

STELLITE™

STELLITE™ 1 ALLOY

TECHNICAL DATA

TIG WELD DEPOSITION | MMA WELD DEPOSITION | MIG WELD DEPOSITION | PTA & LASER WELD DEPOSITION

NOMINAL COMPOSITION (MASS %) AND PHYSICAL PROPERTIES

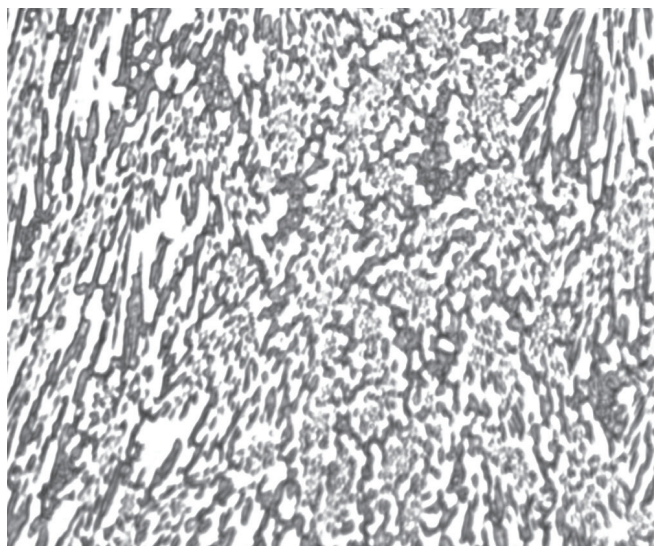
Co	Cr	W	C	Others	Hardness	Density	Melting Range
Base	28-32	11-13	2.0-3.0	Ni, Fe, Si, Mn, Mo	50-58 HRC 550-720 HV	8.69 g/cm ³ 0.314 lb/in ³	2175-2450 °F 1190-1345 °C

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.

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.



Optical micrograph of a Stellite™ 1 weld overlay



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		psi	GPa
Castings	79	550	-	-	<1	36.0x10 ⁶	248
Stellite™ HS-1 (*)	173	1195	152	1050	<1	33.4x10 ⁶	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 ² /°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 blands or parts. Kennametal Stellite™ also offers hardfacing services.

Stellite™ 1 can be supplied to the following specifications:

SPECIFICATION	PRODUCT FORM
UNS R30001	Stellite™ 1 Rod, castings, powder for PTA or laser processing
UNS R30001	Stellite™ HS-1 (HIP-consolidated from powder)
UNS W73031	Stellite™ 1 Wire
UNS W73001	Stellite™ 1 Electrode

SPECIFICATION	PRODUCT FORM
AWS A5.21 / ASME BPVC IIC SFA 5.21 ERCoCr-C	Stellite™ 1 Rod
AWS A5.21 / ASME BPVC IIC SFA 5.21 ERCCoCr-C	Stellite™ 1 Wire
AWS A5.13 / ASME BPVC IIC SFA 5.13 ECoCr-C	Stellite™ 1 Electrode

Kennametal 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 Kennametal 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 Kennametal Stellite™ does not warrant or guarantee this information in any way. Selection and purchase of Kennametal 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. Kennametal Stellite™ cannot know or anticipate the many variables that affect individual product use and individual performance results may vary. For these reasons, Kennametal 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.

EUROPEAN SALES OFFICES

Kennametal Stellite Unit 3, Birch Kembrey Business Park Swindon SN2 8UU UK Phone: 44.1793.498500 Fax: 44.1793.498501	Kennametal Stellite Zur Bergpflege 51 – 53 56070 Koblenz Germany Phone: 49.261.80.88.0 Fax: 49.261.80.88.35	Kennametal Stellite Via G. Di Vittorio, 24 20090 Pieve Emanuele Milan Italy Phone: 39.02.907871 Fax: 39.02.90787 231
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E-mail: europesales.stellite@kennametal.com

AMERICAS SALES OFFICE

Kennametal Stellite
1201 Eisenhower Drive N
Goshen, Indiana 46526
USA
Phone: 1.574.534.2585
Fax: 1.574.534.3417

E-mail: americasales.stellite@kennametal.com



www.kennametal.com/stellite