LucasMilhaupt®
A Handy & Harman Company
Global Brazing Solutions®

Technical Data Sheet

SILVALOY® 505
(BRAZE™ 505, SILVALOY® A50N)

NOMINAL COMPOSITION

Silver	50.0% ± 1.0%
Copper	20.0% ± 1.0%
Zinc	28.0% ± 2.0%
Nickel	2.0% ± 0.5%
Other Elements (Total)	0.15% Max

PHYSICAL PROPERTIES

Color	Yellow White
Melting Point (Solidus)	1220°F (660°C)
Flow Point (Liquidus)	1305°F (705°C)
Brazing Temperature Range	1305°F - 1550°F (705°C - 843°C)
Specific Gravity	8.97
Density (Troy oz/in^3)	4.73
Electrical Conductivity (%IACS) (1)	15.0
Electrical Resistivity (Microhm-cm)	11.9

(1) IACS = International Annealed Copper Standard

PRODUCT USES

Silvaloy 505 readily wets nickel and iron base alloys. It is recommended for joining 300 Series stainless steel and will retard interface corrosion in most exposures for which the base metals are suitable. However, for joints on cupro-nickel exposed to salt water at elevated temperatures, zinc-free alloys such as Silvaloy 559, 603, or 630 should be used to avoid joint failure by dezincification. Because this alloy is cadmium-free, it can be safely used on food handling equipment and hospital utensils. The presence of nickel in Silvaloy 505 aids in the joining of small tungsten carbide inserts in cutting tools. In addition, it offsets joint interface brittleness caused by diffusion of aluminum into the brazing alloy, when joining aluminum-bronze to steel.

BRAZING CHARACTERISTICS

Silvaloy 505 is very fluid at its flow point and will quickly fill long, narrow joints. Because it has the tendency to liquate (i.e., separate into low and high melting constituents) when heated slowly, this alloy should be heated quickly through its melting range. Its low flow point will minimize oxidation of the stainless steel during brazing. Handy Flux® is normally used with Silvaloy 505, but Handy Flux® Type B-1 may be used where slightly better fluxing action is needed.

PROPERTIES OF BRAZED JOINTS

The properties of a brazed joint are dependent upon numerous factors including base metal properties, joint design, metallurgical interaction between the base metal and the filler metal.

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PROPERTIES OF BRAZED JOINTS

Butt joints have been brazed and tested for tensile strength at room temperature, on the listed metals, with the following typical results:

	Tensile Strength (lbs/in^2)	Elongation (% in 2 in.)
Copper	25,000 - 30,000	13.0 - 22.0
Brass	45,000 - 50,000	20.0 - 36.0
Nickel-Silver	45,000 - 55,000	14.0 - 28.0
Cold-Rolled Steel	70,000 - 75,000	20.0 - 25.0

CORROSION RESISTANCE

Silvaloy 505 showed the same order of resistance to interface corrosion as Easy-Flo® 3 when 304 stainless steel joints were exposed to running tap water for 17 days. For the same period in parallel tests with 430 stainless, Silvaloy 505 showed appreciable interface corrosion whereas Easy-Flo 3 showed only incipient corrosion at the feather edges of the fillet.

When stainless steels are brazed with flux, it appears that chromium is selectively removed from the surface by oxidation and subsequent solution of the chromic oxide in the molten flux. This leaves a thin layer of chromium-free iron, which is attacked by aerated water particularly when chlorides are present. However, some of the small amount of nickel contained in Silvaloy 505 apparently concentrates at the braze interface increasing the resistance to corrosion of the vulnerable area, and for most applications of 300 Series steels this suffices. For the 400 Series, the corrosion is retarded but not stopped by the Silvaloy 505.

AVAILABLE FORMS

Wire, strip, engineered preforms, specialty preforms per customer specification, powder and paste.

SPECIFICATIONS

Silvaloy 505 alloy conforms to the following specifications:

- American Welding Society (AWS) A5.8/A5.8M BAg-24
- ASME Boiler & Pressure Vessel Code, Sec II-C, SFA-5.8 BAg-24
- Society of Automotive Engineers (SAE) / AMS 4788
- International Organization for Standardization (ISO) 17672 Ag 450

APPLICABLE PRODUCT CODE(S)

The applicable Lucas-Milhaupt product code(s) for this technical data sheet: A00000039, Legacy Codes: 32-505, 17095.

Distribution P/N: 98070, 98071, 98072, 98050, 98051, 98052, 98053.

SAFETY INFORMATION

The operation and maintenance of brazing equipment or facility should conform to the provisions of American National Standard (ANSI) Z49.1, "Safety in Welding and Cutting". For more complete information refer to the Material Safety Data Sheet for Silvaloy 505.

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