LEGOR®

MASTER ALLOY

TECHNICAL SHEET

NI1811-05 585‰

LOW NICKEL RELEASE MASTER ALLOY FOR MECHANICAL WORKING OF 585‰ (14 KT) WHITE GOLD

GENERAL INFORMATION

General information	
Color	White low nickel release
Color shade	Off-white
Production process	Mechanical working
Typology	Master alloy for gold
Melting temperatures	
Liquidus [°C]	910.0
Solidus [°C]	830.0

Commercial composition	
Copper (%)	75,00
Nickel (%)	8,00
Zinc (%)	17,00

Ni1811

FULL CHARACTERIZATION DATA

Color coordinates	
L*	88.3
a*	2.8
b*	13.2
c*	13.5
Yellow index	27.6
Physical characteristics	
Density [g/cm³]	12.7

Mechanical characteristics	
As cast hardness [HV 0.2]	130.0

Product applications
Blanking production
Ingot casting
Continuous casting
Wire production
Massive chain production
Hollow chain production
Stamping production
Cladding production
Production of tube from continuous casting
Sheet production
TIG tube production
CNC and lathe production

RELATED PRODUCTS LIST

Related Products	
CUT10X2	Copper tube, 10.0 mm diameter, 2.0 mm wall thickness, 2500 mm length, cold worked
L1A	Powder for soldering of gold and silver chains
LSG409	Master alloy for soldering of 585‰ (14 Kt) yellow gold
LSG409D	Master alloy for soldering of 585‰ (14 Kt) yellow gold
LSG419	Master alloy for soldering of 375‰ (9Kt) yellow gold
TOMBACP	Tombac plate, 10.0 mm thickness, 100.0 mm width
Alternative Products	
NI1811-RHC	Low nickel release all-purpose master alloy for 585-750‰ (14-18 Kt) white gold

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MECHANICAL WORKING PARAMETERS

Pre-mixing temperature [°C]	1030.0

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

POURING TEMPERATURES	**Countinous from [°C]**	**Countinous to [°C]**	**Ingot from [°C]**	**Ingot to [°C]**
Temperatures	1010.0	1090.0	990.0	1010.0

MECHANICAL WORKING ANNEALING	**Temp. from [°C]**	**Temp. to [°C]**	**Time [min]**
<1 mm	660.0	700.0	30.0
1 - 5 mm	660.0	700.0	35.0
>5 mm	660.0	700.0	40.0

Mechanical working quenching

Let cool in air down to 550°C, then quench in a 50% water/50% alcohol solution or in water

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PRODUCT TECHNICAL GUIDELINES

Preliminary checks

A preliminary check on the process and on the kind of items to be produced has to be done, in order to identify possible critical steps. Some kinds of production processes or of finishing are incompatible with nickel release reduction: they have to be eliminated or at least limited and measured,
even when using a low nickel release alloy. In order to minimize nickel release, it is important to obtain objects as much as possible without porosity, shiny, with homogeneous microstructure and with the minimum amount of soldered joints.

Pre-mixing

It is advised to pre-mix materials, by granulation or by casting of a semi finished item (bar, wire). This in order to optimize title and homogenization of the elements in the alloy.

Material re-usage

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

Processing temperatures

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

Flasks temperatures and quenching time

For casting processes do not exceed 700°C for the investment flask. Use high quality investment in order to reduce reactivity between metal and flask.
For casting without stones, quench within 20 minutes after pouring. For casting with stones quench within 45 minutes after pouring.

Microstructure of the item

The item before finishing, or at least the composing items before soldering should be thermally homogenized (760°C x 40' followed by quenching) or annealed (680°C x 30').
Thermal treatments must be done in furnace providing temperature control and protective atmosphere.

Surface porosity

An item without porosity generates on average a lower nickel release than a porous object.

Parts assemblies

Mechanical assemblies of items constituted by the same alloy at 750‰ title are to be preferred. Items of other compositions are allowed for assembly (mechanical or by soldering), provided that they are nickel-free.

Soldering

Soldering techniques that give a good process control are to be preferred:
a. Furnace soldering (with or without soldering pastes)
b. Laser soldering with or without external material (same composition of the alloy at 750‰ title).
Note: although not forbidden, torch soldering is not advised.

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Finishing and cleaning

Only mirror-finish, shiny surfaces are allowed; surface before plating should have the minimum roughness compatible with that accepted for goldsmithry finishing, after using polishing wheels with fine polishing pastes.

Post assemblies

Legor Group policy is that for post assemblies and parts in contact with pierced skin, nickel based alloys should be avoided; this because skin elicitation to nickel ions can occur even for release values that are compliant to the standards.

Plating processes

An item with low nickel release, on which a plating layer at guaranteed thickness is deposited, allows to pass the accelerated wear test prescribed by the UNI EN 12472:2009 standard.
Below, two preferred alternative methods to obtain wear resistant plating layers are described:

a. Thick Palladium + thick Rhodium (Pd 0,5 µm + Rh 0,20 µm)
b. Thick Rhodium (Rh >0,25 µm)

Using these plating layers, Legor Group tests have shown reduction on nickel release values of approximately 5 times in comparison with the same item without plating.
Preferred plating products:
RH2M (Ready to use Rhodium plating solution for thick deposits)
PDXW or PDFE (Palladium for bath larger than 40 liters)
PD3-ECO or PD4-FE (Palladium for bath smaller than 40 liters)

Final results assessement

Nickel release depends on very wide range of factors: it is necessary to obtain statistics that are based on one's specific objects, making frequent release tests, if necessary on several models.
This approach is valid also for low nickel release compositions; when starting to use these alloys, they should be frequently tested for nickel release.
Nickel release test is as a matter of fact mandatory, because it is needed to obtain a statistical database on the items of a customer. This is the best way to monitor the correct functioning of the final product.

Conclusive notes

The jewelry manufacturing company is the only and sole responsible in front of the end user for what concerns the compliance of UNI EN 1811:2015 standard on a jewelry item.

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