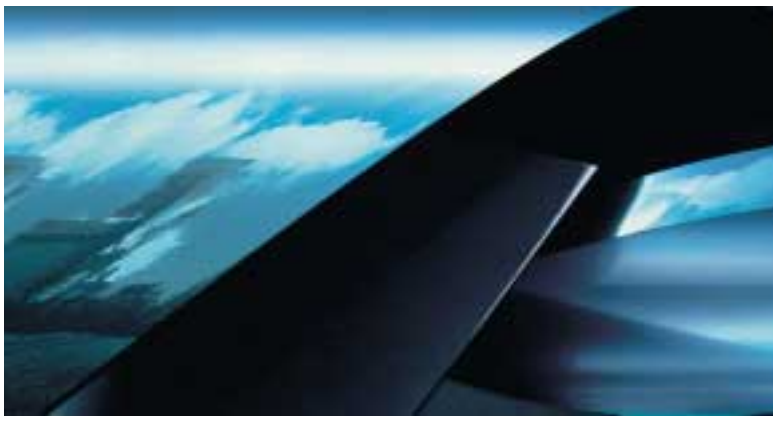
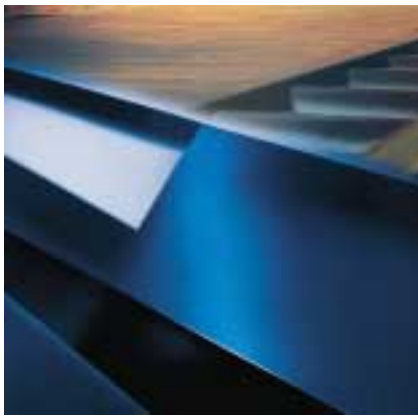
High-performance alloys:
The key to innovative solutions.





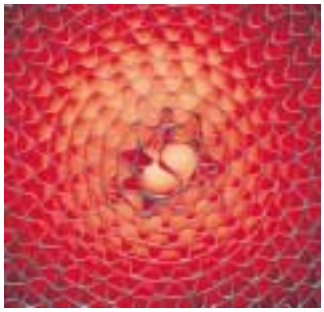
A company of
ThyssenKrupp
Stainless

ThyssenKrupp VDM

ThyssenKrupp



Welcome to ThyssenKrupp VDM.



Wherever established technologies are stretched to their limits and new ones created, is the world of ThyssenKrupp VDM. High-performance alloys play vital roles in our industrial society, guaranteeing that technological innovation will be both practically and economically viable. Now more than ever, advances in leading-edge materials are the precondition for all progress.

Creativity and innovation are the raw ingredients for developments that are eagerly awaited around the world. The quality of ideas is demonstrated not only in the form of products, but also in sophisticated processes and organizational procedures. Corporate policies put the customer at the very center of all our decision-making processes. This philosophy makes uncompromising quality the focus of all activities, the ultimate stimulus to technological development.

ThyssenKrupp VDM.
New ideas start here.

We've been developing materials for the most demanding applications for many decades. This experience has made us one of the world's leading suppliers of high-performance alloys.
Our product range is correspondingly broad and varied. It includes semi-finished items in nickel-based alloys and special stainless steels, coin blanks, finished components in soft magnetic alloys, punched and shaped components. They meet the specific needs of a diverse range of industries.

Our special strengths are in the development of tailor-made material concepts and new manufacturing technologies. ThyssenKrupp VDM materials are key elements of many branches of industry, vital to the feasibility and practical implementation of entire technologies. ThyssenKrupp VDM supplies allround packages to energy and environmental engineering, electronics and electrical engineering, the automotive industry, aerospace, chemicals and petrochemicals, agrichemicals, pharmaceuticals, pulp and paper, offshore and marine engineering, and the construction of industrial furnaces.

There are many convincing arguments in favor of classical metals. Cost-benefit analyses are frequently decisive, in addition to the service properties required, in a decision for or against a particular material. Metals win on both counts. They will continue to play a dominant role in modern industry, especially when, as at ThyssenKrupp VDM, they are developed in close cooperation with users, focusing on cost-effectiveness. In today's complex market environment, with enormously diverse requirements and expectations, our principle is to tread new paths alongside our customers, making them the shortest routes to success.

ThyssenKrupp VDM experience covers more than a century of high-performance alloy making. Through constant research and innovation, coupled with modern manufacturing methods in which integrated quality control is foremost, ThyssenKrupp VDM provides a complete range of high-performance corrosion and heat resisting alloys. ThyssenKrupp VDM controls the whole production process, from the melting and alloying right through to the finishing operation.

Unna plant

Altena plant

Werdohl plant

Bärenstein plant

Melting and refining.

All ThyssenKrupp VDM alloys have their origin in the company's ultra-modern melting plant at Unna near Dortmund. The Unna plant is equipped for the melting and ladle treatment of high-nickel superalloys, high-alloy special stainless steels and copper-nickel alloys.
The sizes and arrangement of buildings, furnaces and materials handling facilities were designed for maximum efficiency in material flow and easy enlargement.

Melting processes
The duplex melting process of electric-arc primary melting followed by VOD refining was specially developed by Thyssen Krupp VDM for the production of nickel alloys and high-alloy special stainless steels.
A 30-tonne arc furnace as well as three 16-tonne induction furnaces are available for primary melting, alloying and refining. Secondary metallurgical treatments and fine adjustment of chemical composition are performed in the VOD facility. The operation takes place in a vacuum vessel using argon or nitrogen as stirring gas. Carefully controlled pressure reduction enables the carbon content to be reduced below 0.005 per cent. Hydrogen and nitrogen contents are simultaneously reduced to extremely low residual values. Metallurgical treatment follows in a ladle furnace.

A new VIM furnace is scheduled to start up in mid-2003.
It will be fitted with 20/30-tonne interchangeable vessels and set up in a separate shop beside the two remelting facilities (ESR and VAR). Unlike most other VIM furnaces, this one will allow liquid charging, thereby providing ThyssenKrupp VDM with an integrated melting shop for nickel-base materials.

Remelting
Certain materials for special applications require exceptionally high purity with segregation levels reduced to an absolute minimum. To this end, electrodes produced at the Unna plant are refined by electro-slag or vacuum-arc remelting.

Casting
After a final check of the chemical composition, the molten metal is released for casting. The majority of heats are cast by bottom pouring into ingot molds, with an argon shield to protect the metal stream from oxygen and nitrogen pick-up.

Quality assurance and control
By means of systematic quality checks, a continuous record is created for every heat. Such records are based on a comprehensive program of quality-assurance measures, such as chemical analyses, ultrasonic tests and surface inspection at defined production steps. Only when all results have been found satisfactory is material released for the next stage of processing. Quality assurance personnel are free to make any decision required in pursuit of their responsibilities and are totally independent of the production departments.

Product forms.

Flat rolled products
Sheet and strip in all their forms and variants are standard in our manufacturing program. The production center for cold-rolled sheet is our Altena plant. Slab is the starting point, carefully ground then sawn or plasma-cut to length prior to hot rolling.
Cold rolling is performed on a computer-controlled six-roll Sendzimir cold rolling mill, the world's-largest single-sheet reversing mill for widths up to 2,500 mm. Even difficult-to-deform materials can be processed to exceptionally large sheets using these methods, to tight tolerances and outstanding surface quality. Computer control is used at all stages of intermediate and final treatment, making it possible to meet even exceptional requirements quickly and easily.

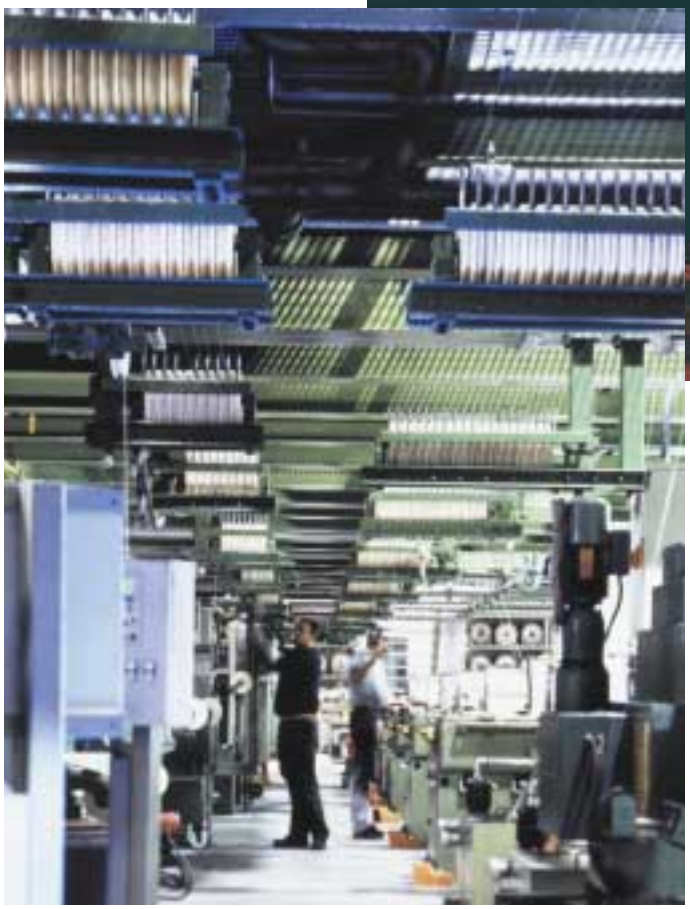
Cut-outs and drilled holes are made to customers' precise specifications. Flat products clad by explosive and roll-bonding processes are produced by associated companies.
Strip is produced in our Werdohl plant from rolled ingots or continuously cast slabs, reduced on a wide-strip hot-rolling mill. Cold rolling is performed on modern four-high mills or on a six-roll high-precision reversing mill, making it possible to produce wide strip up to 800 mm width and narrow strip up to 400 mm width and 0.06 mm thickness to the finest tolerances.

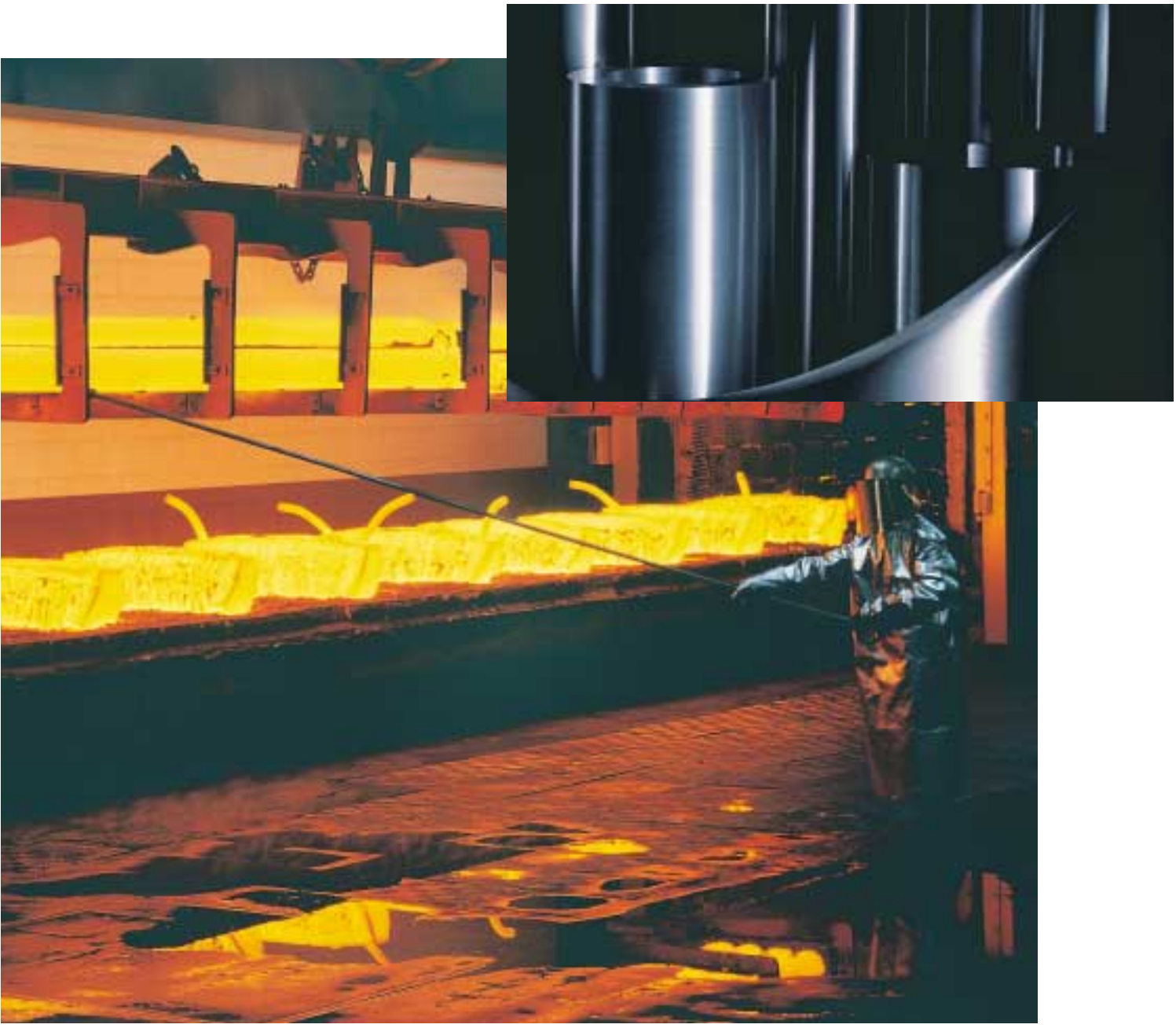
Foil is manufactured on a 20-roll mill, using ultramodern control electronics, in widths between 350 and 750 mm and thicknesses down to 0.02 mm.

Product forms.

Wire, rod and bar, welding consumables, seamless and welded tubes and pipes
Wire, rod and bar, forgings and material for seamless tube production, in every shape and size, are part of our standard range. We work closely with customers to achieve exactly the right solution for their needs. State-of-art production equipment enable us to achieve results that meet or exceed the requirements for national and international certification.
Continuous development of new process engineering materials requires corresponding progress in welding processes and filler metals. Our welding laboratory performs pathfinding work in this field, and has already solved welding problems encountered by many users of high-performance alloys. We are now one of the leading manufacturers of welding filler metals, with a range that includes wire, rod and strip-type electrodes as well as electrode core wire.

Bar, rod and forged materials are produced from cast and remelted ingots by hot rolling or forging. The special products range includes hammer forgings produced in varied shapes and sizes to customers' drawings, then finished to final dimensions.
Seamless and longitudinally welded tubes made from ThyssenKrupp VDM high-performance alloys are produced and marketed via a network of national and international alliances.
In the field of seamless tubing, we have an internationally distinguished associate in DMV STAINLESS.





Chemical and petrochemical industries.

Raw materials and sources of energy are becoming ever scarcer and more expensive, environmental legislation ever more stringent. At the same time, the demands made on processes and technologies are continually growing, and hence the standards set for materials and operating parameters. The close interaction between new chemical processes and advances in high-performance alloys is particularly apparent.

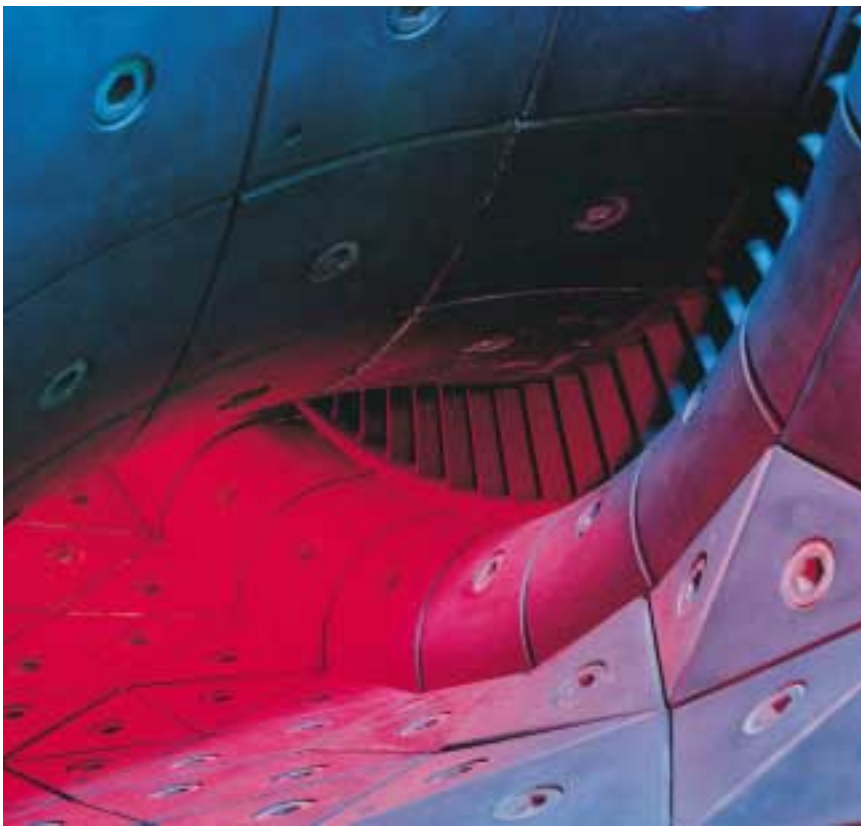
The chemicals industry is by tradition one of the largest users of high-quality corrosion- and heat-resistant materials. Our environmentally safe, process-oriented solutions put us at the forefront of development. ThyssenKrupp VDM alloys are used in many chemical industry applications, in plants for mineral and organic acids, in cellulose and paper production, in the fertilizer industry and in pharmaceuticals. They also play a vital role in the safe and efficient recycling of chemical wastes.

In petrochemicals, nickel-based alloys and high-temperature, creep-resistant stainless steels are needed for the production of plastics and synthetic fibers. The alloys' function is to extend the service-life of plant systems and individual components, prevent corrosion damage and ensure the purity of manufactured products.
Novel chemical and petrochemical processes rely on parallel developments in materials. Alloys such as Nicrofer 3127 hMo - alloy 31, a high-performance material displaying outstanding resistance in highly chloride containing media, or Nicrofer 3033 - alloy 33, a material developed in close cooperation with Bayer AG for oxidizing media. Nicrofer 5923 hMo - alloy 59, the most advanced alloy in the Ni-Cr-Mo family, has exhibited superior versatility in handling both oxidizing and reducing corrosive media and has replaced other "C" family alloys in many applications.

New corrosion-resistant materials for the chemical and petrochemical industries

ThyssenKrupp VDM alloy designation	W.-Nr.	UNS designation
Nicrofer 3033 - alloy 33	1.4591	R20033
Nicrofer 3127 hMo - alloy 31	1.4562	N08031
Nicrofer 5923 hMo - alloy 59	2.4605	N06059

Energy and the environment.



New ideas for environmental technology and the energy industry are more in demand than ever, and metallic materials are playing a decisive role. In the energy industry, they help both in enhancing efficiency and in achieving environmentally safe conversion of fossil fuels.
Our materials are no less in their element in the field of environmental technology. Based on hard-acquired know-how, alloys must fulfill exceptionally high demands.

Energy technology
High-efficiency heat-exchanger systems, gas turbine housings and the gasifier modules of combined-cycle power generating plants are vital components of these evolving technologies. Materials which remain strong even at elevated temperatures, are resistant to corrosion and heat, are easy to work and, above all, are readily available, are crucial for such developments.

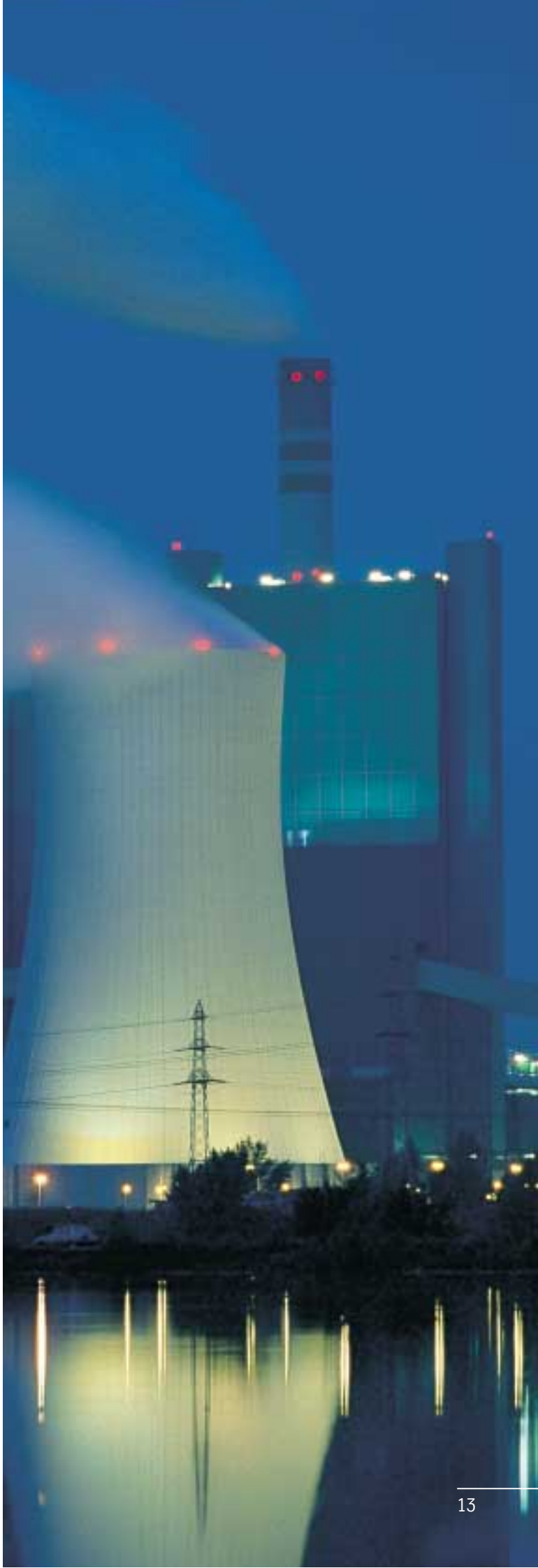
New and proven materials for energy and environmental technology

ThyssenKrupp VDM alloy designation	W.-Nr.	UNS designation
Nicrofer 45 TM - alloy 45 TM	2.4889	N06045
Nicrofer 6025 HT - alloy 602 CA	2.4633	N06025
Nicrofer 3127 hMo - alloy 31	1.4562	N08031
Nicrofer 5716 hMoW - alloy C-276	2.4819	N10276
Nicrofer 5923 hMo - alloy 59	2.4605	N06059

Flue-gas desulfurization
Flue-gas desulfurization systems are intrinsic parts of modern power-generating plants and, around the world, incorporate ThyssenKrupp VDM materials. Our alloys ensure environmentally safe operation, re-sisting corrosion at operating temperature and the aggres-sive attack of circulating fluids. They enhance not only system service life but also efficiency, even in retrofitted and converted plants. All Thyssen Krupp VDM alloys are completely recyclable.

Waste incineration
Incineration of waste materials is set to gain ever more importance, as space for landfill sites becomes prohibtively expensive and capacity scarcer. As a result of the miscellaneous range of waste materials processed, incineration produces complex and highly corrosive gases at temperatures up to 1000 °C. The need here is for materials with good hot strength and exceptional resistance to hydrogen chloride attack. ThyssenKrupp VDM has developed special alloys for protection against environmental problems in this field.

Waste-water treatment
To defend man's environment, the discharge of effluent into the world's seas and rivers is subject to limits. These cannot be met using conventional systems but are achievable using technologies such as evaporative concentration. End products are highly concentrated solutions and crystallized salts. Operating conditions are exceptionally corrosive. This is a field in which nickel alloys, Nicrofer 5923 hMo - alloy 59 in particular, and special stainless steels have proven their outstanding capabilities time and time again.



Industrial furnace construction.

Industrial furnace process conditions make enormous demands on constructional materials. The reasons include exposure to extreme operating temperatures under highly oxidizing conditions, in contact with aggressive compounds such as halogens. High-nickel alloys from Krupp VDM cover a broad range of requirements, and are certified suitable for exacting applications. High-alloy, austenitic special stainless steels can be used at temperatures below 850 °C, high-performance nickel alloys for temperatures above 850 °C up to approx. 1,200 °C. Furnace constructional materials must not only assure strength at high temperatures, but also have necessary resistance to corrosive attack. They must also be easily fabricable. In addition, many applications involve a need for welding operations. For high-nickel alloys, a range of weld filler materials is available with appropriate welding guidelines.

New high-temperature, high-strength materials for industrial furnace construction

ThyssenKrupp VDM alloy designation	W.-Nr.	UNS designation
Nicrofer 45 TM - alloy 45 TM	2.4889	N06045
Nicrofer 6025 HT - alloy 602 CA	2.4633	N06025

Transportation.

Travel nowadays has many different aspects. It's no longer just a question of the fastest way from A to B. Instead, that primary need must be reconciled with safety and urgent ecological priorities. Our alloys make convincing contributions to modern transport, by road, rail and in the air.
In the automotive industry, Aluchrom and Nicrofer alloys are used primarily in exhaust-gas catalytic converters. Examples are the support structures of metal units and the wire mesh in ceramic designs. In addition, we supply high-temperature creep-resistant alloys for exhaust manifolds, high-nickel wire for spark plugs, and the stems for diesel-engine exhaust valves.

In electric rail traction, Thyssen Krupp VDM products are present as the resistance-alloy wire and strip used in starting and braking resistors.
Our alloys are also in international demand for the aerospace industry, for instance: in jet engine combustors and the liquid-fuel tanks of Europe's Ariane launch vehicle. Our US subsidiary, Precision Rolled Products, Inc., with plants in Reno, Nevada, and Florham Park, New Jersey, supplies semi-finished starting materials for internal components and rings, especially high-temperature creep-resistant alloys for aircraft gas turbines and space exploration.

New and proven materials for the automotive industry

ThyssenKrupp VDM alloy designation	W.-Nr.	UNS designation
Aluchrom Y	1.4767	-
Aluchrom ISE	1.4767	-
Aluchrom YHf	1.4767	-

Oil and gas production, offshore engineering.

The exploitation of oil and natural gas reserves is one of the 20th century's greatest technological challenges - particularly at extreme depths and under highly adverse climatic conditions. Structural materials must withstand especially severe corrosive attack. Uncompromising quality assurance is a major factor in the construction and operation of off-shore facilities: Reduced risk of failure and enhancement of assured function also depend decisively on the materials used.
For this reason, physical and mechanical properties, and resistance to various types of corrosive media are critical to material selection.

ThyssenKrupp VDM corrosion-resistant alloys are used in safety, fire-fighting and product piping systems on oil and gas production platforms. They are also employed in the sheathing of platform colums and riser pipes in wave-exposed and tidal zones, as well as in flare stacks.
There is also a substantial demand for corrosion-resistant materials in seawater desalination plants. Our high-performance alloys are standard equipment in heat exchangers and other system components, such as water jackets and tubes containing the membranes of reverse osmosis plants.

New and proven corrosion-resistant materials for oil and gas production, offshore engineering

ThyssenKrupp VDM alloy designation	W.-Nr.	UNS designation
Nicrofer 3127 hMo - alloy 31	1.4562	N08031
Nicrofer 4221 - alloy 825	2.4858	N08825
Nicrofer 5923 hMo - alloy 59	2.4605	N06059
Nicrofer 6020 hMo - alloy 625	2.4856	N06625
Cronifer 1925 hMo - alloy 926	1.4529	N08926

ThyssenKrupp VDM high-performance materials and products.

ThyssenKrupp VDM alloy designation Werkstoff-Nr. *Designation* *UNS* *BS*	Typical analysis, wt.-%												
	Ni	Cr	Fe	C	Mn	Si	Cu	Mo	Co	Al	Ti	Nb	Others
Corrosion-resistant alloys													
Ni – NiCu													
VDM Nickel 99.2 – alloy 200 2.4066 *Ni 99.2* *N02200* *NA 11*	≥ 99.2	–	≤ 0.4	≤ 0.10	≤ 0.3	≤ 0.1	≤ 0.2	–	–	–	–	–	Mg ≤ 0.05
VDM LC-Nickel 99.2 – alloy 201 2.4068 *LC-Ni 99* *N02201* *NA 12*	≥ 99.0	–	≤ 0.4	≤ 0.02	≤ 0.3	≤ 0.1	≤ 0.2	–	–	–	0.01–0.10	–	Mg ≤ 0.05
VDM LC-Nickel 99.6 – alloy 205 2.4061 *LC-Ni 99.6* *N02205* –	≥ 99.6	–	≤ 0.2	≤ 0.02	≤ 0.3	≤ 0.1	≤ 0.1	–	–	–	0.01–0.10	–	Mg ≤ 0.05
Nicorros – alloy 400 2.4360 *NiCu30Fe* *N04400* *NA 13*	≥ 63.0	–	1.0 – 2.5	≤ 0.15	≤ 1.25	≤ 0.5	28.0–34.0	–	–	≤ 0.5	≤ 0.3	–	Mg ≤ 0.05
Nicorros Al – alloy K-500 2.4375 *NiCu30Al* *N05500* *NA 18*	≥ 63.0	–	0.5–2.0	≤ 0.25	≤ 1.5	≤ 0.5	27.0–33.0	–	–	2.3–3.15	0.35–0.85	–	Mg ≤ 0.05
NiMo – NiCrMo – NiCrFeMo – superalloys													
Nimofer 6928 – alloy B-2 2.4617 *NiMo28* *N10665* –	balance	0.4–1.0	1.6–2.0	≤ 0.01	≤ 1.0	≤ 0.08	≤ 0.5	26.0–30.0	≤ 1.0	–	–	–	–
Nimofer 6224 – alloy B-10 2.4710 *NiMo23Cr8Fe* *N10624* –	≥ 58.0	6.0–10.0	5.8–8.0	≤ 0.01	≤ 1.0	≤ 0.1	≤ 0.5	21.0–25.0	–	≤ 0.5	–	–	–
Nicrofer 6616 hMo – alloy C-4 2.4610 *NiMo16Cr16Ti* *N06455* –	balance	14.5–17.5	≤ 3.0	≤ 0.009	≤ 1.0	≤ 0.05	–	14.0–17.0	≤ 2.0	–	≤ 0.7	–	–
Nicrofer 6020 hMo – alloy 625 2.4856 *NiCr22Mo9Nb* *N06625* *NA 21*	balance	21.0–23.0	≤ 3.0	≤ 0.025	≤ 0.40	≤ 0.40	–	8.0–10.0	≤ 1.0	≤ 0.40	≤ 0.4	3.2–3.8	–
Nicrofer 5923 hMo – alloy 59 2.4605 *NiCr23Mo16Al* *N06059* –	balance	22.0–24.0	≤ 1.5	≤ 0.010	≤ 0.5	≤ 0.10	–	15.0–16.5	≤ 0.3	0.1–0.4	–	–	–
Nicrofer 5716 hMoW – alloy C-276 2.4819 *NiMo16Cr15W* *N10276* –	balance	15.0–16.5	4.0–7.0	≤ 0.010	≤ 1.0	≤ 0.08	–	15.0–17.0	≤ 2.5	–	–	–	W 3.0–4.5, V 0.1–0.3
Nicrofer 5219 Nb – alloy 718 2.4668 *NiCr19NbMo* *N07718* –	50.0–55.0	17.0–21.0	balance	0.02–0.08	≤ 0.35	≤ 0.35	≤ 0.20	2.8–3.3	≤ 1.0	0.3–0.7	0.7–1.15	4.8–5.5	B 0.002–0.006
Nicrofer 5020 hMo – alloy 50 PLUS 2.4850 *NiCr20Fe14Mo11WN*	balance	18.0–21.0	12.0–16.0	≤ 0.03	≤ 0.5	≤ 0.5	–	9.5–12.5	–	0.05–0.50	≤ 0.1	0.05–0.50	Nb 0.05–0.50 N 0.05–0.20 W 0.05–2.5 Ca 0.001–0.010 Zr 0.001–0.030
Nicrofer 4823 hMo – alloy G-3 2.4619 *NiCr22Mo7Cu* *N06985* –	balance	21.5–23.5	18.0–21.0	≤ 0.015	≤ 1.0	≤ 1.0	1.5–2.5	6.0–8.0	≤ 5.0	–	–	0.2–0.5	W ≤ 1.5

Production of seamless tubes and pipes is carried out at DMV STAINLESS SAS using stock supplied by ThyssenKrupp VDM.
Seam-welded tubes and pipes are obtainable from reputed manufacturers and are produced from stock supplied by Krupp VDM.

Available product form				Filler Metal for GTAW TIG/TIG Hot Wire and GMAW MIG/MAG	**Major applications**
Sheet, plate	Strip	Wire	Rod, bar		
●	●	●	●	VDM Nickel S 9604 – FM 61	Caustic manufacture and storage equipment, VCM production equipment, food processing equipment.
●	●	●	●	VDM Nickel S 9604 – FM 61	Caustic evaporators operating above 600 °F (315 °C), synthetic fiber production.
●	●	●	●	VDM Nickel S 9604 – FM 61	Magnetostrictive devices.
●	●	●	●	Nicorros S 6530 – FM 60	Chemical processing equipment, petroleum refining and production equipment, feedwater heaters, salt production equipment.
	●	●	●	Nicorros S 6530 – FM 60	Pump and propeller shafts, doctor blades, oil well drill collars.
●	●	●	●	Nimofer S 6928 – FM B-2	Chemical processing for equipment handling hydrochloric, sulfuric, acetic and phosphoric acids.
●	●	●	●	Nimofer S 6224 – FM B-10	Heat-recovery systems in flue-gas desulfurization plants. Flue-gas scrubbers of thermal waste incineration plants. Equipment for the recovery of waste sulfuric acid under reducing conditions. Metal pickling plants.
●	●	●	●	Nicrofer S 6616 – FM C-4	Acetic acid production equipment, fertilizer and pesticide production equipment.
●	●	●	●	Nicrofer S 6020 – FM 625	Chemical and petrochemical processing equipment, offshore oil and gas production equipment.
●	●	●	●	Nicrofer S 5923 – FM 59	Flue-gas scrubbers and other pollution-control equipment of fossil-fired power stations and waste incineration plants, chemical processing equipment, pulp and paper industry. Marine/offshore environment, waste water treatment. **The most versatile alloy.**
●	●	●	●	Nicrofer S 5923 – FM 59 or Nicrofer S 5716 – FM C-276	Critical chemical and petrochemical processing equipment, pulp and paper industry, pollution-control equipment.
●		●	●	Nicrofer S 5219 – FM 718	Pump shafts and other components in offshore and marine engineering.
	●	●		Nicrofer S 5020 – FM 50	Chemical processing equipment. As the filler metal Nicrofer S 5020 for industrial engineering: e.g. for weld-cladding of boiler tubes in waste incineration plants.
●		●	●	Nicrofer S 6020 – FM 625	Sulfuric and phosphoric acid manufacture and handling equipment,

ThyssenKrupp VDM high-performance materials and products.

ThyssenKrupp VDM alloy designation Werkstoff-Nr. *Designation* *UNS* *BS*	Typical analysis, wt.-%												
	Ni	Cr	Fe	C	Mn	Si	Cu	Mo	Co	Al	Ti	Nb	Others
Corrosion-resistant alloys													
NiCrFe – FeNiCrMo – standard alloys													
Nicrofer 7216 LC – alloy 600 L 2.4817 *LC-NiCr15Fe* *N06602* *NA 14*	≥ 72.0	14.0–17.0	6.0–10.0	≤ 0.025	≤ 1.0	≤ 0.5	≤ 0.5	–	–	≤ 0.3	≤ 0.3	–	B ≤ 0.006
Nicrofer 6030 – alloy 690 2.4642 *NiCr29Fe* *N06690* –	≥ 60.0	27.0–30.0	8.0–10.0	≤ 0.02	≤ 0.3	≤ 0.3	≤ 0.5	–	–	≤ 0.3	≤ 0.3	–	–
Nicrofer 4221 – alloy 825 2.4858 *NiCr21Mo* *N08825* *NA 16*	38.0–46.0	19.5–23.5	balance	≤ 0.025	≤ 1.0	≤ 0.5	1.5–3.0	2.5–3.5	–	≤ 0.2	0.6–1.2	–	(C 0.04–0.06 available on request)
Nicrofer 3620 Nb – alloy 20 2.4660 *NiCr20CuMo* *N08020* –	36.5–38.0	19.0–21.0	balance	≤ 0.02	1.0–2.0	≤ 0.7	3.0–4.0	–	–	0.15–0.40	0.35–0.60	–	Al+Ti ≤ 1.0
Nicrofer 3220 – alloy 800 1.4876 | 1.4958 *X10NiCrAlTi32-20* | *X5NiCrAlTi31-20 RK* *N08800* | – *NA 15* | –	30.0–32.0	19.0–21.5	balance	0.04–0.08	0.5–1.0	0.2–0.6	≤ 0.5	–	–	0.20–0.40	0.20–0.50	–	Al+Ti ≤ 1.0
Nicrofer 3127 hMo – alloy 31 1.4562 *X1NiCrMoCu32-28-7* *N08031* –	30.0–32.0	26.0–28.0	balance	≤ 0.015	≤ 2.0	≤ 0.3	1.0–1.4	6.0–7.0	–	–	–	–	N 0.15–0.25
Nicrofer 3127 LC – alloy 28 1.4563 *X1NiCrMoCuN31-27-4* *N08028* –	30.0–32.0	26.0–28.0	balance	≤ 0.015	≤ 2.0	≤ 0.7	1.0–1.4	3.0–4.0	–	–	–	–	N 0.04–0.07
FeNiCr – special stainless steels													
Nicrofer 3033 – alloy 33 1.4591 *X1CrNiMoCuN33-32-1* *R20033* –	30.0–33.0 –	31.0–35.0	balance	≤ 0.015	≤ 2.0	≤ 0.5	0.3–1.2	0.5–2.0	–	–	–	–	N 0.35–0.60 P ≤ 0.02 S ≤ 0.01
Cronifer 2525 LCN 1.4465 *X1CrNiMoN25-25-2* *(N08310)* –	24.0–25.0	24.0–25.5	balance	≤ 0.02	1.5–2.0	≤ 0.5	≤ 1.0	2.0–2.5	–	–	–	–	N 0.10–0.16
Cronifer 1925 hMo – alloy 926 1.4529 *X1NiCrMoCuN25-20-7* *N08926* –	24.5–25.5	20.0–21.0	balance	≤ 0.02	≤ 1.0	≤ 0.5	0.8–1.0	6.0–6.8	–	–	–	–	N 0.18–0.20
CuNi													
Cunifer 30 – alloy CuNi70/30 2.0882 *CuNi30Mn1Fe* *C71500* *CN 107*	30.0–32.0	–	0.4–1.0	≤ 0.02	0.5–1.0	–	balance	–	–	–	–	–	Zn ≤ 0.5 Pb ≤ 0.02
Cunifer 10 – alloy CuNi90/10 2.0872 *CuNi10Fe1Mn* *C70600* *CN 102*	9.0–11.0	–	1.0–1.8	≤ 0.05	0.5–1.0	–	balance	–	–	–	–	–	Zn ≤ 0.5 Pb ≤ 0.01

Production of seamless tubes and pipes is carried out at DMV Stainless SAS using stock supplied by ThyssenKrupp VDM.
Seam-welded tubes and pipes are obtainable from reputed manufacturers and are produced from stock supplied by ThyssenKrupp VDM.

Available product form				Filler Metal for GTAW TIG/TIG Hot Wire and GMAW MIG/MAG	**Major applications**
Sheet, plate	Strip	Wire	Rod, bar		
●	●	●	●	Nicrofer S 7020 – FM 82	Caustic and VCM production and processing, pulp and paper industry, nuclear engineering.
●		●	●	Nicrofer S 7020 – FM 82 or Nicrofer S 6030 – FM 690	Nuclear engineering. Steam generators in pressurized water reactors.
●	●	●	●	Nicrofer S 6020 – FM 625	Sulfuric and phosphoric acid manufacture and handling, pickling equipment, offshore oil and gas production and processing.
●	●	●	●	Nicrofer S 5923 – FM 59 or Nicrofer S 6020 – FM 625	Sulfuric and phosphoric acid manufacture and processing, crude oil distillation, pharmaceuticals and plastics.
●	●	●	●	Nicrofer S 7020 – FM 82	Acetic anhydrite production, chemical process piping and heat-exchanger tubes, nuclear engineering.
●	●	●	●	Nicrofer S 5923 – FM 59 or Nicrofer S 3127 – FM 31	Flue-gas scrubbers and other pollution-control equipment of fossil-fired power stations and waste incineration plants, pulp and paper industry, marine and offshore engineering.
●	●	●	●	Nicrofer S 6020 – FM 625 or Nicrofer S 3028 – FM 28	Nitric, sulfuric and phosphoric acid production and processing, seawater cooling.
●	●	●	●	Nicrofer S 3033	Sulfuric, phosphoric, nitric and fluoric acid production and processing, caustic manufacture and handling, pulp and paper industry.
●				matching	Urea and sulfuric acid manufacture and processing.
●	●	●	●	Nicrofer S 5923 – FM 59	Sulfuric and phosphoric acid manufacture, processing and handling, pulp and paper industry, seawater cooling, offshore oil and gas production, flue-gas scrubbers and other pollution-control equipment.
●	●	●	●	Cunifer S 7030 – FM 67	Seawater piping systems on ships, offshore oil and gas production platforms, seawater desalination plants.
●		●	●	Cunifer S 7030 – FM 67	Seawater piping systems on ships, offshore oil and gas production platforms, seawater desalination plants.

ThyssenKrupp VDM high-performance materials and products.

ThyssenKrupp VDM alloy designation Werkstoff-Nr. *Designation* *UNS* *BS*	Typical analysis, wt.-% Ni	Cr	Fe	C	Mn	Si	Cu	Mo	Co	Al	Ti	Nb	Others
Heat-resistant alloys													
NiCrFe – FeNiCr													
Nicrofer 7520 – alloy 75 2.4951 *NiCr20Ti* *N06075* *HR 203*	balance	19.0–21.0	≤ 5.0	0.08–0.13	≤ 1.0	0.3–0.7	≤ 0.5	–	–	≤ 0.3	0.2–0.6	–	–
Nicrofer 7216 – alloy 600 2.4816 *NiCr15Fe* *N06600* *NA 14*	≥ 72.0	14.0–17.0	6.0–10.0	0.05 0.08	≤ 1.0	≤ 0.5	≤ 0.5	–	–	≤ 0.3	≤ 0.3	–	B ≤ 0.006
Nicrofer 6030 – alloy 690 2.4642 *NiCr29Fe* *N06690* –	≥ 60.0	27.0–30.0	8.0–10.0	≤ 0.02	≤ 0.3	≤ 0.3	≤ 0.5	–	–	≤ 0.3	≤ 0.3	–	–
Nicrofer 6023 – alloy 601 2.4851 *NiCr23Fe* *N06601* –	58.0–63.0	22.0–24.0	balance	0.03 0.08	≤ 0.8	≤ 0.5	≤ 0.5	–	–	1.1–1.6	0.1–0.4	–	–
Nicrofer 3718 So – alloy DS 1.4862 *X8NiCrSi38-18* – *NA 17*	35.0–39.0	17.0–19.0	balance	≤ 0.10	0.8–1.5	1.9–2.5	≤ 0.5	–	–	–	≤ 0.20	–	–
Nicrofer 3718 – (alloy 330) 1.4864 *X12NiCrSi36-16* *(N08330)* –	34.0–37.0	15.0–17.0	balance	≤ 0.15	≤ 2.0	1.0–2.0	–	–	–	–	≤ 0.20	–	(N ≤ 0.11)
High-temperature, high-strength alloys													
NiCr – NiCrFe – NiCrMo – NiCrCoMo – superalloys													
Nicrofer 7520 Ti – alloy 80 A 2.4952 *NiCr20TiAl* *N07080* *NA 20*	balance	19.0–21.0	≤ 1.0	0.04–0.09	≤ 1.0	≤ 0.5	–	–	≤ 2.0	1.1–1.7	2.0–2.6	0.70–1.20	–
Nicrofer 7016 TiNb – alloy X-750 2.4669 *NiCr15Fe7TiAl* *N07750* –	≥ 70.0	14.0–17.0	5.0–9.0	≤ 0.08	≤ 1.0	≤ 0.50	≤ 0.50	–	(≤ 1.0)	0.40–1.00	2.25–2.75	0.70–1.20	–
Nicrofer 7016 TiAl – alloy 751 2.4694 *NiCr16Fe7TiAl* *N07751* –	≥ 70.0	15.0–17.0	5.0–9.0	≤ 0.08	–	–	–	–	–	1.0–1.6	2.0–2.6	0.80–1.20	–
Nicrofer 6025 HT – alloy 602 CA 2.4633 *NiCr25FeAlY* *N06025* –	balance	24.0–26.0	8.0–11.0	0.15–0.25	≤ 0.1	≤ 0.5	≤ 0.1	–	–	1.8–2.4	0.1–0.2	–	Y 0.05–0.12, Zr 0.01–0.10
Nicrofer 5520 Co – alloy 617 2.4663 *NiCr23Co12Mo* *N06617* –	balance	20.0–23.0	≤ 2.0	0.05–0.10	≤ 0.70	≤ 0.70	–	8.0–10.0	10.0–13.0	0.60–1.50	0.20–0.60	–	–
Nicrofer 5219 Nb – alloy 718 2.4668 *NiCr19NbMo* *N07718* –	50.0–55.0	17.0–21.0	balance	0.02–0.08	≤ 0.35	≤ 0.35	≤ 0.20	2.8–3.3	≤ 1.0	0.30–0.70	0.70–1.15	4.8–5.5	B 0.002–0.006
Nicrofer 5120 CoTi – alloy C-263 2.4650 *NiCo20Cr20MoTi* *N07263* *HR 206*	balance	19.0–21.0	≤ 0.7	0.04–0.08	≤ 0.6	≤ 0.4	≤ 0.2	5.6–6.1	19.0–21.0	0.30–0.60	1.90–2.40	–	Al+Ti 2.40–2.80, B ≤ 0.005
Nicrofer 4722 Co – alloy X 2.4665 *NiCr22Fe18Mo* *N06002* *HR 204*	balance	20.5–23.5	17.0–20.0	0.05–0.15	≤ 1.0	≤ 1.0	–	8.0–10.0	0.5–2.5	≤ 0.10	–	–	W 0.2–1.0, B ≤ 0.005
Nicrofer 4626 MoW – alloy 333 2.4608 *NiCr26MoW* *N06333* –	44.0–47.0	24.0–26.0	balance	0.03–0.06	1.2–2.0	0.8–1.2	≤ 0.5	2.5–3.5	2.5–3.5	–	0.1–0.2	–	W 2.5–3.5

Production of seamless tubes and pipes is carried out at DMV Stainless SAS using stock supplied by ThyssenKrupp VDM.
Seam-welded tubes and pipes are obtainable from reputed manufacturers and are produced from stock supplied by ThyssenKrupp VDM.

Available product form				Filler Metal for GTAW TIG/TIG Hot Wire and GMAW MIG/MAG	**Major applications**
Sheet, plate	Strip	Wire	Rod, bar		
●	●	●		Nicrofer S 7020 – FM 82	Sheet-metal fabrications in gas turbines, flame tubes and other equipment in heat-treatment furnaces.
●	●	●	●	Nicrofer S 7020 – FM 82	Furnace components, production of VCM, titanium dioxide, aluminium fluoride and chloride.
●		●	●	Nicrofer S 7020 – FM 82 or Nicrofer S 6030 – FM 690	PWA steam generators, heavy-oil fired furnace components.
	●	●	●	Nicrofer S 6025 – FM 602	Furnace components, radiant tubes, catalytic converters for the detoxification of exhaust gases from combustion engines, combustion chambers of waste incineration plants.
●	●	●	●	Nicrofer S 7020 – FM 82	High-temperature carburizing or carbonitriding furnace components, radiant tubes, thermocouple tubes, flare-stack tips.
●			●	Nicrofer S 7020 – FM 82	Furnace components such as muffles, conveyor systems, baskets, radiant tubes.
			●	Nicrofer S 7020 – FM 82	Gas turbine components, steam turbine bolting. Diesel engine exhaust valves.
●	●		●	Nicrofer S 7020 – FM 82	Gas turbine components, extrusion dies and forming tools, springs and bolts also for nuclear reactors.
		●	●	Nicrofer S 7020 – FM 82	Internal combustion engine exhaust valves.
●	●	●	●	Nicrofer S 6025 – FM 602	Radiant tubes, furnace rollers, furnace muffles and other components, pigtails in reformer furnaces, components for the detoxification of exhaust gases (catalytic support systems). Nuclear waste vitrification units.
●	●	●	●	Nicrofer S 5520 – FM 617	Non-rotating, high-temperature gas-turbine components, furnace components, radiant tubes, nitric acid catalyst supports.
●		●	●	Nicrofer S 5219 – FM 718	Highly stressed parts in gas turbines and rocket engines, springs, bolting and 'egg crates' in nuclear reactors.
●	●	●	●	Nicrofer S 5120 – FM 263	Non-rotating, high temperature gas turbine components such as rings, casings, transition liners, combustion chambers.
●	●		●	Nicrofer S 4722 – FM X	Gas turbine components such as combustion chambers, rings; heat-treatment furnace components such as rollers, fasteners; nitric acid catalyst supports.
●		●	●	Nicrofer S 4626 – FM 333	Non-rotating, high-temperature gas turbine components, heat-treatment furnace components such as muffles, rollers, radiant tubes.

ThyssenKrupp VDM high-performance materials and products.

ThyssenKrupp VDM alloy designation Werkstoff-Nr. *Designation* *UNS* *BS*	Typical analysis, wt.-%												
	Ni	Cr	Fe	C	Mn	Si	Cu	Mo	Co	Al	Ti	Nb	Others
High-temperature, high-strength alloys													
NiCrFe – FeNiCr – standard alloys													
Nicrofer 7216 H – alloy 600 H 2.4816 *NiCr15Fe* *N06600* *NA 14 (H)*	≥ 72.0	14.0–17.0	6.0–10.0	0.05–0.08	≤ 1.0	≤ 0.5	≤ 0.5	–	–	≤ 0.3	≤ 0.3	–	B ≤ 0.006
Nicrofer 6023 H – alloy 601 H 2.4851 *NiCr23Fe* *N06601* –	58.0–63.0	22.0–24.0	balance	≤ 0.10	≤ 0.6	≤ 0.5	≤ 0.5	–	–	1.1–1.6	0.3–0.6	–	Zr ≤ 0.03
Nicrofer 45 TM – alloy 45 TM 2.4889 *NiCr28FeSiCe* *N06045* –	≥ 45.0	26.0–29.0	21.0–25.0	0.05–0.12	≤ 1.0	2.5–3.0	≤ 0.3	–	–	–	–	–	RE 0.05–0.15 (Ce 0.03–0.09)
Nicrofer 3220 HP – alloy 800 HP 1.4959 *X8NiCrAlTi32-21* *N08811* –	30.0–32.0	19.0–22.0	balance	0.06–0.10	0.5–1.0	0.2–0.6	≤ 0.5	–	–	0.30–0.60	0.30–0.60	–	(Al+Ti) 0.85–1.20
Nicrofer 3220 H – alloy 800 H 1.4876 | 1.4958 *X10NiCrAlTi32-20* | *X5NiCrAlTi31-20* *N08810* | *N08810* *NA 15 (H)* | *NA 15 (H)*	30.0–32.0	19.0–21.0	balance	0.06–0.08	0.5–1.0	0.2–0.6	≤ 0.5	–	–	0.20–0.40	0.20–0.50	–	(Al+Ti) ≤ 0.7
CoCrNiW													
Conicro 5010 W – alloy 25 2.4964 *CoCr20W15Ni* *R30605* *HR 240*	9.0–11.0	19.0–21.0	≤ 3.0	0.05–0.15	1.0–2.0	≤ 0.3	–	–	balance	–	–	–	W 14.0–16.0
Conicro 4023 W – alloy 188 2.4683 *CoCr22NiW* *R30188* –	20.0–24.0	20.0–24.0	≤ 3.0	0.05–0.15	≤ 1.25	0.2–0.4	–	–	balance	≤ 0.20	–	–	W 13.0–16.0, La 0.02–0.12, B ≤ 0.01
Heating-element and resistance alloys													
NiCr – FeCrAl													
Cronix 80 – alloy NiCr 80/20 2.4869 *NiCr80-20* *N06003* –	balance	19.0–21.0	≤ 1.0	≤ 0.08	≤ 1.0	1.0–1.5	≤ 0.5	–	–	≤ 0.20	–	–	RE 0.01–0.04
Cronix 70 – alloy NiCr 70/30 2.4658 *NiCr70-30* *N06008* –	balance	29.0–31.0	≤ 1.0	≤ 0.07	≤ 1.0	1.0–1.5	≤ 0.5	–	–	≤ 0.20	–	–	RE 0.01–0.04
Aluchrom Y ~ 1.4767 *(CrAl22-5)Y* – –	≤ 0.3	20.0–22.0	balance	0.01–0.10	≤ 0.5	≤ 0.3	–	–	–	5.0–6.0	0.01–0.10	–	Zr 0.01–0.10, Y 0.05–0.15
Aluchrom ISE ~ 1.4767 *(CrAl20-5)SE* – –	≤ 0.3	19.0–21.0	balance	≤ 0.10	≤ 0.5	≤ 0.5	–	–	–	4.5–5.5	≤ 0.10	–	RE 0.01–0.10, N ≤ 0.02
Aluchrom YHf ~ 1.4767 *(CrAl22-5)YHf* – –	≤ 0.3	19.0–21.0	balance	≤ 0.10	≤ 0.5	≤ 0.5	–	–	–	5.0–6.0	–	–	Y 0.02–0.1, Zr 0.02–0.1, Hf 0.02–0.1
Controlled expansion and glass-sealing alloys													
FeNi – FeNiCo													
Pernifer 36 – alloy 36 1.3912 *Ni36* *K 93600/601* –	35.0–37.0	≤ 0.2	balance	≤ 0.03	≤ 0.35	≤ 0.2	–	–	≤ 0.5	–	–	–	–
Pernifer 2918 1.3981 *NiCo29-18* *K 94610* –	28.0–29.5	–	balance	≤ 0.03	≤ 0.3	≤ 0.2	≤ 0.2	–	16.5–18.0	≤ 0.05	≤ 0.1	–	(Al+Mg+ Zr+Ti) ≤ 0.20

Production of seamless tubes and pipes is carried out at DMV Stainless SAS using stock supplied by ThyssenKrupp VDM.
Seam-welded tubes and pipes are obtainable from reputed manufacturers and are produced from stock supplied by ThyssenKrupp VDM.

Available product form				Filler Metal for GTAW TIG/TIG Hot Wire and GMAW MIG/MAG	**Major applications**
Sheet, plate	Strip	Wire	Rod, bar		
●	●		●	Nicrofer S 6020 – FM 625 or Nicrofer S 7020 – FM 82	Bright-annealing furnace components such as muffles, radiant tubes, baskets, catalyst regenerators in petrochemical processes.
●	●	●	●	Nicrofer S 6025 – FM 602	Heat-treatment furnace components such as muffles, rollers, waste incinerators, gas-turbine components, flare stack tips.
●		●	●	Nicrofer S 3028 – FM 28	Coal gasification and waste incineration components, heat-treatment and industrial furnace components.
●			●	Nicrofer S 7020 – FM 82 or matching (S 2133)	Heat-treatment furnace components such as radiant tubes, fans, conveyors, chemical and power plant superheater tubes.
●	●	●	●	Nicrofer S 7020 – FM 82 or matching (S 2133)	Heat-treatment furnace components such as radiant tubes, fans, conveyors, chemical and power plant superheater and reheater tubes.
●	●	●	●	Conicro S 5010 – FM 25	Gas-turbine components, furnace rollers, muffles and radiant tubes, high-temperature valves and springs.
●	●	●	●	Conicro S 4023 – FM 188	Gas-turbine components, furnace rollers and muffles, high-temperature valves and springs.

●	●	●	●	matching	Industrial electric furnaces, enamelling furnaces.
●	●	●	●	matching and Nicrofer S 7020 – FM 82	Industrial electric furnaces.
	●	●		matching	Metal supports for car exhaust gas catalytic converters. Industrial electric furnaces.
	●	●		matching	Metal supports for car exhaust gas catalytic converters. Industrial electric furnaces.
	●			matching	Metal supports for car exhaust gas catalytic converters.

●	●	●		Nicrofer S 7020 – FM 82 or matching	Measuring instruments, thermostatic elements, laser welding equipment, tanks for liquefied natural gas.
●	●	●		matching	Glass/ceramic-to-metal seals, lead wires and frames, transistor caps, X-ray tubes.

Availability.

ThyssenKrupp VDM materials are available in the following standard product forms:

Sheet & plate
Conditions:
cold rolled, (for cut-to-length availability, refer to strip)

Conditions:
hot or cold rolled (hr, cr), thermally treated and pickled

Thickness mm	hr / cr	Width[1] mm	Length[1] mm
1.10 – < 1.50	cr	2000	8000
1.50 – < 3.00	cr	2500	8000
3.00 – < 7.50	cr / hr	2500	8000
7.50 – < 25.00	hr	2500	8000[2]
> 25.00[1]	hr	2500[2]	8000[2]

inches		inches	inches
0.043 – < 0.060	cr	80	320
0.060 – < 0.120	cr	100	320
0.120 – < 0.300	cr / hr	100	320
0.300 – < 1.000	hr	100	320[2]
> 1.000[1]	hr	100[1]	320[2]

[1] other sizes subject to special enquiry
[2] depending on piece weight

Discs and rings
Conditions:
hot rolled or forged, thermally treated,
descaled or pickled or machined;
some heat-resistant, high-temperature alloys
also available in oxidized condition.

Product	Weight kg	Thickness mm	O. D.[1] mm	I. D.[1] mm
Disc	≤ 10000	≤ 300	≤ 3000	
Ring	≤ 3000	≤ 200	≤ 2500	on request

	lbs	inches	inches	inches
Disc	≤ 22000	≤ 12	≤ 120	
Ring	≤ 6600	≤ 8	≤ 100	on request

[1] other sizes subject to special enquiry

Rod & bar
Conditions:
forged, rolled, drawn, thermally treated,
descaled or pickled, machined, peeled or ground;
some heat-resistant, high-temperature alloys
also available in oxidized condition.

Product	Forged[1] mm	Rolled[1] mm	Drawn[1] mm
Rod (O. D.)	≤ 600	8 – 60	12 – 50
Bar, square (a)	40 – 600	15 – 280	Not standard
Bar, flat (a x b)	(40 – 80) x (200 – 600)	(5 – 20) x (120 – 600)	(10 – 20) x (30 – 80)
Bar, hexagonal (s)	40 – 80	13 – 41	≤ 50

	inches	inches	inches
Rod (O. D.)	≤ 24	$^{5}/_{16}$ – 2 $^{3}/_{8}$	$^{1}/_{2}$ – 2
Bar, square (a)	$1^{5}/_{8}$ – 24	10/16 – 11	Not standard
Bar, flat (a x b)	($1^{5}/_{8}$ – $3^{1}/_{8}$) x (8 – 24)	($^{3}/_{16}$ – $^{3}/_{4}$) x ($4^{3}/_{4}$ – 24)	($^{3}/_{8}$ – $^{3}/_{4}$) x ($1^{1}/_{4}$ – $3^{1}/_{8}$)
Bar, hexagonal (s)	$1^{5}/_{8}$ – $3^{1}/_{8}$	$^{1}/_{2}$ – $1^{5}/_{8}$	≤ 2

[1] other sizes subject to special enquiry

Forgings
Shapes other than discs, rings, rod and bar are subject to special enquiry. Flanges and hollow shafts may be available up to a piece weight of 10 t.

Strip[1]
Conditions:
cold rolled, thermally treated and pickled or bright annealed[2].

Thickness mm	Width[3] mm	Coil I. D. mm			
0.02 – < 0.10	4 – 200[4]	300	400		
> 0.10 – ≤ 0.20	4 – 350[4]	300	400	500	
> 0.20 – ≤ 0.25	4 – 750		400	500	600
> 0.25 – ≤ 0.60	6 – 750		400	500	600
> 0.60 – ≤ 1.0	8 – 750		400	500	600
> 1.0 – ≤ 2.0	15 – 750		400	500	600
> 2.0 – ≤ 3.0	25 – 750		400	500	600

inches	inches	inches			
0.0008 – < 0.004	0.16 – 8[4)]	12	16		
> 0.004 – ≤ 0.008	0.16 – 14[4)]	12	16	20	
> 0.008 – ≤ 0.010	0.16 – 30		16	20	24
> 0.010 – ≤ 0.024	0.20 – 30		16	20	24
> 0.024 – ≤ 0.040	0.32 – 30		16	20	24
> 0.040 – ≤ 0.080	0.60 – 30		16	20	24
> 0.080 – ≤ 0.120	1.0 – 30		16	20	24

[1)] cut-to-length available in lengths from 250 to 4000 mm (10 to 158 in.)
[2)] Maximum thickness 3 mm (0.125 in.)
[3)] Wider widths are subject to special enquiry
[4)] Wider widths up to 730 mm (29 in.) are subject to special enquiry

Wire
Conditions:
bright drawn, 1/4 hard to hard, bright annealed;
some heat-resistant, high-temperature alloys
also available in oxidized condition.

Dimensions:
0.01 – 12.0 mm (0.0004 – 0.47 in.) diameter,
in coils, pay-off packs, on spools and spiders

Welding filler metals
Suitable welding rods, wire, strip electrodes and electrode core wire are available in all standard sizes.

Seamless tube and pipe
Using ThyssenKrupp VDM cast materials seamless tubes and pipes are produced and available from DMV STAINLESS SAS, Tour Neptune, F-92086 Paris, La Défense Cedex (Fax: +33-1-4796 8141; Tel.: +33-1-4796 8140), E-mai: dmv-hq@dmv-stainless.com

Welded tube and pipe
Welded tubes and pipes are obtainable from qualified manufacturers using ThyssenKrupp VDM semi-fabricated products.

ThyssenKrupp VDM sales offices, subsidiaries and representations.

Germany

Head Office
ThyssenKrupp VDM GmbH
Plettenberger Strasse 2
58791 Werdohl
P.O. Box 1820
58778 Werdohl
Phone: +49 (23 92) 55-0
Fax: +49 (23 92) 55-22 17
e-mail:
info@tks-vdm.thyssen-krupp.com
www.thyssenkruppvdm.de

Germany

Berlin
ThyssenKrupp VDM GmbH
Wittestrasse 49
13509 Berlin
Phone: +49 (30) 4 32 40 36
Fax: +49 (30) 4 35 29 68
e-mail:
krupp_vdm_berlin@t-online.de

Dresden
ThyssenKrupp VDM GmbH
Oskar-Röder-Strasse 3
01237 Dresden
Phone: +49 (3 51) 2 52 28 06
Fax: +49 (3 51) 2 52 28 07
e-mail:
krupp_vdm_dresden@t-online.de

Nuremberg
ThyssenKrupp VDM GmbH
Dieselstrasse 55
90441 Nürnberg
Phone: +49 (9 11) 6 63 26 00
Fax: +49 (9 11) 6 63 26 01
e-mail:
krupp_vdm_nuernberg@t-online.de

Stuttgart
ThyssenKrupp VDM GmbH
Am Ostkai 15
70327 Stuttgart
Phone: +49 (7 11) 9 32 88-0/36
Fax: +49 (7 11) 9 32 89 30
e-mail: hstegmaier@tks-vdm.
thyssenkrupp.com

Werdohl - Northern Office
ThyssenKrupp VDM GmbH
Plettenberger Strasse 2
P.O. Box 1820
58778 Werdohl
Phone: +49 (23 92) 55-23 76
Fax: +49 (23 92) 55-25 26
e-mail: jleonhardt@tks-vdm.
thyssenkrupp.com

Werdohl - Western Office
ThyssenKrupp VDM GmbH
Plettenberger Strasse 2
P.O. Box 1820
58778 Werdohl
Phone: +49 (23 92) 55-27 90
Fax: +49 (23 92) 55-25 26
e-mail:
rpechan@tks-vdm.thyssenkrupp.com

Europe

ThyssenKrupp VDM Europe
30, Bd Bellerive
F-92566 Rueil Malmaison CEDEX
Phone: +33 (1) 41 39 04 20
Fax: +33 (1) 47 16 78 20/14
e-mail:
j.kloewer@kruppvdm.fr

Austria/Central and Eastern Europe
ThyssenKrupp VDM Austria GmbH
Tenschertstrasse 3
A-1230 Wien
Phone: +43 (1) 6 15 06 00
Fax: +43 (1) 6 15 36 00
e-mail: office@krupp-vdm.at

Belgium/Luxembourg
S.A.ThyssenKrupp VDM Belgium N.V.
Avenue du Champ de Mai, 14
Bte 34
Résidence Saturne
B-1410 Waterloo
Phone: +32 (2) 3 54 29 00
Fax: +32 (2) 3 54 36 26
e-mail:
kruppvdm.be@skynet.be

Bulgaria
ThyssenKrupp VDM Austria GmbH
Parensov Str. 26
BG-1000 Sofia
Phone: +359 (2) 9 89 16 77
9 88 65 22
Fax: +359 (2) 9 89 16 77
e-mail: dikov-kruppvdm@inet.bg

Czech Republic/Slovakia
ThyssenKrupp VDM Austria GmbH
Nejedleho 9
CZ-63800-Brno
Phone: +42 (5) 45 22 23 40
Fax: +42 (5) 45 22 23 40
e-mail: cou@email.cz

Finland
Oy Cronimo Ab
Karhutie 6
SF-01900 Nurmijärvi
Phone: +358 (9) 2 76 42 10
Fax: +358 (9) 27 64 21 50
e-mail: sales@cronimo.fi

France
ThyssenKrupp VDM SARL
30 Bd Bellerive
F-92566 Rueil Malmaison Cedex
Phone: +33 (1) 41 39 04 20
Fax: +33 (1) 47 16 78 20/14
e-mail: r.iken@kruppvdm.fr

Europe

Greece
INTERAG Ltd.
P.O. Box 65060
8, Pambouki Str.
GR-15410 Psychico (Athens)
Phone: +30 (10) 6 83 95 35
Fax: +30 (10) 6 83 95 36

Italy
ThyssenKrupp VDM Italia Srl
Via Milanese 20
I-20099 Sesto San Giovanni (Mi)
Phone: +39 (02) 24 10 46 1
Fax: +39 (02) 24 10 46 29
e-mail: cquva@tin.it

Netherlands
ThyssenKrupp VDM Nederland B.V.
Stationsweg 4
NL-3311 JW Dordrecht
P.O. Box 750
NL-3300 AT Dordrecht
Phone: +31 (78) 6 31 69 66
Fax: +31(78) 6 31 58 57
e-mail: krupp.vdm.nl@worldonline.nl

Norway
A/S Stavanger Rørhandel
Gamle Forusvei 53
P.O. Box 184
N-4033 Forus
Phone: +47 (51) 81 85 00
Fax: +47 (51) 81 86 00

Poland
ThyssenKrupp VDM Austria GmbH
Ul. Fredry 20
PL-30-605 Krakow
Phone: +48 (12) 656 21 68
Fax: +48 (12) 656 21 72
e-mail: w.przyluski@krupp-vdm.pl

Romania
ThyssenKrupp VDM Austria GmbH
Str. Popa Savu Nr. 74
R-71262 Bucuresti 1
Phone: +40 (1) 2 22 75 55
Fax: +40 (1) 2 22 28 63
e-mail: kruppvdm@fx.ro

Russian Federation
ThyssenKrupp VDM Austria GmbH
Krasnopresnenskaja nab 12
Internationales Handels-
Zentrum (CMT)
Büro 1209
GUS-123610 Moskau
Phone: +7 (502) 258 2074
Fax: +7 (502) 258 2076
e-mail: kruppmow@wtt.ru

Spain/Portugal
ThyssenKrupp VDM Ibérica
Calvet, 30 – 32, 2.°, 1.ª
E-08021 Barcelona
Phone: +34 (93) 2 00 90 11
Fax: +34 (93) 2 00 22 54
e-mail: vdmib@infonegocio.com

Europe

Sweden
ESMA AB
Domnarvsgatan 8
P.O. Box 8027
S-16308 Spanga/Stockholm
Phone: +46 (8) 47 44 200
Fax: +46 (8) 47 44 260
e-mail: gert.frohmader@esma.se

Switzerland
ThyssenKrupp VDM (Schweiz) AG
Lange Gasse 90
P.O. Box
CH-4002 Basel
Phone: +41 (61) 2 05 84 88
Fax: +41 (61) 2 05 84 15
e-mail:
raoul.roth@thyssenkruppvdm.ch

Turkey
Akkurt A.S.
Ahmediye Köyü
TR-34904 Cekmece-Istanbul
Phone: +90 (2 12) 8 87 14 15 – 17
Fax: +90 (2 12) 8 87 10 79
e-mail: akkurt@ibm.net

United Kingdom, Ireland
ThyssenKrupp VDM U.K. Ltd.
111, Hare Lane
Claygate-Esher, Surrey KT10 OQY
Phone: +44 (1372) 46 71 37
Fax: +44 (1372) 46 83 88
e-mail: mtaylor@kruppvdm.co.uk

North and Central America

Canada
ThyssenKrupp VDM Canada Ltd.
Suite 203
11 Allstate Parkway
Markham, Ontario L3R 9T8
Phone: +1 (9 05) 4 77-20 64
Fax: +1 (9 05) 4 77-28 17
e-mail: kvdmcls@direct.ca

USA
ThyssenKrupp VDM USA, Inc.
306 Columbia Turnpike
Florham Park, N.J. 07932
Phone: +1 (973) 2 36-16 64
Fax: +1 (973) 2 36-19 60
e-mail: vdmtech@vdmt.com

Mexico
ThyssenKrupp VDM
de México S.A. de C.V.,
Bulevard Manuel Avila
Camacho No. 80 PH-A
Lomas de Sotelo
Naucalpan
Edo. de México
C.P. 53390 México
Phone: +52 55 57-1471
Fax: +52 55 57-1476
e-mail: kruppvdm@prodigy.net.mx

South America

Argentina
Walvoss S.R.L.
Humberto 1° 1333
C 1103 ADA Buenos Aires
Phone: +54 (11) 43 04 87 70
Fax: +54 (11) 43 05 06 91
e-mail: wvsponte@pinos.com

Brazil
Thyssen Acos Especiais Ltda.
Rua Roberto Koch, no. 277
CEP 04221-060
Sao Paulo-SP
Phone: +55 (11) 61 65-56 60
Fax: +55 (11) 61 65-56 61
e-mail: natel@thyssen-tae.com.br

Chile
Thyssen Aceros y Servicios S.A.
Av. Las Americas 1022
Cerrillos-Santiago
Phone: +56 (2) 420 55 00
Fax: +56 (2) 443 88 00
e-mail:
gerencia.tas@thyssenkrupp.cl

Columbia
HERGUT Ltda.
CRA 43 A No. 1,
Sur-31, Of. 208
Medellin
Phone: +57 (4) 266-17 37
17 57
Fax: +57 (4) 268-61 92

Ecuador
Importadora Schiller Cia. Ltda.
Toledo 1328 y Coruna
Quito
Phone: +593 (2) 54 77 60
Fax: +593 (2) 56 27 78

Peru
AMSET E.I.R.L.
José Maria Eguren
(Chumbiongo) 107,
Dpto. 302
Miraflores (Lima 18)
Phone: +51 (1) 440 49 53
Fax: +51 (1) 442 12 33

Uruguay
Fierro Vignoli S.A.
Av. Uruguay 1274/76
Montevideo
Phone: +598 (2) 91 45 60
Fax: +598 (2) 92 12 30

Venezuela
Gunz S.R.L.
2da. Av. c/c 1ra. Transversal.,
Edf. La Pradera, Torre B.,
Piso 9, P.H. 90-B,
Urb. Los Palos Grandes,
Caracas 1060
Phone: +58 (2) 284-24 96
Fax: +58 (2) 978-12 85

Africa

Egypt
OSAB Trade
Dr. O. Abbas
6, El Nil El Abiad St.
Lebanon Square
Giza/Cairo
Phone: +20 (2) 3 03 46 33
Fax: +20 (2) 3 46 08 00

Samir L.W. El Ayoubi
P.O. Box Maadi 191
House 30, Street 11
Maadi-Cairo
Phone: +20 (2) 3 50-21 12
Fax: +20 (2) 3 78 31 15

Nigeria
Betcy Investment Limited
Betcy House
Block 14, Plot 241, Amuwo
Odofin/Festac Access Road
3792 Festac Town
Phone: +234 (1) 589 05 52/3
Fax: +234 (1) 588 29 69
e-mail: betcygp@gacom.net

South Africa
THYSSENKRUPP VDM SA (PTY) LTD
P.O. Box 1484
Wendywood 2144
Phone: +27 (11) 4 44-36 20
Fax: +27 (11) 4 44-39 50
e-mail: heath@intecom.co.za

Middle East

Islamic Republic of Iran
Krupp Iran Ltd.
Division ThyssenKrupp VDM
P.O. Box 141 55-1979
Ostad Motahari Ave. 368
Teheran 15968
Phone: +98 (21) 890 65 92
Fax: +98 (21) 890 02 56
e-mail: allami@kruppiran.com

Israel
Middle East Metals Ltd.
1, Korazin St.
P.O. Box 870
53 583 Givatayim
Phone: +972 (3) 5 71 53 74/69
Fax: +972 (3) 5 71 53 71
e-mail: isbrildo@netvision.net.il

Jordan
International Technical
Construction Company
P.O. Box 95 02 79
Amman
Phone: +962 (6) 551 49 63
Fax: +962 (6) 553 70 69
e-mail: itcc@go.com.jo

Saudi Arabia
Al-Bassam Petroleum
Equipment Co.
King Street, P.O. Box 2611
Damman
Phone: +966 (3) 8 34 07 19
Fax: +966 (3) 8 33 26 71

U.A.E.
Eastern Union Corporation
P.O. Box 3489
Tourist Club Area
Abu Dhabi
Phone: +971 (2) 78 24 62
Fax: +971 (2) 77 19 58

India

Variety (Agents) Private Ltd.
301, Kakad Chambers
132, Dr. Annie Besant Road
Worli, Mumbai-400 018
Phone: +91 (22) 4 93-26 91
Fax: +91 (22) 4 95-05 78
e-mail: variety@bom3.vsnl.net.in

Asia

Hong Kong
ThyssenKrupp VDM Hongkong Ltd.
Rooms 715-737, 7/F.
Sun Hung Kai Centre
30 Harbour Road, Wanchai
Hong Kong
Phone: +852 31 81 78 00
Fax: +852 25 27 20 45
e-mail: ukuehn@vdm.com.hk

Japan
ThyssenKrupp VDM Japan K.K.
2nd Floor
Ochanomizu Itoh Bldg.
3-3, Kanda-Surugadai
Chiyoda-Ku
Tokyo 101-0062
Phone: +81 (3) 32 95-45 91
Fax: +81 (3) 32 95-45 94
e-mail: vdmj-t.k@galaxy.ocn.ne.jp

People´s Republic of China
ThyssenKrupp VDM Hongkong Ltd.
Beijing Representative Office
Unit 8A, 22/F. China Life Tower
No. 16 Chaoyangmenwai Avenue
Chaoyang District
Beijing 100020
Phone: +86 (10) 85 25 29 99
Fax: +86 (10) 85 25 21 61
e-mail: zhoujtk@tkpek.com.cn

ThyssenKrupp VDM Hongkong Ltd.
Shanghai Representative Office
Unit 2009, 20/F.
China Merchants Tower
161 Lujiazui Dong Road, Pu Dong
Shanghai 200120
Phone: +86 (21) 38 78 47 00
Fax: +86 (21) 58 82 95 89
e-mail: libj@tksha.com.cn

People´s Republic of China and Hong Kong
Fordley Development Ltd
Rm 705-707, Yu Sung Boon
Building
107-111 Des Voeux Road Central
Hong Kong
Phone: +852 25 41 00 00
Fax: +852 28 54 19 42
e-mail: desmond@fordley.com.hk

Philippines
MESCO Inc.
MESCO Building
Reliance Corner Brixton Streets
1603 Pasig City, Metro Manila
Phone: +63 (2) 6 31 - 17 75-85
Fax: +63 (2) 6 31 - 40 28
6 35 - 00 36
e-mail: mescophil@skyinet.net

Asia

Singapore, Malaysia, Indonesia
Firsttech Distribution Pte. Ltd
No. 10 Ubi Crescent #07-11
Ubi TechPark
Singapore 408564
Phone: +65 68 46 88 22
Fax: +65 68 46 88 33
e-mail:
Daniel.Lo@FIRSTTECH.com.sq

South Korea
ThyssenKrupp VDM Korea Co., Ltd.
12 13, Hyundai Office B/D
9-4 Sunai-dong, Bundang-gu
Sungnam-Si
Kyunggido 463-020
Phone: +82 (31) 711-1583
Fax: +82 (31) 717-1583
e-mail:
michoi@vdmkorea.onnet21.com

Taiwan
Far East Alloy Corporation
2F-2, No. 29-1, Lane 169
Kang Ning St., Shih-Chih City
Taipai Hsien
Phone: +886 (2) 26 95 30 33
Fax: +886 (2) 26 95 07 66
e-mail: sales@fea.com.tw

Thailand
Sahakol Trading Co. Ltd.
128/113 9th FL,
Payatai Plaza Building
Payatai Road
Bangkok 10400
Phone: +66 (2) 216 57 36-38
216 57 47-48
Fax: +66 (2) 216 57 21
e-mail: sahakol@loxinfo.co.th

Vietnam
ThyssenKrupp AG
Representative Office Vietnam
Office Hanoi
Suite 503, 5th Floor
Hanoi Central Office Building
44B Ly Thuong Kiet Street
Hoan Kiem District
Hanoi
Phone: +84 (4) 934 70 43
Fax: +84 (4) 934 70 46
e-mail:
doan@thyssenkrupp.com.vn

ThyssenKrupp AG
Representative Office Vietnam
Office Hochiminh
Room 3 B08, 3rd Floor, Sai Gon
Trade Centre
37 Ton Duc Thang, District 1
Ho Chi Minh City
Phone: +84 (8) 910 24 38
Fax: +84 (8) 910 24 40
e-mail: tkhochiminh@hcm.vnn.vn

Australia

ThyssenKrupp VDM
Australia Pty. Ltd.
724 Springvale Road
Mulgrave, Victoria 3170
Phone: +61 (3) 95 61 13 11
Fax: +61 (3) 95 61 44 65
e-mail: j.wilson@kruppvdm.com.au

ThyssenKrupp VDM stockholders and distributors.

Europe

Germany
F. W. Hempel & Co.
Gesellschaft für Spezial- und
Rostfrei-Metalle mbH
Weissensteinstrasse 70
46149 Oberhausen-Sterkrade
Phone: +49 (2 08) 6 20 4-0
Fax: +49 (2 08) 6 20 4-174
e-mail: info@hempel-metals.com
www.hempel-metals.com

Welding consumables

UTP Schweißmaterial GmbH
Elsässer Straße 10
79189 Bad Krozingen
Phone: +49 (76 33) 4 09-01
Fax: +49 (76 33) 4 09-2 22
e-mail: info.utp@btsw.de
www.utp.de

France
Jacquet S. A.
B. P. 61
Rue du Bordelais
F-69802 St. Priest Cedex
Phone: +33 (4) 72 23 23 23
Fax: +33 (4) 72 23 23 10
e.mail: ji@jacquetindustries.com

Great Britain
Philip Cornes & Co. Ltd.
Lanner Building, Clews Road
Redditch, Worcestershire B98 7ST
Phone: +44 (15 27) 55 50 00
Fax: +44 (15 27) 54 70 00
e-mail: mail@cornes.com.sg
www.cornes.com.sg

Italy
Chun & Vollerin S.R.L.
Via Veneto 7
I-20094 Buccinasco (Milano)
Phone: +39 (2) 48 84 21 60
Fax: +39 (2) 488 26 97

Norway
A/S Stavanger Rørhandel
Gamle Forusvei 53
P.O. Box 184
N-4033 Forus
Phone: +47 (51) 81 85 00
Fax: +47 (51) 81 86 00

Sverdrup Hanssen
Kvitsøygt. 95
N-4014 Stavanger
Phone: +47 (4) 89 18 00
Fax: +47 (4) 89 18 18

North America

USA
Sheet and plate

Corrosion Materials
P.O. Box 666
2262 Groom Road
Baker, LA 70714
Phone: +1 (225) 775-3675
Fax: +1 (225) 778-6452

RASCO
(Reynolds Aluminium Supply Co.)
P.O. Box 26885
Richmond, VA 23261
Phone: +1 (804) 281-2000
Fax: +1 (804) 281-4059

Rolled Alloys
P.O. Box 310
125, West Sterns Road
Temperance, MI 48182
Phone: +1 (734) 847-0561
Fax: +1 (734) 847-6917
e-mail: rolled@glasscity.net
www.rolledalloys.com

Strip

Ed Fagan, Inc.
769 Susquehanna Ave.
Franklin Lakes, NJ 07417
Phone: +1 (201) 891-40 03
Fax: +1 (201) 891-32 07
e-mail: sales@edfagan.com
www.edfagan.com

Rod and bar

Corrosion Materials
P.O. Box 666
2262 Groom Road
Baker, LA 70714
Phone: +1 (225) 775-3675
Fax: +1 (225) 778-6452

The Trident Company
405 North Plano Road
Richardson, TX 75080-3900
Phone: +1 (972) 231-5176
Fax: +1 (972) 437-6569

Africa

South Africa
THYSSENKRUPP VDM TECHNOLOGY
S. A.
(PTY.) LTD.
40, Desmond Street
Kramerville 2148
Phone: +27 (11) 444-36 20
Fax: +27 (11) 444-39 50
e-mail: heath@intecom.w.za

Middle East

Israel
SCOPE
Metal Trading & Technical
Services Ltd.
P.O. Box 3
BNE AYISH
PARK REEM (MIZVA), 79845
Phone: +972 (8) 34 99 43
Fax: +972 (8) 34 94 02

Australia

ThyssenKrupp VDM
Australia Pty. Ltd.
724 Springvale Road
Mulgrave, Victoria 3170
Phone: +61 (3) 95 61 13 11
Fax: +61 (3) 95 61 44 65
e-mail: j.wilson@kruppvdm.com.au
www.vdmaustralia.com

USA Manufacturing Division.

USA

Precision Rolled
Products, Inc.
Corporate Office
14255 Mt. Bismark Street
Reno, Nevada 89506
Phone: +1 (775) 972 02 72
Fax: +1 (775) 972 43 68
e-mail: info@prpusa.com
www.prpusa.com

Precision Rolled
Products, Inc.
306 Columbia Road
Florham Park, N.J. 07932
Phone: +1 (973) 236 16 64
Fax: +1 (973) 236 19 60
e-mail: gplenk@prpusa.com
lguyaux@prpusa.com
www.prpusa.com

Manufacturing program:
Ingots, billets and bar products made of high-temperature alloys (nickel and cobalt-base alloys) titanium and specialty steels in the form of flats, rounds and shapes

Plants:
Reno, Nevada – bar production

Florham Park, New Jersey – melting plant and billet production

Imprint

High-performance alloys:
The key to innovative
solutions

Publisher
ThyssenKrupp VDM GmbH
Marketing Services
Plettenberger Strasse 2
58791 Werdohl
P.O. Box 1820
58778 Werdohl
Germany
Phone: +49 (2392) 55-0
Fax: +49 (2392) 55-21 11
E-mail: info@tks-vdm.thyssenkrupp.com
www.thyssenkruppvdm.de

Publication no. N 565
November 2002 Edition

This broschure replaces our publication
N 565 – edition of August 2001

ThyssenKrupp VDM GmbH
Plettenberger Strasse 2
P.O. Box18 20
58778 Werdohl
Germany
Phone: +49 (23 92) 55-0
Fax: +49 (23 92) 55-22 17
E-Mail: info@tks-vdm.thyssenkrupp.com
www.thyssenkruppvdm.de