STELLITE™ 4 Alloy

TECHNICAL DATA

CASTING | PTA & LASER WELD DEPOSITION

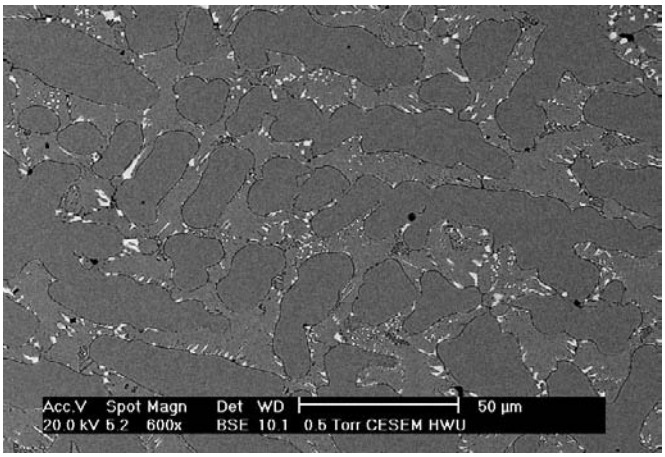
NOMINAL COMPOSITION (MASS %) AND PHYSICAL PROPERTIES

Co	Cr	W	C	Others	Hardness	Density	Melting Range
Base	30	14	1	Mn, Fe, Si, Ni	45-49 HRC	8.61 g/cm³ 0.311 lb/in³	1340–1395°C 2245–2545°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 4 is a cobalt-based alloy having greater wear resistance than **STELLITE 6** and is used for applications subject to only moderate mechanical shock. It is a machinable casting alloy having extremely good high temperature strength due to the higher tungsten and carbon contents. It has very good galling resistance at room and elevated temperatures. It exhibits a very low coefficient of friction when rubbed against itself and hard steels.

STELLITE 4 is often used for dies, hot pressing, and hot extrusion of copper base and aluminum alloys. It has also been used with success in pumps in corrosive and erosive conditions. **STELLITE 4** is also used for bushings and sleeves for Zn-Al hot dipping process.



Stellite 4 Microstructure at 600X

WEAR

The higher tungsten content of **STELLITE 4** gives improved high temperature properties and an increase in abrasive wear resistance over **STELLITE 6**. Adhesive wear is similar to **STELLITE 6**, but resistance improves as the load increases. Galling resistance is excellent. The alloy is brittle and withstands less impact than **STELLITE 6**. This material is suitable for high-temperature abrasion in corrosive environments.

CORROSION RESISTANCE

STELLITE 4 has higher corrosion resistance than **STELLITE 6** in oxidizing environments such as nitric and sulphuric acids. This improvement is due to the higher chromium content in the cobalt-rich matrix, making this material suitable for pump components. The alloy has excellent resistance to manganese di-oxide, carbon particles, and ammonium and zinc chlorides used in the manufacturing of dry batteries. Corrosion resistance will vary depending on acid concentration, temperature, stress, and contamination, thus production exposure tests are recommended.

KENNAMETAL™
STELLITE

www.stellite.com

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	9.50	10.01	10.62	11.00	11.61	12.01	12.42	12.80	13.50
µ-inch/inch °F	5.28	5.56	5.90	6.11	6.45	6.67	6.90	7.11	7.50

NOMINAL TENSILE PROPERTIES AT ROOM TEMPERATURE

	Ultimate Tensile Strength Rm		Yield Stress Rp (0.2%)		Elongation	Elastic Modulus	
	ksi	MPa	ksi	MPa	A(%)	ksi	MPa
Castings	110	757	80	550	<1%	34,100	235,010

NOMINAL HOT HARDNESS (DPH) AS-CAST

22°C (72°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)
505	490	479	438	409	387	333	244	183	124

THERMAL AND ELECTRICAL PROPERTIES

	Approximate Value at Room Temperature	
Thermal Conductivity	15 W/m K	102 BTU-in./hr./ft.²/°F
Electrical Resistivity	91.8 µ-ohm cm	36.1 µ-ohm inch

AVAILABLE PRODUCT FORMS

STELLITE 4 is available as a casting and powder.

DESIGNATION	PRODUCT FORMS
UNS R30404	Castings and Powder

SALES OFFICE - COMPONENTS

Kennametal Stellite
471 Dundas St. East
Belleville, Ontario
K8N 1G2
Canada
T: 1 613 968 3481
F: 1 613 966 8269
E-mail: k-blvl.service@Kennametal.com

SALES OFFICE - WELDING CONSUMABLES

Kennametal Stellite
1201 Eisenhower Drive N
Goshen, Indiana
46526
USA
T: 1 574 534 2585
F: 1 574 534 3417
E-mail: k-gshn.service@Kennametal.com

KENNAMETAL™ STELLITE

www.stellite.com