Deloro Wear Solutions

TECHNICAL DATA

STELLITE™ 12 ALLOY

STELLITE™ COBALT-BASED ALLOYS consists 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 is a cobalt-base alloy having high heat and corrosion resistance with excellent wear and abrasion resistance. Examples include industrial knives for cutting carpets, plastics, paper and synthetic fibers; and saw tips in the timber industry. It is also used for control plates in the beverage industry, pump vanes, bearing bushes and narrow neck glass mold plungers; and for hardfacing of engine valves, pinch rollers in the metal-processing industries and rotor blade edges. Stellite™ 12 could be considered an intermediate alloy between Stellite™ 6 and Stellite™ 1 resp. Stellite™ 3. It contains a higher fraction of hard, brittle carbides than Stellite™ 6, and has increased resistance to low angle 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 resp. Stellite™ 3. 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.

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.

NOMINAL CHEMICAL COMPOSITION (MASS%)

ALLOY	Co	Cr	W	C	Others
Stellite™ 12	Bal.	29,0	8,5	1,8	Fe, Ni, Mo, Mn, Si

PHYSICAL PROPERTIES

ALLOY	Hardness	Density	Melting Range
Stellite™ 12	46 - 51 HRC / 450 - 540 HV	~ 8,50 g/cm^3	~ 1200 – 1365℃

NOMINAL HOT HARDNESS (HV resp. DPH) AS CAST

20℃	100℃	200℃	300℃	400℃	500℃	600℃	700℃	800℃	900℃
546	456	418	390	380	371	362	328	232	153

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EXAMPLE FOR TENSILE PROPERTIES AT ROOM TEMPERATURE

PRODUCT FORM	Ultimate Tensile Strength Rm	Yield Stress Rp (0,2%)	Elongation A
Investment Casting, As cast	~ 740 MPa	~ 580 MPa	<< 1%

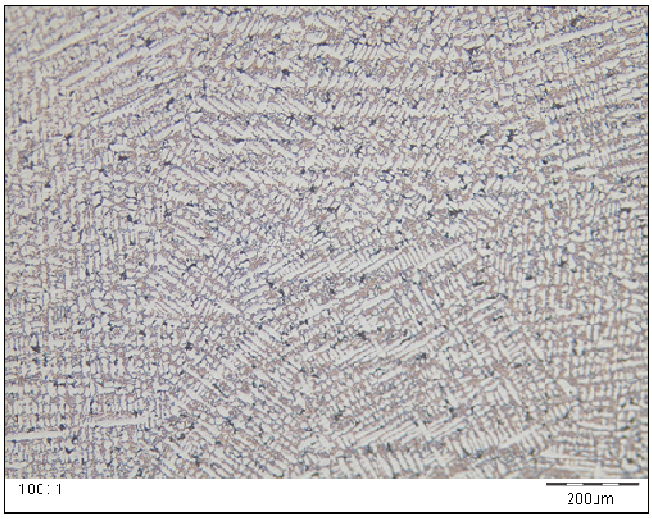
PRODUCT FORMS

Components				
Castings	Cladded / Hardfaced	PM rods and tips for saw tipping	ALM parts*	HIP parts*

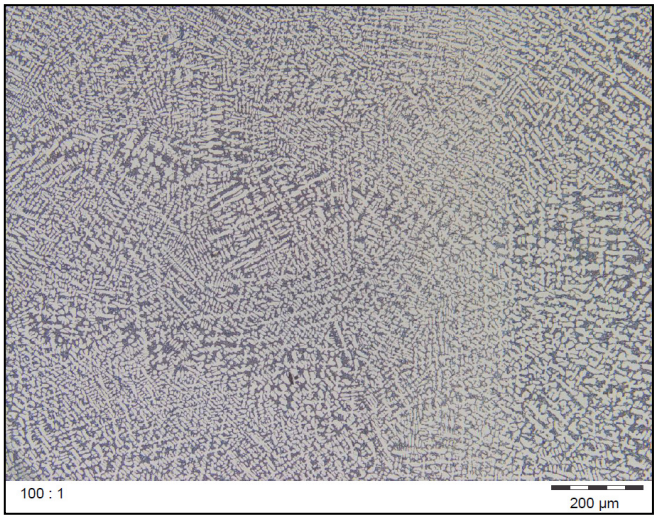
* On special request.

Consumables for Cladding / Hardfacing and Additive Layer Manufacturing (ALM)						
Rods	TIG-Welding			Oxy-Acetylene Welding		
Electrode	MMA Welding					
Cored Wire	MIG Welding			Submerged Arc Welding		
Powder	PTA Cladding	Laser Cladding	HVOF Spraying	Powder Welding	Spray&Fuse	ALM

TYPICAL STRUCTURE



Casted Stellite™ 12 Alloy (Resin Shell Casting)



Welded Stellite™ 12 Alloy (Plasma Powder Cladding)

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Deloro Wear Solutions GmbH | Zur Bergpflege 51 – 53 | 56070 Koblenz | Germany
T +49 (0) 261 8088 0 | F +49 (0) 261 8088 35
Email us at: info@deloro.com | Visit us at: www.deloro.com