VDM Metals

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VDM Alloy 31 Plus®

The Cost-Effective High-Performance Alternative for Extreme Oil & Gas Environments

VDM Alloy 31 Plus® (UNS N08034 / 2.4692) is the advanced material solution designed for ultra-demanding conditions in the oil and gas industry. Serving as a highly efficient alternative to traditional nickel alloys, this specialty material combines exceptional corrosion resistance and strength with optimal cost-efficiency.

Chemical Composition

	Ni	Cr	Fe	S	Si	Mn	P	Mo	Cu	N	Al	C
Min.	33.5	26.0	Rest			1.0		6.0	0.5	0.10		
Max.	35.0	27.0		0.01	0.1	4.0	0.02	7.0	1.5	0.25	0.30	0.01

Economic Value Proposition

By choosing VDM Alloy 31 Plus®, you significantly lower capital expenses without compromising on safety, service life, or reliability in aggressive production media. VDM Alloy 31 Plus® features unchallenged cost advantages due to its unique chemical composition (less nickel, no niobium) and lower specific weight in comparison to traditionally used nickel alloys in the oil and gas sector.

Alloy	Density (g/cm³)
VDM Alloy 31 Plus®	8.08
Alloy 718	8.26
Alloy 625	8.47

VDM Metals International GmbH
Plettenberger Straße 2
58791 Werdohl
Germany

www.vdm-metals.com

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Corrosion Performance

Featuring a Pitting Resistance Equivalent Number (PREN) of approx. 47, VDM Alloy 31 Plus® offers outstanding protection against pitting and crevice corrosion in high-chloride media. The alloy is virtually immune to hydrogen embrittlement. The elevated levels of nickel, chromium, and molybdenum ensure superior resistance to stress corrosion cracking (SCC) in severe sour gas environments.

In both solution annealed and cold-worked condition, the alloy fully meets the stringent requirements of NACE MR0175 / ISO 15156 for downhole applications. Furthermore, VDM Alloy 31 Plus® demonstrates outstanding resistance in pure and contaminated seawater environments, making it ideal for offshore cooling and injection systems.

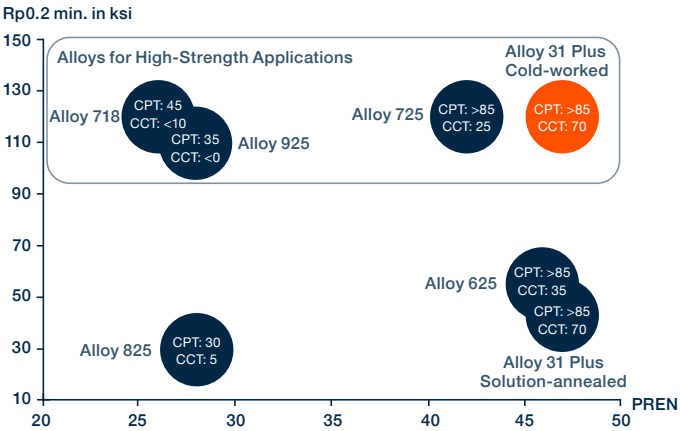
Good to know!

Cold-working does not impair the material's outstanding resistance to pitting corrosion and stress corrosion cracking (SCC), thereby demonstrating its suitability for sour gas conditions.

Mechanical Properties & Processing

Through precise cold-working, VDM Alloy 31 Plus® achieves the high yield strengths required for deepwater and high-pressure drilling operations, reaching mechanical properties comparable to Alloy 718, and even better mechanical properties than Alloy 925.

In the solution-annealed condition, its excellent weldability makes it e.g. an ideal liner material for MLPs (Mechanically Lined Pipes).



Yield strength in relation to Pitting Resistance Equivalent Number (PREN), Critical Pitting Temperature (CPT) and Critical Crevice Temperature (CCT) according to ASTM G48 Methods C and D in °C of different nickel alloys.

Available Product Forms

Plate	Thickness:	1-7 mm (cold-rolled) 3-30 mm (hot-rolled)
	Width:	max. 2,500 mm
	Length:	max. 12,500 mm
Strip	Thickness:	0.03 – 3 mm
	Width:	4 – 750 mm
Bar	Diameter:	up to 200 mm
	Length:	up to 12,000 mm
Welding Wire/Electrodes		
	Wire Diameter:	0.8 – 1.6 mm
	Electrodes Diameter:	1.6 – 3.2 mm
Powder	Particle Fractions:	10 – 53 µm 50 – 150 µm

Moritz Jordan
Vice President Sales – Oil and Gas

Phone + 49 (0) 2392 55-2370

moritz.jordan@vdm-metals.com

Christian Heet
Application Engineer – Oil and Gas

Phone + 49 (0) 2392 55-3854

christian.heet@vdm-metals.com