

STELLITE 6

STELLITE™ 6 ALLOY

TECHNICAL DATA

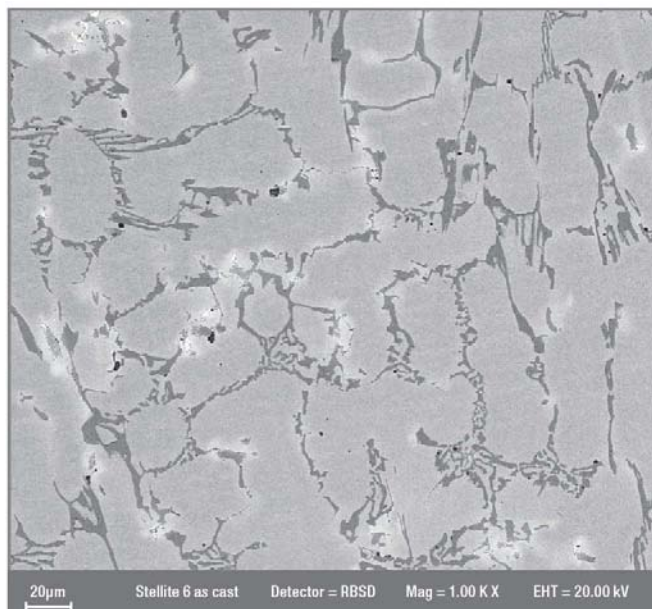
TIG WELD DEPOSITION | MMA WELD DEPOSITION | MIG WELD DEPOSITION | PTA & LASER WELD DEPOSITION | CASTINGS & POWDER METALLURGY | ADDITIVE MANUFACTURING

NOMINAL COMPOSITION (MASS %) AND PHYSICAL PROPERTIES

Co	Cr	W	C	Others	Hardness	Density	Melting Range
Base	27-32	3-6	0.9-1.4	Ni, Fe, Si, Mn, Mo	36-45 HRC 380-490 HV	8.44 g/cm ³ 0.305 lb/in ³	1250-1360°C 2282-2480°F

STELLITE COBALT-BASED ALLOYS consist of complex carbides in an alloy matrix. They are resistant to wear, galling, and corrosion and retain these properties at high temperatures. Their exceptional wear resistance is due mainly to the unique inherent characteristics of the hard carbide phase dispersed in a CoCr alloy matrix.

STELLITE 6 is the most widely used of the wear-resistant cobalt-based alloys and exhibits good all-round performance. It is regarded as the industry standard for general-purpose wear-resistance applications, has excellent resistance to many forms of mechanical and chemical degradation over a wide temperature range, and retains a reasonable level of hardness up to 500°C (930°F). It also has good resistance to impact and cavitation erosion. **STELLITE 6** is ideally suited to a variety of hardfacing processes and can be turned with carbide tooling. Examples include valve seats and gates, pump shafts and bearings, erosion shields, and rolling couples. It is often used self-mated.



Scanning Electron Micrograph of Cast Stellite 6 at 1000X Magnification.

CORROSION RESISTANCE

The typical electrode potential in sea water at room temperature is -0.25V (SCE). Like stainless steels, **STELLITE 6** corrodes primarily by a pitting mechanism and not by general mass loss in seawater and chloride solutions. Its mass loss in sea water is below 0.05mm per year at 22°C. More 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)	1000°C (1832°F)
μm/m K	11.35	12.95	13.6	13.9	14.2	14.5	14.7	15.05	15.5	17.5
μ-inch/inch °F	6.31	7.20	7.56	7.72	7.89	8.06	8.17	8.36	8.61	9.72

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	123	850	101.5	700	<1	30.3x10 ⁶	209

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)
410	390	356	345	334	301	235	155	138	95

THERMAL AND ELECTRICAL PROPERTIES

	Approximate Value at Room Temperature	
Thermal conductivity	14.82 W/m.K	102.7 Btu-in/hr/ft ² /°F
Electrical resistivity	106 μ-ohm.cm	41.7 μ-ohm.inch

PRODUCT FORMS AND CROSS-REFERENCE SPECIFICATIONS

STELLITE 6 is available as a spooled welding wire (solid and cored), rod, powder, electrodes, finished castings, powder metallurgy components, and additively manufactured components. A separate brochure is available for the wrought forms of this alloy, namely **STELLITE 6B** and **STELLITE 6K**.

STELLITE 6 can be supplied to the following specifications:

SPECIFICATION	PRODUCT FORM
UNS R30006	Rod, Castings
UNS R30106	P/M Parts
UNS W73006	Electrode
UNS W73036	Wire
AMS 5387, AMS 5373	Castings
AMS 5788	Rod, Wire
AMS 7239	P/M Parts

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

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