	700	101	105	66	80	79	87	82	618	892	1095	1168	700	990	606	413	Grain size as cast [µm]	
11,1	11	9,6	9,5	10,1	10,9	10,9	10,2	11	...	...	...	...	...	...	...	...	Deep drawing test after annealing [mm]	
430	445	525	541	468	472	465	493	480	...	...	...	...	...	...	...	...	Ultimate tensile strenght after annealing [MPa]	
220	230	320	337	233	225	235	255	230	...	...	...	...	...	...	...	...	Yield strenght after annealing [MPa]	
42	38	29	28	31	35	40	34	36	...	...	...	...	...	...	...	...	Percent elongation after annealing [%]	
...	...	...	...	...	...	...	...	...	329	375	345	319	370	340	366	401	Ultimate tensile strenght as cast [MPa]	
...	...	...	...	...	...	...	...	...	137	169	154	131	172	145	184	178	Yield strenght as cast [MPa]	
...	...	...	...	...	...	...	...	...	55	48	49	58	45	54	45	44	Percent elongation as cast [%]	
...	...	...	...	...	...	...	...	...	102	121	108	96	125	104	127	122	Hardness as cast [HV]	
103	101	147	135	92	100	106	112	101	...	...	...	...	...	...	...	...	Hardnessafter annealing [HV]	
2	2	3	3	4	3	2	3	3	...	...	...	...	...	...	...	...	Mould casting	Application field
2	2	4	4	4	2	2	3	3	...	...	...	...	...	...	...	...	Continuous casting without cooling system	
2	3	4	4	4	2	2	3	4	...	...	...	...	...	...	...	...	Continuous casting with cooling system	
4	3	2	2	1	3	3	3	2	...	...	...	...	...	...	...	...	Handworking	
2	2	5	5	1	2	2	2	2	...	...	...	...	...	...	...	...	Flat-bottom stampato	
3	3	5	5	1	3	3	3	3	...	...	...	...	...	...	...	...	Double stampato	
3	2	3	3	3	5	5	3	3	...	...	...	...	...	...	...	...	Handmade solid chain	
3	3	4	4	5	5	5	5	5	...	...	...	...	...	...	...	...	Machine made solid chain	
2	2	5	5	3	3	3	3	3	...	...	...	...	...	...	...	...	Handmade hollow chain	
2	2	2	2	5	2	2	2	2	...	...	...	...	...	...	...	...	Machine made hollow chain	
2	2	5	5	3	3	3	3	3	...	...	...	...	...	...	...	...	Items by soldered tube	
3	3	3	3	2	4	4	3	3	...	...	...	...	...	...	...	...	Machine tool production	
...	...	...	...	...	...	...	...	...	4	4	4	4	4	4	4	4	Centrifugal casting	
...	...	...	...	...	...	...	...	...	3	4	3	3	4	3	4	4	Casting by open systems	
...	...	...	...	...	...	...	...	...	4	4	4	3	4	4	3	4	Casting by vacuum systems	
...	...	...	...	...	...	...	...	...	3	3	3	3	3	3	3	3	Casting without stones in place	
...	...	...	...	...	...	...	...	...	4	4	4	4	4	4	4	4	Casting with stones in place	

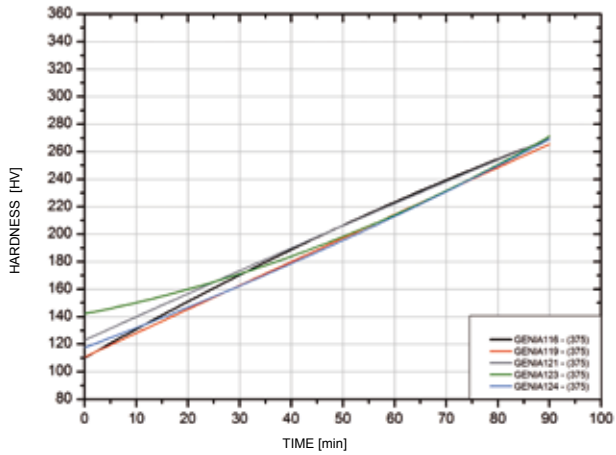
417/375 Gold/Yellow

COLD WORKING GRAPHS

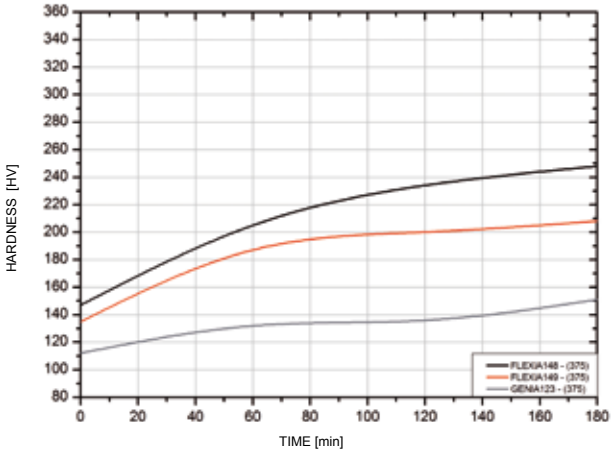


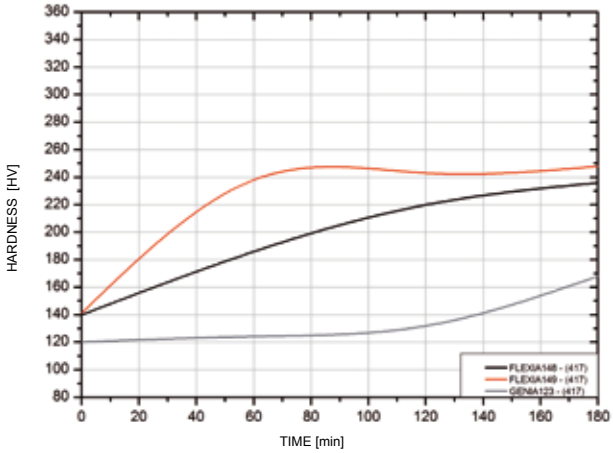


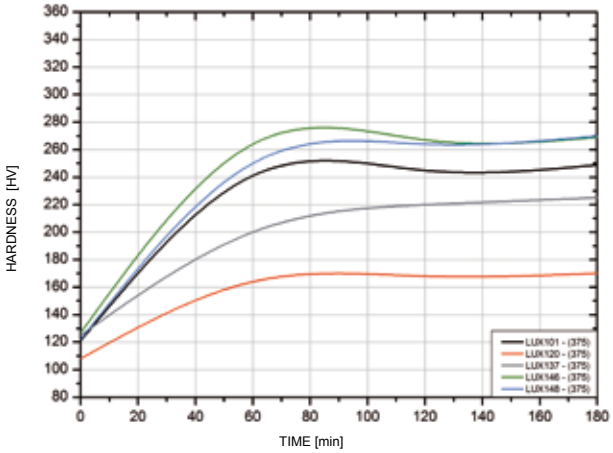


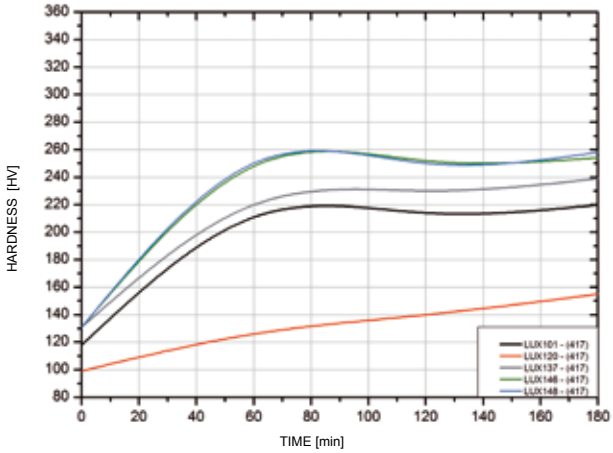


HARDENING GRAPHS









FLEXIA113
Master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni15Zn15). The resulting alloy is for the production of stamped items and solid chains. Rhodium plating is recommended; however, final decision is left to the producer. Only the 18 ct gold alloy lends itself for hardening. It can be used to produce also 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. Use of traditional mould casting methods is recommended.

FLEXIA116
Master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni20Zn12). The resulting alloy is for the production of stamped items and solid chains. Rhodium plating is recommended for the 18 ct gold alloy; however, final decision is left to the producer. The 18 ct gold alloy lends itself for hardening. It can be used to produce also 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. Use of traditional mould casting methods is recommended.

FLEXIA123
Master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni10Zn10). The resulting alloy is for the production of stamped items and solid chains. Compliance with the EU Nickel Directive for the 9-10 ct gold alloys is not guaranteed. Rhodium plating is required; however, final decision is left to the producer. Only the 18 ct gold alloy lends itself for hardening. Use of traditional mould casting methods is recommended.

FLEXIA155
Plus-category master alloy suitable for the production of 9, 10 ct (for the production of items that can be sold only in countries with no restrictions on nickel use) and 14 ct white gold alloys (Ni15Zn8Ag10). The resulting alloy is for the production of stamped items, hollow chain, earrings, bracelets and tube rings. Rhodium plating is recommended; however, final decision is left to the producer. It has a fine grain microstructure alloy and it is suitable for continuous casting in low finenesses.

FLEXIA162
Plus-category master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni15Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Rhodium plating is recommended; however, final decision is left to the producer. This 18 ct gold alloy lends itself very well for hardening. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. It can be cast and melted with both traditional casting methods (mould casting) and continuous casting.

FLEXIA163
Plus-category master alloy suitable for the production of 9, 10, 14 and 18 ct white gold alloys (Ni20Zn14). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings. Rhodium plating is recommended for the 18 ct gold alloy; however, final decision is left to the producer. The 18 ct gold alloy lends itself for hardening. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries wtih no restrictions on nickel use. It can be cast and melted with both traditional casting methods (mould casting) and continuous casting.

GENIA112
Master alloy suitable for the production of 9 and 10 ct white gold alloys (Ni0). This gold alloy lends itself for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items without precious stones. Rhodium plating is not required thanks to the good intensity of white; however, final decision is left to the producer. This gold alloy lends itself quite well for hardening. During plastic deformation, it can be cast with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA200
Master alloy suitable for the production of 9 and 10 ct (suggested for countries with no restrictions on nickel use) white gold alloys (Ni12Zn17Ag7). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with or without stones in place. Rhodium plating is suggested, however final decision is left to the producer. Its main feature is low melting temperature, which makes it suitable for low finenesses. It displays excellent filling ability. It has a fine grain microstructure. During plastic deformation, it can be cast and melted with all traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

LUX112
Master alloy suitable for the production of 9, 10 and 14 ct white gold alloys (Ni15Zn25). The resulting alloy is for the production of items without precious stones. Rhodium plating is recommended; however, final decision is left to the producer. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX121
Master alloy suitable for the production of 9, 10 and 14 ct white gold alloys (Ni12Zn20). The resulting alloy is for the production of items with or without precious stones. Rhodium plating is recommended; however, final decision is left to the producer. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. It can be used for casting with stones only if the surface area in contact with the stones is small. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX154
Master alloy suitable for the production of 9, 10, 14 and 18 ct white gold investment cast items with or without precious stones (Ni15Zn15). Rhodium plating is recommended; however, final decision is left to the producer. The gold alloy lends itself for the production of 9, 10 ct items which are sold in countries with no restrictions on nickel use. This gold alloy does not lend itself for hardening. All the most common investment casting techniques can be used.

LUX160
Plus-category master alloy suitable for the production of 9, 10 and 14 ct white gold alloys (Ni15Zn10Ag15). The resulting alloy is for the production of investment cast items with or without precious stones in place. Rhodium plating is suggested; however, final decision is left to the producer. The main feature of this product is its high filling capability. The gold alloy lends itself for hardening. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. All the most common investment casting techniques can be used.

LUX161
Plus-category master alloy suitable for the production of 9, 10 and 14 ct white gold alloys (Ni15Zn15Ag15). The resulting alloy

is for the production of investment cast items with or without precious stones in place. Rhodium plating is suggested; however, final decision is left to the producer. The main features of this product are good filling capability and reduced defectiveness of the pieces cast. This gold alloy lends itself well for hardening. It can be used to produce 9 and 10 ct white gold items which can be sold only in countries with no restrictions on nickel use. All the most common investment casting techniques can be used.

PURA101
Master alloy suitable for the production of 9, 10 and 14 ct white gold alloys (Ni10Zn15). The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items with and without stones in place. Rhodium plating is suggested; however, final decision is left to the producer. This gold alloy does not lend itself for hardening. Its main feature is the extreme pureness of the master alloy which ensures superior quality of finished items. It is particularly recommended when low hardness values are fundamental. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

UNIKA109
Master alloy suitable for the production of white gold alloys (Ni19Zn17Ag7) in 9, 10 and 14 ct. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets and tube rings, investment cast items with and without stones in place. Rhodium plating is not necessary thanks to the good intesity of white, however final decision is left to the producer. The alloy does not lend itself for hardening. During plastic deformation it can be cast and melted with both traditional methods (mould casting) and continuous casting; all the most common investment casting techniques can be used. Its use is recommended only when casting takes place in a protected atmosphere (reducing flame, inert atmosphere, boric acid).

UNIKA112
Master alloy suitable for the production of 9 and 10 ct white gold alloys (Ni0). The resulting gold alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with and without stones in place. Rhodium plating is not required thanks to the good intensity of white; however, final decision is left to the producer. This gold alloy lends itself quite well for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used. Its use is recommended only when casting takes place in a protected atmosphere (reducing flame, inert atmosphere, boric acid).

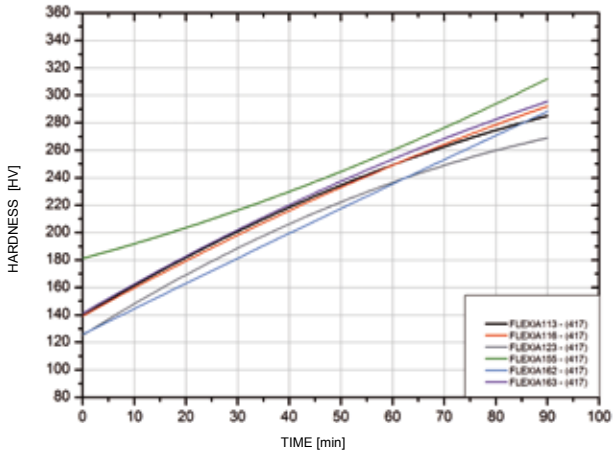
417/375 Gold/White

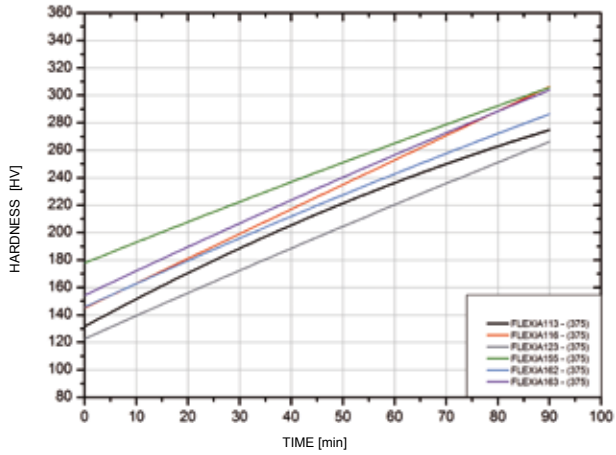
	Au	FLEXIA113 - (417)	FLEXIA116 - (417)	FLEXIA123 - (417)	FLEXIA155 - (417)	FLEXIA162 - (417)	FLEXIA163 - (417)	GENIA112 - (417)	GENIA200 - (417)	LUX112 - (417)	LUX121 - (417)	LUX154 - (417)	LUX160 - (417)	LUX161 - (417)	PURA101 - (417)	UNIKA109 - (417)	UNIKA112 - (417)	FLEXIA113 - (375)	FLEXIA116 - (375)
Physical and mechanical properties	Density [g/cm³]	11,25	11,3	11,26	11,45	11,26	11,27	12,55	11,27	11,12	11,15	11,12	11,46	11,34	11,3	11,29	12,6	10,94	10,95
	Temperature Solidus [°C]	961	972	956	796	955	971	816	785	921	930	918	778	768	955	819	816	974	992
	Temperature Liquidus [°C]	997	1009	986	1012	994	1008	908	936	999	993	1001	975	953	985	961	908	1041	1054
	Colour coordinates [L*]	87,45	86,47	87,14	87,45	87,47	86,84	95,37	87,63	88,2	88,22	88,2	88,03	88,06	87,2	87,61	93,94	87,51	86,68
	Colour coordinates [a*]	1,51	1,24	3,58	2,14	1,71	1,18	-2,1	1,14	0,16	1,07	0,15	1,24	0,42	2,1	0,34	-2,1	1,42	1,26
	Colour coordinates [b*]	10,04	8,65	11,89	10,26	10,05	8,59	9,94	11,69	10,29	11,8	10,29	10,21	10,84	13,3	8,76	13,06	9,8	8,18
	Grain size as cast [µm]	250	210	720	101	105	95	115	105	1100	1050	1020	270	290	115	195	500	224	94
	Deep drawing test after annealing [mm]	10,5	10,1	10,3	...	10,4	10	10,7	...	...	...	...	...	...	10,3	9,3	10,6	9,7	9,5
	Ultimate tensile strenght after annealing [MPa]	534	575	472	625	534	579	388	408	...	...	...	...	...	468	652	385	553	596
	Yield strenght after annealing [MPa]	259	328	212	381	271	313	211	148	...	...	...	...	...	214	405	209	292	345
	Percent elongation after annealing [%]	35	31	33	30	35	31	30	39	...	...	...	...	...	32	26	30	32	30
	Ultimate tensile strenght as cast [MPa]	...	...	...	...	...	...	348	479	341	370	343	499	558	321	448	345	...	...
	Yield strenght as cast [MPa]	...	...	...	...	...	...	155	271	137	145	139	249	275	131	216	150	...	...
	Percent elongation as cast [%]	...	...	...	...	...	...	48	44	45	37	47	38	34	43	33	46	...	...
	Hardness as cast [HV]	...	...	...	...	...	...	100	147	111	105	111	153	172	109	148	100	...	...
	Hardnessafter annealing [HV]	114	135	110	165	121	136	102	...	...	...	...	...	...	109	150	102	106	133
Application field	Mould casting	3	3	3	4	4	4	4	3	...	...	...	...	...	...	3	3	3	3
	Continuous casting without cooling system	2	2	2	5	3	3	5	3	...	...	...	...	...	...	3	3	2	2
	Continuous casting with cooling system	2	2	2	5	3	3	5	3	...	...	...	...	...	...	3	3	2	2
	Handworking	3	2	3	4	3	2	5	2	...	...	...	...	...	...	3	4	3	2
	Flat-bottom stampato	2	3	2	3	2	3	2	3	...	...	...	...	...	...	3	2	2	3
	Double stampato	2	3	2	3	2	3	3	3	...	...	...	...	...	...	3	3	2	3
	Handmade solid chain	3	2	3	5	4	3	5	3	...	...	...	...	...	...	3	4	3	2
	Machine made solid chain	3	3	3	5	4	4	5	2	...	...	...	...	...	...	2	2	3	3
	Handmade hollow chain	3	3	3	5	4	4	4	3	...	...	...	...	...	...	4	3	3	3
	Machine made hollow chain	3	3	3	5	4	4	4	3	...	...	...	...	...	...	4	3	3	3
	Items by soldered tube	2	2	2	5	4	3	4	3	...	...	...	...	...	...	3	3	2	2
	Machine tool production	3	3	3	4	3	3	5	3	...	...	...	...	...	...	4	4	3	3
	Centrifugal casting	...	...	...	...	...	...	3	4	4	3	3	4	4	4	4	4	...	...
	Casting by open systems	...	...	...	...	...	...	4	4	4	4	4	5	5	4	4	5	...	...
	Casting by vacuum systems	...	...	...	...	...	...	5	4	2	2	2	5	4	4	4	4	...	...
	Casting without stones in place	...	...	...	...	...	...	5	5	2	2	2	3	3	4	4	5	...	...
	Casting with stones in place	...	...	...	...	...	...	2	5	1	1	1	4	5	4	5	5	...	...

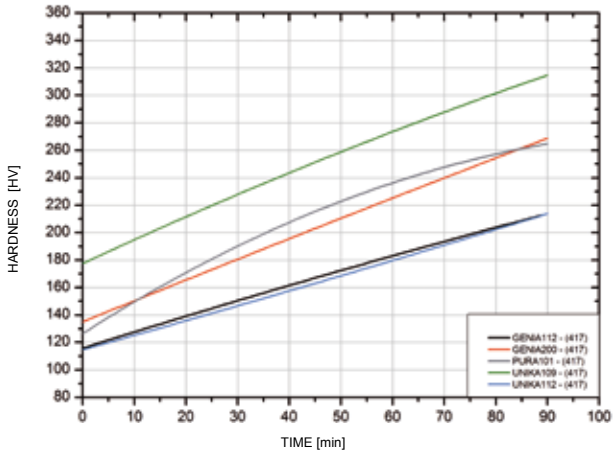
FLEXIA123 - (375)	FLEXIA155 - (375)	FLEXIA162 - (375)	FLEXIA163 - (375)	GENIA112 - (375)	GENIA200 - (375)	LUX112 - (375)	LUX121 - (375)	LUX154 - (375)	LUX160 - (375)	LUX161 - (375)	PURA101 - (375)	UNIKA109 - (375)	UNIKA112 - (375)		
10,98	11,13	10,94	10,96	12,25	10,88	11,1	10,85	10,83	11,17	11,09	10,9	10,95	12,22	Density [g/cm³]	Physical and mechanical properties
981	901	977	988	805	859	918	938	932	773	756	975	882	803	Temperature Solidus [°C]	
1026	1031	1043	1051	894	1005	1001	1011	1025	1006	990	1035	967	889	Temperature Liquidus [°C]	
87,75	87,13	87,51	86,71	94,97	87,6	87,84	88,34	87,9	88,02	88,07	86,9	87,32	95,26	Colour coordinates [L*]	
3,23	2,01	1,57	0,99	-1,88	0,92	0,11	0,85	0,06	1,31	0,34	1,8	0,27	-1,84	Colour coordinates [a*]	
11,23	10,2	9,84	8,41	9,69	11,3	10,19	11,63	10,19	10,22	10,58	12,7	8,71	8,97	Colour coordinates [b*]	
736	99	103	83	110	105	1100	1113	1074	210	229	120	240	568	Grain size as cast [µm]	
10,2	9,1	9,8	9,4	10,5	9,4	...	...	...	...	...	10,1	8,6	10,3	Deep drawing test after annealing [mm]	
497	618	564	606	398	415	...	...	...	...	...	505	687	408	Ultimate tensile strenght after annealing [MPa]	
245	399	301	339	234	190	...	...	...	...	...	244	433	258	Yield strenght after annealing [MPa]	
31	26	30	29	30	44	...	...	...	...	...	30	25	22	Percent elongation after annealing [%]	
...	...	...	...	351	490	335	360	363	490	562	430	435	331	Ultimate tensile strenght as cast [MPa]	
...	...	...	...	160	265	135	170	180	292	333	205	212	134	Yield strenght as cast [MPa]	
...	...	...	...	51	44	46	34	45	37	33	40	26	52	Percent elongation as cast [%]	
...	...	...	...	103	110	112	113	112	154	169	110	152	98	Hardness as cast [HV]	
112	148	120	125	110	112	...	...	...	...	...	110	158	99	Hardnessafter annealing [HV]	
3	4	4	4	4	3	...	...	...	...	...	...	3	3	Mould casting	Application field
2	5	3	3	5	3	...	...	...	...	...	...	3	3	Continuous casting without cooling system	
2	5	3	3	5	3	...	...	...	...	...	...	3	3	Continuous casting with cooling system	
3	4	3	2	5	2	...	...	...	...	...	...	3	4	Handworking	
2	3	2	3	2	3	...	...	...	...	...	...	3	2	Flat-bottom stampato	
2	3	2	3	3	3	...	...	...	...	...	...	3	3	Double stampato	
3	5	4	3	5	3	...	...	...	...	...	...	3	4	Handmade solid chain	
3	5	4	4	5	2	...	...	...	...	...	...	2	2	Machine made solid chain	
3	5	4	4	4	3	...	...	...	...	...	...	4	3	Handmade hollow chain	
3	5	4	4	4	3	...	...	...	...	...	...	4	3	Machine made hollow chain	
2	5	4	3	4	3	...	...	...	...	...	...	3	3	Items by soldered tube	
3	4	3	3	5	3	...	...	...	...	...	...	4	4	Machine tool production	
...	...	...	...	3	4	4	3	3	4	4	4	4	4	Centrifugal casting	
...	...	...	...	4	4	4	4	4	5	5	5	4	5	Casting by open systems	
...	...	...	...	5	4	2	2	2	5	4	3	4	4	Casting by vacuum systems	
...	...	...	...	5	5	2	2	2	3	3	3	4	5	Casting without stones in place	
...	...	...	...	2	5	1	1	1	4	5	3	5	5	Casting with stones in place	

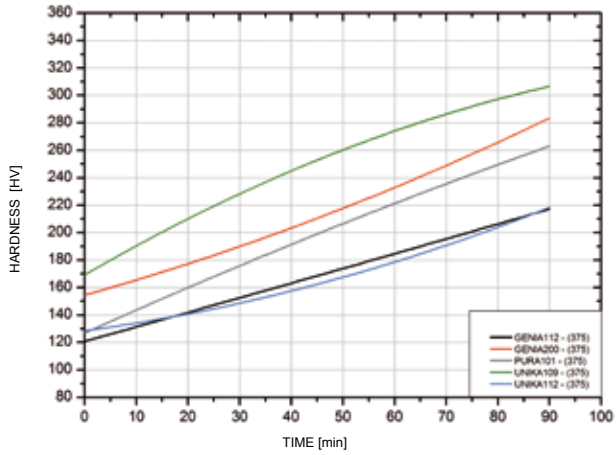
417/375 Gold/White

COLD WORKING GRAPHS

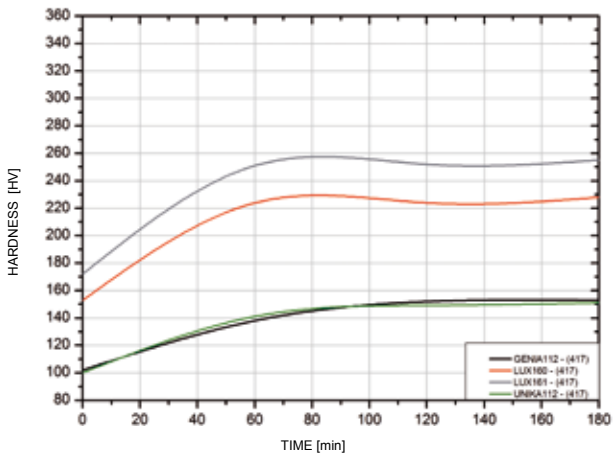


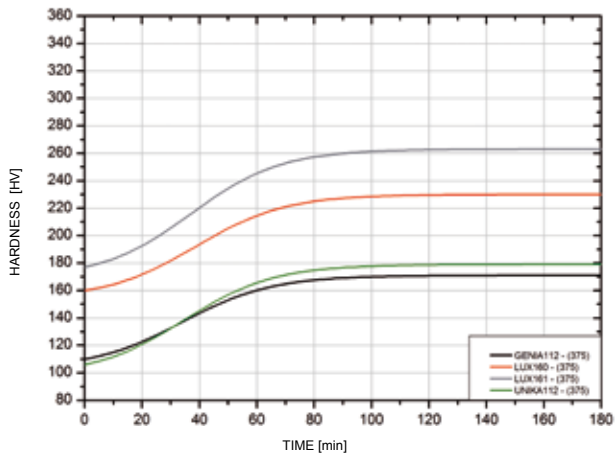






HARDENING GRAPHS





FLEXIA158
Master alloy suitable for the production of 925 fineness silver alloys. The resulting alloy is for the production of stamped items and solid chains. It is particularly suggested when laser soldering is used. The alloy lends itself for hardening. It can be cast and melted using both traditional methods (mould casting) and continuous casting.

GENIA140
Alloy suitable for the production of silver stamped items, solid and hollow chains, bracelets, earrings, tube rings and investment cast items without stones in place (Ag93Zn3). The alloy lends itself for hardening and its main features are excellent mechanical characteristics combined with a marked reduction of copper oxides (surface stain) and high brightness. During plastic deformation it can be cast and melted with traditional mould casting. All investment casting techniques operating under atmospheric pressure can be used.

GENIA141
Master alloy suitable for the production of 925 fineness silver alloys. The resulting alloy is for the production of stamped items, solid and hollow chains, bracelets and tube rings; investment cast items without precious stones. This alloy lends itself for hardening and its main features are excellent mechanical characteristics combined with a marked reduction of copper oxides (glossy surface stains) and high brightness. During plastic deformation, it can be cast using mould casting only. All investment casting techniques operating under atmospheric pressure can be used.

GENIA142
Alloy suitable for the production of silver stamped items, solid and hollow chains, bracelets, earrings, tube rings and investment cast items without precious stones (Ag93Zn0.5). The alloy lends itself for hardening and its main features are excellent mechanical characteristics combined with a marked reduction of copper oxides (surface stain) and high brightness. During plastic deformation it can be cast and melted with traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA143
Master alloy suitable for the production of 925 fineness silver alloys. The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items without precious stones. The silver alloy lends itself for hardening and its main features are excellent mechanical characteristics combined with a marked reduction of copper oxides (glossy surface stains) and high brightness. During plastic deformation, it can be cast with traditional methods (mould casting and continuous casting). All the most common investment casting techniques can be used.

GENIA160
Plus-category master alloy suitable for the production of 925 and 950‰ silver alloys. The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings and investment cast items with and without stones in place. Its main features are excellent mechanical properties and a sensitive reduction of copper oxides (stains on the glossy surfaces) and high brightness. It is especially recommended for the production of complex items with flat surfaces, which can display shrinkage porosity. The silver alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional casting methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

GENIA163
935‰ silver alloy suitable for the production of stamped items, solid and hollow chains, bracelets, earrings, tube rings and investment cast items without precious stones. The silver alloy lends itself for hardening and its main features are: high brightness and excellent mechanical properties combined with a marked reduction of copper oxides (surface stain). During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA185
Master alloy suitable for the production of 925 fineness silver alloys. This silver alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items without precious stones. Its main features are excellent mechanical characteristics combined with a marked reduction of copper oxides (surface stains). The silver alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA187
940‰ silver alloy suitable for the production of stamped items, solid and hollow chains, bracelets, earrings, tube rings and investment cast items without precious stones. The silver alloy lends itself for hardening and its main features are: high brightness and excellent mechanical characteristics combined with a marked reduction of copper oxides (glossy surface stains). During plastic deformation, the silver alloy can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA190
Master alloy suitable for the production of 925 fineness silver alloys. The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings, investment cast items without precious stones. The silver alloy lends itself for hardening and its main features are excellent mechanical properties combined with a marked reduction of copper oxides (glossy surface stains). During plastic deformation, the silver alloy can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA191
Master alloy suitable for the production of 925 fineness alloys. The resulting alloy is for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings, investment cast items without stones. Its main features are excellent mechanical properties, combined with a marked reduction of copper oxides (glossy surface stains). The silver alloy lends itself for hardening. During plastic deformation, the silver alloy can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

GENIA197
930‰ plus-category silver master alloy. This alloy is suitable for the production of stamped items, solid and hollow chains, earrings, bracelets and tube rings; investment cast items with and without stones in place. Its main features are excellent mechanical properties together with a sentitive reduction of copper oxides (glossy surface stains) and high brightness. It is recommended for the production of complex items with flat surfaces, which can

display shrinkage porosity. The silver alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional casting methods (mould casting) and continuous casting; all the most common investment casting techniques can be used.

LUX118
Master alloy suitable for the production of 925 fineness silver alloys. The resulting alloy is for the production of investment cast items with or without precious stones. The silver alloy lends itself for casting using traditional machines where boric acid can be used to protect the molten metal. This silver alloy lends itself quite well for hardening.

LUX128
Master alloy suitable for the production of 925 fineness silver alloys. The resulting alloy is for the production of items with or without precious stones. Use in traditional machines, where boric acid can be used to protect the molten metal, is recommended. It is recommended for the production of big items with large resistant cross sections. This silver alloy lends itself quite well for hardening.

UNIKA102
Master alloy suitable for the production of 925 silver alloys. The resulting alloy is for the production of stamped items, solid and hollow chain, earrings, bracelets, tube rings, and investment cast articles with and without stones in place. Its main features are excellent mechanical features together with a sensitive reduction of copper oxides (glossy surface spots), high brightness and casts with deoxidized surfaces. The alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used. Its use is recommended only when casting takes place in a protected atmosphere (reducing flame, inert atmosphere, boric acid).

XILVER100
930‰ silver suitable for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items with and without precious stones. Its main feature is high resistance to tarnish and oxidation at high temperatures. This silver alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

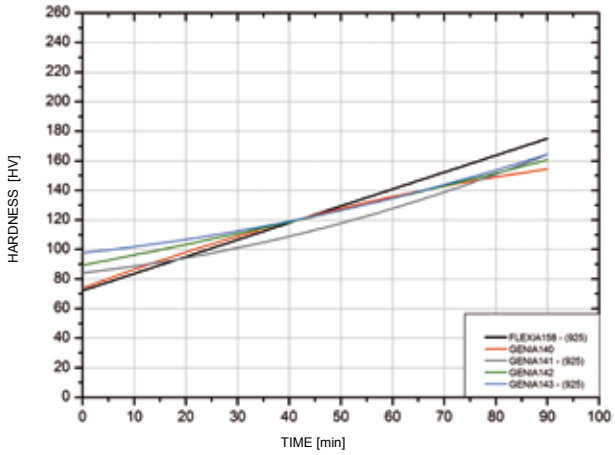
XILVER101
950‰ silver alloy suitable for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items with and without precious stones. Its main feature is high resistance to tarnish and oxidation at high temperatures. This silver alloy lends itself quite well for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

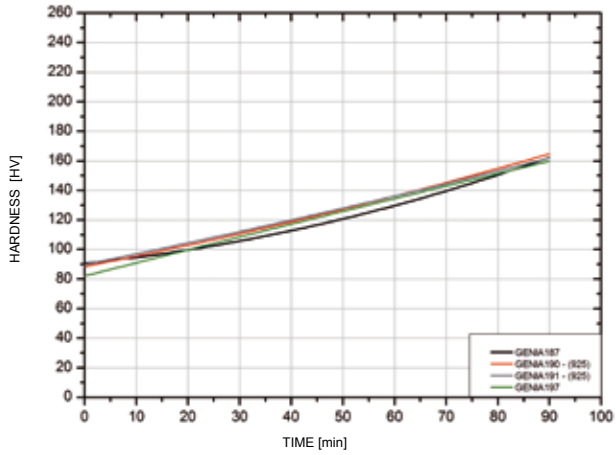
XILVER102
930‰ silver alloy suitable for the production of investment cast items with and without precious stones. Its main feature is high resistance to tarnish and oxidation at high temperatures, with low sensitivity to hot tearing. This silver alloy lends itself for hardening. All the most common investment casting techniques can be used.

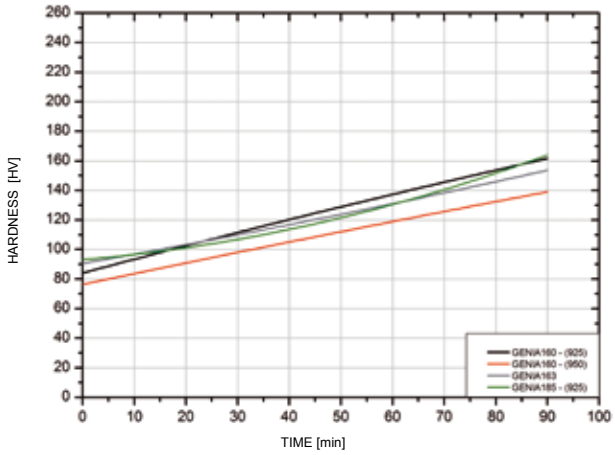
XILVER103
935‰ silver alloy suitable for the production of stamped items, solid and hollow chains, earrings, bracelets, tube rings, and investment cast items with and without precious stones. Its main feature is high resistance to tarnish and oxidation at high temperatures, with low sensitivity to hot tearing. This silver alloy lends itself for hardening. During plastic deformation, it can be cast and melted with both traditional methods (mould casting) and continuous casting. All the most common investment casting techniques can be used.

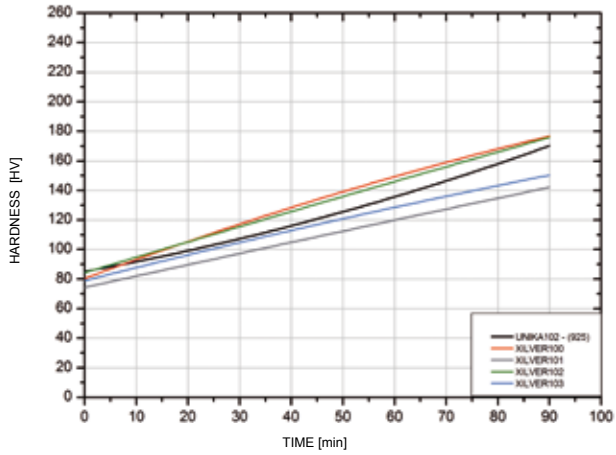
	Ag	FLEXIA158 - (925)	GENIA140	GENIA141 - (925)	GENIA142	GENIA143 - (925)	GENIA160 - (925)	GENIA160 - (950)	GENIA163	GENIA185 - (925)	GENIA187	GENIA190 - (925)	GENIA191 - (925)	GENIA197	LUX118 - (925)	LUX128 - (925)	UNIKA102 - (925)	XILVER100	XILVER101	XILVER102	XILVER103
Physical and mechanical properties	Density [g/cm³]	10,28	10,28	10,27	10,3	10,3	10,32	10,4	10,35	10,32	10,34	10,32	10,31	10,33	10,28	10,21	10,29	10,28	10,44	10,3	10,35
	Temperature Solidus [°C]	776	793	797	780	773	772	872	781	775	778	773	785	775	759	730	781	721	733	720	710
	Temperature Liquidus [°C]	898	909	903	907	904	904	927	920	894	921	900	896	906	903	900	900	902	916	908	915
	Colour coordinates [L*]	95,67	95,97	96,27	96,01	96,04	96,34	95,98	96,89	95,35	96,9	95,47	95,91	96,1	95,92	96,28	95,76	96,67	96,65	95,65	96,1
	Colour coordinates [a*]	-0,73	-0,75	-0,68	-0,8	-0,69	-0,72	-0,55	-0,45	-0,59	-0,45	-0,73	-0,73	-0,74	-0,71	-0,72	-0,72	-0,66	-0,75	-0,4	-0,45
	Colour coordinates [b*]	5,63	5,68	5,39	5,78	5,88	4,72	4,97	5,02	6,01	5	5,72	4,86	4,78	5,7	4,85	5,56	4,85	4,45	4,1	4,5
	Grain size as cast [µm]	2965	106	104	103	102	187	188	108	150	110	108	109	190	950	909	350	420	415	430	430
	Deep drawing test after annealing [mm]	10,3	11,7	11,6	10,8	10,7	10,2	10,8	11	9,5	10,9	10,5	9,6	10,2	...	...	11,3	12,1	12,2	12	12,1
	Ultimate tensile strenght after annealing [MPa]	305	265	267	308	311	307	244	301	303	302	301	297	304	...	...	282	255	225	252	245
	Yield strenght after annealing [MPa]	155	119	121	175	179	173	102	169	153	175	164	163	170	...	...	132	105	94	104	101
	Percent elongation after annealing [%]	23	36	35	20	19	22	28	21	23	21	21	23	22	...	...	31	34	37	34	35
	Ultimate tensile strenght as cast [MPa]	...	225	240	233	245	234	208	228	241	240	233	234	229	215	195	217	197	182	195	191
	Yield strenght as cast [MPa]	...	83	92	92	105	94	87	89	100	101	95	93	93	126	90	83	87	75	85	82
	Percent elongation as cast [%]	...	56	55	53	42	52	50	54	50	42	52	56	52	29	24	60	34	38	34	35
	Hardness as cast [HV]	...	62	62	60	60	60	53	57	59	59	59	56	59	63	60	58	61	52	61	55
	Hardnessafter annealing [HV]	62	64	67	61	68	67	52	58	65	60	65	64	61	...	...	65	67	54	64	58
Application field	Mould casting	3	3	3	4	4	4	4	4	4	4	4	3	4	...	...	3	3	3	...	3
	Continuous casting without cooling system	3	1	1	4	4	4	4	4	4	4	5	2	4	...	...	3	2	2	...	2
	Continuous casting with cooling system	3	1	1	4	4	4	4	4	4	4	5	2	4	...	...	3	2	2	...	2
	Handworking	4	4	4	3	3	3	3	3	3	3	3	3	3	...	...	3	4	4	...	4
	Flat-bottom stampato	1	1	1	1	1	1	1	1	1	1	1	1	1	...	...	1	1	1	...	1
	Double stampato	2	2	2	2	2	2	2	2	2	2	2	2	2	...	...	2	2	2	...	2
	Handmade solid chain	5	5	5	5	5	5	5	5	5	5	5	4	5	...	...	3	4	4	...	4
	Machine made solid chain	5	5	5	5	5	5	5	5	5	5	5	4	5	...	...	1	1	1	...	1
	Handmade hollow chain	2	2	2	2	2	2	2	2	2	2	2	2	2	...	...	2	2	2	...	2
	Machine made hollow chain	2	2	2	2	2	2	2	2	2	2	2	2	2	...	...	1	1	1	...	1
	Items by soldered tube	2	2	2	2	2	2	2	2	2	2	2	2	2	...	...	2	2	2	...	2
	Machine tool production	4	3	3	3	3	3	3	3	3	3	3	3	3	...	...	3	3	3	...	3
	Centrifugal casting	...	2	2	2	2	3	3	2	2	2	2	2	3	3	3	4	2	2	2	2
	Casting by open systems	...	3	3	3	3	3	3	3	3	3	3	2	3	3	3	4	4	4	4	4
	Casting by vacuum systems	...	1	1	4	4	4	4	4	4	4	4	2	4	2	1	5	4	4	4	4
	Casting without stones in place	...	2	2	4	4	4	4	4	4	4	4	2	4	2	2	5	4	4	4	4
	Casting with stones in place	...	2	2	3	3	3	3	3	3	3	3	2	3	2	2	5	4	4	4	4

COLD WORKING GRAPHS

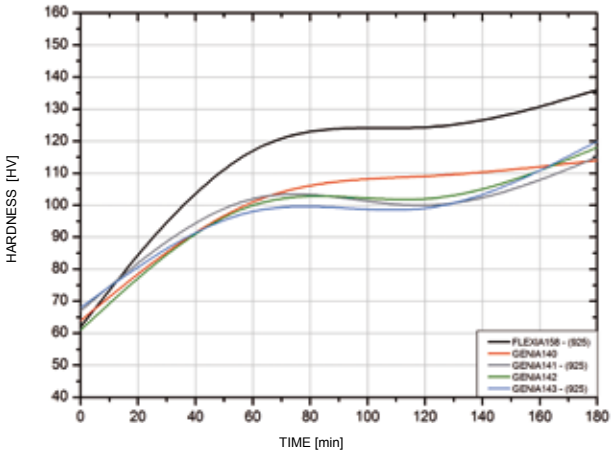


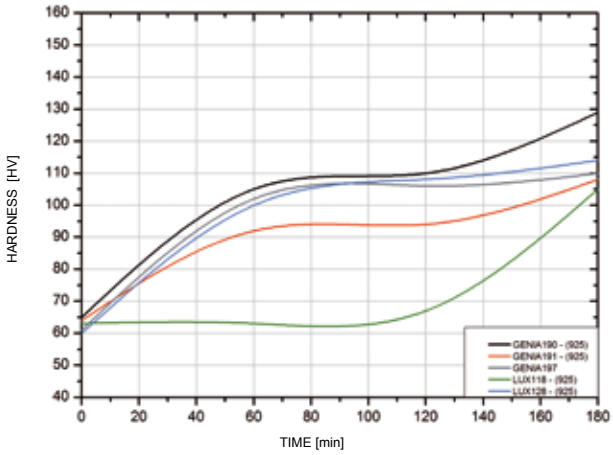


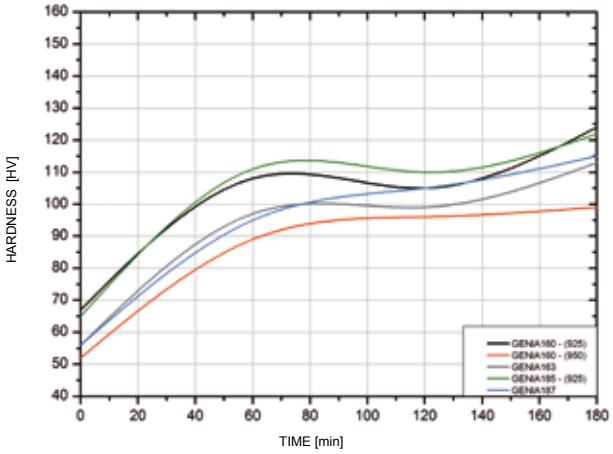


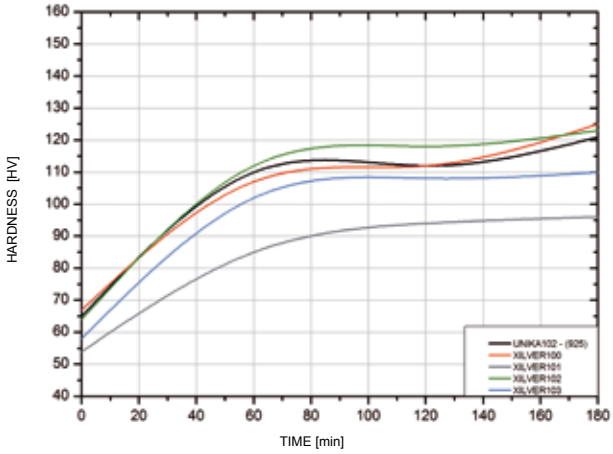


HARDENING GRAPHS









950 Platinum

PLATINA100
Master alloy suitable for the production of 950‰ platinum based alloys. The resulting alloy is for the production of investment cast items with and without stones in place. In case of stone-in-place casting, it is recommended to use a proper procedure both for the preparation of the models and then for the casting itself. The main feature of this alloy is the low melting range, which enables high surface quality. The platinum alloy can be highly hardened after proper heat treatment.

	Pt	PLATINA100 - (950)
Physical and mechanical properties	Density [g/cm³]	19,74
	Temperature Solidus [°C]	1540
	Temperature Liquidus [°C]	1620
	Colour coordinates [L*]	85,65
	Colour coordinates [a*]	0,57
	Colour coordinates [b*]	5,11
	Grain size as cast [µm]	...
	Deep drawing test after annealing [mm]	...
	Ultimate tensile strenght after annealing [MPa]	...
	Yield strenght after annealing [MPa]	...
	Percent elongation after annealing [%]	...
	Ultimate tensile strenght as cast [MPa]	706
	Yield strenght as cast [MPa]	426
	Percent elongation as cast [%]	20
	Hardness as cast [HV]	240
	Hardnessafter annealing [HV]	190
Application field	Mould casting	...
	Continuous casting without cooling system	...
	Continuous casting with cooling system	...
	Handworking	...
	Flat-bottom stampato	...
	Double stampato	...
	Handmade solid chain	...
	Machine made solid chain	...
	Handmade hollow chain	...
	Machine made hollow chain	...
	Items by soldered tube	...
	Machine tool production	...
	Centrifugal casting	4
	Casting by open systems	...
	Casting by vacuum systems	3
	Casting without stones in place	3
	Casting with stones in place	3

917/875 **Gold**/Soldering/Yellow

UNIBRAX108
Master alloy suitable for the production of 18, 21 and 22 ct yellow gold alloys (Ag30In20Zn25). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered an extra soft soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX136
Master alloy suitable for the production of 18, 21 and 22 ct yellow gold alloys (Ag24In24Zn16). The resulting gold alloy is for the production of soldering sheets. Thanks to its melting point and wettability, this soldering alloy is considered a soft soldering alloy. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX140
Master alloy suitable for the production of 22 ct yellow gold alloys. The resulting gold alloy is for the production of soldering sheets. Thanks to its melting point and wettability, this soldering alloy is considered an extra soft soldering alloy. It has the lowest melting range in 22 ct. Use of traditional mould melting and casting methods is recommended for the preparation

Au		UNIBRAX108 - (917)	UNIBRAX136 - (917)	UNIBRAX140 - (917)	UNIBRAX108 - (875)	UNIBRAX136 - (875)
Physical and mechanical properties	Density [g/cm³]	17,47	17,07	17,6	16,66	16,66
	Temperature Solidus [°C]	848	861	601	786	803
	Temperature Liquidus [°C]	937	952	792	886	898
Application field	Mould casting	3	3	3	3	3
	Continuous casting without cooling system	1	1	1	1	1
	Continuous casting with cooling system	1	1	1	1	1
	Soldering sheet	3	3	3	3	3
	Soldering wire	1	1	1	1	1

750/585/417/375 **Gold**/Soldering/Red

UNIBRAX115
Master alloy suitable for the production of 9, 10, 14 and 18 ct pink gold alloys (Ag5Ga4In4Zn4). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a hard soldering alloy. It is recommended for furnace use (should you need to use it for bench soldering, please attention to the molten bath). Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX116
Master alloy suitable for the production of 9, 10, 14 and 18 ct pink gold alloys (In4Zn15). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered an extra hard soldering alloy. It is recommended for furnace use (should you need to use it for bench soldering, please pay attention to the molten bath). Use of traditional mould melting and casting methods is recommended for the preparation.

Au		UNIBRAX115 - (750)	UNIBRAX116 - (750)	UNIBRAX115 - (585)	UNIBRAX116 - (585)	UNIBRAX115 - (417)	UNIBRAX116 - (417)	UNIBRAX115 - (375)	UNIBRAX116 - (375)
Physical and mechanical properties	Density [g/cm³]	14,76	14,61	12,83	12,69	11,36	11,21	11,03	10,9
	Temperature Solidus [°C]	816	828	802	832	786	803	784	841
	Temperature Liquidus [°C]	870	872	894	904	924	939	934	947
Application field	Mould casting	3	2	3	2	3	2	3	2
	Continuous casting without cooling system	2	1	2	1	2	1	2	1
	Continuous casting with cooling system	2	1	2	1	2	1	2	1
	Soldering sheet	3	2	3	2	3	2	3	2
	Soldering wire	2	1	2	1	2	1	2	1

UNIBRAX100
Master alloy lends itself for the production of 18 ct yellow gold alloys (Ag30In10Zn25). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a hard soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX101
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag35In5Zn6). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a hard soldering. It can be cast and metlted with both traditional methods (mould casting) and continuous casting.

UNIBRAX105
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag30In14Zn25). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a medium soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX106
Master alloy suitable for the production of 18 ct yellow gold alloys (Ag30In16Zn25). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered an extra soft soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX107
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag17.5Ga7In6Zn6.5). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a soft soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX108
Master alloy suitable for the production of 18, 21 and 22 ct yellow gold alloys (Ag30In20Zn25). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered an extra soft soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX109
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag25Ga5In5Zn5). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a medium-hard soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX110
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag30Ga4In4Zn4). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a hard soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX111
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag35Ga3In3Zn3). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered an extra-hard soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX112
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag38Ga8Zn10). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a medium soldering alloy. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX120
Master alloy lends itself for the production of 18 ct yellow gold alloys (Ag30In12Zn25). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a medium soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX122
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag35Ga5In5Zn5). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a hard soldering alloy. In 18 ct, the resulting colour is very similar to 2N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX123
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag40Ga4In4Zn4). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a hard soldering alloy. In 18 ct, the resulting colour is very similar to 2N yellow, as defined by the EN28654 standards. It can be cast and melted using both traditional methods (mould casting) and continuous casting.

UNIBRAX124
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag45Ga3In3Zn3). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered an extra-hard soldering alloy in low finenesses, whereas a medium-soft one in 18 ct. In 18 ct, the resulting colour is very similar to 2N yellow, as defined by the EN28654 standards. It can be cast and melted using both traditional methods (mould casting) and continuous casting.

UNIBRAX136
Master alloy suitable for the production of 18, 21 and 22 ct yellow gold alloys (Ag24In24Zn16). The resulting gold alloy is for the production of soldering sheets. Thanks to its melting point and wettability, this soldering alloy is considered a soft soldering alloy. Use of traditional mould melting and casting methods is recommended for the preparation.

Au		UNIBRAX100 - (750)	UNIBRAX101 - (750)	UNIBRAX105 - (750)	UNIBRAX106 - (750)	UNIBRAX107 - (750)	UNIBRAX108 - (750)	UNIBRAX109 - (750)	UNIBRAX110 - (750)	UNIBRAX111 - (750)	UNIBRAX112 - (750)	UNIBRAX120 - (750)	UNIBRAX122 - (750)	UNIBRAX123 - (750)	UNIBRAX124 - (750)	UNIBRAX136 - (750)
Physical and mechanical properties	Density [g/cm³]	13	14,95	14,89	14,95	14,72	14,95	14,87	15,04	15,08	14,97	15,23	14,96	14,68	14,95	14,96
	Temperature Solidus [°C]	722	829	688	674	737	640	765	793	811	739	725	761	787	807	720
	Temperature Liquidus [°C]	788	854	772	762	820	753	832	850	855	816	793	832	845	864	775
Application field	Mould casting	3	3	3	3	3	2	4	4	4	3	3	4	4	4	2
	Continuous casting without cooling system	1	4	1	1	4	1	4	4	4	4	1	4	4	4	1
	Continuous casting with cooling system	2	4	1	1	4	1	4	4	4	4	1	4	4	4	1
	Soldering sheet	4	4	3	3	4	3	4	4	4	4	4	4	4	4	3
	Soldering wire	2	4	1	1	3	1	4	4	4	4	2	4	4	4	1

750/585/417/375 **Gold**/Soldering/White

UNIBRAX104
Master alloy suitable for the production of 9 and 10 ct white gold alloys (Ag40In8Ni2Zn17). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a soft soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX113
Master alloy suitable for the production of 9, 10, 14 ct white gold alloys (Ag30In8Ni3Zn18). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a medium-soft soldering alloy. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX117
Master alloy suitable for the production of 18 ct white gold alloys (Ag10In8Ni9Zn32). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a medium soldering alloy. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX119
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag30In4Zn20). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a medium soldering alloy. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX125
Master alloy suitable for the production of 18 ct white gold alloys (Ga8.5In8.5Ni21Zn15). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a hard soldering alloy. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX126
Master alloy suitable for the production of 18 ct white gold alloys (Ga8.5In8.5Ni24Zn15). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a hard soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX137
Master alloy suitable for the production of 18 ct white gold alloys (Ag8In10Sn2Zn34Ni8). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered an extra soft soldering alloy. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX142
Master alloy suitable for the production of 18 ct white gold alloys (Ag4Ga3In32Zn29). Its main feature is its lack of nickel; it must be used only after adding 88 to 94‰ palladium. The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a hard soldering alloy. Use of traditional mould melting and casting methods is recommended for the preparation.

Au		UNIBRAX117 - (750)	UNIBRAX125 - (750)	UNIBRAX126 - (750)	UNIBRAX129 - (750)	UNIBRAX137 - (750)	UNIBRAX142 - (750)	UNIBRAX113 - (585)	UNIBRAX119 - (585)	UNIBRAX113 - (417)	UNIBRAX119 - (417)	UNIBRAX104 - (375)	UNIBRAX113 - (375)	UNIBRAX119 - (375)
Physical and mechanical properties	Density [g/cm³]	14,98	14,68	14,7	14,66	14,51	15,7	13,06	13,03	11,7	11,53	11,4	11,35	11,24
	Temperature Solidus [°C]	745	736	742	793	664	782	698	733	621	676	628	607	659
	Temperature Liquidus [°C]	818	838	844	882	788	895	794	798	791	819	754	788	792
Application field	Mould casting	4	3	2	3	4	4	3	3	3	3	3	3	3
	Continuous casting without cooling system	2	1	1	2	2	2	1	1	1	1	1	1	1
	Continuous casting with cooling system	2	1	1	2	2	2	1	1	1	1	1	1	1
	Soldering sheet	4	2	2	2	4	4	4	4	4	4	3	4	4
	Soldering wire	3	1	1	2	3	3	2	2	3	2	3	3	2

UNIBRAX101
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag35In5Zn6). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a hard soldering. It can be cast and metlted with both traditional methods (mould casting) and continuous casting.

UNIBRAX103
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag30In8Zn25). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered an extra soft soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX107
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag17.5Ga7In6Zn6.5). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a soft soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX109
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag25Ga5In5Zn5). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a medium-hard soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX110
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag30Ga4In4Zn4). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a hard soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX111
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag35Ga3In3Zn3). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered an extra-hard soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX112
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag38Ga8Zn10). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a medium soldering alloy. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX119
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag30In4Zn20). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a medium soldering alloy. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX121
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag30In6Zn25). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a medium-soft soldering alloy. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX122
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag35Ga5In5Zn5). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a hard soldering alloy. In 18 ct, the resulting colour is very similar to 2N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX123
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag40Ga4In4Zn4). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a hard soldering alloy. In 18 ct, the resulting colour is very similar to 2N yellow, as defined by the EN28654 standards. It can be cast and melted using both traditional methods (mould casting) and continuous casting.

UNIBRAX124
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag45Ga3In3Zn3). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered an extra-hard soldering alloy in low finenesses, whereas a medium-soft one in 18 ct. In 18 ct, the resulting colour is very similar to 2N yellow, as defined by the EN28654 standards. It can be cast and melted using both traditional methods (mould casting) and continuous casting.

UNIBRAX130
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag40In12Zn9.5). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a medium-soft soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX131
Master alloy suitable for the production of 14 ct yellow gold alloys (Ag30In16Zn14). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a medium-soft soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX139
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag20In4Ga4Zn10). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a medium-hard soldering alloy. It can be cast using traditional methods (mould casting) and continuous casting.

Au		UNIBRAX101 - (585)	UNIBRAX103 - (585)	UNIBRAX107 - (585)	UNIBRAX109 - (585)	UNIBRAX110 - (585)	UNIBRAX111 - (585)	UNIBRAX112 - (585)	UNIBRAX119 - (585)	UNIBRAX121 - (585)	UNIBRAX122 - (585)	UNIBRAX123 - (585)	UNIBRAX124 - (585)	UNIBRAX130 - (585)	UNIBRAX131 - (585)	UNIBRAX139 - (585)
Physical and mechanical properties	Density [g/cm³]	13	13	13	13	13	13	13,1	13,03	12,94	13	13,01	13,01	13,23	13,06	13
	Temperature Solidus [°C]	797	649	720	721	736	756	700	733	679	746	787	797	695	706	731
	Temperature Liquidus [°C]	846	748	805	846	861	876	763	798	762	866	866	879	764	769	829
Application field	Mould casting	4	3	3	4	4	4	3	3	3	4	4	4	3	3	3
	Continuous casting without cooling system	3	1	4	4	4	4	2	1	1	3	3	3	2	1	2
	Continuous casting with cooling system	3	1	4	4	4	4	2	1	1	3	3	3	2	1	2
	Soldering sheet	4	3	4	4	4	4	5	4	3	4	4	4	4	3	4
	Soldering wire	4	1	3	4	4	4	4	2	2	4	4	4	2	1	3

417/375 **Gold**/Soldering/Yellow

UNIBRAX101
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag35In5Zn6). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a hard soldering. It can be cast and metlted with both traditional methods (mould casting) and continuous casting.

UNIBRAX102
Master alloy suitable for the production of 9, 10 ct yellow gold alloys (Ag38Ga4In3.5Zn15). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a soft soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX107
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag17.5Ga7In6Zn6.5). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a soft soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX109
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag25Ga5In5Zn5). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a medium-hard soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX110
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag30Ga4In4Zn4). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a hard soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX111
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag35Ga3In3Zn3). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered an extra-hard soldering alloy. In 18 ct, the resulting colour is very similar to 3N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX112
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag38Ga8Zn10). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a medium soldering alloy. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX119
Master alloy suitable for the production of 9, 10 and 14 ct yellow gold alloys (Ag30In4Zn20). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a medium soldering alloy. Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX122
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag35Ga5In5Zn5). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a hard soldering alloy. In 18 ct, the resulting colour is very similar to 2N yellow, as defined by the EN28654 standards. It can be cast and melted with both traditional methods (mould casting) and continuous casting.

UNIBRAX123
Master alloy suitable for the production of 9, 10, 14 and 18 ct yel-

low gold alloys (Ag40Ga4In4Zn4). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered a hard soldering alloy. In 18 ct, the resulting colour is very similar to 2N yellow, as defined by the EN28654 standards. It can be cast and melted using both traditional methods (mould casting) and continuous casting.

UNIBRAX124
Master alloy suitable for the production of 9, 10, 14 and 18 ct yellow gold alloys (Ag45Ga3In3Zn3). The resulting gold alloy is for the production of soldered sheets and wires. Thanks to its melting point and wettability it is considered an extra-hard soldering alloy in low finenesses, whereas a medium-soft one in 18 ct. In 18 ct, the resulting colour is very similar to 2N yellow, as defined by the EN28654 standards. It can be cast and melted using both traditional methods (mould casting) and continuous casting.

UNIBRAX127
Master alloy suitable for the production of 9, 10 ct yellow gold alloys (Ag20In2.5Zn25). The resulting gold alloy is for the production of soldering sheets and wires. Thanks to its melting point and wettability, this soldering alloy is considered a hard soldering. Use of traditional mould melting and casting methods is recommended for the preparation.

Au		UNIBRAX101 - (417)	UNIBRAX102 - (417)	UNIBRAX107 - (417)	UNIBRAX109 - (417)	UNIBRAX110 - (417)	UNIBRAX111 - (417)	UNIBRAX112 - (417)	UNIBRAX119 - (417)	UNIBRAX122 - (417)	UNIBRAX123 - (417)	UNIBRAX124 - (417)	UNIBRAX127 - (417)	UNIBRAX101 - (375)	UNIBRAX102 - (375)	UNIBRAX107 - (375)	UNIBRAX109 - (375)	UNIBRAX110 - (375)	UNIBRAX111 - (375)	UNIBRAX112 - (375)	UNIBRAX119 - (375)	UNIBRAX122 - (375)	UNIBRAX123 - (375)	UNIBRAX124 - (375)	UNIBRAX127 - (375)
Physical and mechanical properties	Density [g/cm³]	11,65	11,64	11,65	11,65	11,65	11,65	11,65	11,53	11,65	11,35	11,58	11,52	11,3	11,29	11,3	11,3	11,3	11,3	11,29	11,24	11,3	11,05	11,25	11,23
	Temperature Solidus [°C]	735	645	710	733	748	768	688	676	758	765	780	749	699	638	695	731	746	766	686	659	756	748	701	752
	Temperature Liquidus [°C]	850	754	800	885	900	915	865	819	905	893	908	841	824	746	785	853	868	883	833	792	873	902	916	842
Application field	Mould casting	4	3	3	4	4	4	3	3	4	4	4	3	4	3	3	4	4	4	3	3	4	4	4	3
	Continuous casting without cooling system	3	2	4	4	4	4	3	1	3	3	3	1	3	2	4	4	4	4	3	1	3	3	3	1
	Continuous casting with cooling system	3	2	4	4	4	4	3	1	3	3	3	1	3	2	4	4	4	4	3	1	3	3	3	1
	Soldering sheet	3	4	4	4	4	4	3	4	3	3	3	3	3	4	4	4	4	4	3	4	3	3	3	3
	Soldering wire	4	2	3	4	4	4	3	2	3	4	4	2	4	2	3	4	4	4	3	2	3	4	4	2

925 **Silver**/Soldering

UNIBRAX128
Master alloy suitable for the production of silver alloys (In18Zn15). The resulting silver alloy is for the production of soldering sheets and wires. It can be produced at different melting points and wettability, which depend on the amount of silver added (500-600-700 mil.) Use of traditional mould melting and casting methods is recommended for the preparation.

UNIBRAX138
800 fineness silver alloy suitable for the production of sheets and soldering wires (Ga3Sn3In3Zn1). Thanks to its melting point and its wettability, it is considered a hard soldering. Use of this alloy is recommended when hard a soldering with very high resistance to tarnish is needed, therefore use it combined with Xilver family products. It can be cast and melted with both traditional methods (mould casting) and continuous casting. It is suitable for the production of soldering sheets and wires.

Ag		UNIBRAX128 - (500)	UNIBRAX128 - (600)	UNIBRAX128 - (700)	UNIBRAX138
PPhysical and mechanical properties	Density [g/cm³]	9,7	9,8	9,9	9,99
	Temperature Solidus [°C]	633	673	703	651
	Temperature Liquidus [°C]	695	718	730	799
Application field	Mould casting	3	2	2	4
	Continuous casting without cooling system	3	2	2	3
	Continuous casting with cooling system	3	2	2	3
	Soldering sheet	3	4	4	4
	Soldering wire	2	3	3	2

PRACTICAL INFORMATION:

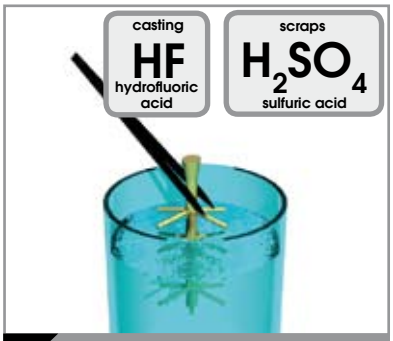
CASTING OF A GOLD ALLOY

1 Put the alloy inside the crucible

2 Put on to the master alloy

3 Put boric acid

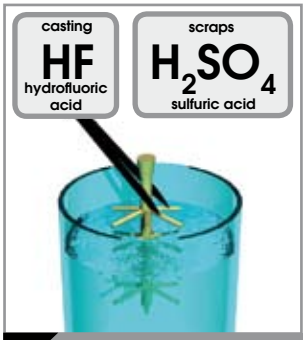
SCAPS REUSAGE (1)



1 Clean the tree or the scraps

2 Put the master alloy, gold, boric acid, the tree and then cast

SCAPS REUSAGE (2)



1 Clean the tree or the scraps

2 Cast the tree with boric acid and then go on with scorification

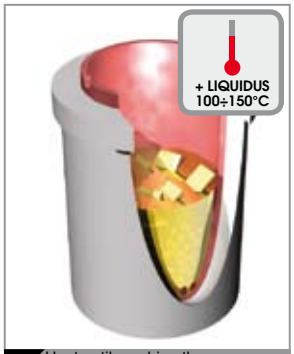
3 Mould cast (a sheet is obtained) or cast in water (grains are obtained)

MOULD CASTING

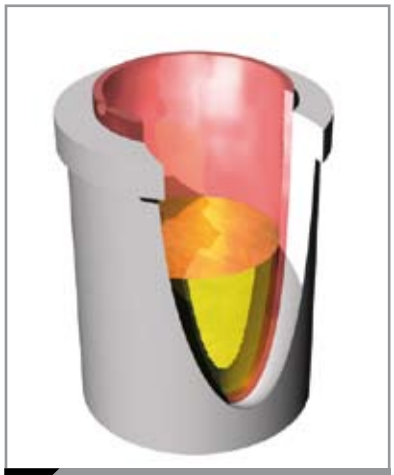
1 Put the alloy inside the crucible

2 Put on to the master alloy

3 Put boric acid



4 Heat until reaching the casting temperature

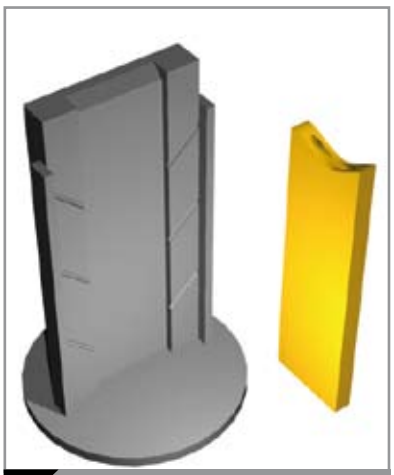


5 Alloy completely molten

6 Mix

7 Scorification of boric acid using a agitator

8 Pour the alloy into the crucible



9 Sheet obtained by vertical mould

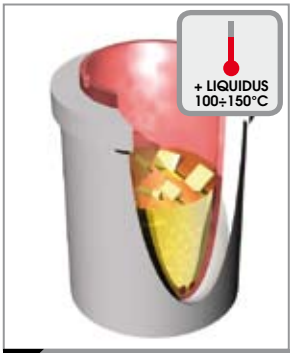
10 Quench

CONTINUOS CASTING (ASIDE PRE-MELTING)

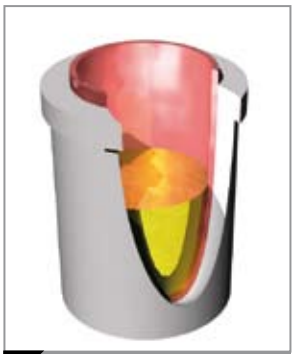
1 Put the alloy inside the crucible

2 Put on to the master alloy

3 Put boric acid



4 Heat until reaching the casting temperature



5 Alloy completely molten

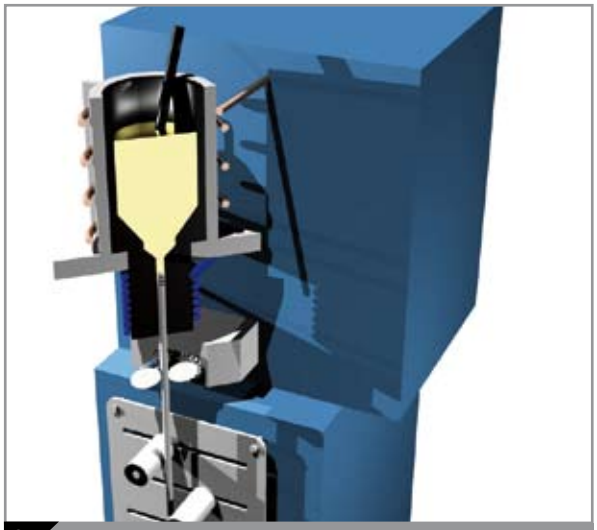
6 Mix

7 Scorification of boric acid using a agitator

8 Pour the molten alloy into the continuos casting machine

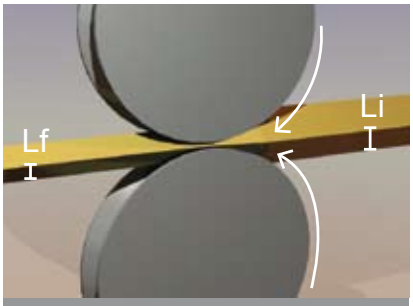
CONTINUOS CASTING (WITHOUT PRE-MELTING)

1 Put the master alloy and gold in the crucible



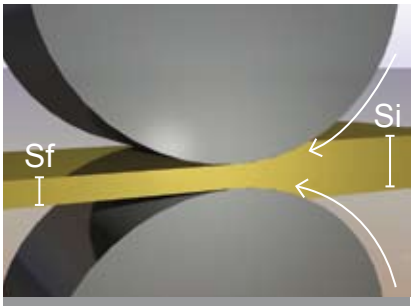
2 Mix

COLD - DEFORMATION % CALCULATION (ROLLING AND/OR DRAWING)



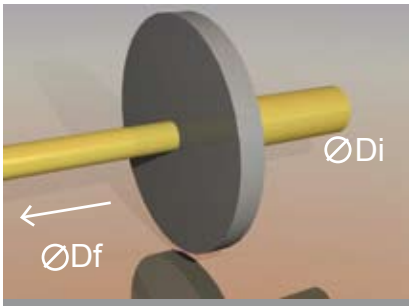
Deformation % calculation (square section wire): Li = initial side
Lf = final side

$$\text{deformation \%} = \frac{Li^2 - Lf^2}{Li^2} \times 100$$



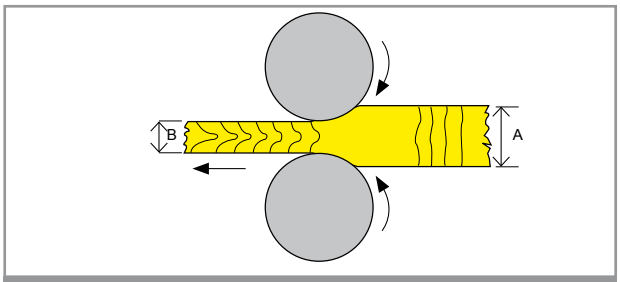
Deformation % calculation (sheet):
Si = initial thickness
Sf = final thickness

$$\text{deformation \%} = \frac{Si - Sf}{Si} \times 100$$

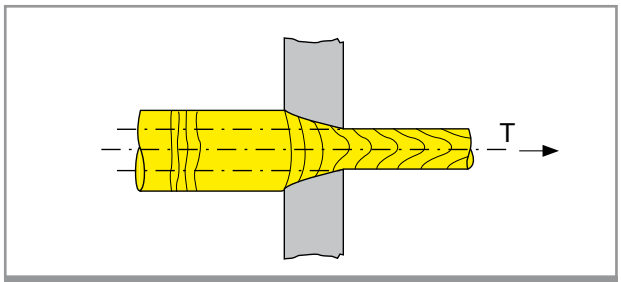


Deformation % calculation (round section wire): Di = initial diameter
Df = final diameter

$$\text{deformation \%} = \frac{Di^2 - Df^2}{Di^2} \times 100$$



Deformation's progress on the material during rolling



Deformation's progress on the material during drawing

Example of deformation % calculation of a sheet:

We presume to have a starting sheet of 12 mm of thickness and to reach a thickness of 0,7 mm.
To calculate the deformation's passages a percentage of deformation between 65% and 85% is considered optimal.

STARTING 1st STEP

mm spessore	16	14	12	10	9	8	7	6	5	4	3
16	-	12,5%	25,0%	37,5%	43,8%	50,0%	56,3%	62,5%	68,8%	75,0%	81,3%
14	12,5%	-	14,3%	28,6%	35,7%	42,9%	50,0%	57,1%	64,3%	71,4%	78,6%
12	25,0%	14,3%		16,7%	25,0%	33,3%	41,7%	50,0%	58,3%	66,7%	75,0%
10	37,5%	28,6%	16,7%	-	10,0%	20,0%	30,0%	40,0%	50,0%	60,0%	70,0%
9	43,8%	35,7%	25,0%	10,0%	-	11,1%	22,2%	33,3%	44,4%	55,6%	66,7%
8	50,0%	42,9%	33,3%	20,0%	11,1%	-	12,5%	25,0%	37,5%	50,0%	62,5%
7	56,3%	50,0%	41,7%	30,0%	22,2%	12,5%	-	14,3%	28,6%	42,9%	57,1%
6	62,5%	57,1%	50,0%	40,0%	33,3%	25,0%	14,3%	-	16,7%	33,3%	50,0%
5	68,8%	64,3%	58,3%	50,0%	44,4%	37,5%	28,6%	16,7%	-	20,0%	40,0%
4	75,0%	71,4%	66,7%	60,0%	55,6%	50,0%	42,9%	33,3%	20,0%	-	25,0%
3	81,3%	78,6%	75,0%	70,0%	66,7%	62,5%	57,1%	50,0%	40,0%	25,0%	-
2	87,5%	85,7%	83,3%	80,0%	77,8%	75,0%	71,4%	66,7%	60,0%	50,0%	33,3%
1,8	88,8%	87,1%	85,0%	82,0%	80,0%	77,5%	74,3%	70,0%	64,0%	55,0%	40,0%
1,6	90,0%	88,6%	86,7%	84,0%	82,2%	80,0%	77,1%	73,3%	68,0%	60,0%	46,7%
1,5	90,6%	89,3%	87,5%	85,0%	83,3%	81,3%	78,6%	75,0%	70,0%	62,5%	50,0%
1,4	91,3%	90,0%	88,3%	86,0%	84,4%	82,5%	80,0%	76,7%	72,0%	65,0%	53,3%
1,3	91,9%	90,7%	89,2%	87,0%	85,6%	83,8%	81,4%	78,3%	74,0%	67,5%	56,7%
1,2	92,5%	91,4%	90,0%	88,0%	86,7%	85,0%	82,9%	80,0%	76,0%	70,0%	60,0%
1,1	93,1%	92,1%	90,8%	89,0%	87,8%	86,3%	84,3%	81,7%	78,0%	72,5%	63,3%
1	93,8%	92,9%	91,7%	90,0%	88,9%	87,5%	85,7%	83,3%	80,0%	75,0%	66,7%
0,9	94,4%	93,6%	92,5%	91,0%	90,0%	88,8%	87,1%	85,0%	82,0%	77,5%	70,0%
0,8	95,0%	94,3%	93,3%	92,0%	91,1%	90,0%	88,6%	86,7%	84,0%	80,0%	73,3%
0,7	95,6%	95,0%	94,2%	93,0%	92,2%	91,3%	90,0%	88,3%	86,0%	82,5%	76,7%

ANNEALING STOP

FINISH 2st STEP

Deformation % calculation - sheet

mm thickness	16	14	12	10	9	8	7	6	5	4	3	2	1,8	1,6	1,5	1,4	1,3	1,2	1,1	1	0,9	0,8	0,7	0,6	0,5	0,4	0,3	0,2	0,1
16	-	12,5%	25,0%	37,5%	43,8%	50,0%	56,3%	62,5%	68,8%	75,0%	81,3%	87,5%	88,8%	90,0%	90,6%	91,3%	91,9%	92,5%	93,1%	93,8%	94,4%	95,0%	95,6%	96,3%	96,9%	97,5%	98,1%	98,8%	99,4%
14	12,5%	-	14,3%	28,6%	35,7%	42,9%	50,0%	57,1%	64,3%	71,4%	78,6%	85,7%	87,1%	88,6%	89,3%	90,0%	90,7%	91,4%	92,1%	92,9%	93,6%	94,3%	95,0%	95,7%	96,4%	97,1%	97,9%	98,6%	99,3%
12	25,0%	14,3%	-	16,7%	25,0%	33,3%	41,7%	50,0%	58,3%	66,7%	75,0%	83,3%	85,0%	86,7%	87,5%	88,3%	89,2%	90,0%	90,8%	91,7%	92,5%	93,3%	94,2%	95,0%	95,8%	96,7%	97,5%	98,3%	99,2%
10	37,5%	28,6%	16,7%	-	10,0%	20,0%	30,0%	40,0%	50,0%	60,0%	70,0%	80,0%	82,0%	84,0%	85,0%	86,0%	87,0%	88,0%	89,0%	90,0%	91,0%	92,0%	93,0%	94,0%	95,0%	96,0%	97,0%	98,0%	99,0%
9	43,8%	35,7%	25,0%	10,0%	-	11,1%	22,2%	33,3%	44,4%	55,6%	66,7%	77,8%	80,0%	82,2%	83,3%	84,4%	85,6%	86,7%	87,8%	88,9%	90,0%	91,1%	92,2%	93,3%	94,4%	95,6%	96,7%	97,8%	98,9%
8	50,0%	42,9%	33,3%	20,0%	11,1%	-	12,5%	25,0%	37,5%	50,0%	62,5%	75,0%	77,5%	80,0%	81,3%	82,5%	83,8%	85,0%	86,3%	87,5%	88,8%	90,0%	91,3%	92,5%	93,8%	95,0%	96,3%	97,5%	98,8%
7	56,3%	50,0%	41,7%	30,0%	22,2%	12,5%	-	14,3%	28,6%	42,9%	57,1%	71,4%	74,3%	77,1%	78,6%	80,0%	81,4%	82,9%	84,3%	85,7%	87,1%	88,6%	90,0%	91,4%	92,9%	94,3%	95,7%	97,1%	98,6%
6	62,5%	57,1%	50,0%	40,0%	33,3%	25,0%	14,3%	-	16,7%	33,3%	50,0%	66,7%	70,0%	73,3%	75,0%	76,7%	78,3%	80,0%	81,7%	83,3%	85,0%	86,7%	88,3%	90,0%	91,7%	93,3%	95,0%	96,7%	98,3%
5	68,8%	64,3%	58,3%	50,0%	44,4%	37,5%	28,6%	16,7%	-	20,0%	40,0%	60,0%	64,0%	68,0%	70,0%	72,0%	74,0%	76,0%	78,0%	80,0%	82,0%	84,0%	86,0%	88,0%	90,0%	92,0%	94,0%	96,0%	98,0%
4	75,0%	71,4%	66,7%	60,0%	55,6%	50,0%	42,9%	33,3%	20,0%	-	25,0%	50,0%	55,0%	60,0%	62,5%	65,0%	67,5%	70,0%	72,5%	75,0%	77,5%	80,0%	82,5%	85,0%	87,5%	90,0%	92,5%	95,0%	97,5%
3	81,3%	78,6%	75,0%	70,0%	66,7%	62,5%	57,1%	50,0%	40,0%	25,0%	-	33,3%	40,0%	46,7%	50,0%	53,3%	56,7%	60,0%	63,3%	66,7%	70,0%	73,3%	76,7%	80,0%	83,3%	86,7%	90,0%	93,3%	96,7%
2	87,5%	85,7%	83,3%	80,0%	77,8%	75,0%	71,4%	66,7%	60,0%	50,0%	33,3%	-	10,0%	20,0%	25,0%	30,0%	35,0%	40,0%	45,0%	50,0%	55,0%	60,0%	65,0%	70,0%	75,0%	80,0%	85,0%	90,0%	95,0%
1,8	88,8%	87,1%	85,0%	82,0%	80,0%	77,5%	74,3%	70,0%	64,0%	55,0%	40,0%	10,0%	-	11,1%	16,7%	22,2%	27,8%	33,3%	38,9%	44,4%	50,0%	55,6%	61,1%	66,7%	72,2%	77,8%	83,3%	88,9%	94,4%
1,6	90,0%	88,6%	86,7%	84,0%	82,2%	80,0%	77,1%	73,3%	68,0%	60,0%	46,7%	20,0%	11,1%	-	6,3%	12,5%	18,8%	25,0%	31,3%	37,5%	43,8%	50,0%	56,3%	62,5%	68,8%	75,0%	81,3%	87,5%	93,8%
1,5	90,6%	89,3%	87,5%	85,0%	83,3%	81,3%	78,6%	75,0%	70,0%	62,5%	50,0%	25,0%	16,7%	6,3%	-	6,7%	13,3%	20,0%	26,7%	33,3%	40,0%	46,7%	53,3%	60,0%	66,7%	73,3%	80,0%	86,7%	93,3%
1,4	91,3%	90,0%	88,3%	86,0%	84,4%	82,5%	80,0%	76,7%	72,0%	65,0%	53,3%	30,0%	22,2%	12,5%	6,7%	-	7,1%	14,3%	21,4%	28,6%	35,7%	42,9%	50,0%	57,1%	64,3%	71,4%	78,6%	85,7%	92,9%
1,3	91,9%	90,7%	89,2%	87,0%	85,6%	83,8%	81,4%	78,3%	74,0%	67,5%	56,7%	35,0%	27,8%	18,8%	13,3%	7,1%	-	7,7%	15,4%	23,1%	30,8%	38,5%	46,2%	53,8%	61,5%	69,2%	76,9%	84,6%	92,3%
1,2	92,5%	91,4%	90,0%	88,0%	86,7%	85,0%	82,9%	80,0%	76,0%	70,0%	60,0%	40,0%	33,3%	25,0%	20,0%	14,3%	7,7%	-	8,3%	16,7%	25,0%	33,3%	41,7%	50,0%	58,3%	66,7%	75,0%	83,3%	91,7%
1,1	93,1%	92,1%	90,8%	89,0%	87,8%	86,3%	84,3%	81,7%	78,0%	72,5%	63,3%	45,0%	38,9%	31,3%	26,7%	21,4%	15,4%	8,3%	-	9,1%	18,2%	27,3%	36,4%	45,5%	54,5%	63,6%	72,7%	81,8%	90,9%
1	93,8%	92,9%	91,7%	90,0%	88,9%	87,5%	85,7%	83,3%	80,0%	75,0%	66,7%	50,0%	44,4%	37,5%	33,3%	28,6%	23,1%	16,7%	9,1%	-	10,0%	20,0%	30,0%	40,0%	50,0%	60,0%	70,0%	80,0%	90,0%
0,9	94,4%	93,6%	92,5%	91,0%	90,0%	88,8%	87,1%	85,0%	82,0%	77,5%	70,0%	55,0%	50,0%	43,8%	40,0%	35,7%	30,8%	25,0%	18,2%	10,0%	-	11,1%	22,2%	33,3%	44,4%	55,6%	66,7%	77,8%	88,9%
0,8	95,0%	94,3%	93,3%	92,0%	91,1%	90,0%	88,6%	86,7%	84,0%	80,0%	73,3%	60,0%	55,6%	50,0%	46,7%	42,9%	38,5%	33,3%	27,3%	20,0%	11,1%	-	12,5%	25,0%	37,5%	50,0%	62,5%	75,0%	87,5%
0,7	95,6%	95,0%	94,2%	93,0%	92,2%	91,3%	90,0%	88,3%	86,0%	82,5%	76,7%	65,0%	61,1%	56,3%	53,3%	50,0%	46,2%	41,7%	36,4%	30,0%	22,2%	12,5%	-	14,3%	28,6%	42,9%	57,1%	71,4%	85,7%
0,6	96,3%	95,7%	95,0%	94,0%	93,3%	92,5%	91,4%	90,0%	88,0%	85,0%	80,0%	70,0%	66,7%	62,5%	60,0%	57,1%	53,8%	50,0%	45,5%	40,0%	33,3%	25,0%	14,3%	-	16,7%	33,3%	50,0%	66,7%	83,3%
0,5	96,9%	96,4%	95,8%	95,0%	94,4%	93,8%	92,9%	91,7%	90,0%	87,5%	83,3%	75,0%	72,2%	68,8%	66,7%	64,3%	61,5%	58,3%	54,5%	50,0%	44,4%	37,5%	28,6%	16,7%	-	20,0%	40,0%	60,0%	80,0%
0,4	97,5%	97,1%	96,7%	96,0%	95,6%	95,0%	94,3%	93,3%	92,0%	90,0%	86,7%	80,0%	77,8%	75,0%	73,3%	71,4%	69,2%	66,7%	63,6%	60,0%	55,6%	50,0%	42,9%	33,3%	20,0%	-	25,0%	50,0%	75,0%
0,3	98,1%	97,9%	97,5%	97,0%	96,7%	96,3%	95,7%	95,0%	94,0%	92,5%	90,0%	85,0%	83,3%	81,3%	80,0%	78,6%	76,9%	75,0%	72,7%	70,0%	66,7%	62,5%	57,1%	50,0%	40,0%	25,0%	-	33,3%	66,7%
0,2	98,8%	98,6%	98,3%	98,0%	97,8%	97,5%	97,1%	96,7%	96,0%	95,0%	93,3%	90,0%	88,9%	87,5%	86,7%	85,7%	84,6%	83,3%	81,8%	80,0%	77,8%	75,0%	71,4%	66,7%	60,0%	50,0%	33,3%	-	50,0%
0,1	99,4%	99,3%	99,2%	99,0%	98,9%	98,8%	98,6%	98,3%	98,0%	97,5%	96,7%	95,0%	94,4%	93,8%	93,3%	92,9%	92,3%	91,7%	90,9%	90,0%	88,9%	87,5%	85,7%	83,3%	80,0%	75,0%	66,7%	50,0%	-

Deformation % calculation - squared wire up to 1,1mm then rounded

mm thickness	16	14	12	10	9	8	7	6	5	4	3	2	1,8	1,6	1,5	1,4	1,3	1,2	1,1	1	0,9	0,8	0,7	0,6	0,5	0,4	0,3	0,2	0,1
16	-	23,4%	43,8%	60,9%	68,4%	75,0%	80,9%	85,9%	90,2%	93,8%	96,5%	98,4%	98,7%	99,0%	99,1%	99,2%	99,3%	99,4%	99,6%	99,7%	99,8%	99,8%	99,9%	99,9%	99,9%	-	-	-	-
14	23,4%	-	26,5%	49,0%	58,7%	67,3%	75,0%	81,6%	87,2%	91,8%	95,4%	98,0%	98,3%	98,7%	98,9%	99,0%	99,1%	99,3%	99,5%	99,6%	99,7%	99,8%	99,8%	99,9%	99,9%	99,9%	-	-	-
12	43,8%	26,5%	-	30,6%	43,8%	55,6%	66,0%	75,0%	82,6%	88,9%	93,8%	97,2%	97,8%	98,2%	98,4%	98,6%	98,8%	99,0%	99,4%	99,5%	99,6%	99,7%	99,7%	99,8%	99,9%	99,9%	-	-	-
10	60,9%	49,0%	30,6%	-	19,0%	36,0%	51,0%	64,0%	75,0%	84,0%	91,0%	96,0%	96,8%	97,4%	97,8%	98,0%	98,3%	98,6%	99,1%	99,3%	99,4%	99,5%	99,6%	99,7%	99,8%	99,9%	99,9%	-	-
9	68,4%	58,7%	43,8%	19,0%	-	21,0%	39,5%	55,6%	69,1%	80,2%	88,9%	95,1%	96,0%	96,8%	97,2%	97,6%	97,9%	98,2%	98,9%	99,1%	99,3%	99,4%	99,5%	99,7%	99,8%	99,9%	99,9%	-	-
8	75,0%	67,3%	55,6%	36,0%	21,0%	-	23,4%	43,8%	60,9%	75,0%	85,9%	93,8%	94,9%	96,0%	96,5%	96,9%	97,4%	97,8%	98,6%	98,8%	99,1%	99,3%	99,4%	99,6%	99,7%	99,8%	99,9%	-	-
7	80,9%	75,0%	66,0%	51,0%	39,5%	23,4%	-	26,5%	49,0%	67,3%	81,6%	91,8%	93,4%	94,8%	95,4%	96,0%	96,6%	97,1%	98,2%	98,5%	98,8%	99,0%	99,3%	99,5%	99,6%	99,8%	99,9%	99,9%	-
6	85,9%	81,6%	75,0%	64,0%	55,6%	43,8%	26,5%	-	30,6%	55,6%	75,0%	88,9%	91,0%	92,9%	93,8%	94,6%	95,3%	96,0%	97,5%	97,9%	98,3%	98,7%	99,0%	99,3%	99,5%	99,7%	99,8%	99,9%	-
5	90,2%	87,2%	82,6%	75,0%	69,1%	60,9%	49,0%	30,6%	-	36,0%	64,0%	84,0%	87,0%	89,8%	91,0%	92,2%	93,2%	94,2%	96,4%	97,0%	97,6%	98,1%	98,5%	98,9%	99,3%	99,5%	99,7%	99,9%	-
4	93,8%	91,8%	88,9%	84,0%	80,2%	75,0%	67,3%	55,6%	36,0%	-	43,8%	75,0%	79,8%	84,0%	85,9%	87,8%	89,4%	91,0%	94,4%	95,3%	96,2%	97,0%	97,7%	98,3%	98,8%	99,3%	99,6%	99,8%	-
3	96,5%	95,4%	93,8%	91,0%	88,9%	85,9%	81,6%	75,0%	64,0%	43,8%	-	55,6%	64,0%	71,6%	75,0%	78,2%	81,2%	84,0%	90,0%	91,7%	93,3%	94,7%	95,9%	97,0%	97,9%	98,7%	99,3%	99,7%	99,9%
2	98,4%	98,0%	97,2%	96,0%	95,1%	93,8%	91,8%	88,9%	84,0%	75,0%	55,6%	-	19,0%	36,0%	43,8%	51,0%	57,8%	64,0%	77,4%	81,4%	84,9%	88,1%	90,9%	93,3%	95,3%	97,0%	98,3%	99,3%	99,8%
1,8	98,7%	98,3%	97,8%	96,8%	96,0%	94,9%	93,4%	91,0%	87,0%	79,8%	64,0%	19,0%	-	21,0%	30,6%	39,5%	47,8%	55,6%	72,1%	77,0%	81,4%	85,3%	88,7%	91,7%	94,2%	96,3%	97,9%	99,1%	99,8%
1,6	99,0%	98,7%	98,2%	97,4%	96,8%	96,0%	94,8%	92,9%	89,8%	84,0%	71,6%	36,0%	21,0%	-	12,1%	23,4%	34,0%	43,8%	64,8%	70,9%	76,4%	81,4%	85,7%	89,5%	92,7%	95,3%	97,4%	98,8%	99,7%
1,5	99,1%	98,9%	98,4%	97,8%	97,2%	96,5%	95,4%	93,8%	91,0%	85,9%	75,0%	43,8%	30,6%	12,1%	-	12,9%	24,9%	36,0%	59,9%	66,9%	73,2%	78,8%	83,8%	88,1%	91,7%	94,7%	97,0%	98,7%	99,7%
1,4	99,2%	99,0%	98,6%	98,0%	97,6%	96,9%	96,0%	94,6%	92,2%	87,8%	78,2%	51,0%	39,5%	23,4%	12,9%	-	13,8%	26,5%	54,0%	62,0%	69,2%	75,6%	81,4%	86,3%	90,5%	93,9%	96,6%	98,5%	99,6%
1,3	99,3%	99,1%	98,8%	98,3%	97,9%	97,4%	96,6%	95,3%	93,2%	89,4%	81,2%	57,8%	47,8%	34,0%	24,9%	13,8%	-	14,8%	46,6%	55,9%	64,3%	71,8%	78,4%	84,1%	89,0%	92,9%	96,0%	98,2%	99,6%
1,2	99,4%	99,3%	99,0%	98,6%	98,2%	97,8%	97,1%	96,0%	94,2%	91,0%	84,0%	64,0%	55,6%	43,8%	36,0%	26,5%	14,8%	-	37,3%	48,2%	58,1%	66,9%	74,6%	81,4%	87,1%	91,7%	95,3%	97,9%	99,5%
1,1	99,5%	99,4%	99,2%	98,8%	98,5%	98,1%	97,5%	96,6%	95,2%	92,4%	86,6%	69,8%	62,7%	52,7%	46,2%	38,3%	28,4%	16,0%	-	38,4%	50,1%	60,6%	69,8%	77,8%	84,6%	90,1%	94,5%	97,5%	99,4%
1	99,7%	99,6%	99,5%	99,3%	99,1%	98,8%	98,5%	97,9%	97,0%	95,3%	91,7%	81,4%	77,0%	70,9%	66,9%	62,0%	55,9%	48,2%	38,4%	-	39,6%	52,3%	63,5%	73,2%	81,4%	88,1%	93,3%	97,0%	99,3%
0,9	99,8%	99,7%	99,6%	99,4%	99,3%	99,1%	98,8%	98,3%	97,6%	96,2%	93,3%	84,9%	81,4%	76,4%	73,2%	69,2%	64,3%	58,1%	50,1%	39,6%	-	41,1%	54,9%	66,9%	77,0%	85,3%	91,7%	96,3%	99,1%
0,8	99,8%	99,8%	99,7%	99,5%	99,4%	99,3%	99,0%	98,7%	98,1%	97,0%	94,7%	88,1%	85,3%	81,4%	78,8%	75,6%	71,8%	66,9%	60,6%	52,3%	41,1%	-	42,9%	58,1%	70,9%	81,4%	89,5%	95,3%	98,8%
0,7	99,9%	99,8%	99,7%	99,6%	99,5%	99,4%	99,3%	99,0%	98,5%	97,7%	95,9%	90,9%	88,7%	85,7%	83,8%	81,4%	78,4%	74,6%	69,8%	63,5%	54,9%	42,9%	-	45,2%	62,0%	75,6%	86,3%	93,9%	98,5%
0,6	99,9%	99,9%	99,8%	99,7%	99,7%	99,6%	99,5%	99,3%	98,9%	98,3%	97,0%	93,3%	91,7%	89,5%	88,1%	86,3%	84,1%	81,4%	77,8%	73,2%	66,9%	58,1%	45,2%	-	48,2%	66,9%	81,4%	91,7%	97,9%
0,5	99,9%	99,9%	99,9%	99,8%	99,8%	99,7%	99,6%	99,5%	99,3%	98,8%	97,9%	95,3%	94,2%	92,7%	91,7%	90,5%	89,0%	87,1%	84,6%	81,4%	77,0%	70,9%	62,0%	48,2%	-	52,3%	73,2%	88,1%	97,0%
0,4	-	99,9%	99,9%	99,9%	99,9%	99,8%	99,8%	99,7%	99,5%	99,3%	98,7%	97,0%	96,3%	95,3%	94,7%	93,9%	92,9%	91,7%	90,1%	88,1%	85,3%	81,4%	75,6%	66,9%	52,3%	-	58,1%	81,4%	95,3%
0,3	-	-	-	99,9%	99,9%	99,9%	99,9%	99,8%	99,7%	99,6%	99,3%	98,3%	97,9%	97,4%	97,0%	96,6%	96,0%	95,3%	94,5%	93,3%	91,7%	89,5%	86,3%	81,4%	73,2%	58,1%	-	66,9%	91,7%
0,2	-	-	-	-	-	-	99,9%	99,9%	99,9%	99,8%	99,7%	99,3%	99,1%	98,8%	98,7%	98,5%	98,2%	97,9%	97,5%	97,0%	96,3%	95,3%	93,9%	91,7%	88,1%	81,4%	66,9%	-	81,4%
0,1	-	-	-	-	-	-	-	-	-	-	99,9%	99,8%	99,8%	99,7%	99,7%	99,6%	99,6%	99,5%	99,4%	99,3%	99,1%	98,8%	98,5%	97,9%	97,0%	95,3%	91,7%	81,4%	-

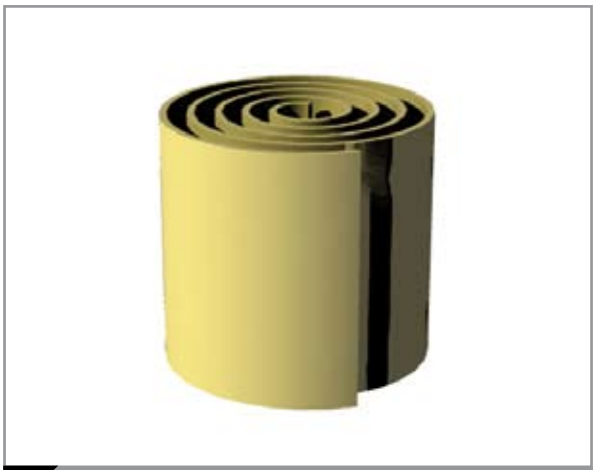
Deformation % calculation - square wire up to 2mm then rounded

mm thickness	16	14	12	10	9	8	7	6	5	4	3	2	1,8	1,6	1,5	1,4	1,3	1,2	1,1	1	0,9	0,8	0,7	0,6	0,5	0,4	0,3	0,2	0,1
16	-	23,4%	43,8%	60,9%	68,4%	75,0%	80,9%	85,9%	90,2%	93,8%	96,5%	98,8%	99,1%	99,3%	99,3%	99,4%	99,5%	99,6%	99,6%	99,7%	99,8%	99,8%	99,9%	99,9%	99,9%	-	-	-	-
14	23,4%	-	26,5%	49,0%	58,7%	67,3%	75,0%	81,6%	87,2%	91,8%	95,4%	98,5%	98,8%	99,0%	99,1%	99,3%	99,4%	99,5%	99,5%	99,6%	99,7%	99,8%	99,8%	99,9%	99,9%	99,9%	-	-	-
12	43,8%	26,5%	-	30,6%	43,8%	55,6%	66,0%	75,0%	82,6%	88,9%	93,8%	97,9%	98,3%	98,7%	98,8%	99,0%	99,1%	99,3%	99,4%	99,5%	99,6%	99,7%	99,7%	99,8%	99,9%	99,9%	-	-	-
10	60,9%	49,0%	30,6%	-	19,0%	36,0%	51,0%	64,0%	75,0%	84,0%	91,0%	97,0%	97,6%	98,1%	98,3%	98,5%	98,7%	98,9%	99,1%	99,3%	99,4%	99,5%	99,6%	99,7%	99,8%	99,9%	99,9%	-	-
9	68,4%	58,7%	43,8%	19,0%	-	21,0%	39,5%	55,6%	69,1%	80,2%	88,9%	96,3%	97,0%	97,6%	97,9%	98,2%	98,4%	98,7%	98,9%	99,1%	99,3%	99,4%	99,5%	99,7%	99,8%	99,9%	99,9%	-	-
8	75,0%	67,3%	55,6%	36,0%	21,0%	-	23,4%	43,8%	60,9%	75,0%	85,9%	95,3%	96,2%	97,0%	97,4%	97,7%	98,0%	98,3%	98,6%	98,8%	99,1%	99,3%	99,4%	99,6%	99,7%	99,8%	99,9%	-	-
7	80,9%	75,0%	66,0%	51,0%	39,5%	23,4%	-	26,5%	49,0%	67,3%	81,6%	93,9%	95,1%	96,1%	96,6%	97,0%	97,4%	97,8%	98,2%	98,5%	98,8%	99,0%	99,3%	99,5%	99,6%	99,8%	99,9%	99,9%	-
6	85,9%	81,6%	75,0%	64,0%	55,6%	43,8%	26,5%	-	30,6%	55,6%	75,0%	91,7%	93,3%	94,7%	95,3%	95,9%	96,5%	97,0%	97,5%	97,9%	98,3%	98,7%	99,0%	99,3%	99,5%	99,7%	99,8%	99,9%	-
5	90,2%	87,2%	82,6%	75,0%	69,1%	60,9%	49,0%	30,6%	-	36,0%	64,0%	88,1%	90,3%	92,4%	93,3%	94,2%	95,0%	95,7%	96,4%	97,0%	97,6%	98,1%	98,5%	98,9%	99,3%	99,5%	99,7%	99,9%	-
4	93,8%	91,8%	88,9%	84,0%	80,2%	75,0%	67,3%	55,6%	36,0%	-	43,8%	81,4%	84,9%	88,1%	89,5%	90,9%	92,1%	93,3%	94,4%	95,3%	96,2%	97,0%	97,7%	98,3%	98,8%	99,3%	99,6%	99,8%	-
3	96,5%	95,4%	93,8%	91,0%	88,9%	85,9%	81,6%	75,0%	64,0%	43,8%	-	66,9%	73,2%	78,8%	81,4%	83,8%	86,0%	88,1%	90,0%	91,7%	93,3%	94,7%	95,9%	97,0%	97,9%	98,7%	99,3%	99,7%	99,9%
2	98,8%	98,5%	97,9%	97,0%	96,3%	95,3%	93,9%	91,7%	88,1%	81,4%	66,9%	-	39,6%	52,3%	58,1%	63,5%	68,5%	73,2%	77,4%	81,4%	84,9%	88,1%	90,9%	93,3%	95,3%	97,0%	98,3%	99,3%	99,8%
1,8	99,1%	98,8%	98,3%	97,6%	97,0%	96,2%	95,1%	93,3%	90,3%	84,9%	73,2%	39,6%	-	41,1%	48,2%	54,9%	61,1%	66,9%	72,1%	77,0%	81,4%	85,3%	88,7%	91,7%	94,2%	96,3%	97,9%	99,1%	99,8%
1,6	99,3%	99,0%	98,7%	98,1%	97,6%	97,0%	96,1%	94,7%	92,4%	88,1%	78,8%	52,3%	41,1%	-	34,5%	42,9%	50,8%	58,1%	64,8%	70,9%	76,4%	81,4%	85,7%	89,5%	92,7%	95,3%	97,4%	98,8%	99,7%
1,5	99,3%	99,1%	98,8%	98,3%	97,9%	97,4%	96,6%	95,3%	93,3%	89,5%	81,4%	58,1%	48,2%	34,5%	-	35,0%	44,0%	52,3%	59,9%	66,9%	73,2%	78,8%	83,8%	88,1%	91,7%	94,7%	97,0%	98,7%	99,7%
1,4	99,4%	99,3%	99,0%	98,5%	98,2%	97,7%	97,0%	95,9%	94,2%	90,9%	83,8%	63,5%	54,9%	42,9%	35,0%	-	35,7%	45,2%	54,0%	62,0%	69,2%	75,6%	81,4%	86,3%	90,5%	93,9%	96,6%	98,5%	99,6%
1,3	99,5%	99,4%	99,1%	98,7%	98,4%	98,0%	97,4%	96,5%	95,0%	92,1%	86,0%	68,5%	61,1%	50,8%	44,0%	35,7%	-	36,5%	46,6%	55,9%	64,3%	71,8%	78,4%	84,1%	89,0%	92,9%	96,0%	98,2%	99,6%
1,2	99,6%	99,5%	99,3%	98,9%	98,7%	98,3%	97,8%	97,0%	95,7%	93,3%	88,1%	73,2%	66,9%	58,1%	52,3%	45,2%	36,5%	-	37,3%	48,2%	58,1%	66,9%	74,6%	81,4%	87,1%	91,7%	95,3%	97,9%	99,5%
1,1	99,6%	99,5%	99,4%	99,1%	98,9%	98,6%	98,2%	97,5%	96,4%	94,4%	90,0%	77,4%	72,1%	64,8%	59,9%	54,0%	46,6%	37,3%	-	38,4%	50,1%	60,6%	69,8%	77,8%	84,6%	90,1%	94,5%	97,5%	99,4%
1	99,7%	99,6%	99,5%	99,3%	99,1%	98,8%	98,5%	97,9%	97,0%	95,3%	91,7%	81,4%	77,0%	70,9%	66,9%	62,0%	55,9%	48,2%	38,4%	-	39,6%	52,3%	63,5%	73,2%	81,4%	88,1%	93,3%	97,0%	99,3%
0,9	99,8%	99,7%	99,6%	99,4%	99,3%	99,1%	98,8%	98,3%	97,6%	96,2%	93,3%	84,9%	81,4%	76,4%	73,2%	69,2%	64,3%	58,1%	50,1%	39,6%	-	41,1%	54,9%	66,9%	77,0%	85,3%	91,7%	96,3%	99,1%
0,8	99,8%	99,8%	99,7%	99,5%	99,4%	99,3%	99,0%	98,7%	98,1%	97,0%	94,7%	88,1%	85,3%	81,4%	78,8%	75,6%	71,8%	66,9%	60,6%	52,3%	41,1%	-	42,9%	58,1%	70,9%	81,4%	89,5%	95,3%	98,8%
0,7	99,9%	99,8%	99,7%	99,6%	99,5%	99,4%	99,3%	99,0%	98,5%	97,7%	95,9%	90,9%	88,7%	85,7%	83,8%	81,4%	78,4%	74,6%	69,8%	63,5%	54,9%	42,9%	-	45,2%	62,0%	75,6%	86,3%	93,9%	98,5%
0,6	99,9%	99,9%	99,8%	99,7%	99,7%	99,6%	99,5%	99,3%	98,9%	98,3%	97,0%	93,3%	91,7%	89,5%	88,1%	86,3%	84,1%	81,4%	77,8%	73,2%	66,9%	58,1%	45,2%	-	48,2%	66,9%	81,4%	91,7%	97,9%
0,5	99,9%	99,9%	99,9%	99,8%	99,8%	99,7%	99,6%	99,5%	99,3%	98,8%	97,9%	95,3%	94,2%	92,7%	91,7%	90,5%	89,0%	87,1%	84,6%	81,4%	77,0%	70,9%	62,0%	48,2%	-	52,3%	73,2%	88,1%	97,0%
0,4	-	99,9%	99,9%	99,9%	99,9%	99,8%	99,8%	99,7%	99,5%	99,3%	98,7%	97,0%	96,3%	95,3%	94,7%	93,9%	92,9%	91,7%	90,1%	88,1%	85,3%	81,4%	75,6%	66,9%	52,3%	-	58,1%	81,4%	95,3%
0,3	-	-	-	99,9%	99,9%	99,9%	99,9%	99,8%	99,7%	99,6%	99,3%	98,3%	97,9%	97,4%	97,0%	96,6%	96,0%	95,3%	94,5%	93,3%	91,7%	89,5%	86,3%	81,4%	73,2%	58,1%	-	66,9%	91,7%
0,2	-	-	-	-	-	-	99,9%	99,9%	99,9%	99,8%	99,7%	99,3%	99,1%	98,8%	98,7%	98,5%	98,2%	97,9%	97,5%	97,0%	96,3%	95,3%	93,9%	91,7%	88,1%	81,4%	66,9%	-	81,4%
0,1	-	-	-	-	-	-	-	-	-	-	99,9%	99,8%	99,8%	99,7%	99,7%	99,6%	99,6%	99,5%	99,4%	99,3%	99,1%	98,8%	98,5%	97,9%	97,0%	95,3%	91,7%	81,4%	-

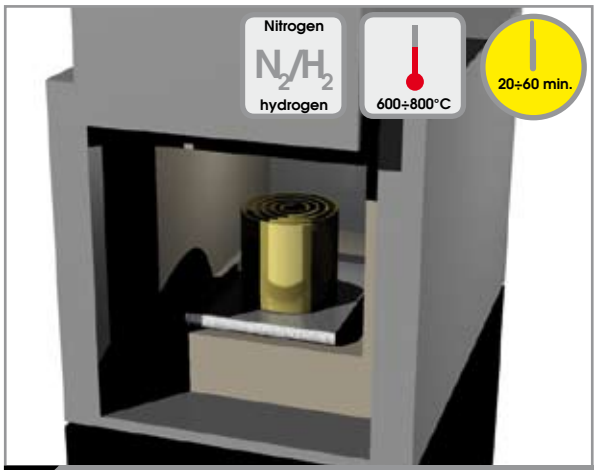
Deformation % calculation - rounded wire

mm thickness	16	14	12	10	9	8	7	6	5	4	3	2	1,8	1,6	1,5	1,4	1,3	1,2	1,1	1	0,9	0,8	0,7	0,6	0,5	0,4	0,3	0,2	0,1
16	-	23,4%	43,8%	60,9%	68,4%	75,0%	80,9%	85,9%	90,2%	93,8%	96,5%	98,4%	98,7%	99,0%	99,1%	99,2%	99,3%	99,4%	99,5%	99,6%	99,7%	99,8%	99,8%	99,9%	99,9%	-	-	-	-
14	23,4%	-	26,5%	49,0%	58,7%	67,3%	75,0%	81,6%	87,2%	91,8%	95,4%	98,0%	98,3%	98,7%	98,9%	99,0%	99,1%	99,3%	99,4%	99,5%	99,6%	99,7%	99,8%	99,8%	99,9%	99,9%	-	-	-
12	43,8%	26,5%	-	30,6%	43,8%	55,6%	66,0%	75,0%	82,6%	88,9%	93,8%	97,2%	97,8%	98,2%	98,4%	98,6%	98,8%	99,0%	99,2%	99,3%	99,4%	99,6%	99,7%	99,8%	99,8%	99,9%	-	-	-
10	60,9%	49,0%	30,6%	-	19,0%	36,0%	51,0%	64,0%	75,0%	84,0%	91,0%	96,0%	96,8%	97,4%	97,8%	98,0%	98,3%	98,6%	98,8%	99,0%	99,2%	99,4%	99,5%	99,6%	99,8%	99,8%	99,9%	-	-
9	68,4%	58,7%	43,8%	19,0%	-	21,0%	39,5%	55,6%	69,1%	80,2%	88,9%	95,1%	96,0%	96,8%	97,2%	97,6%	97,9%	98,2%	98,5%	98,8%	99,0%	99,2%	99,4%	99,6%	99,7%	99,8%	99,9%	-	-
8	75,0%	67,3%	55,6%	36,0%	21,0%	-	23,4%	43,8%	60,9%	75,0%	85,9%	93,8%	94,9%	96,0%	96,5%	96,9%	97,4%	97,8%	98,1%	98,4%	98,7%	99,0%	99,2%	99,4%	99,6%	99,8%	99,9%	-	-
7	80,9%	75,0%	66,0%	51,0%	39,5%	23,4%	-	26,5%	49,0%	67,3%	81,6%	91,8%	93,4%	94,8%	95,4%	96,0%	96,6%	97,1%	97,5%	98,0%	98,3%	98,7%	99,0%	99,3%	99,5%	99,7%	99,8%	99,9%	-
6	85,9%	81,6%	75,0%	64,0%	55,6%	43,8%	26,5%	-	30,6%	55,6%	75,0%	88,9%	91,0%	92,9%	93,8%	94,6%	95,3%	96,0%	96,6%	97,2%	97,8%	98,2%	98,6%	99,0%	99,3%	99,6%	99,8%	99,9%	-
5	90,2%	87,2%	82,6%	75,0%	69,1%	60,9%	49,0%	30,6%	-	36,0%	64,0%	84,0%	87,0%	89,8%	91,0%	92,2%	93,2%	94,2%	95,2%	96,0%	96,8%	97,4%	98,0%	98,6%	99,0%	99,4%	99,6%	99,8%	-
4	93,8%	91,8%	88,9%	84,0%	80,2%	75,0%	67,3%	55,6%	36,0%	-	43,8%	75,0%	79,8%	84,0%	85,9%	87,8%	89,4%	91,0%	92,4%	93,8%	94,9%	96,0%	96,9%	97,8%	98,4%	99,0%	99,4%	99,8%	-
3	96,5%	95,4%	93,8%	91,0%	88,9%	85,9%	81,6%	75,0%	64,0%	43,8%	-	55,6%	64,0%	71,6%	75,0%	78,2%	81,2%	84,0%	86,6%	88,9%	91,0%	92,9%	94,6%	96,0%	97,2%	98,2%	99,0%	99,6%	99,9%
2	98,4%	98,0%	97,2%	96,0%	95,1%	93,8%	91,8%	88,9%	84,0%	75,0%	55,6%	-	19,0%	36,0%	43,8%	51,0%	57,8%	64,0%	69,8%	75,0%	79,8%	84,0%	87,8%	91,0%	93,8%	96,0%	97,8%	99,0%	99,8%
1,8	98,7%	98,3%	97,8%	96,8%	96,0%	94,9%	93,4%	91,0%	87,0%	79,8%	64,0%	19,0%	-	21,0%	30,6%	39,5%	47,8%	55,6%	62,7%	69,1%	75,0%	80,2%	84,9%	88,9%	92,3%	95,1%	97,2%	98,8%	99,7%
1,6	99,0%	98,7%	98,2%	97,4%	96,8%	96,0%	94,8%	92,9%	89,8%	84,0%	71,6%	36,0%	21,0%	-	12,1%	23,4%	34,0%	43,8%	52,7%	60,9%	68,4%	75,0%	80,9%	85,9%	90,2%	93,8%	96,5%	98,4%	99,6%
1,5	99,1%	98,9%	98,4%	97,8%	97,2%	96,5%	95,4%	93,8%	91,0%	85,9%	75,0%	43,8%	30,6%	12,1%	-	12,9%	24,9%	36,0%	46,2%	55,6%	64,0%	71,6%	78,2%	84,0%	88,9%	92,9%	96,0%	98,2%	99,6%
1,4	99,2%	99,0%	98,6%	98,0%	97,6%	96,9%	96,0%	94,6%	92,2%	87,8%	78,2%	51,0%	39,5%	23,4%	12,9%	-	13,8%	26,5%	38,3%	49,0%	58,7%	67,3%	75,0%	81,6%	87,2%	91,8%	95,4%	98,0%	99,5%
1,3	99,3%	99,1%	98,8%	98,3%	97,9%	97,4%	96,6%	95,3%	93,2%	89,4%	81,2%	57,8%	47,8%	34,0%	24,9%	13,8%	-	14,8%	28,4%	40,8%	52,1%	62,1%	71,0%	78,7%	85,2%	90,5%	94,7%	97,6%	99,4%
1,2	99,4%	99,3%	99,0%	98,6%	98,2%	97,8%	97,1%	96,0%	94,2%	91,0%	84,0%	64,0%	55,6%	43,8%	36,0%	26,5%	14,8%	-	16,0%	30,6%	43,8%	55,6%	66,0%	75,0%	82,6%	88,9%	93,8%	97,2%	99,3%
1,1	99,5%	99,4%	99,2%	98,8%	98,5%	98,1%	97,5%	96,6%	95,2%	92,4%	86,6%	69,8%	62,7%	52,7%	46,2%	38,3%	28,4%	16,0%	-	17,4%	33,1%	47,1%	59,5%	70,2%	79,3%	86,8%	92,6%	96,7%	99,2%
1	99,6%	99,5%	99,3%	99,0%	98,8%	98,4%	98,0%	97,2%	96,0%	93,8%	88,9%	75,0%	69,1%	60,9%	55,6%	49,0%	40,8%	30,6%	17,4%	-	19,0%	36,0%	51,0%	64,0%	75,0%	84,0%	91,0%	96,0%	99,0%
0,9	99,7%	99,6%	99,4%	99,2%	99,0%	98,7%	98,3%	97,8%	96,8%	94,9%	91,0%	79,8%	75,0%	68,4%	64,0%	58,7%	52,1%	43,8%	33,1%	19,0%	-	21,0%	39,5%	55,6%	69,1%	80,2%	88,9%	95,1%	98,8%
0,8	99,8%	99,7%	99,6%	99,4%	99,2%	99,0%	98,7%	98,2%	97,4%	96,0%	92,9%	84,0%	80,2%	75,0%	71,6%	67,3%	62,1%	55,6%	47,1%	36,0%	21,0%	-	23,4%	43,8%	60,9%	75,0%	85,9%	93,8%	98,4%
0,7	99,8%	99,8%	99,7%	99,5%	99,4%	99,2%	99,0%	98,6%	98,0%	96,9%	94,6%	87,8%	84,9%	80,9%	78,2%	75,0%	71,0%	66,0%	59,5%	51,0%	39,5%	23,4%	-	26,5%	49,0%	67,3%	81,6%	91,8%	98,0%
0,6	99,9%	99,8%	99,8%	99,6%	99,6%	99,4%	99,3%	99,0%	98,6%	97,8%	96,0%	91,0%	88,9%	85,9%	84,0%	81,6%	78,7%	75,0%	70,2%	64,0%	55,6%	43,8%	26,5%	-	30,6%	55,6%	75,0%	88,9%	97,2%
0,5	99,9%	99,9%	99,8%	99,8%	99,7%	99,6%	99,5%	99,3%	99,0%	98,4%	97,2%	93,8%	92,3%	90,2%	88,9%	87,2%	85,2%	82,6%	79,3%	75,0%	69,1%	60,9%	49,0%	30,6%	-	36,0%	64,0%	84,0%	96,0%
0,4	-	99,9%	99,9%	99,8%	99,8%	99,8%	99,7%	99,6%	99,4%	99,0%	98,2%	96,0%	95,1%	93,8%	92,9%	91,8%	90,5%	88,9%	86,8%	84,0%	80,2%	75,0%	67,3%	55,6%	36,0%	-	43,8%	75,0%	93,8%
0,3	-	-	-	99,9%	99,9%	99,9%	99,8%	99,8%	99,6%	99,4%	99,0%	97,8%	97,2%	96,5%	96,0%	95,4%	94,7%	93,8%	92,6%	91,0%	88,9%	85,9%	81,6%	75,0%	64,0%	43,8%	-	55,6%	88,9%
0,2	-	-	-	-	-	-	99,9%	99,9%	99,8%	99,8%	99,6%	99,0%	98,8%	98,4%	98,2%	98,0%	97,6%	97,2%	96,7%	96,0%	95,1%	93,8%	91,8%	88,9%	84,0%	75,0%	55,6%	-	75,0%
0,1	-	-	-	-	-	-	-	-	-	-	99,9%	99,8%	99,7%	99,6%	99,6%	99,5%	99,4%	99,3%	99,2%	99,0%	98,8%	98,4%	98,0%	97,2%	96,0%	93,8%	88,9%	75,0%	-

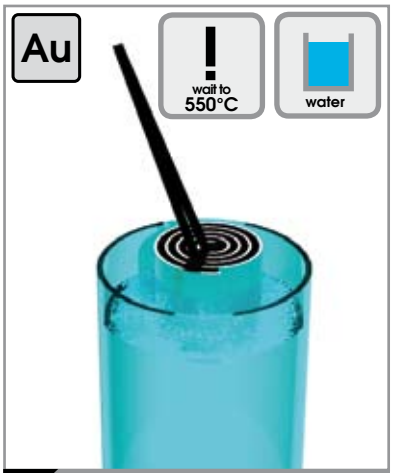
RECRYSTALIZATION ANNEALING



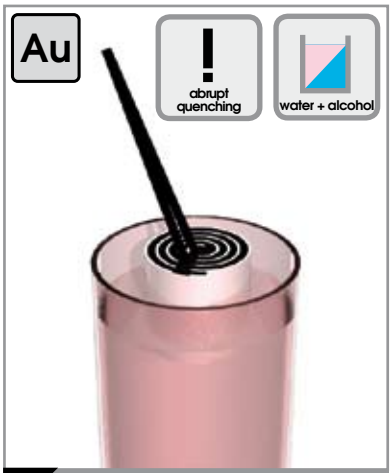
1 Wrapped up sheet



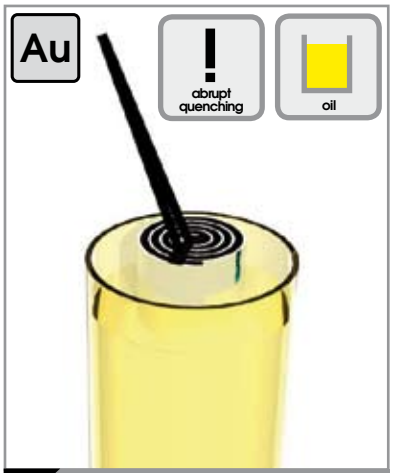
2 Put into the furnace



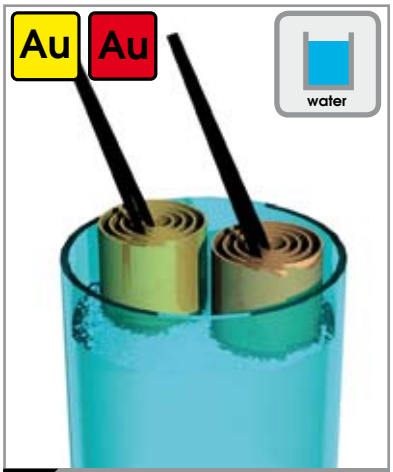
3 A type quenching



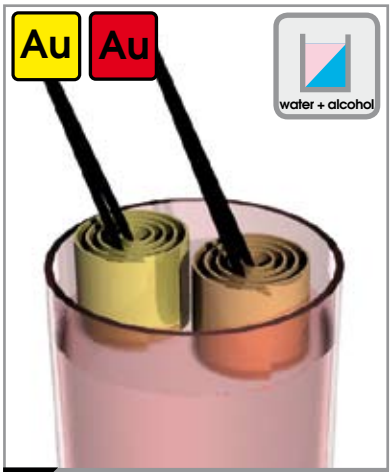
4 B type quenching



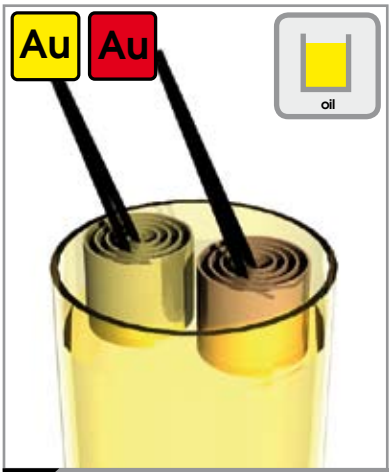
5 C type quenching



6 A type quenching

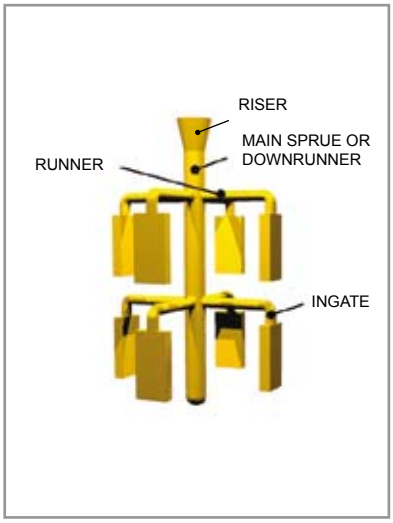


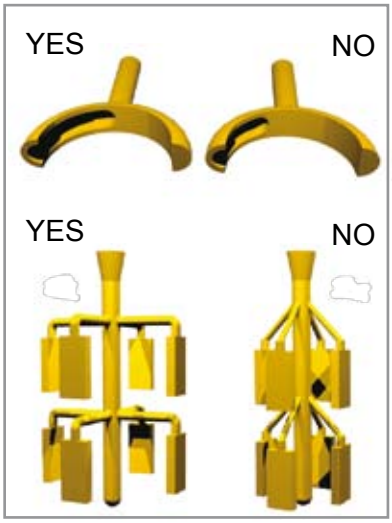
7 B type quenching

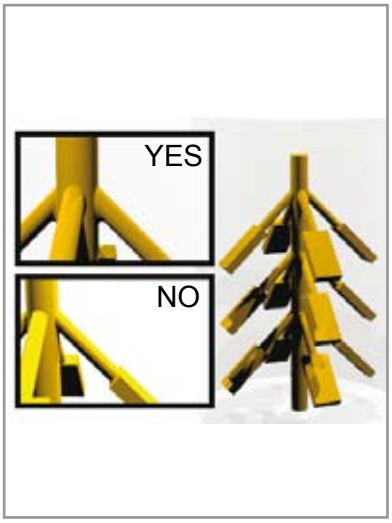


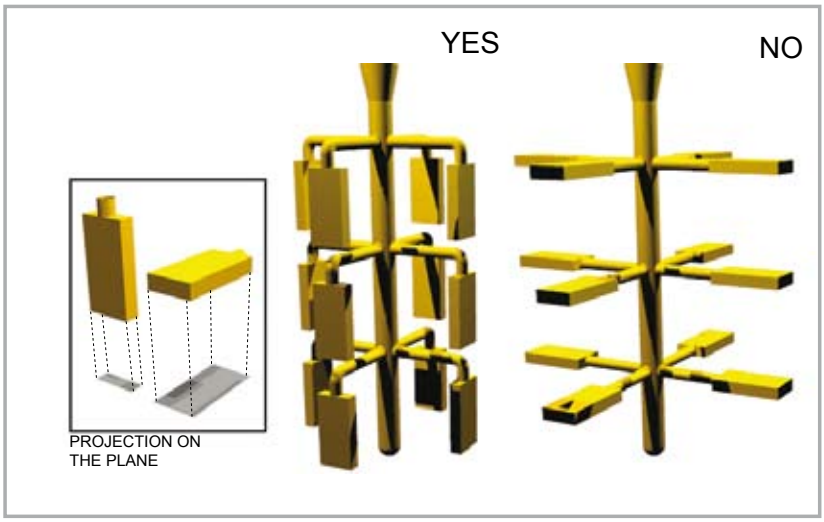
8 C type quenching

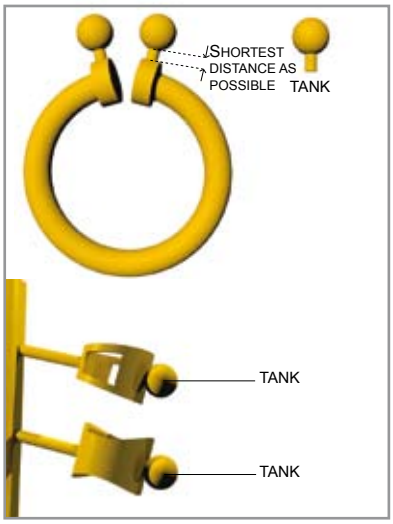
METHODS OF CASTS FEEDING

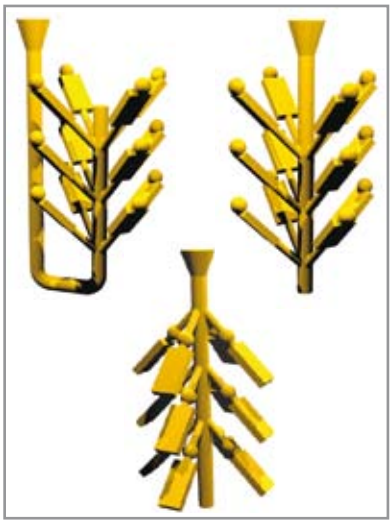




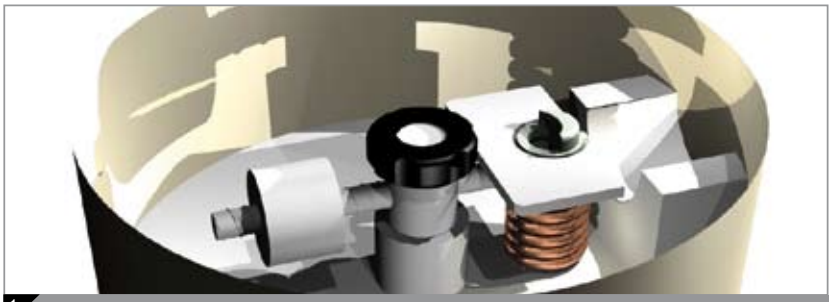








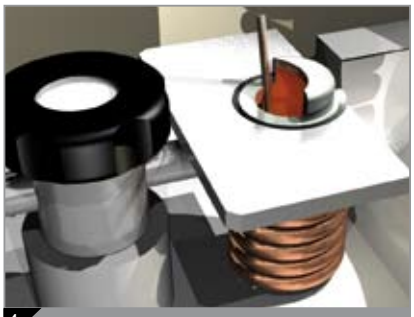
CASTING IN A CENTRIFUGAL SYSTEM



1 Centrifugal casting machine

2 Charging of the crucible: master ally, gold and boric acid

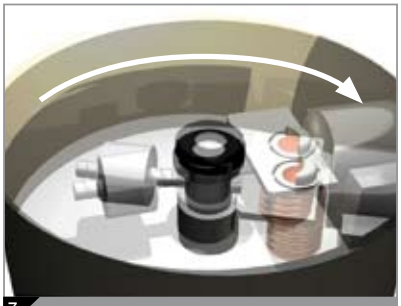
3 Completely molten alloy



4 Mix

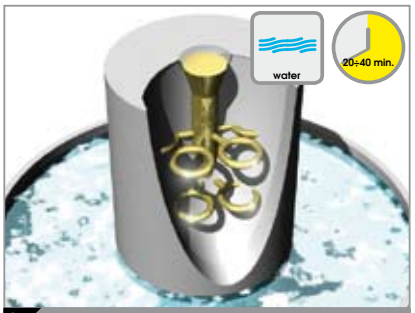
5 Scorification of boric acid using a agitator

6 Placing the flask



7 Casting with low acceleration

8 Hold of the flask in air if without stones in place



9 Hold of the flask in air if with stones in place

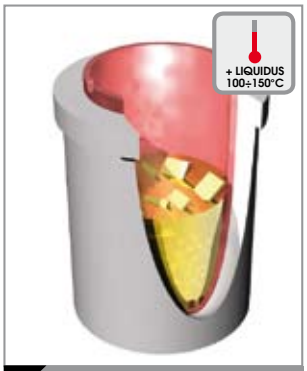
10 Quenching in water

CASTING IN A CENTRIFUGAL SYSTEM

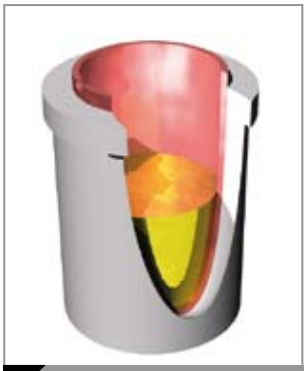
1 Put the alloy inside the crucible

2 Put gold above the master alloy

3 Put boric acid



4 Heat until reaching the casting temperature

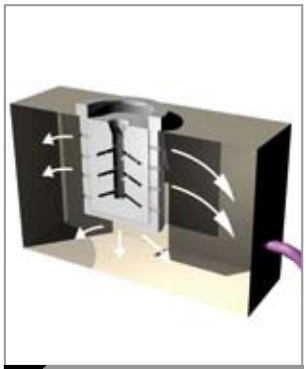


5 Completely molten alloy

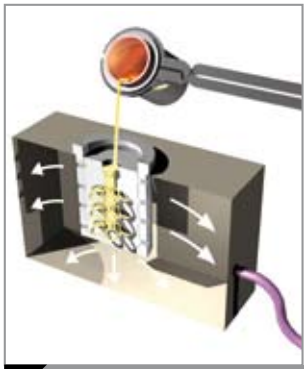
6 Mix

7 Scorification of boric acid using a agitator

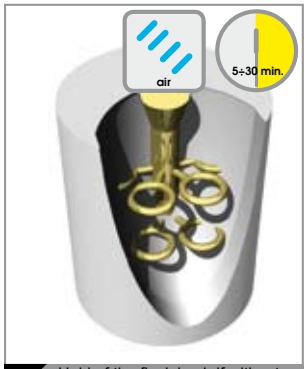
8 Put the flask into the vacuum chamber



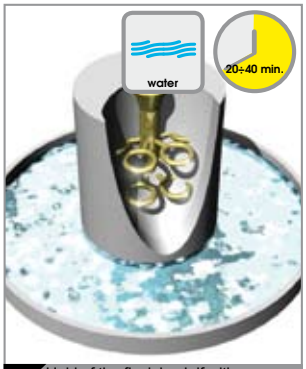
9 Section: start the vacuum pump



10 Section: pour the liquid metal



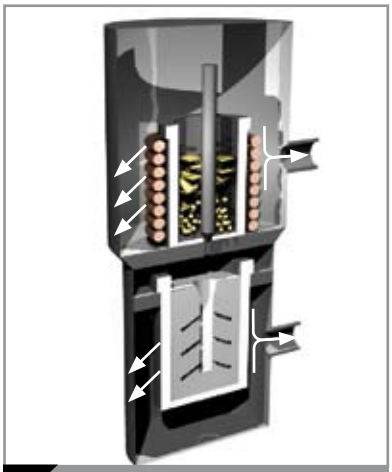
11 Hold of the flask in air if without stones in place



12 Hold of the flask in air if with stones in place

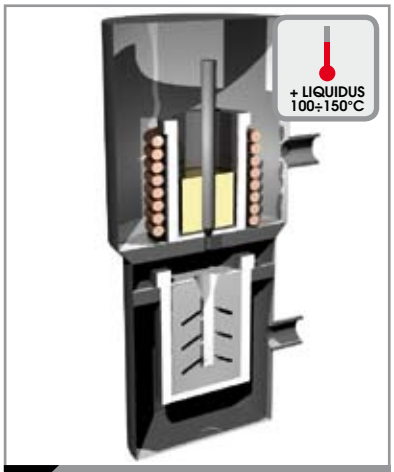
13 Quenching in water

STATIC CASTING IN CONTROLLED ATMOSPHERE

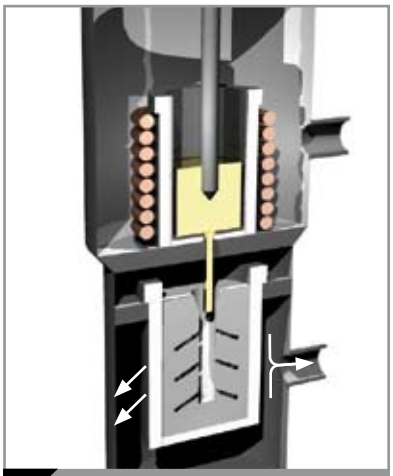


1 Charge the crucible (master alloy and gold), scrub the camber when metal is solid and casting

2 Partially molten alloy in inert atmosphere



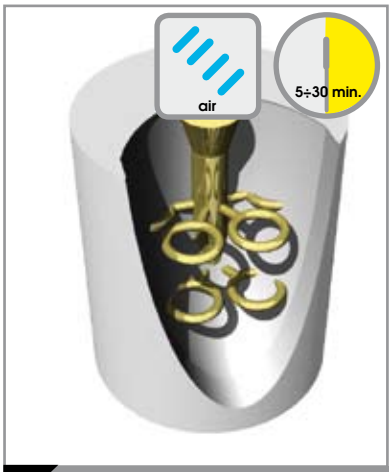
3 Completely molten alloy in inert atmosphere



4 Pouring the alloy into the flask

5 Applying the over pressure

6 The flask is completely filled

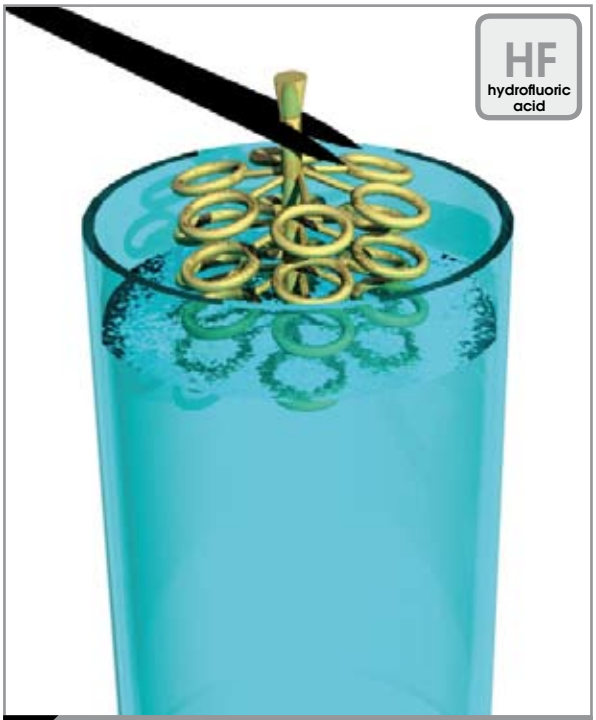


7 Hold of the flask in air if without stones in place

8 Hold of the flask in air if with stones in place

9 Quenching in water

1 Wash off the tree from the residuals of investment under a high pressure water jet



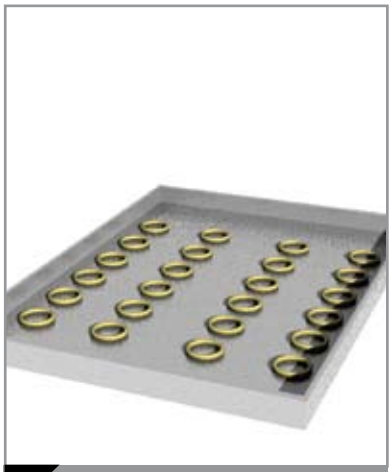
2 Put the tree into a solution of hydrofluoric acid

3 Wash off again under a high pressure water jet

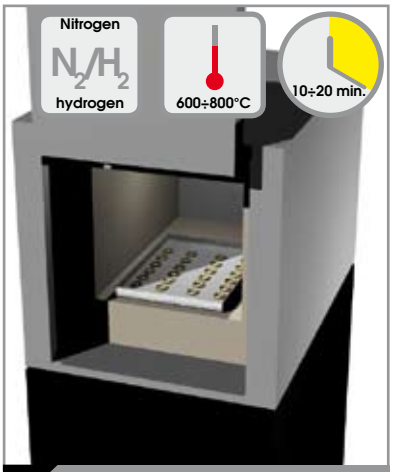
4 A tree completely clean

SOLUBILIZATION ANNEALING

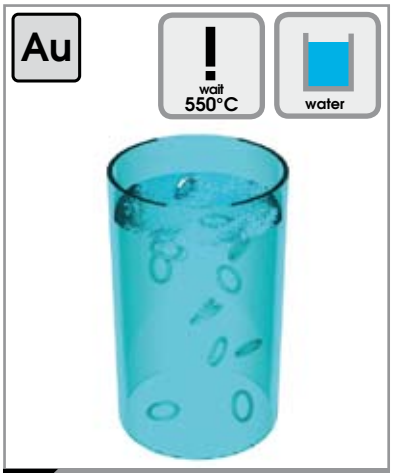
1 Pull off the items from thee tree



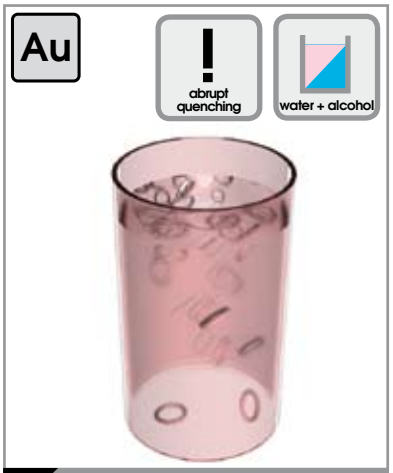
2 Place the items on a tray



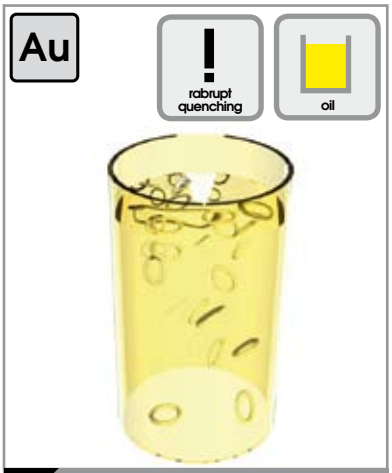
3 Put the items into the furnace



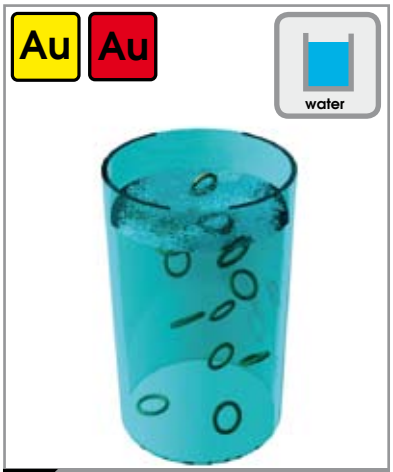
4 A type quenching



5 B type quenching

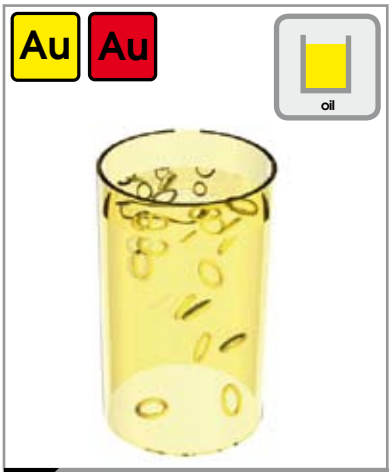


6 C type quenching



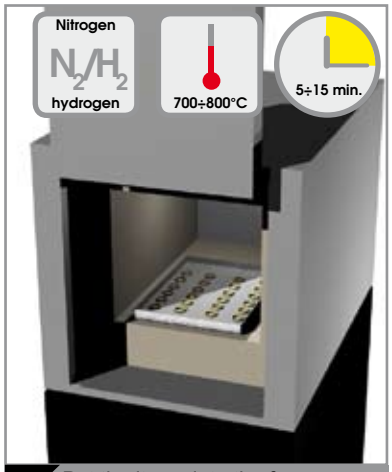
7 A type quenching

8 B type quenching

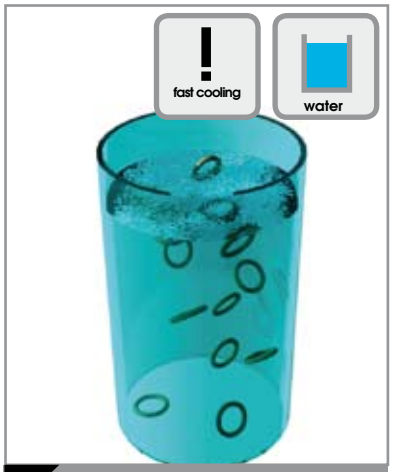


9 C type quenching

1 Place the items on a tray



2 Put the items into the furnace for the solubilization annealing



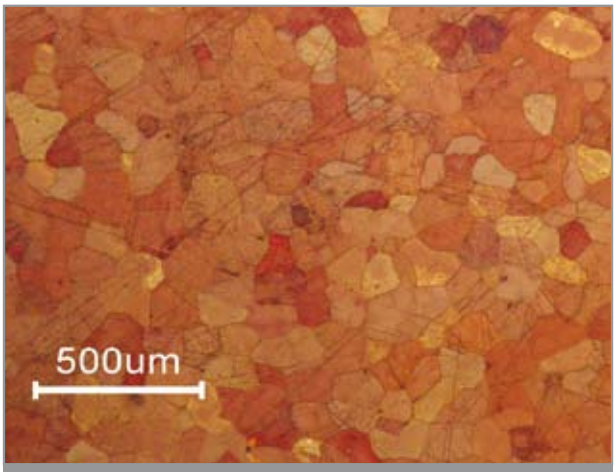
3 Abrupt quenching in water

4 Put the items into the furnace

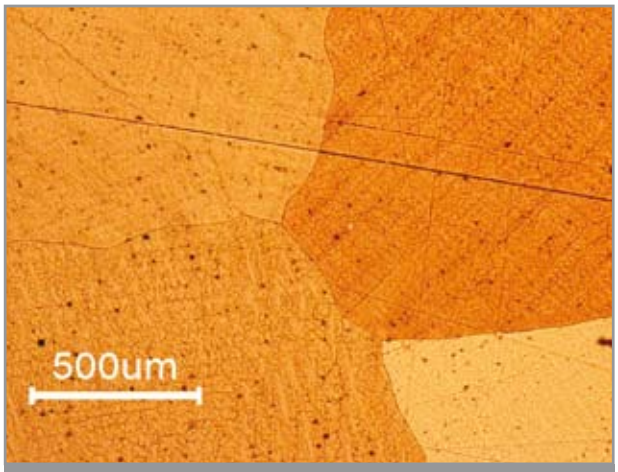
5 Cooling the items in air

DEFECTS EXAMPLES:

MICROSTRUCTURE

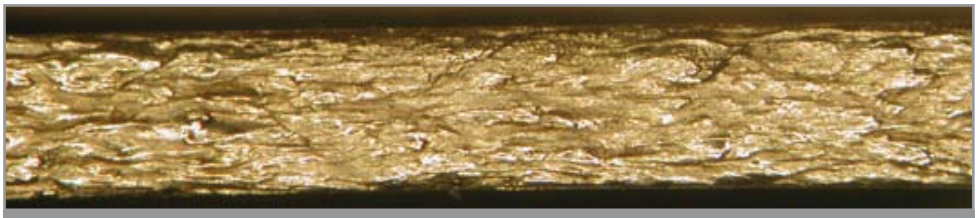


Micrography of an alloy with fine grain microstructure

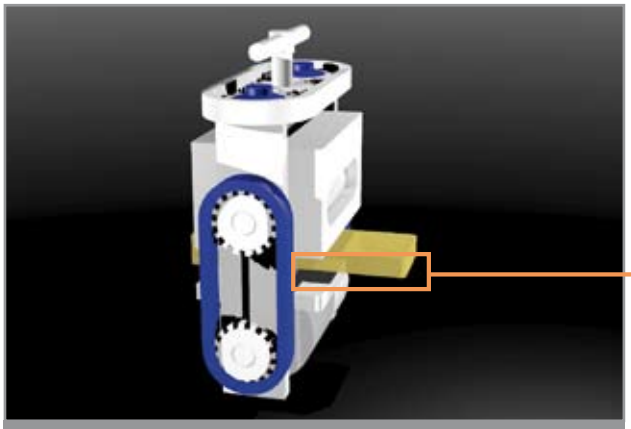


Micrography of an alloy with big grain microstructure

Fine grain microstructure

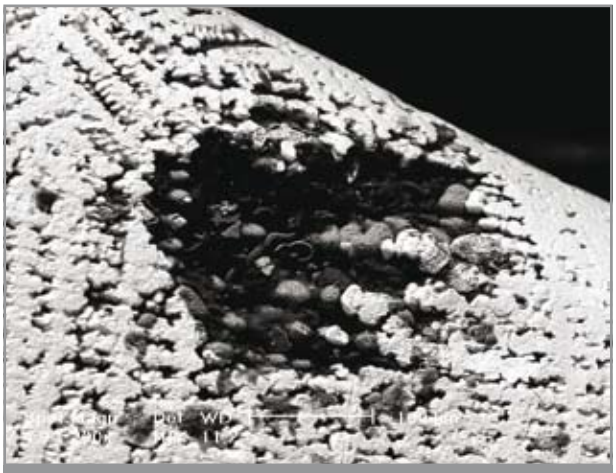


Big grain microstructure

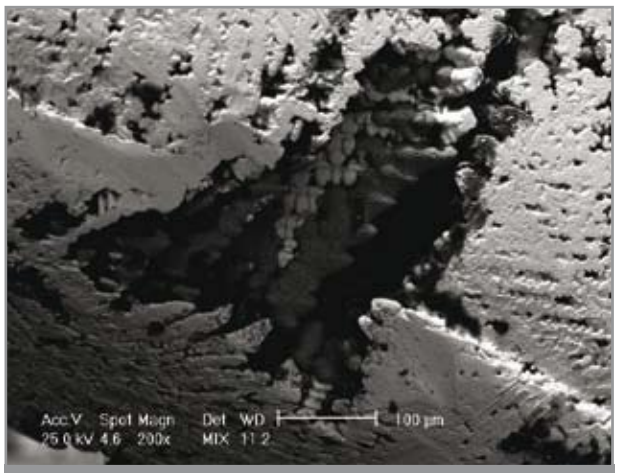


Sheet's side during rolling step

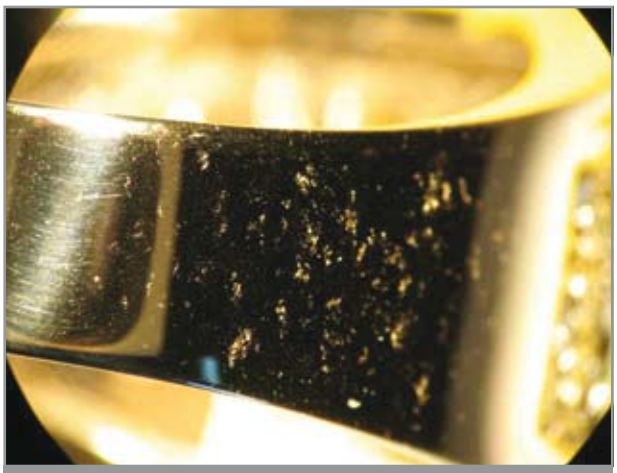
SHRINKAGE POROSITY



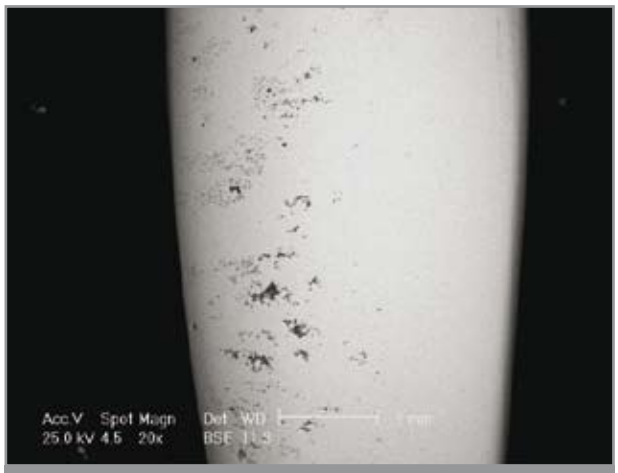
Spongy morphology



Spongy area



Shrinkage porosity

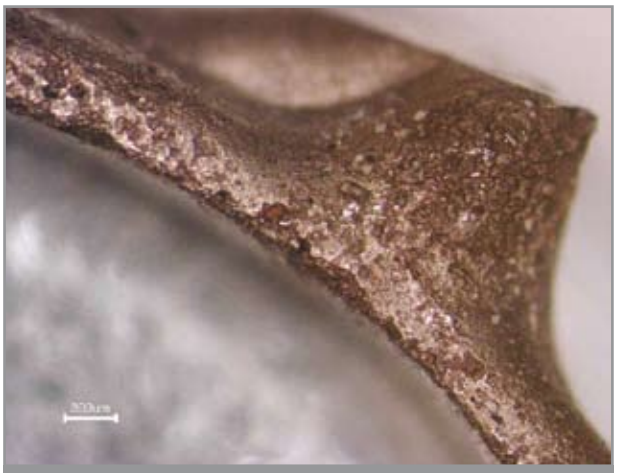


Shrinkage porosity

GAS POROSITY

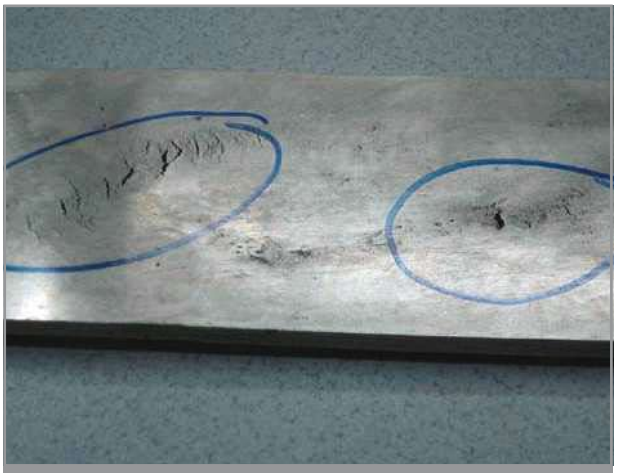
Gas porosity due to investment quality

Gas porosity due to investment quality at higher magnifications



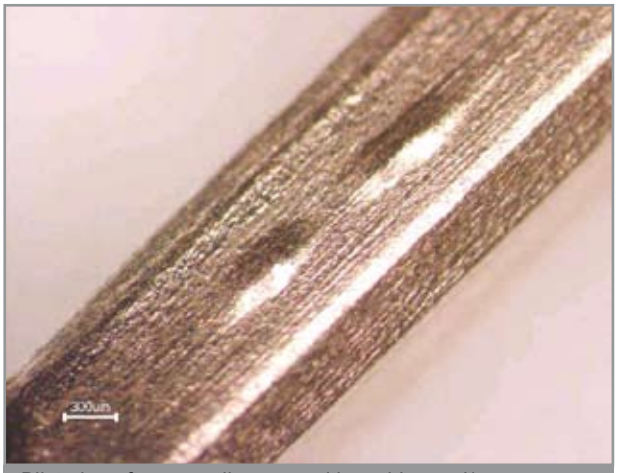
Gas porosity after casting

GAS INCLUSIONS (BUBBLES)



Internal breaking displayed after rolling

Blistering after annealing

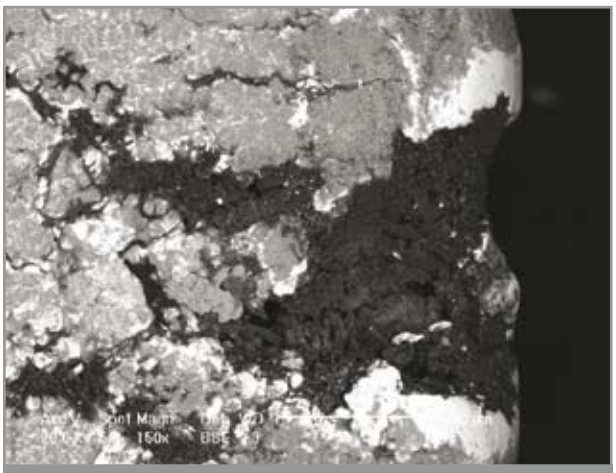


Blistering after annealing caused by oxides and/or polluting substances of the two metals interface

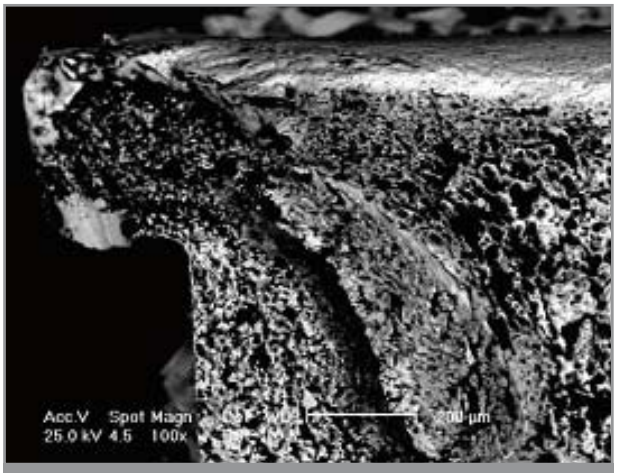
Gas bubbles in the wax

GRAPHITE INCLUSIONS

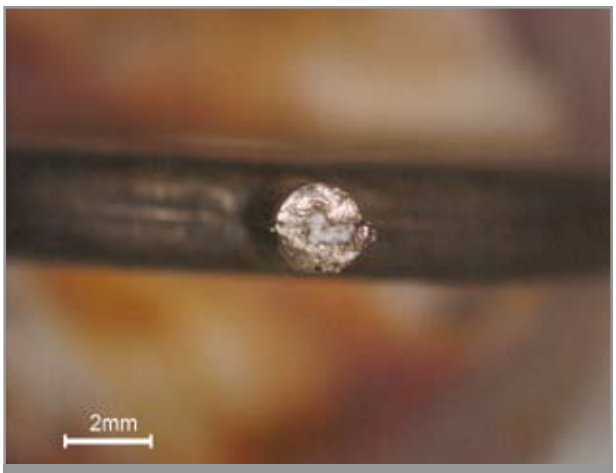
Graphite inclusions



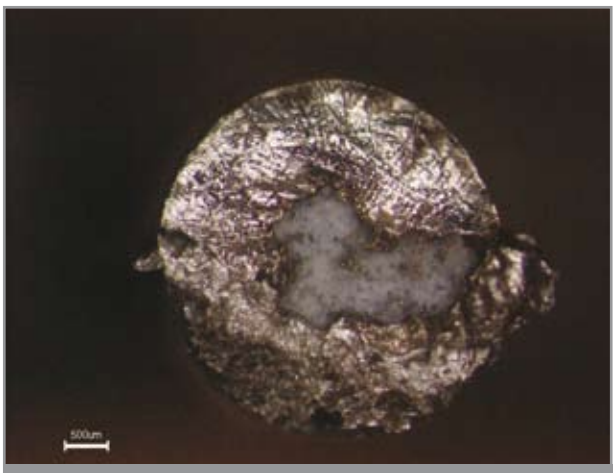
Graphite inclusions at higher magnifications



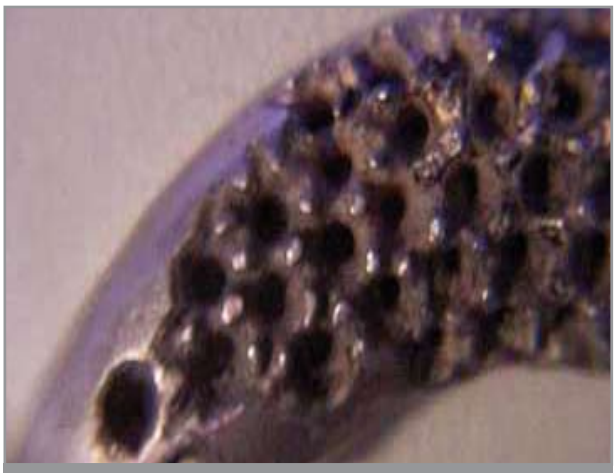
Breaking due to a graphite inclusion



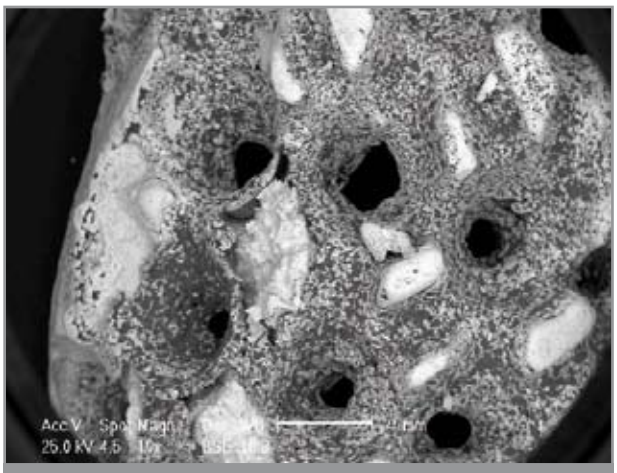
Incorporated investment inclusion



Incorporated investment inclusion at higher magnifications

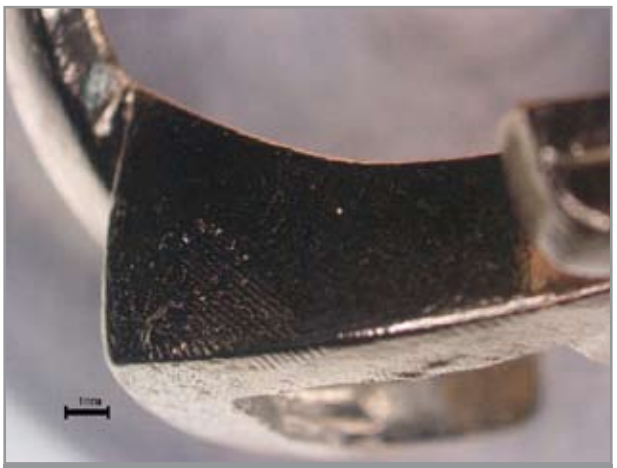


Surface investment inclusion

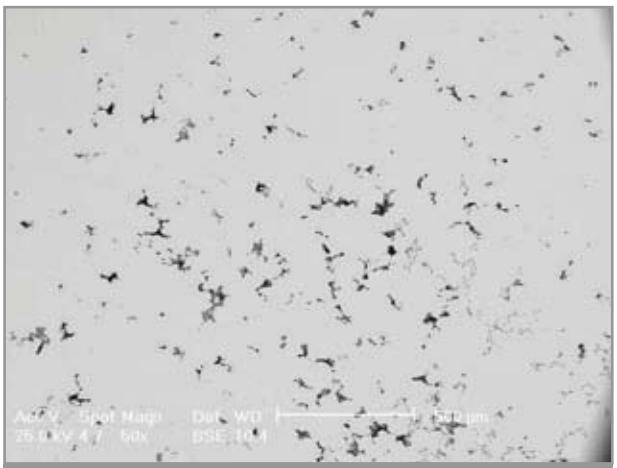


Surface investment inclusion at higher magnifications

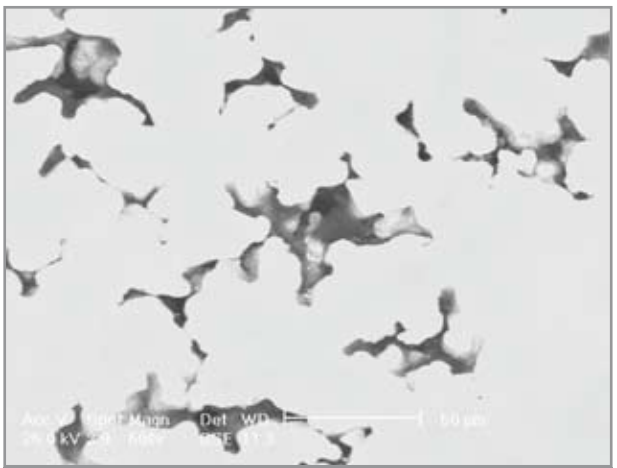
OXIDES INCLUSIONS



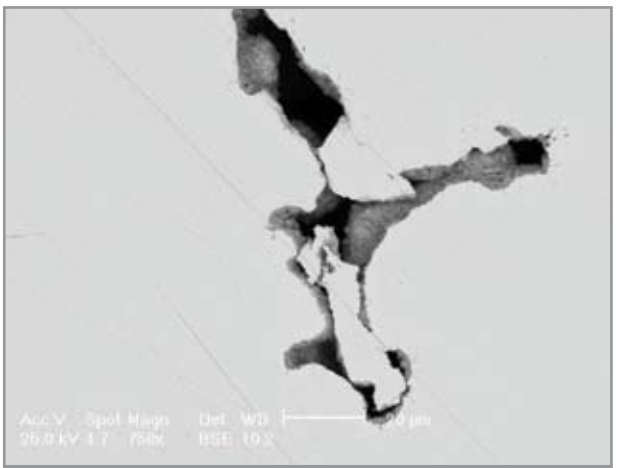
Examples of oxides inclusions observed on a ring made by investment casting



Porosity due to oxides inclusions



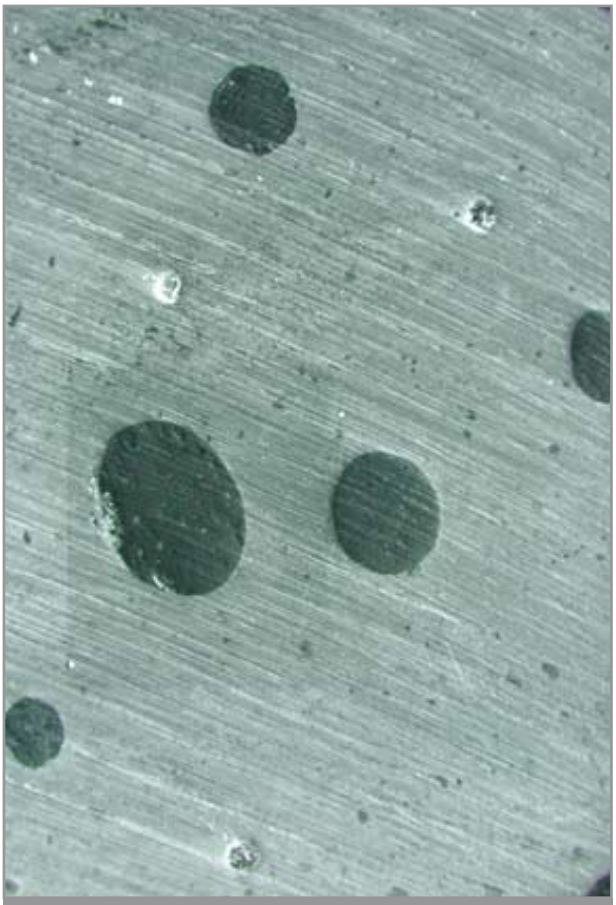
Porosity due to oxides inclusions



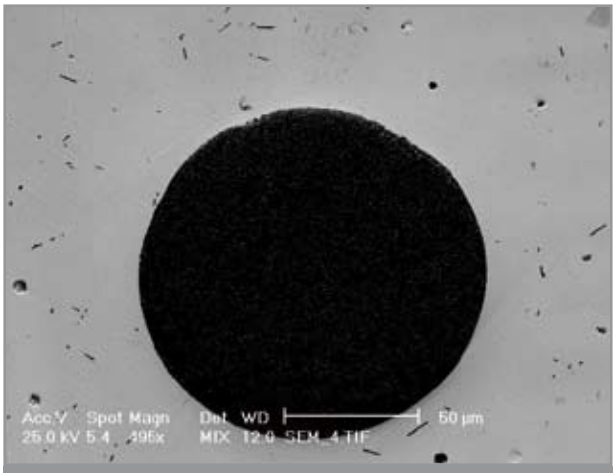
Porosity due to oxides inclusions

HARD SPOTS GENERATED BY SEGREGATION AND AGGLOMERATION

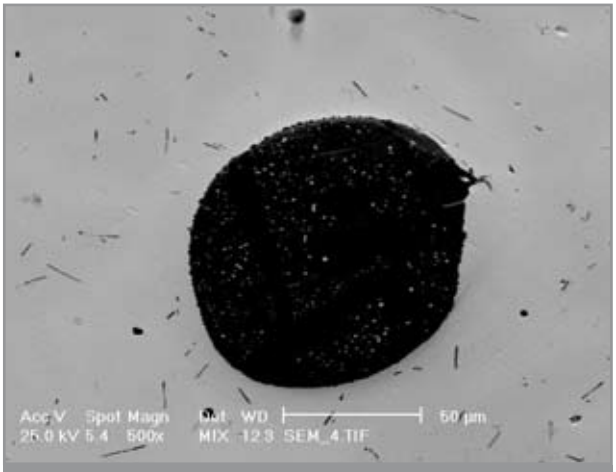
Nickel silicides hard spots



Nickel silicides hard spots

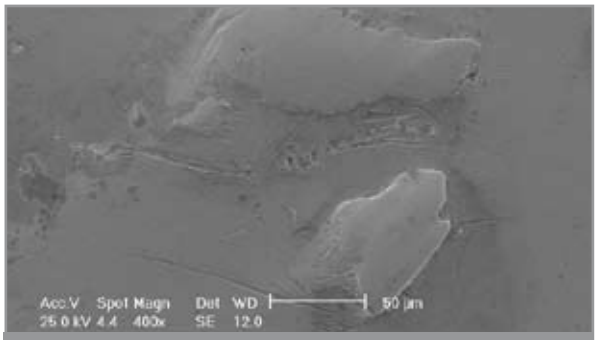


Nickel silicides hard spots



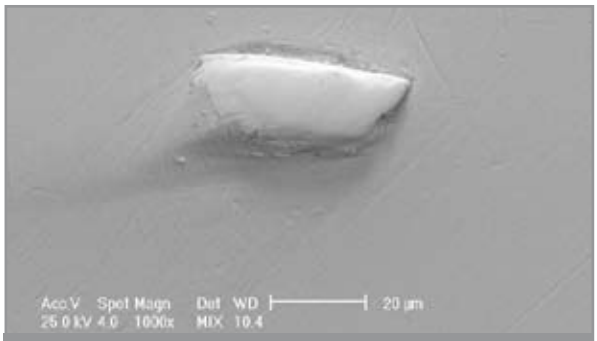
Nickel silicides hard spots

HARD SPOTS GENERATED BY IMPURITIES

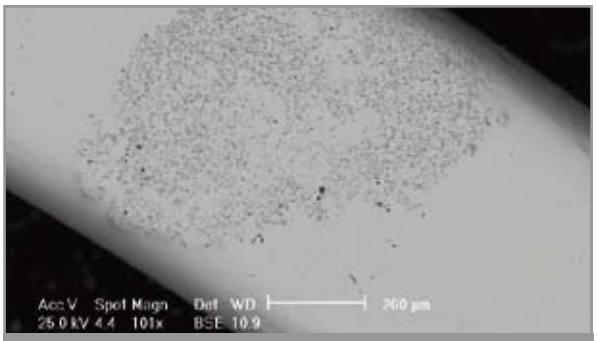


Hard spot composed of osmium, ruthenium and iridium

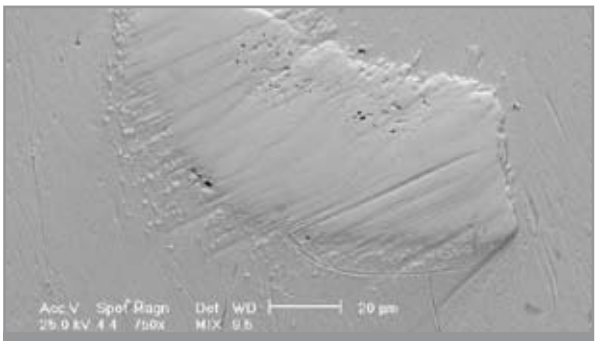
Hard spot composed of osmium, ruthenium and iridium



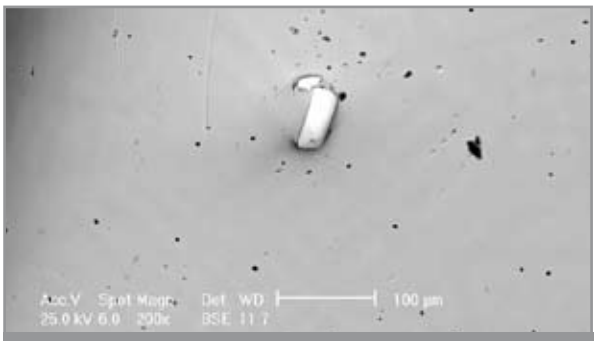
Hard spot composed of osmium, ruthenium and iridium



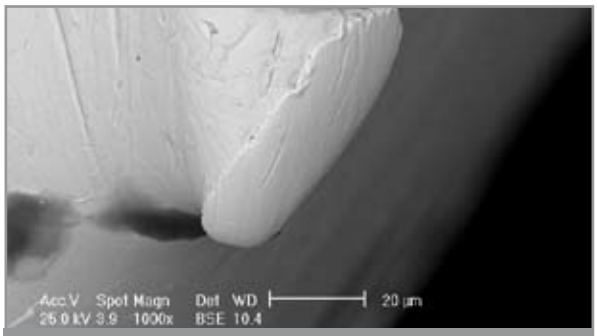
Hard spot composed of osmium, ruthenium and iridium



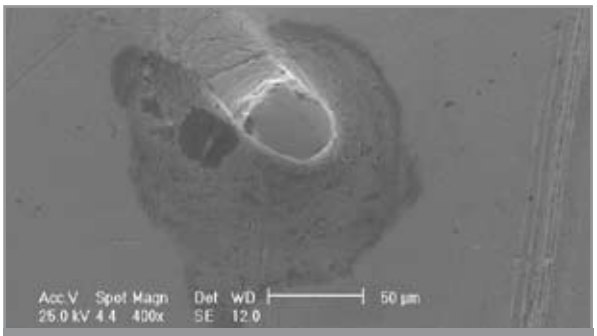
Hard spot composed of osmium, ruthenium and iridium



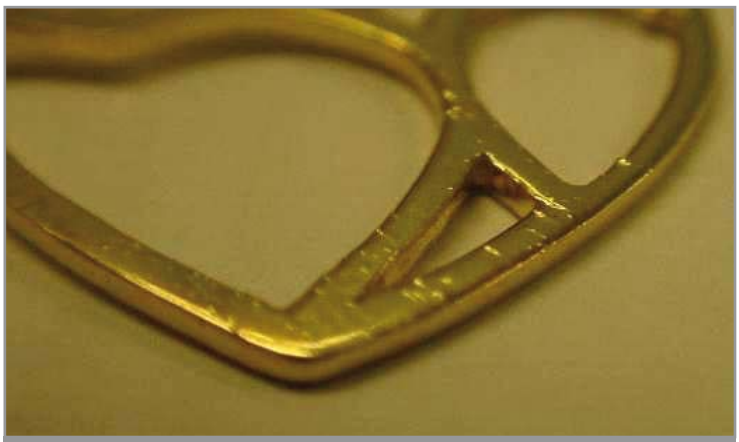
Hard spot composed of osmium, ruthenium and iridium



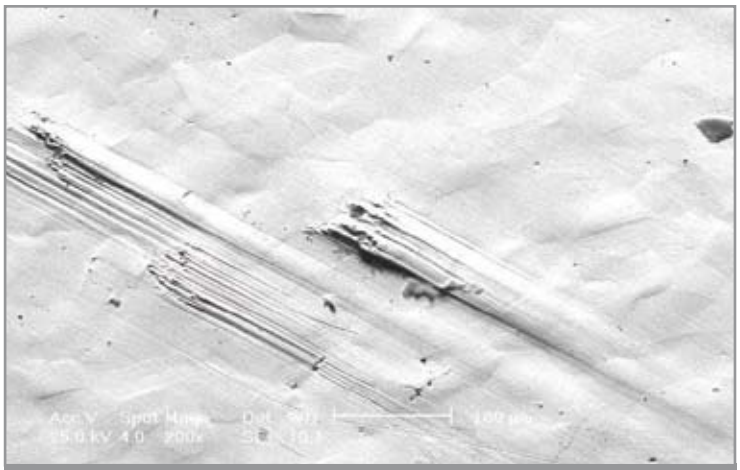
Hard spot composed of osmium, ruthenium and iridium



Hard spot composed of osmium, ruthenium and iridium

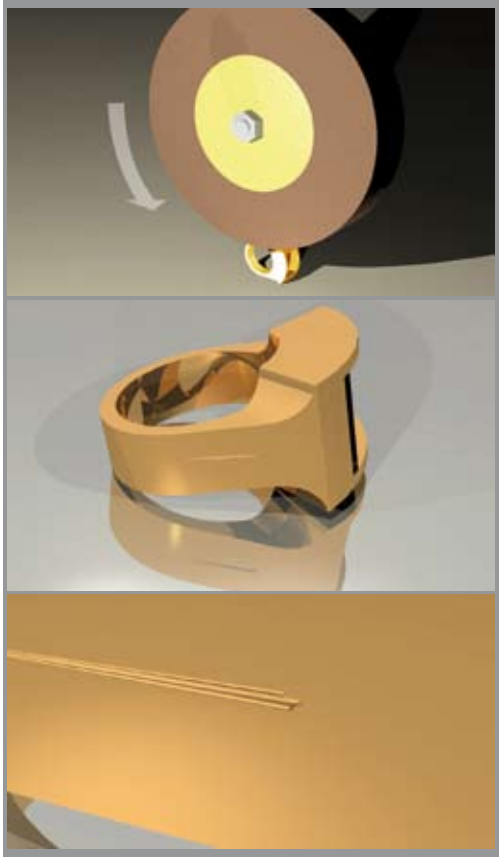


Hard spots generated by impurities



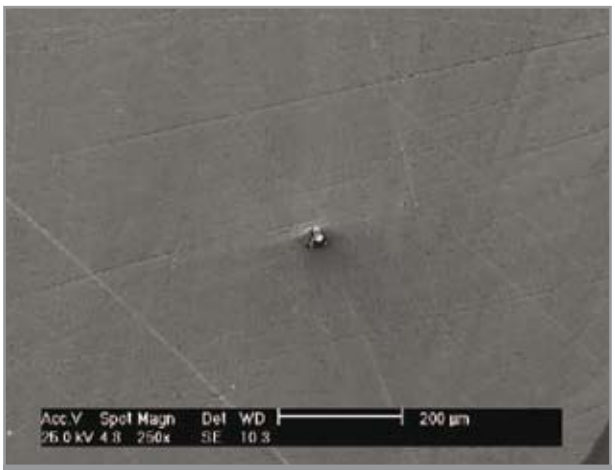
Comet effect

HOW THE HARD SPOT LOOKS AFTER THE POLISHING STEP



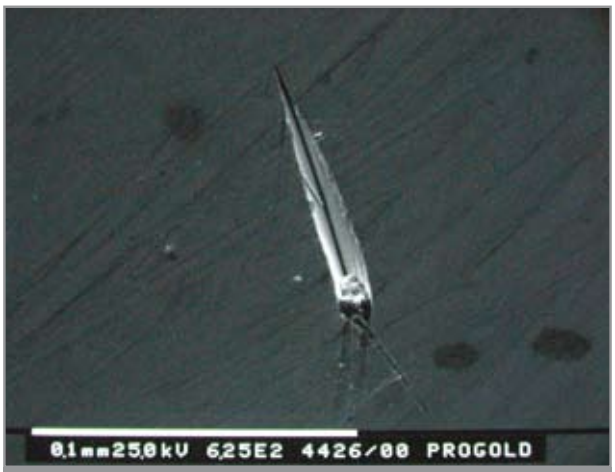
Comet effect. The raised area behind the hard inclusion looks like a comet tail.

ABRASIVE INCLUSIONS



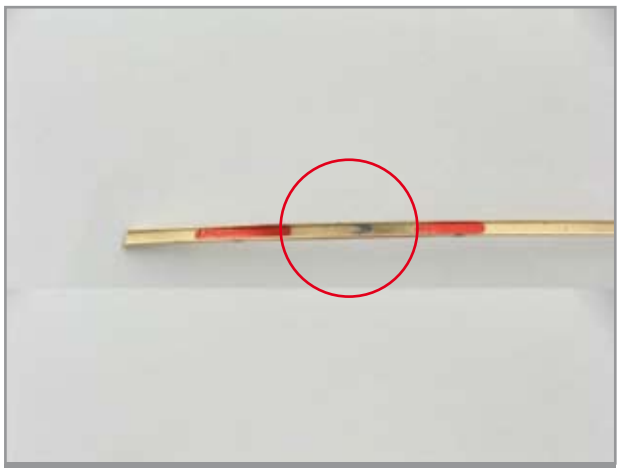
Inclusion of abrasives alumina based

Inclusion of abrasives alumina based at higher magnifications

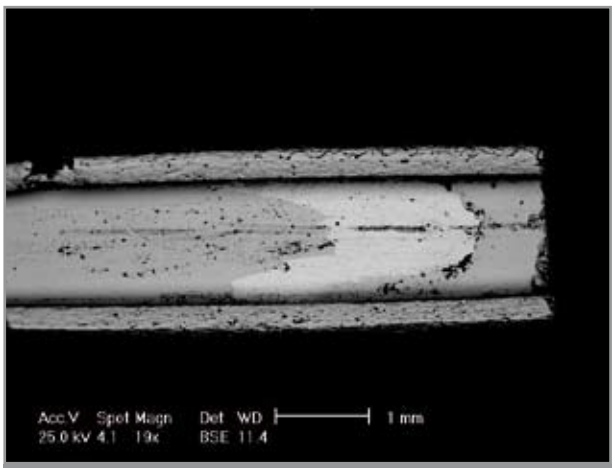


Alumina inserted in the metal

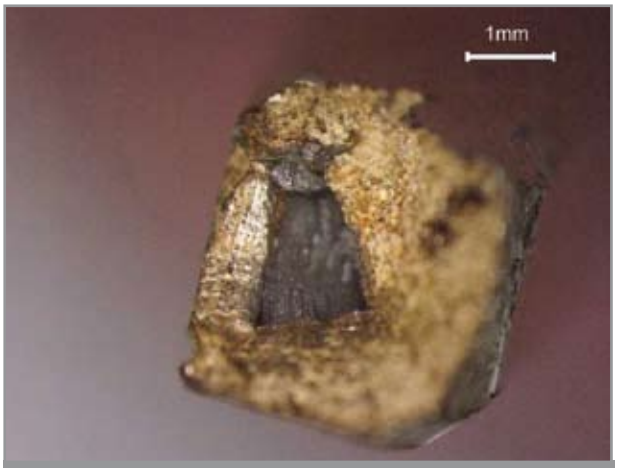
Alumina inserted in the metal at higher magnifications



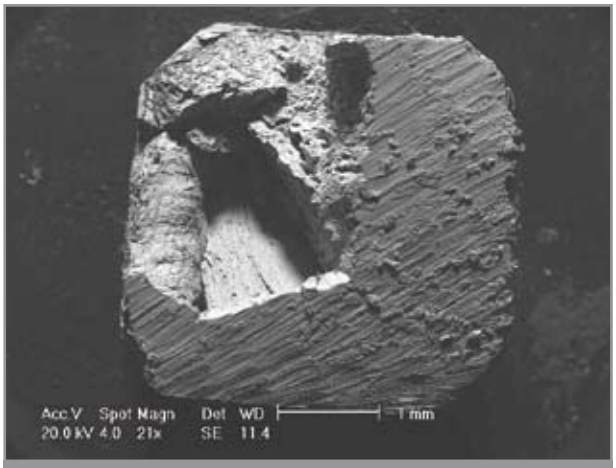
Lead inclusions which origin was not clear



Lead inclusions which origin was not clear - SEM observation



Breaking due to an inclusion of tungsten - stereoscope observation



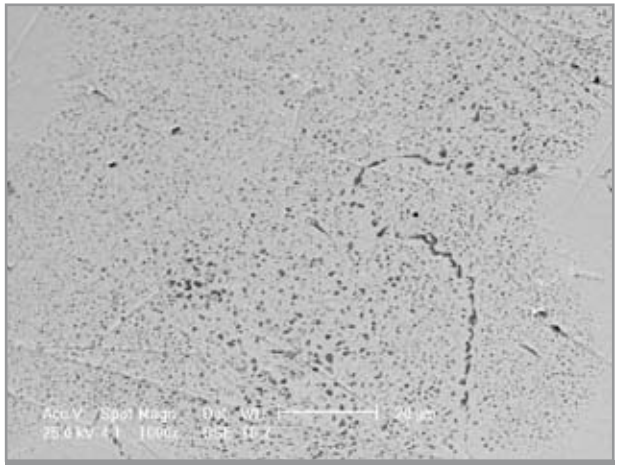
Breaking due to an inclusion of tungsten - SEM observation

FIRE STAIN IN STERLING SILVER

Fire stain on a silver item observed with the naked eye

Fire stain on a silver item observed with the naked eye

Fire stain on a silver item observed with the naked eye



Fire stain on a silver item observed at 1000x magnification

Broken ring after a too fast quenching in cold water

Broken ring after a too fast quenching in cold water

Broken ring after a too fast quenching in cold water

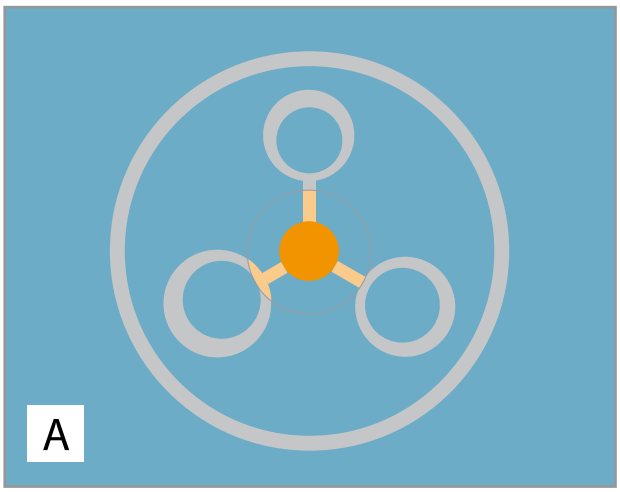
Broken ring after a too fast quenching in cold water

Silver items with different scales of tarnishing

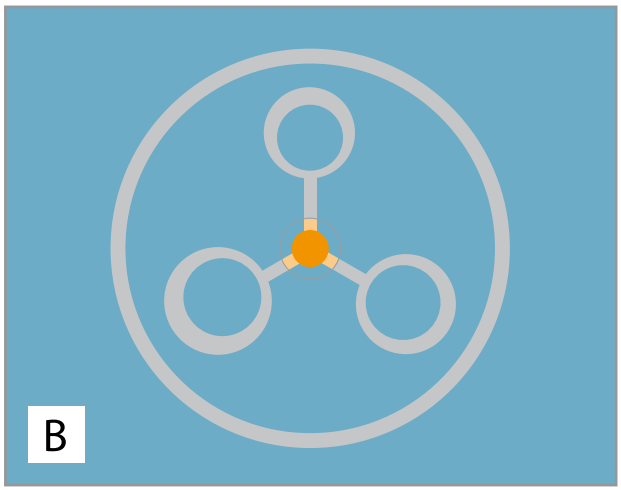
Silver items with different scales of tarnishing

Silver items with different scales of tarnishing

Silver items with different scales of tarnishing

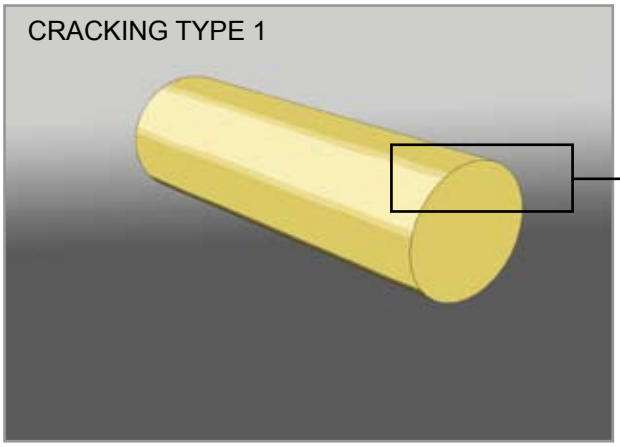


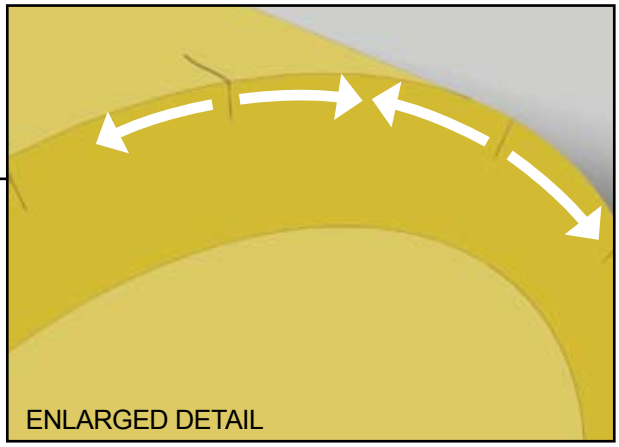
Hot Tear Crack. Crack at the junction of the feed sprue and the ring shank.

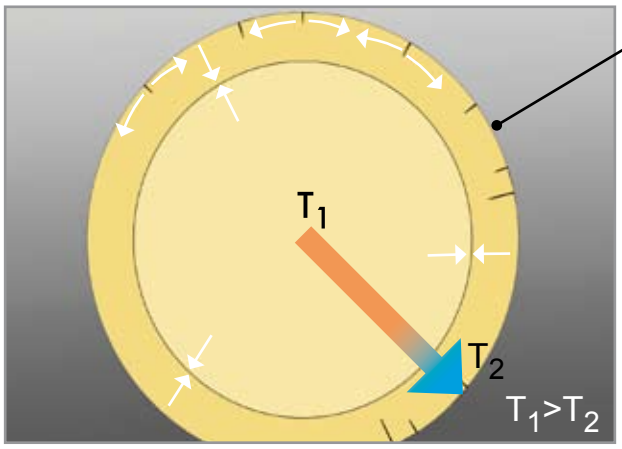


Effect of central sprue size on ring cracking by hot tearing. (a) Larger diameter. (b) Smaller diameter. Conducted heat from the large 15.8mm diameter central sprue (a) was enough to keep the feed sprue junction from cooling sufficiently to prevent a hot tear. Large finger size rings have shorter feed sprues, which bring the affected junction closer to the main sprue. Smaller rings have longer feed sprues and therefore fewer cracks.

CRACKINGS BY TENSIONS AFTER CASTINGS - TYPE1



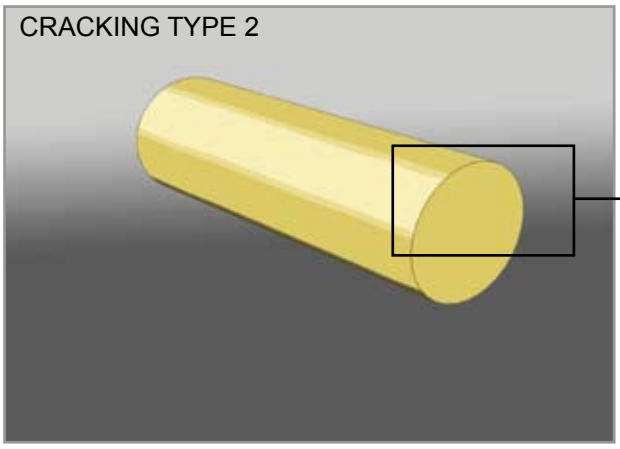


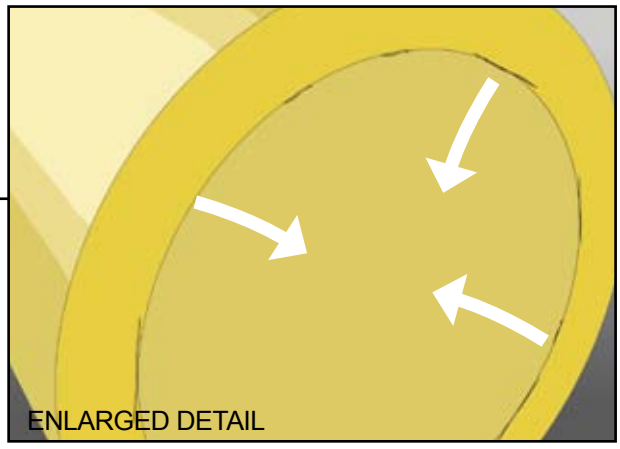


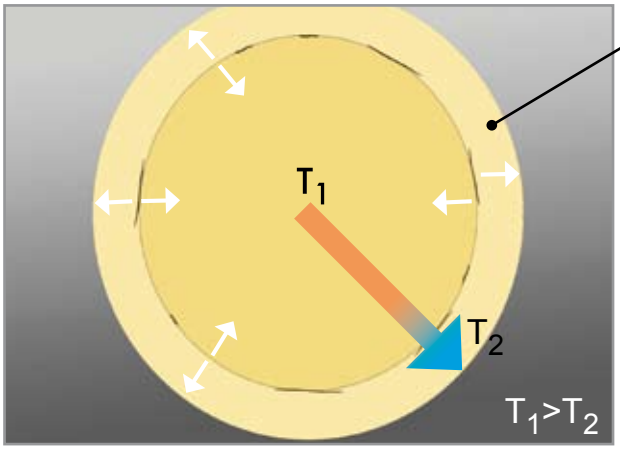
MATERIAL DURING THE CONTRACTION'S PHASE

- Typical phenomenon of wires and sheets' production.
- Aroused from different time of cooling between the outside and the inside.
- Typical in case of big sections.

CRACKINGS BY TENSIONS AFTER CASTINGS - TYPE2







MATERIAL DURING THE CONTRACTION'S PHASE

- Typical phenomenon of wires and sheets' production.
- Aroused from different time of cooling between the outside and the inside.
- Typical in case of big sections.