

STAR493



TECHNICAL DATA SHEET

Fineness	925 ‰	Density	10.32 g/cm ³
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Physical Data

Colour	Silver	Colour Coordinates	L* = 95.35 a* = -0.59 b* = 6.01
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Melting Range	Solidus: 775 °C Liquidus: 893 °C	Casting Temperature	Min: 1000°C Max: 1050°C
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Mechanical Data

Hardness	As Cast 61 HV	Hardened 123 HV
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INVESTMENT CASTING

CASTING INSTRUCTIONS

Metaltech suggests to make a premelting of the master alloy and fine gold to homogenize the alloy in the best way, before casting. In any case, if a premelting is not done, put first the master alloy in the crucible, and then the fine gold on top, reach a temperature between 1000 and 1050°C (according with the mass and the shape of the casted pieces) then pour the metal in the flask. Also the flask temperature must be set considering the mass and the shape of the pieces which have to be casted. In any case, it must be stabilized at a temperature between 450 and 700°C. After casting, quench the flask after a time

between 5 and 20', always according with the kind of pieces you are producing and, moreover, with the mass of the entire tree. So, trees with higher masses request longer quenching times. In case of castings with stones in place, increase the quenching time considering the stones resistance features. Shorter quenches ensure a reduction of the phenomenon of firestain (black stains on the surface), a typical and quite difficult to remove problem of sterling silver.

CLEANING AND PICKLING

Clean the tree from investment residuals with a water jet and, to completely remove them, put the tree in a 5 - 10% solution of hydrofluoric acid at 40 - 60°C. The use of an ultrasonic tank will increase the

removal power of the acid. After cleaning, make a pickling using a 10% solution of citric acid at 40-60°C. It is suggestible to not use solutions containing sulphur or sulphur compounds. A often renewal of the acid solution is suggested to keep its features stable.

SCRAPS REUSE

The scraps of the alloy can be reused in a percentage not higher than 50%. The quantity of scraps to reuse depends on the level of impurities contamination of them during the production cycles and on the grade of protection of the bath during casting (which reduces oxides creation and related alloy contamination). To increase the scraps reuse capability, is also very important to remove as meticulously as possible the investment residuals from sprues.

HEAT TREATMENTS

SOLUTION ANNEALING

It can be done to make the material release the possible tensions accumulated during the tree casting and cooling, and make it more resistant to bending or other processes which require high mechanical resistance. To make the solution annealing, put the pieces in oven with protected atmosphere (if available) at a temperature of 720°C for 15 - 20' and then quench immediately.

AGE HARDENING

This treatment can be done to increase the hardness of the alloy, when this characteristic is needed. To get the maximum hardening effect, it is important to carry out a solution annealing before age hardening (instructions above). To make this treatment, heat the pieces in a oven at 275°C for a time between 60 and 180'; different times will give different hardness values; please contact Metaltech to get the precise different hardness' at every different duration of heating treatment. In any case, the maximum hardness value is reachable using a time of 180', cooling the pieces very slowly inside the oven, when a oven with protected atmosphere is available. In case of excessive oxidation, the treatment can be done in a molten salts or oil bath.

MECHANICAL WORKING

HAND POURING IN MOULD

Prepare the mould, heating it until a temperature between 300 and 350°C preferably inside a furnace (if a furnace is not available, heat it by a powerful flame before pouring). Put the master alloy in the crucible first, then put the fine gold on top (if you have not made a premelting previously). Heat the metal, protecting with boric acid, until a temperature between 1000 and 1050°C. Protect the molten metal with a reducing flame or with any available inert gas (we suggest the use of argon or forming gas). Tilt the mould in the opposite direction than pouring verse, in order to avoid that the metal touches first the bottom of the mould, but making it touch the internal side before, to prevent turbulence and related defects. Pour the metal in the mould, giving to the molten metal a stable and not too fast flow in it, possibly always protecting it as did during melting. After casting, remove the casted metal and quench it immediately.

CONTINUOUS CASTING

Put the master alloy in the crucible first, then put the fine gold on top (if you have not made a premelting previously). Heat the metal, protecting it, if a furnace without atmosphere protection is used, with boric acid, until a temperature between 1000 and 1050°C, protecting the molten metal with a reducing flame or with any available inert gas (we suggest the use of argon or forming gas). To avoid an excessive crystalline grain growth, use the fastest speed possible (guaranteeing satisfactory casting quality) and during metal exit from the die, if a cooling system is not installed in the casting machine, cool it with water.

REDUCTIONS

The thickness reductions must be done not exceeding the 60% at the first step (just after casting) and not exceeding the 80-85% during subsequent steps, so after that a recrystallization annealing have been carried out. It is important to not make deformations steps lower than 50%, which are reasons of excessive crystalline grain growth.

RECRYSTALLIZATION ANNEALING

After the proper deformation steps as per above explanation, put the material in the furnace heating it at a temperature of 720°C for 15-25'.

SCRAP REUSE

The scraps of the alloy can be reused in a percentage not higher than 50%. The quantity of scraps to reuse depends on the level of impurities contamination of them during the production cycles and on the grade of protection of the bath during casting (which reduces oxides creation and related alloy contamination).

FURTHER INFORMATION

For any further information or request, please contact our local agent.