

ALLOY DATA SHEET CF-3M

CORROSION RESISTANT ALLOY

REVISION: 01/90

DESCRIPTION

CF-3M is an Fe-Cr-Ni-Mo alloy that is the cast equivalent of wrought, low carbon, AISI 316L stainless steel. The low carbon content of the alloy results in greater resistance to sensitization of the welds. Consequently, it is most commonly used in applications where post-weld heat treatment cannot be applied. Optimum corrosion resistance is reached after solution annealing at 1900 to 2050°F followed by rapid cooling. It has good resistance to organic acids and salts, sulphuric and sulphurous acids, phosphoric and phosphoric-sulphuric-hydrofluoric acid mixtures, sulphate and sulphite liquors, sea water and other chloride solutions, sodium hydroxide and steam.

A modified form of the alloy, known as CF-3MA, has higher strength than the normal CF-3M. This is achieved by balancing the composition to produce a higher range of ferrite than the 20% present in the CF-3M grade.

COMPOSITION

	<u>C</u>	<u>Mn</u>	<u>Si</u>	<u>Cr</u>	<u>Ni</u>	<u>Mo</u>	<u>P</u>	<u>S</u>
Min %				17.0	9.0	2.0		
Max %	0.03	1.50	1.50	21.0	13.0	3.0	0.04	0.04

APPLICATIONS

Impellers, propellers, pump casings, suction manifolds and valve bodies.

PRODUCT FORMS

Horizontal and vertical centrifugal castings; static castings.

PHYSICAL PROPERTIES

Density (lbs/in ³)	0.280
Liquidus(°F)	2600
Thermal Conductivity (Btu/h/ft ² /ft/°F)	9.4 @ 212°F 12.3 @ 1000°F
Thermal Expansion (10 ⁻⁶ in/in °F)	8.9 @ 70-212°F 9.7 @ 70-1000°F
Magnetic Permeability	1.2 to 3.0

MECHANICAL PROPERTIES

(Typical Values at Room Temperature - Solution Annealed at >1900°F, Water Quenched.)

		CF-3M		CF-3MA		ASTM Specs A351 and A743	
		CF-3M	CF-3MA	A743 CF-3M	A351CF-3A		
U.T.S.	K.S.I.	80	90	70 Min	77 Min.		
Y.S.	K.S.I.	38	45	30 Min	35 Min.		
Elong.	%	55	45	35 Min	35 Min		
Brinell	H B	150	170				
Charpy 'V'	ft-lbs	120	100				

WELDABILITY

CF-3M may be welded by the SMAW, GTAW and GMAW processes.

Electrodes 308Mo, 316, 317, 316L, 308MoL.

Preheat Not required.

Post weld heat treatment Not normally required

Procedures for welding CF-3M alloy are available from Kubota Metal Corporation.

RELATED SPECIFICATIONS

ASTM A351(CF3M and CF3MA), A743(CF-3M), A744(CF-3M), A 451 (CPF3M), J92800

Nearest wrought grade: AISI 316L.

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