

# STELLITE® 1 ALLOY

## TECHNICAL DATA

TIG WELD DEPOSITION

MMA WELD DEPOSITION

MIG WELD DEPOSITION

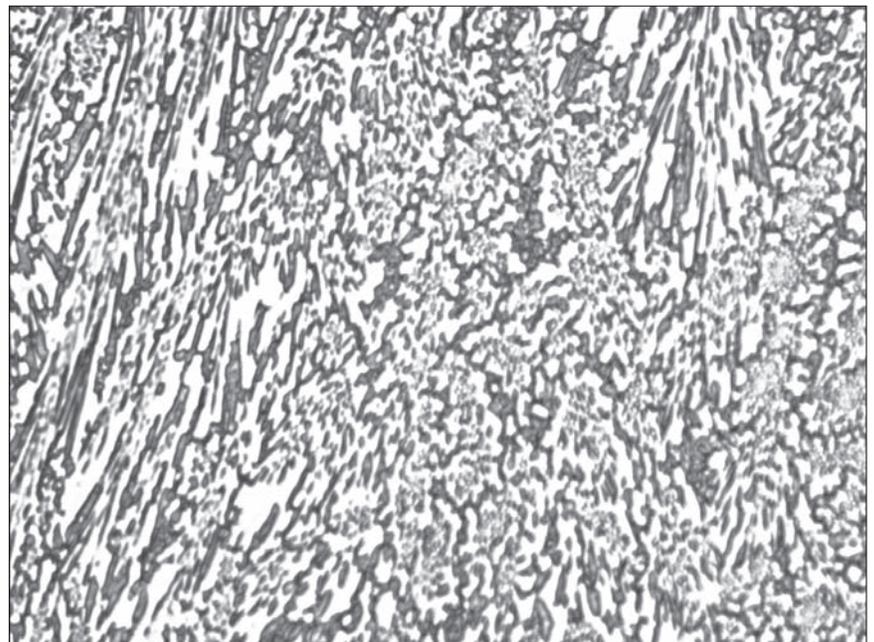
PTA & LASER WELD DEPOSITION

### Nominal Composition (mass %) and Physical Properties

Co	Cr	W	C	Others	Hardness	Density	Melting Range
Base	28 - 32	11-13	2.0-3.0	Ni, Fe, Si, Mn, Mo	50-58 HRC 550-720 HV	8.69 g/cm <sup>3</sup> 0.314 lb/in <sup>3</sup>	2175-2450 °F 1190-1345 °C

**Stellite® 1** is a hardfacing alloy possessing excellent abrasion and corrosion resistance for applications such as pump sleeves, rotary seal rings, wear pads, expeller screws and bearing sleeves. It retains its hardness at temperatures in excess of 760°C (1400°F).

**Stellite® 1** contains a high proportion of hard, wear resistant primary carbides. These render the alloy well suited to applications involving extreme low-angle erosion and severe abrasion, with some sacrifice in toughness. Compared to other **Stellite®** alloys it is more crack-sensitive, and care should be taken to minimize the cooling stresses experienced during casting and hardfacing processes. Due to its high hardness and wear resistance, **Stellite® 1** should only be finished by grinding.



Optical micrograph of a Stellite @ 1 weld overlay

### Corrosion Resistance

**Stellite® 1** has good general corrosion resistance. The typical electrode potential in sea water at room temperature is approx. -0.4 V (SCE). **Stellite® 1** corrodes primarily by a pitting mechanism and not by general mass loss in seawater and chloride solutions. More detailed information regarding corrosion resistance can be provided on request.

### Nominal Thermal Expansion Coefficient (from 20°C/68°F to stated temperature)

	100°C (212°F)	200°C (392°F)	300°C (572°F)	400°C (752°F)	500°C (932°F)	600°C (1112°F)	700°C (1292°F)	800°C (1472°F)	900°C (1652°F)
µm/m.K	10.5	11.3	11.8	12.1	12.5	12.8	13.5	13.9	14.4
µ-inch/inch.°F	5.8	6.3	6.5	6.7	6.9	7.1	7.5	7.7	8.0

### Nominal Tensile Properties at Room Temperature

	Ultimate Tensile Strength Rm		Yield Stress Rp(0.2%)		Elongation	Elastic Modulus	
	ksi	MPa	ksi	MPa	A(%)	psi	GPa
Castings	79	550	-	-	<1	36.0x10 <sup>6</sup>	248
Stellite® HS-1 (*)	173	1195	152	1050	<1	33.4x10 <sup>6</sup>	230

(\*) "HS" = HIP-consolidated from the powder form.

### Nominal Hot Hardness (DPH) as-cast

20°C (68°F)	100°C (212°F)	200°C (392°F)	300°C (572°F)	400°C (752°F)	500°C (932°F)	600°C (1112°F)	700°C (1292°F)	800°C (1472°F)	900°C (1652°F)
606	573	540	508	485	453	406	330	217	140

### Thermal and Electrical Properties

	Approximate value at Room Temperature	
Thermal conductivity	14.5 W/m.K	100.5 Btu-in/hr/ft <sup>2</sup> /°F
Electrical resistivity	94.0 µ-ohm.cm	37.0 µ-ohm.inch

### Product Forms and Cross Reference Specifications

Stellite® 1 is available as welding wire, rod, powder, and electrodes, finished castings and HIP consolidated blanks or parts. Deloro Stellite also offers hardfacing services.

Stellite® 1 can be supplied to the following specifications:

SPECIFICATION	PRODUCT FORM	SPECIFICATION	PRODUCT FORM
UNS R30001	Stellite® 1 Rod, castings, powder for PTA or laser processing	AWS A5.21 / ASME BPVC IIC SFA 5.21 ERCoCr-C	Stellite® 1 Rod
UNS R30001	Stellite® HS-1 (HIP-consolidated from powder)	AWS A5.21 / ASME BPVC IIC SFA 5.21 ERCCoCr-C	Stellite® 1 Wire
UNS W73031	Stellite® 1 Wire	AWS A5.13 / ASME BPVC IIC SFA 5.13 ECoCr-C	Stellite® 1 Electrode

Stellite is a registered Trade Name of Deloro Stellite.

Deloro Stellite manufactures sophisticated alloys in the form of castings, powders, coatings, consumables, and machined parts that resist wear, corrosion, and abrasion. Information provided in this document is intended only for general guidance about Deloro Stellite products and is the best information in our possession at the time. Product users may request information about their individual use of our products, but Deloro Stellite does not warrant or guarantee this information in any way. Selection and purchase of Deloro Stellite products is the sole responsibility of the product user based on the suitability of each use. Individual applications must be fully evaluated by the user, including compliance with applicable laws, regulations, and non-infringement. Deloro Stellite cannot know or anticipate the many variables that affect individual product use and individual performance results may vary. For these reasons, Deloro Stellite does not warrant or guarantee advice or information in this document, assumes no liability regarding the same, and expressly disclaims any warranty of any kind, including any warranty of fitness for a particular purpose, regarding the same.



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