LucasMilhaupt®
A Handy & Harman Company
Global Brazing Solutions®

Technical Data Sheet

HANDY ONE® SILVALOY 300
(HANDY ONE® BRAZE™ 300)

This proprietary family of brazing & soldering products eliminates the need for a separate fluxing operation, which can result in a significant increase in productivity while minimizing flux exposure to your personnel and plant equipment.

GENERAL DESCRIPTION

Handy One is a trademark for a family of flux-cored brazing materials that offers numerous advantages compared to traditional metal joining methods. It consists of a filler metal in strip form that is rolled around a powdered flux. Formulations currently exist for silver (and aluminum based) brazing filler metals and it is available on spools, coils or rods for wire feed applications and as preformed rings and shapes for automated production lines.

Some of the primary advantages of Handy One cored wire include:

- It simplifies the brazing process by eliminating the manual fluxing operation; this also reduces flux exposure to your brazing personnel.
- Joint quality and throughput can be improved due to the consistent application of flux and filler metal.
- Reduces heating time and secondary post braze operations, increasing productivity and throughput
- Improved strength due to a reduction in flux inclusions at the joint interface
- Reduces the flux in your wastewater effluent by as much as 75%
- Multiple formulations exist for a variety of base metals, joint designs and heating methods.

These materials will join ferrous and non-ferrous metals including steel, stainless steel, copper, brass and bronze.

NOMINAL COMPOSITION

Silver	30.0% ± 1.0%
Copper	38.0% ± 1.0%
Zinc	32.0% ± 1.0%
Other Elements (Total)	0.15% Max

PHYSICAL PROPERTIES

Color	Light Yellow
Melting Point (Solidus)	1250°F (675°C)
Flow Point (Liquidus)	1410°F (765°C)
Brazing Temperature Range	1410°F - 1600°F (765°C - 871°C)
Specific Gravity	8.84
Density (Troy oz/in^3)	4.66
Electrical Conductivity (%IACS) [(1)]	24.4
Electrical Resistivity (Microhm-cm)	6.85

[(1)] IACS = International Annealed Copper Standard

Lucas-Milhaupt, Inc. • 5656 S. Pennsylvania Ave • Cudahy, WI 53110 • Phone: 414.769.6000 • Fax: 414.769.1093 • www.lucasmilhaupt.com

LucasMilhaupt®
A Handy & Harman Company
Global Brazing Solutions®

Technical Data Sheet

PRODUCT USES

Silvaloy 300 is a general purpose, intermediate temperature brazing alloy for use on copper, brass, nickel-silver, bronze, steel and other nonferrous alloys melting above 1450°F (765°C). Uses include the brazing of nickel-silver hollow knife handles and electrical equipment. It is particularly adaptable to metal bath dip brazing of fine wires for radio, small transformer and electronics assemblies because its flow point matches the fluid temperature of borax. Borax is used as a metal bath flux cover because it is less corrosive to ceramic pot linings than Handy Flux®. Silvaloy 300 exhibits better stability than lower melting alloys when used for metal bath dip brazing.

BRAZING CHARACTERISTICS

Silvaloy 300 is an intermediate temperature silver brazing alloy with a fairly long (160°F/70°C) melting range. This long melting range is helpful when wide gap joints are brazed and is useful in producing large joint fillets to reduce the notch effect on stressed assemblies. Where the higher brazing temperature and characteristics of this alloy are permissible, the lower silver content affords a saving.

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. In tests at room temperature, torch brazed "wiped" butt joints yielded the following average results:

	Tensile Strength (lbs/in^2)	Elongation (% in 2 in.)
Copper	30,000 - 35,000	15.0 - 25.0
Brass	35,000 - 45,000	16.0 - 31.0
Nickel-Silver	35,000 - 40,000	7.00 - 17.0

CORROSION RESISTANCE

Silvaloy 300 is not considered as corrosion resistant as the higher silver content braze filler metals, but the following results were obtained from corrosion tests on this filler metal:

Solution	Test Temp.	Conditions	Loss in Weight $Mgs/dcm^2/Day$
5% Sulphuric Acid	Room	Constant Immersion	15.57
5% Sulphuric Acid	160°F (70°C)	Constant Immersion	1115.5
10% Sulphuric Acid	Room	Constant Immersion	15.7
10% Sulphuric Acid	160°F (70°C)	Constant Immersion	207.6
20% Sulphuric Acid	Room	Constant Immersion	13.9
20% Sulphuric Acid	160°F (70°C)	Constant Immersion	181.1

In addition to the tests above, brazed joints of copper, brass and nickel-silver were subjected to corrosion tests. At the conclusion of these tests, the brazed joints showed less corrosion than the base metal and the brazing alloy stood up in relief where the base metal had dissolved faster than the joint.

Lucas-Milhaupt, Inc. • 5656 S. Pennsylvania Ave • Cudahy, WI 53110 • Phone: 414.769.6000 • Fax: 414.769.1093 • www.lucasmilhaupt.com

PROPERTIES OF BRAZED JOINTS

Lucas-Milhaupt, Inc has several different fluxes available depending upon the material form (wire or preformed shape) as well as base metals and heating methods utilized.

- **Restrictive Flux** – protects the parts being joined, yet restricts the flow of the filler metal, enabling the building of fillets and minimizing post braze secondary operations. This flux is recommended for most hand feed or wire feed applications. Flux content is typically 12% (±3%) of the total volume.

- **Free Flowing Flux** – This very fluid flux provides excellent protection of your parts and facilitates filler metal flow. Recommended for preformed ring applications, it is typically 18% (±3%) of the total volume.

- **Heat Resistant Flux** – Boron modified flux for large mass assemblies or long heating cycles. It is also typically 18% (± 3%) of the total volume and also recommended for preformed ring applications.

Please Note: Flux percentages may vary depending upon material size and finished form, please contact Lucas-Milhaupt's Technical Services Department for specific product and process parameters.

AVAILABLE FORMS

Wire, rod, engineered preforms, specialty preforms per customer specification.

SPECIFICATIONS

Silvaloy 300 alloy conforms to the following specifications:

- American Welding Society (AWS) A5.8/A5.8M BAg-20
- ASME Boiler & Pressure Vessel Code, Sec II-C, SFA-5.8 BAg-20

APPLICABLE PRODUCT CODE(S)

The applicable Lucas-Milhaupt product code(s) for this technical data sheet: 30-300; 30-301; 30-302; 30-304; 30-305

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 Handy One Silvaloy 300.

Lucas-Milhaupt, Inc. • 5656 S. Pennsylvania Ave • Cudahy, WI 53110 • Phone: 414.769.6000 • Fax: 414.769.1093 • www.lucasmilhaupt.com

WARRANTY CLAUSE

Lucas-Milhaupt, Inc. believes the information contained herein to be reliable. However, the information is given by Lucas-Milhaupt, Inc. without charge and the user shall use such information at its own discretion and risk. This information is provided on an "AS IS" AND "AS AVAILABLE" basis and Lucas-Milhaupt, Inc. specifically disclaims warranties of any kind, either express or implied, including, but not limited to, warranties of title or implied warranties of merchantability or fitness for a particular purpose. No oral advice or written or electronically delivered information given by Lucas-Milhaupt, Inc. or any of its officers, directors, employees, or agents shall create any warranty. Lucas-Milhaupt, Inc. assumes no responsibility for results obtained or damages incurred from the use of such information in whole or in part.

Lucas-Milhaupt, Inc. • 5656 S. Pennsylvania Ave • Cudahy, WI 53110 • Phone: 414.769.6000 • Fax: 414.769.1093 • www.lucasmilhaupt.com