



Casting Material: Stainless Steel CF3

CF3 is a cast austenitic corrosion resistant alloy material for pressure containing parts, which covered by ASTM A351, ASTM A743 and ASTM A744 standard. The difference between CF3 and CF8 is carbon content; CF3 has only 0.03% carbon. CF3M has molybdenum but CF3 don't contain it.

Manufactured by sand casting or investment casting (lost wax precision casting) process.

UNS: J92500; Wrought UNS S30403, grade 304L.

CF3(SS304) Chemical Requirements in those two standards as bellow, little difference:

ASTM A351 Standard Specification for Castings, Austenitic, for Pressure-Containing Parts:

Carbon: 0.03 max

Manganese: 1.50 max

Silicon: 1.50 max

Sulfur: 0.040 max

Phosphorus: 0.040 max

Chromium: 17.0-21.0

Nickel: **8.0-12.0**

Tensile Strength: min 70ksi(485Mpa)

Yield Strength: min 30ksi (205Mpa)

Elongation in 2in. or 50mm: min 35.0%

ASTM 743A Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application:

Carbon: 0.03 max

Manganese: 1.50 max

Silicon: 2.00 max

Sulfur: 0.040 max

Phosphorus: 0.040 max

Chromium: 17.0-21.0

Nickel: **8.0-12.0**

Tensile Strength: min 70ksi(485Mpa)

Yield Strength: min 30ksi (205Mpa)

Elongation in 2in. or 50mm: min 35.0%

ASTM A744 Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service : The chemistry and mechanical property is same as A743

CF3(SS304) Heat treatment process: Heat to 1900°F [1040°C] minimum, hold for sufficient time to heat casting to temperature, quench in water or rapid cool by other means. As cast if corrosion resistance is acceptable too.

CF3(SS304) Similar Material: EN No. 1.4306; DIN 1.4306; X2CrNi19-11; Chinese grade ZG00Cr18Ni10; JIS G5121 SCS19A, BS970 1504 304C12E



Wrought grade: DIN X2Crn18 9 (W-Nr 1.4306); 304L

CF3(SS304) is an Fe-Cr-Ni alloy that is the cast equivalent of wrought, low carbon, AISI 304L /F304L 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 2050oF followed by rapid cooling. It has good resistance to organic acids and salts, sulphuric and sulphurous acids, phosphoric and phosphoric-sulphurichydrofluoric 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-3A, has higher strength than the normal CF-3 this is achieved by balancing the composition to produce a higher range of ferrite than the 20% present in the CF-3 grade.

CF3A, indicated in ASTM A351 only, it's same as CF3, just the tensile is different: tensile 77ksi (530Mpa) and yield strength of 35Ksi (240Mpa). CF3A is not recommended for service at temperatures above 800F (425C) because of thermal instability.

CF3(SS304) APPLICATIONS

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

CF3(SS304) WELDABILITY

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

What means of CF3:

As to the designation -

C (first letter) means the service it is intended to be used in this case - corrosion resistant service , but casting quality think sometimes it means of CASTING USAGE because you will find F316 in ASTM A 350 (F = FORGE)

F(second letter) -The second letter indicates the approximate location of the alloy on the iron-chromium-nickel (FeCrNi) ternary diagram. For users familiar with the diagram, the second letter does provide an indication of the nominal iron, nickel, and chromium content, but most people would have to obtain alloying information from a material specification.



3 - the third and fourth digits represent the maximum permitted carbon content in units of 0.01% (e.g., CF8M has a maximum of 0.08% carbon)

(M- the Molybdenum contained. If no "M", means no Molybdenum contained, Such as CF3M,CF8M)

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