STELLITE™ 12 ALLOY

TECHNICAL DATA

TIG & OXY-ACETYLENE WELDING | MMA WELD DEPOSITION | MIG WELD DEPOSITION | PTA & LASER WELD DEPOSITION | HVOF & PLASMA SPRAY DEPOSITION

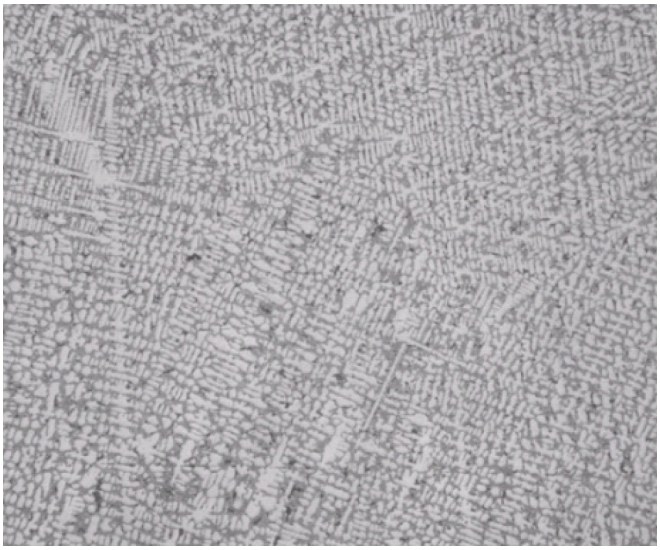
NOMINAL COMPOSITION (MASS %) AND PHYSICAL PROPERTIES

Co	Cr	W	C	Others	Hardness	Density	Melting Range
Base	27-32	7.5-9.5	1.4-1.7 (hardfacings) 1.7-2.0 (castings)	Ni, Fe, Si, Mn	45-51 HRC 435-590 HV	8.53 g/cm^3 0.308 lb/in^3	2192-2489 °F 1200-1365 °C

Stellite™ cobalt base 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™ 12 could be considered an intermediate alloy between **Stellite™ 6** and **Stellite™ 1**. It contains a higher fraction of hard, brittle carbides than **Stellite™ 6**, and has increased resistance to lowangle erosion, abrasion, and severe sliding wear whilst retaining reasonable impact and cavitation resistance. **Stellite™ 12** is often used self-mated or running against **Stellite™ 6** or **Stellite™ 1**. The higher tungsten content provides better high-temperature properties compared to **Stellite™ 6**, and it can be used at temperatures up to about 700˚C.

Stellite™ 12 is typically used for cutting tools that need to withstand abrasion, heat and corrosion. Examples include industrial knives for cutting carpets, plastics, paper and synthetic fibres; and saw tips in the timber industry. It is also used for control plates in the beverage industry, pump vanes, bearing bushes and narrowneck glass mold plungers; and for hardfacing of engine valves, pinch rollers in the metal-processing industries, and rotor blade edges.



Optical Micrograph of a Stellite™ 12 PTA Deposit at 500X.

CORROSION RESISTANCE

The typical electrode potential in sea water at room temperature is approximately -0.3 V (SCE). Like stainless steels, **Stellite™ 12** corrodes primarily by a pitting mechanism and not by general mass loss in seawater and chloride solutions. Information regarding corrosion resistance in other corrosive environments can be provided on request.

KENNAMETAL™
STELLITE

www.kennametal.com/stellite

NOMINAL THERMAL EXPANSION COEFFICIENT (FROM 20°C 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	11.5	12.1	12.6	12.9	13.3	13.8	14.3	14.8	15.2	15.6
µ-inch/inch.°F	6.4	6.7	7.0	7.2	7.4	7.7	7.95	8.2	8.45	8.7

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	107	740	84	580	<1	$32.8x10^6$	226
Stellite HS-12 (*)	174	1200	130	900	2	$30.1x10^6$	208

(*) "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)
546	456	418	390	380	371	362	328	232	153

THERMAL AND ELECTRICAL PROPERTIES

	Approximate value at Room Temperature	
Thermal conductivity	14.6 W/m.K	100 Btu-in/hr/ft²/°F
Electrical resistivity	98 µ-ohm.cm	38.6 µ-ohm.cm

PRODUCT FORMS AND CROSS REFERENCE SPECIFICATIONS

Stellite™ 12 is available as welding wire, rod, powder, and electrodes; finished castings and P/M parts. Kennametal Stellite also offers hardfacing services.

Stellite™ 12 can be supplied to the following specifications:

SPECIFICATION	PRODUCT FORM
UNS R30012	Rod, Casting
UNS W73012	Electrode
UNS W73042	Wire

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

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

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

KENNAMETAL™ STELLITE

www.kennametal.com/stellite