CUPPER-NICKEL

This material, known as "**Alpaca**" or "**German Silver**," is a well-known ternary alloy with a bluish-white color almost identical to silver, but with greater hardness and lower ductility. It is composed of varying amounts of Copper, Zinc, with additions of Tin to increase density and soundness, Lead to improve machinability, and other elements in smaller amounts, such as Iron and Manganese, which must be strictly controlled because, although they increase whiteness, they also raise the tendency to brittleness.

The properties of this group of alloys, such as color, ductility, fusibility, corrosion resistance, mechanical strength, etc., vary with the proportions of the different metals involved in its composition. The quality of the alpaca is considered higher the more nickel it contains in its composition.

ALLOY: VN - 973 = UNS C97300

Ductile alloy that can be worked by stamping, forging, and machining. It generally does not rust and can be used in very cold and very hot environments. Recommended for processing dairy, oilseeds, beverages, and other emulsified foods; for which Lead is eliminated, Tin is increased, and the chemical balance is completed with the other elements.

Chemical Composition:

%Cu	%Sn	%Pb	%Zn	% Fe	%Ni	%Mn
53 - 58	1,5 - 3	8 - 11	17 - 25	1,5 máx.	11 - 14	0,5 max

Mechanical and Physical Properties:

- **Tensile Strength,** *Kg/mm²*..... 21,1 - 24,6
- **Yield Strength,** *Kg/mm²*..... 10,5 - 11,9
- **Elongation,** *%*..... 20 - 8
- **Hardness,** *HB (10 mm / 500 Kg)*..... 56 - 60
- **Thermal Conductivity,** *W / m °C (20 °C)*..... 16,5
- **Coefficient of thermal Expansion,** *10^{-6} / °C (20 - 300 °C)*..... 46,9
- **Electrical Conductivity,** *% IACS (20 °C)*..... 18,5
- **Operating Temperature,** *°C*..... -233 - 260
- **Operating Load or Pressure,** *Kg/mm²*..... -

Technical manufacturing standards:

- Chemical Composition and Mechanical Properties: UNS C97300
- Centrifugal Casting : ASTM B271 / 271M
- Sand Mold Casting : ASTM B763 / B763M
- Continuous Casting : ASTM B505 / 505M

Main Uses and Application:

Condensers, pasteurizers, evaporators, and accessories for the dairy and food processing industry ● Distillers, washers, bottle fillers, and components in beverage production ● Valves and accessories that must resist corrosive media in the chemical industries ● Racks, rheostats, surgical and dental instruments.

✱ ***Referential Specifications for Chemical Composition, Mechanical, and Physical Properties based on the Unified Numbering System (UNS-C) of the Copper Development Association (CDA) for cast and forged copper alloys; subject to written confirmation by VULCANO METALS***

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