VDM Metals

Materials for the future.

Alloys for the Oil and Gas Industry

A company of ACERINOX

Tough demands are our business

During the past eight decades, VDM Metals has developed into a world market leader for high-performing metallic materials covering the widest product and service portfolio in the industry. The quality of our products and services is based on our integrated production chain in Germany and the United States and a sales network that spans the globe servicing the most demanding industries backed by a strong R&D and Application Engineering force.

VDM Metals produces high-performance alloys for the use in extreme conditions – high temperatures, icy waters, soaring heights and deep underground. Our materials are made to last, resisting heavy mechanical, thermal and chemical stresses, sometimes all three simultaneously. In many key technologies alloys from VDM Metals are indispensable for the industrial-scale implementation and safe control of mission-critical processes in hot or corrosive environments.

Strategic investments, mergers and acquisitions have made the company one of the world leaders in the production of nickel and cobalt alloys, zirconium and special stainless steels. Our production sites can draw on extensive metallurgical know-how and long standing experience in the production of long and flat products as well as welding filler metals.

Focus on safety and reliability
In oil and gas engineering, safe and reliable operations are always the top priorities. Corrosive media, temperature differences and mechanical loads place enormous demands on all components. General corrosion resistance in a wide range of media, both oxidizing and reducing, resistance to stress-corrosion cracking, pitting and crevice corrosion are just some of the features our materials can offer.

Quality control
Materials made by VDM Metals pass through especially stringent quality control. We perform extensive testing on each single product according to the respective customer specifications which define physical and mechanical properties as well as corrosion behavior, thus contributing to safe and reliable operations.

At a very early stage, we established quality assurance as the overriding principle and developed it into a quality management system with in-process checks and inspections. This is closely linked to our continual improvement processes for optimizing all operating procedures.

We are where you need us to be
A globally operating sales organization, working in close cooperation with strategically situated service centers, ensures optimum customer proximity and a significant footprint in all key regions and markets.

The result of our efforts: efficient processes as well as maximum purity, homogeneity, reproducibility and optimized processing characteristics of our products. Thus, our offering is nothing less than premium materials in any form needed as well as first class services, available anywhere in the world, right on time.

Materials for highly demanding applications

VDM Metals is offering high-performance alloys in the product forms plate, sheet, strip, rod, bar and wire. All products exhibit excellent fabricability into tubes, pipes, fittings, flanges, tooling etc. which are subsequently manufactured into the different pieces of equipment required by the oil and gas industry in upstream and midstream applications.

Crude oil and natural gas are organic mixtures with widely varying compositions, depending on their deposits. The standard components of crude oil include hydrocarbons and sulphur, oxygen and nitrogen compounds. Natural gas consists of methane, ethane, propane and other secondary constituents such as sulphuric acid. Resistance to pitting, crevice and stress corrosion is therefore one of the most important characteristics of materials used in the production of oil and gas. For more than three decades, VDM Metals has been a reliable supplier of high-value nickel alloys to the oil and gas industry.

The worldwide supply of energy will continue to rely on petroleum and natural gas extraction for a long time to come. To ensure the long-term availability of these fossil fuel reserves, extraction rates at existing oil and gas wells are continually being improved through deep drilling and the use of secondary and tertiary extraction methods. The efforts to explore new deposits and their development have been intensified. The search for new deposits is becoming increasingly difficult, with future oil and gas production requiring ever more advanced extraction techniques. However, nickel alloys and special stainless steels produced by VDM Metals will continue to contribute to keeping the world supplied with fuel and energy.

Upstream applications
In the upstream segment these materials are used as pressure tubes in umbilicals, in flowlines, riser pipes, valve systems, wire lines and subsea bandings.

Rods and bars (forged, rolled and drawn), produced for example from VDM® Alloy 718, VDM® Alloy 625 and VDM® Alloy K-500, are used in many different areas, including the manufacturing of hanger and packer systems, completion tools and pump shafts.

Midstream applications
Hot or cold rolled plate or sheet metal and strip in coils produced by VDM Metals are used in the manufacture of long-seam welded pipes, as well as flanges and fittings. Sheet and plate are available in lengths up to 39 ft (12 m), depending on the thickness and width of the plate as well as alloy type. Additionally, we are supplying forged billets used as pre-materials for seamless tubes and pipes in the casing and tubing segment, as well as for sub-sea control units.

Welding consumables
Weld cladding with strip and wire electrodes has a firm place in the oil and gas industry as well as in the construction of chemical apparatus and plants. As only the surfaces are susceptible to corrosion, the weld cladding of corrosion resistant materials onto unalloyed or low-alloy steels helps reduce material costs. Many VDM materials such as VDM® Alloy 625 or VDM® Alloy 825 are suitable for weld cladding (deposition welding), e. g. to protect welded pipes made of a low-alloy base material against corrosion.

In general, welding techniques play a vital role in the research and development work at VDM Metals, given its position as manufacturer of special products for corrosion protection and also as an expert for all types of joint welding. We are offering wires on standardized spools, special spools or in various barrel types as well as strips in coils and rods in quivers. Our welding wires are suitable for automatic and semi-automatic gas shielded processes and submerged arc welding.

Alloys & specifications

Common alloys and standard specifications*

VDM Metals designation	UNS	DIN EN	Typical chemical composition, in %	Specification	Product form				
					Billet	Bar	Plate	Wire	Strip
VDM® Alloy 22	N06022	2.4602	Ni-21Cr-13.5Mo-3Fe-3W		•	•	•	•	•
				ANSI/NACE MR0103	•	•	•		•
				ANSI/NACE MR0175/ISO 15156-3	•	•	•		•
				ASTM-B-/ASME-SB-574	•	•			
				ASTM-B-/ASME-SB-575			•		•
				DIN 17744			•	•	•
				DIN 17750			•		•
				DIN 17753				•	
				VdTÜV data sheet 479	•	•	•		•
VDM® Alloy 33	R20033	1.4591	Cr-32Fe-31Ni-1.6Mo-0.7Cu-0.4N		•		•	•	•
				ASTM-B-/ASME-SB-625			•		•
				ASTM-B-/ASME-SB-649	•			•	
				VdTÜV data sheet 516	•		•		•
VDM® Alloy 59	N06059	2.4605	Ni-23Cr-16Mo		•	•	•	•	•
				ANSI/NACE MR0175/ISO 15156-3	•	•	•		•
				ASTM-B-/ASME-SB-574	•	•			
				ASTM-B-/ASME-SB-575			•		•
				DIN 17744	•	•	•	•	•
				DIN 17750			•		•
				DIN 17752	•	•			
				DIN 17753				•	
				VdTÜV data sheet 505	•	•	•		•
VDM® Alloy 400	N04400	2.4360	Ni-32Cu-1.5Fe-1.0Mn		•	•	•	•	•
				ANSI/NACE MR0103			•		•
				ANSI/NACE MR0175/ISO 15156-3	•	•	•		•
				ASTM-B-/ASME-SB-127			•		•
				ASTM-B-/ASME-SB-164	•	•		•	
				DIN 17743	•	•	•	•	•
				DIN 17750			•		•
				DIN 17752	•	•			
				DIN 17753				•	
				QQ-N-281D Amd. 2/Class A/Form 1	•	•			
				QQ-N-281D Amd. 2/Class A/Form 4			•		
				QQ-N-281D Amd. 2/Class A/Form 6			•		
				VdTÜV data sheet 263	•	•	•		
VDM® Alloy 405	N04405	2.4363	Ni-1Fe-32Cu-1Mn		•	•			
				ANSI/NACE MR0175/ISO 15156-3	•	•			
				ASTM-B-/ASME-SB-164	•	•			
				DIN 17743	•	•			
				QQ-N-281D Amd. 2/Class A/Form 1	•	•			
VDM® Alloy 625	N06625	2.4856	Ni-21.5Cr-9Mo-3.5Nb		•	•	•	•	•
				ANSI/NACE MR0103			•		•
				ANSI/NACE MR0175/ISO 15156-3	•	•	•		•
				API 5LD			•		•
				ASTM-B-/ASME-SB-443			•		•
				ASTM-B-/ASME-SB-446	•	•			
				DIN 17744	•	•	•	•	•
				DIN 17750			•		•
				DIN 17752	•	•			
				DIN 17753				•	
				VdTÜV data sheet 499	•	•	•		•

• Available product forms.

* Complete list of available alloys on request.

VDM Metals designation	UNS	DIN EN	Typical chemical composition, in %	Specification	Product form				
					Billet	Bar	Plate	Wire	Strip
VDM® Alloy 690	N06690	2.4642	Ni-29Cr-9Fe		•	•	•		
				ASTM-B-/ASME-SB-166	•	•			
				ASTM-B-/ASME-SB-168			•		
				DIN 17742	•	•			
				DIN 17752	•	•			
VDM® Alloy 699 XA	N06699	2.4842	Ni-30Cr-2,5Fe Al 3; Mn 0,5; Si 0,5; Ti 0,6; Nb 0,5; Cu 0,5; Zr 0,1; C 0,1		•		•		
				ASTM-B-0168			•		
				ASTM-B-0472	•				
				ASTM-B-0166		•		•	
VDM® Alloy 718 CTP	N07718	2.4668	Ni-19Cr-17Fe-3Mo-5Nb-1Ti-0.5Al		•	•	•	•	•
				ANSI/NACE MR0103	•	•			
				ANSI/NACE MR0175/ISO 15156-3	•	•			
				API 6A CRA**	•	•			
				ASTM-B-670			•		•
				DIN 17744	•	•	•	•	•
				DIN 17750			•		•
				DIN 17753				•	
VDM® Alloy 825	N08825	2.4858	Ni-30Fe-23Cr-3Mo-2Cu-0.9Ti		•	•	•	•	•
				ANSI/NACE MR0103			•		•
				ANSI/NACE MR0175/ISO 15156-3	•	•	•		•
				API 5LD			•		•
				ASTM-B-/ASME-SB-424			•		•
				ASTM-B-/ASME-SB-425	•	•			
				DIN 17744	•	•	•	•	•
				DIN 17750			•		•
				DIN 17752	•	•			
				DIN 17753				•	
				VdTÜV data sheet 432	•	•	•		•
VDM® Alloy 825 CTP	N08827	2.4861	Ni-31,5Fe-22Cr-4,5Mo-2Cu			•	•		•
				ASTM B-424			•		•
				ASTM B-425		•			
VDM® Alloy 925	N09925	2.4852	Ni-20Cr-29Fe-3Mo-2.2Ti-2Cu-0.3Al		•	•			
				ANSI/NACE MR0175/ISO 15156-3	•	•			
				API 6A CRA**	•	•			
VDM® Alloy 926	N08926	1.4529	Fe-25Ni-20Cr-7Mo		•	•	•	•	•
				ANSI/NACE MR0175/ISO 15156-3			•		•
				API 5LD					•
				ASTM-B-/ASME-SB-625			•		•
				ASTM-B-/ASME-SB-649	•	•		•	
				DIN EN 10028-7			•	•	•
				DIN EN 10088-2			•	•	•
				DIN EN 10088-3	•	•			
				VdTÜV data sheet 502	•	•	•		•

• Available product forms. ** Strength level on request.

Alloys & specifications

Common alloys and standard specifications*

VDM Metals designation	UNS	DIN EN	Typical chemical composition, in %	Specification	Product form				
					Billet	Bar	Plate	Wire	Strip
VDM® Alloy C-276	N10276	2.4819	Ni-16Cr-16Mo-5Fe-4W		•	•	•	•	•
				ANSI/NACE MR0103			•		•
				ANSI/NACE MR0175/ISO 15156-3	•	•	•		•
				API 5LD					•
				ASTM-B-/ASME-SB-574	•	•			
				ASTM-B-/ASME-SB-575			•		•
				DIN 17744	•	•	•	•	•
				DIN 17750			•		•
				DIN 17752	•	•			
				DIN 17753				•	
				VdTÜV data sheet 400	•	•	•		•
VDM® Alloy K-500	N05500	2.4375	Ni-30Cu-2.7Al-1Fe-1Mn-0.6Ti		•	•			
				ANSI/NACE MR0175/ISO 15156-3	•	•			
				ASTM-B-865	•	•			
				DIN 17743	•	•			
				DIN 17752	•	•			
				QQ-N-286G	•	•			

Welding consumables**

VDM Metals designation	UNS	DIN EN	Typical chemical composition, in %	Specification	Product form		
					Rod	Wire	Strip
VDM® FM 33	R20033	1.4591	Ni-33Cr-32Fe-1.5Mo-0.8Cu-0.4N	AWS A5.9 ER33-31, TÜV	•	•	
VDM FM 52i®	N06056	–	Ni-27Cr-3Mn-2,6Fe-2,3Nb-0,04C	AWS A5.14 EQNiCrFe-15	•	•	•
VDM® FM 59	N06059	2.4607	Ni-22.5Cr-0.5Fe-15.5Mo	AWS A5.14 ERNiCrMo-13, EQNiCrMo-13, TÜV, ABS, FBTS (Wire)	•	•	•
VDM® FM 60	N04060	2.4377	Ni-1Fe-29Cu-3.2Mn-2.4Ti	AWS A5.14 ERNiCu-7, TÜV, ABS	•	•	
VDM® FM 61	N02061	2.4155	Ni-3.3Ti	AWS A5.14 ERNi-1, TÜV, ABS	•	•	
VDM® FM 67	C71581	2.0837	Ni-0.6Fe-67Cu-0.7Mn	AWS A5.7 ERCuNi, TÜV, ABS	•		
VDM® FM 82	N06082	2.4806	Ni-21Cr-1Fe-3.2Mn-2.5Nb	AWS A5.14 ERNiCr-3, EQNiCr-3, TÜV, ABS (Wire)	•	•	•
VDM® FM 625	N06625	2.4831	Ni-22Cr-0.5Fe-9Mo-3.5Nb	AWS A5.14 ERNiCrMo-3, EQNiCrMo-3, TÜV, ABS, FBTS (Wire)	•	•	•
VDM® FM C-276	N10276	2.4886	Ni-16Cr-6Fe-16Mo-3.5W-0.5Mn-0.2V	AWS A5.14 ERNiCrMo-4, EQNiCrMo-4, TÜV (Wire)	•	•	•

Powder for addtitiv manufacturing

VDM Metals designation	UNS	DIN EN	Typical chemical composition, in %	Specification	Particle size distribution*
VDM® Powder 718 CTP	N07718	2.4668	Ni-19Cr-17Fe-3Mo-5Nb-1Ti-0,5Al		10 – 53 µm / 50 – 150 µm*
VDM® Powder 625	N06625	2.4856	Ni-21,5Cr-9Mo-4,5Fe-3,5Nb		10 – 53 µm / 50 – 150 µm*
VDM® Powder C-276	N10276	2.4819	Ni-16Cr-16,5Mo-6Fe-3,5W-0,5Mn-0,2V		10 – 53 µm / 50 – 150 µm*
VDM® Powder 59	N06059	2.4605	Ni-23Cr-16Mo-1,3Fe		10 – 53 µm / 50 – 150 µm*
VDM® Powder 31 Plus	N08034	2.4692	Ni-29Fe-27Cr-6,5Mo-2,1Cu-2Mn-0,2N		10 – 53 µm / 50 – 150 µm*
VDM® Powder 926 L	N08926	1.4529	Fe-25Ni-20,5Cr-6,5Mo-0,9Cu-0,2N	ASTM-A-240	10 – 53 µm / 50 – 150 µm*
VDM® Powder CoCr Mp1	R31538	–	Co-28Cr-6Mo-1Mn-1Si-0,75Fe	ASTM-F-75	10 – 53 µm / 50 – 150 µm*
VDM® Powder 699 XA	–	2.4842	Ni-30Cr-25Fe-3Al-0,5Mn-0,5Si-0,6Ti-0,5Ni-0,5Cu-0,1Zr-0,1C-0,05N-0,02P-0,01S-0,008B		10 – 53 µm / 50 – 150 µm*

* Further particle size distributions are available on request. Please contact us

• Available product forms.

** Please find further detailed information in our welding consumables catalog.

Comprehensive Customer Support

Customer relationships with VDM Metals mean access to a variety of first class services – services that really make the difference.

Technical customer support
From selecting the right materials to any request on specifications, properties and fabrication characteristics – VDM's Application Engineering team will be more than happy to provide you with prompt answers and support, relying on their technical and metallurgical background and experience in all fabrication matters of VDM's materials.

Material and corrosion tests
Quality is a top priority at VDM Metals. In addition to the approvals for individual plants, all quality management systems of the different VDM Metals locations are certified according to ISO 9001 and AS 9100. Extensive product tests and examinations are carried out in our on-site laboratories. This includes our metallography, our spectral laboratory, our chemical laboratory, our corrosion laboratory or our mechanical laboratory.

Research and Development (R&D)
The performance of our materials depends decisively on their chemical composition. This may be surprisingly simple or highly complex, but in every case it is the result of intensive R&D work. Our aim is not just to develop new materials but also to sound out hidden performance potentials in market-proven alloys which we can then qualify for new applications. Our R&D experts accompany the projects, sometimes right up to commissioning and start-up. The solutions that evolve find their way into new products, as well as techniques and processes.

Welding Competence Center
With our state-of-the-art Welding Competence Center we are not only capable to test different materials and welding consumables or new and unconventional materials combinations, but also to train your staff in theory and practice. Make use of our know-how – we are happy to welcome you and your team in our Welding Competence Center.

Service Center
Rapid and reliable service is increasingly gaining importance. Furthermore, long maintenance intervals, reliability and durability of the scrubbers as well as a maintenance-friendly design bring benefits to your customers. In order to meet your needs precisely, flexibly and punctually, we operate Service Centers that offer a comprehensive stock program of corrosion resistant materials and associated services.

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