LEGOR
Extraordinary matter

MASTER ALLOY
SILNOVA

TECHNICAL SHEET

SILNOVA-01 930‰

READY-TO-USE ALL-PURPOSE 930‰ SILVER ALLOY IN DROPS

GENERAL INFORMATION

General information	
Typology	Ready to use silver
Color	Silver
Production process	All-purpose
Grain refinement level	High
Deoxidation level	Low

Commercial composition (%)	
AG	94.00
ZN	4.78
PD	1.22

Melting Temperatures	
Solidus [°C]	875.0
Liquidus [°C]	915.0
Melting range [°C]	40.0

FULL CHARACTERIZATION DATA

Color coordinates

L *	a*	b*	c*	Yellow Index
96.8	-0.3	4.2	4.2	7.6

Mechanical characteristics	
As cast hardness [HV 0.2]	50.0
Hardness after 70% area red. [HV 0.2]	140.0
Hardness after annealing [HV 0.2]	70.0
Single step age-hardening hardness [HV 0.2]	120.0
Tensile strength (Rm) [Mpa]	343.0
Yield strength (Rp0.2) [MPa]	197.0
Elongation at rupture (A) [%]	30.0

Physical characteristics	
As cast grain size [µm]	400.0
Density [g/cm³]	10.5

Product applications

Continuous casting
Ingot casting
Stone-in-place casting
Casting in closed systems
Casting in open systems
Casting without stones
CNC and lathe production
Wire production
Sheet production
Age hardening

02/02/2024

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CASTING PROCESSING PARAMETERS

Pre-melting temperature

Temperature [°C]	1035

POURING TEMPERATURES	Flask from [°C]	Flask to [°C]	Metal from [°C]	Metal to [°C]
< 0.5 mm	640	680	1040	1070
0.5 - 1.2 mm	600	640	1020	1040
> 1.2 mm	560	600	1000	1020

Trees without stones

Let the flask cool down for 3-4 minutes under inert atmosphere, then quench it in water.

Stone-in-place casting trees

Let the flask cool down for 25 minutes, then quench it in water.

Pickling

Dip in RADIAL solution (50 g/l conc. at 60°C) for 2 minutes, or in sulphuric acid (10% concentration at 50°C) for 5 minutes.

MECHANICAL WORKING PARAMETERS

Pre-melting temperature

Temperature [°C]	1035

Reductions

Wire - diameter (%)	45.0
Sheet - area or thickness (%)	70.0

POURING TEMPERATURES	Countinous from [°C]	Countinous to [°C]	Ingot from [°C]	Ingot to [°C]
Temperatures	1040	1120	1020	1060

MECHANICAL WORKING ANNEALING	Temp. from [°C]	Temp. to [°C]	Time [min]
< 1 mm	560	620	20
1 - 5 mm	560	620	25
> 5 mm	560	620	30

Mechanical working quenching

Air cool down to 550°C, then quench in 50%/50% water/alcohol solution or in water.

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AGE HARDENING PROCESSING PARAMETERS

SINGLE STEP	Temperature [°C]	Time [min]	Quenching
AGE HARDENING	500.0	45.0	In air or in furnace

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Pre-mixing

For the production of semi-finished products from continuous casting (bar, wire production, tube) where a plastic deformation, is required, it is advisable to proceed with the pre-melting of the material. For lost wax casting process, the pre-melting is not required.

Material re-usage

The maximum amount of reused metal allowed is of 50% in weight. The material should be clean, deoxidized and without inclusions. anyway advisable to not exceed 30% re-used metal.

Process temperatures

Strictly respect process temperatures indicated in the technical chart. Preferably use casting systems that provide an easy measurement of the metal temperature.

Flask temperatures and cooling times

For lost wax casting processes, do not exceed flask's temperature of 680°C. Use high-quality investment in order to decrease the reactivity between investment and alloy.

Cooling process for casting without stones: it's preferable, in order to improve the hardness of the pieces obtained in casting, to quench in water after 4 minutes from the casting, following it with a single-step heat treatment at 500°C for 45 minutes, or at 390°C for 90 minutes followed by a quench in air. The expected result of hardness after this procedure is of 115-120 HV.

Cooling process for stone-in-place casting: in the case of stone-in-place casting, where quenching times are necessarily longer (1' chamber + 25' in the air > quench in water), an increase of hardness can be obtained by heat treatment at 500°C for 45 minutes, or at 390°C for 90 minutes followed by a quench in air. The expected result of hardness after this procedure is 100 HV.

Surface porosity

An object free from porosity is less reactive towards tarnishing in comparison with a porous object, since it has no cavities that could collect dirt or atmospheric moisture and serve as trigger points for the reaction of tarnishing.

Parts assemblies

Mechanical assemblies of items constituted by the same alloy at title 930‰ are to be preferred.

Soldering

Usage of the specific solder for SILNOVA, ie the SILNOVA-MS code should be preferred. Where applicable, techniques which ensure good repeatability of the process, such as laser welding with or without external material (always consisting of the same alloy at 930‰ title) should be used.

Age-hardening

Follow the instructions given above in the section "Flask temperature and quenching time".

Finishing and cleaning

Mirror-finish, shiny surfaces are to be preferred; surface before plating should have the minimum roughness compatible with that accepted for silversmith finishing, after using polishing wheels with fine polishing pastes.

Post treatments

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Before release to the market

Surface treatments after finishing: to protect the products during storage, it is mandatory to carry out a passivation with the product T-PRO, to passivate the surface. T-PRO (see the product documentation) produces an invisible barrier on the surface of the workpiece which, although not resistant to wear stresses, allows to block the start of any kind of chemical reaction on the surface of the piece for the whole period of storage of the piece, and to coincide the beginning of the effective life time of the product with the first use of the final customer.

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