

## **SILVALOY<sup>®</sup> 541** **(BRAZE<sup>™</sup> 541. SILVALOY<sup>®</sup> A54N)**

### ***NOMINAL COMPOSITION***

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Silver	54.0% ± 1.0%
Copper	40.0% ± 1.0%
Zinc	5.0% ± 1.0%
Nickel	1.0% ± 0.5%
Other Elements (Total)	0.15% Max

### ***PHYSICAL PROPERTIES***

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Color	White
Melting Point (Solidus)	1340°F (725°C)
Flow Point (Liquidus)	1575°F (855°C)
Brazing Temperature Range	1575°F - 1775°F (855°C - 968°C)
Specific Gravity	9.59
Density (Troy oz/in <sup>3</sup> )	5.05
Electrical Conductivity (% IACS) <sup>(1)</sup>	49.8
Electrical Resistivity (Microhm-cm)	3.46

<sup>(1)</sup> IACS = International Annealed Copper Standard

### ***PRODUCT USES***

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Silvaloy 541 is employed in numerous furnace brazing situations because of its low zinc content. The U.S. Air Force specifies it for many jet engine sub-assemblies. It is used for making joints that are subjected to elevated temperatures, ranging up to 700°F (370°C), particularly on stainless steel.

### ***BRAZING CHARACTERISTICS***

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Silvaloy 541 is an intermediate temperature silver brazing alloy with a rather long, 235°F (130°C) melting range. It has a tendency to liquate (i.e. separate into low and high melting constituents) if heated slowly through its melting range. Therefore, it is preferable to use this alloy where the assembly can be heated rapidly to brazing temperature. The long melting range of this alloy is useful when wide gap joints are hand fed since semi-fluid alloys can be worked across the gaps. Handy<sup>®</sup> Flux Type B-1 is recommended for use with this alloy due to the relatively high flow point.

### ***PROPERTIES OF BRAZED JOINTS***

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Stainless steel butt joints furnace brazed (in atmosphere) with Silvaloy 541 develop room temperature tensile strengths of 50,000 - 60,000 PSI with commercial joint clearances. Optimum joint clearances will produce higher tensile values.

## ***PROPERTIES OF BRAZED JOINTS (CONT)***

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Short time shear tests on 18-8 stainless steel gave the following results:

Tensile Strength (lbs/in <sup>2</sup> )	Test Temp.
21,500	500°F (260°C)
15,000	750°F (400°C)
7,000	1000°F (540°C)

Rupture tests at 500°F (260°C) indicate that sound joints will stand a shear stress of 14,000 PSI for a period of about 650 hours. In the temperature range of 500°F (260°C) to 600°F (315°C) comparative tests suggest Silvaloy 541 is superior to Silvaloy 852 (85 Ag/15 Mn). Tensile values of non-ferrous alloy butt joints will approximate very closely the following results obtained with other high silver-copper content brazing alloys:

	Tensile Strength (lbs/in <sup>2</sup> )	Elongation (% in 2 in.)
Copper	30,000 - 35,000	10.0 - 19.0
Brass	35,000 - 50,000	13.0 - 25.0
Nickel-Silver	35,000 - 40,000	2.00 - 3.00

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

	Tensile Strength (lbs/in <sup>2</sup> )	Elongation (% in 2 in.)
Cold-Rolled Steel	60,000 - 75,000	5.00 - 30.0

## ***AVAILABLE FORMS***

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

## ***SPECIFICATIONS***

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Silvaloy 541 alloy conforms to the following specifications:

- American Welding Society (AWS) A5.8/A5.8M BAg-13
- ASME Boiler & Pressure Vessel Code, Sec II-C, SFA-5.8 BAg-13
- Society of Automotive Engineers (SAE) / AMS 4772
- International Organization for Standardization (ISO) 17672 Ag 454

## ***APPLICABLE PRODUCT CODE(S)***

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The applicable Lucas-Milhaupt product code(s) for this technical data sheet: A00000021, Legacy Codes: 32-541, 6544.

## ***SAFETY INFORMATION***

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The operation and maintenance of brazing equipment or facility should conform to the provisions of

# Technical Data Sheet

American National Standard (ANSI) Z49.1, "Safety in Welding and Cutting". For more complete information refer to the Material Safety Data Sheet for Silvaloy 541.

## ***WARRANTY CLAUSE***

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