

# STELLITE® 25 ALLOY

## TECHNICAL DATA

### Nominal Composition (mass %) and Physical Properties

Co	Cr	W	C	Others	Hardness	Density	Melting Range
Base	20	15	0.1	Ni, Fe, Si, Mo, Mn	20-45 HRC	8.31 g/cm <sup>3</sup> 0.300 lb/in <sup>3</sup>	2425-2573°F 1329-1410°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.

#### Description

This tungsten strengthened cobalt-chromium alloy is the cast version of the wrought alloy L605. A special low carbon material has been found to have exceptional thermal fatigue resistance and is useful for tools to work hot steel. The alloy also resists hot metal on metal wear.

#### Corrosion Resistance

**Stellite® alloy 25 is resistant to oxidation and carburization up to 1900°F. The alloy resists wet chlorine at ambient temperatures and is resistant to nitric and hydrochloric acids under certain conditions. Exposure testing is recommended to verify performance.**

#### Wear

**Stellite® alloy 25** forms a protective oxide film during hot metal-on-metal wear which prevents metal transfer and damage due to adhesion. The alloy is resistant to thermal cracking and surface fatigue. Since the micro-structure is relatively free of carbide reinforcement, it is not recommended for low stress or low angle particle erosion service.

#### Finishing

Carbide tools allow a variety of conventional machining operations. Use positive rake angle to avoid burrishing since the alloy work hardens readily. Sharp tools and coolant are recommended for drilling.

#### 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)
μ-inch/inch.°F	-	6.8	-	7.2	-	7.6	-	7.8	-	8.0

#### Nominal Tensile Properties at Room Temperature

	Ultimate Tensile Strength Rm		Yield Stress Rp(0.2%)		Elongation	Elastic Modulus	
	ksi	MPa	ksi	MPa	A(%)	ksi	GPa
Castings	134	925	130	895	5	30,000	207

### Nominal Hot Hardness (Brinell Hardness Number) 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)
350	-	-	-	-	280	-	-	-	130

### Thermal and Electrical Properties

	Approximate value at Room Temperature
Thermal conductivity	65 Btu-in/hr/ft <sup>2</sup> /°F
Electrical resistivity	34.9 μ-ohm.inch

### Applications

Metal working tools where a combination of metal-on-metal wear, thermal fatigue and hot corrosion resistance are required, such as piercing points, forming tools, and extrusion dies. Also used for furnace hardware.

### Available forms

Castings, welding consumables.

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Literature Number:461-3  
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