MP35N Alloy

DATA SHEET

NICKEL-COBALT-CHROMIUM-MOLYBDENUM ALLOY

TYPICAL APPLICATIONS

Downhole pump drive shafts and tools
High strength marine components
Springs
Valve stems and pump shafts in Oil & Gas sector
Fastener system components – pins, tension bolts, shear bolts, engine bolts, tie rods
Medical applications – bone plates, screws, pins
Non -magnetic electrical components and sensing devices
Components in autosport
Aerospace components

PRODUCT DESCRIPTION

MP35N is a vacuum induction, vacuum arc remelted quaternary alloy based on nickel and cobalt with substantial additions of chromium and molybdenum. The alloy possesses an unusually attractive combination of ultra high strength, toughness and outstanding corrosion resistance. MP35N alloy may be employed in the annealed condition but can easily be work strengthened to tensile strength levels in excess of 260 ksi (1,793 MPa) with the retention of good ductility. Aging of worked material causes precipitation hardening and can raise the tensile strength by an additional 40 ksi (276 MPa).
The density of MP35N alloy is 8.43 g/cc.

CORROSION RESISTANCE

MP35N alloy offers outstanding resistance to general corrosion, crevice corrosion and stress corrosion at all strength levels. The four alloying elements in MP35N being the basis for corrosion resistance in almost every stainless steel, nickel and cobalt based alloy commonly used in industry. The alloy resists corrosion in hydrogen sulphide, salt water and other chloride solutions, as well as the mineral acids (nitric, hydrochloric, sulphuric). The alloy is also resistant to hydrogen embrittlement.

MP35N is an extremely noble metal, very similar to titanium, and may cause galvanic corrosion if coupled to a less noble material such as Type 316 stainless steel.

MATERIAL SPECIFICATIONS

- AMS 5758
- AMS 5844
- AMS 5845
- ASTM F562
- ASTM F688
- NACE MR01-75 / ISO 15156

AVAILABILITY

Bar, rod, wire, sheet, plate, strip, tubing.

WORKING, MACHINING AND JOINING

MP35N alloy can be hot and cold worked and formed by a wide variety of processes.
Work strengthening can be accomplished by extruding, rolling, swaging, drawing or a combination of these manufacturing processes.
MP35N alloy may be TIG welded and in general its weldability is similar to that of Type 304 stainless steel. Joint efficiency is dependent upon the heat treatment / worked condition of the material.
The machinability of MP35N is similar to but better than that of Waspaloy, a widely used standard for nickel-cobalt-chromium base alloy machining performance.

TYPICAL CHEMICAL COMPOSITION

Weight%	Ni	Co	Cr	Mo
	35	35	20	10

TYPICAL MECHANICAL PROPERTIES

	Solution annealed MP35N	AMS 5844 aged 4 hr. at 566°C
UTS, MPa (ksi)	896 (130)	2000 (290)
0.2% PS, MPa (ksi)	379 (55)	1931 (280)
Elongation on 4D, %	65	10
R of A, %	75	45
Hardness	90 HRB	51 HRC

TECHNICAL SALES ASSISTANCE

Our resident team of qualified metallurgists and engineers will be pleased to assist further on any technical topic.

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