

The chemical and petrochemical industry in particular has distinguished itself as an industrial pacemaker with a constant series of new developments.

Care of the environment and responsible husbanding of the world's resources are today factors of increasing importance. Processes which present a risk for man and the environment must be effectively shielded; potentially dangerous by-products must be avoided where possible, and in any event rendered harmless and suitable for careful disposal or neutralised and re-used in new processes and applications. This is effective recycling.

Today's simultaneous demand for the highest possible efficiency coupled with improved service life points up the need for outstanding solutions which can reconcile such contradictory requirements and point the way to even better performance in the future. Only high-efficiency products with a guaranteed long life and ease of maintenance are really capable of meeting modern ecological and economic objectives.

We support you in the selection of such materials with high corrosion-resistant and high-temperature HÖVER Corolloy special alloys and HÖVER Coralloy stainless steels for valves and pipework systems.

mps, Valves and Pipework

Corrosion-resistant stainless steels – high-performance stainless steels



Courted 499 1.407 1.4074 1.50 1.3 1.4074 1.50 1.3 1.4074	high-performance stainless steels			
With largest orgished software surfactory existance to water, sown, dishe story gliels and week oxidizing exists. Genetal 401 1,402 1,403	Material	No.	Alloy type	Application
Commist 43-15 4,402 1,402				oxidizing acids.
Ground 4101-15 14/202 X 15 C 13 M 20 C 16th 12 14/202 X 15 C 13 M 20 C 16th 12 14/202 X 17 C 611 16 2 C 20 C 16th 12 M 20 C	Coracid 410	1.4006	X 12 Cr 13	Apparatus and vessel construction in the chemical industry as well as the food, drink and tobacco
Ground 4020 1.4.020 II . 2.00 Cold 13 II . 2.00 Cold 13 III . 2.00 Cold 140 III III III III . 2.00 Cold 140 III . 2.00 Cold 140 II				industry, shipbuilding, valves, extruder screws, power station and reactor construction.
Mile good resistance to voter, stoom, wood cults and allials as well as to stronger evoluting useds. Notarols 1,4057 and 1,4122 show relatively good resistance to sun water uttrock.				
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Canced 13-4				
Carcel of 3.4 man 1.420 1.421 1.441				
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Australite rideal-chromium and nickel-chromium molybelenum steels Flight consorts nesistance and very good methorized positions. In 1,4305				
Canced 3094 1,4301 X 5 CHi 18.10 Industry, first and vessel construction in the chemical industry as well as the food, drink on disclays, fast and supprindustry, rusber industry, fast and supprindustry, rusber industry, fast and supprindustry, rusber industry, rusber industry, fast and supprindustry, rusber industry, fast and supprindustry, rusber industry, rusber industry, fast and supprindustry, rusber industry, rusber indust			n steels	
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Carroid 301L 1,430 X 2 Citik 19.11 Carroid 310L 1,4301 X 2 Citik 19.10 Carroid 310L 1,4301 X 2 Citik 19.10 X 2 Citik 18.10 Carroid 310L 1,4301 X 2 Citik 19.10 X 2 Citik 18.10 Carroid 310L 1,4301 X 2 Citik 19.17.12 Carroid 310L 1,4301 X 2 Citik 19.17.13 Carroid 310L 1,4301 X 2 Citik 19.17.13 Carroid 310L 1,4301 X 2 Citik 19.18.14				
Gracial 4311				
Councid 310				organisating, organisation control, machinea components on autoritatic lattices (1.4003).
Carnol 316 C. 1.4401 X S CNIMO 17.12 Carnol 316U 1.4409 X 2 CNIMO 17.12 Carnol 316U 1.4409 X 2 CNIMO 17.12 Carnol 316U 1.4409 X 2 CNIMO 17.12 Carnol 316U 1.4429 X 2 CNIMO 17.13 Carnol 316U 1.4429 X 2 CNIMO 17.13 Carnol 316U 1.4429 X 2 CNIMO 18.143 Carnol 316U 1.4435 X 3 CNIMO 18.143 Carnol 316U 1.4435 X 2 CNIMO 18.143 Carnol 317U 1.4438 X 2 CNIMO 18.143 Carnol 317U 1.4438 X 2 CNIMO 18.143 Carnol 317U 1.4438 X 2 CNIMO 18.15 Carnol 317U 1.4439 X 3 CNIMO 17.13 Carnol 317U 1.4593 X 3 RIGGLAFO 17.23 Carnol 4503				
Correct 316 M		1.4401		
Increased instance against non-coolicing acids and hologen containing media is provided by the addition of molybdenum Monterial 1,4539 with added copper shows increased resistance to subjective acid. Carcial 316. Carcial 316. Carcial 317. 1,4436 X 2 ChMMo 18,14.3 X 2 ChMMo 18,14.3 Carcial 317. 1,4439 X 2 ChMMo 18,14.4 Carcial 317. Carcial 317. Carcial 4465 X 1 ChMMo 18,13.4 Carcial 317. Carcial 4465 X 2 ChMMo 18,13.4 X 3 ChMMo 17,13.3 Carcial 4513 Carcial 4513 A 1,4530 X 3 No ChMMo 17,13.5 Carcial 4513 Carcial 4513 A 1,4530 X 3 No ChMMo 18,14.4 X 3 ChMMo 17,13.5 Carcial 4510 Carcial 4510 Carcial 4510 Carcial 4510 Carcial 4510 A 1,4530 X 3 No ChMMo 18,14.4 X 4 ChMMo 18,14.4 Carcial 4510 Carcial 4510 Carcial 4510 A 1,4530 X 5 ChMC 18,14.4 X 6 ChMM 18,10.1 Carcial 4510 Carcial 4510 A 1,4551 X 6 ChMMo 18,10.1 Carcial 4510 Carcial 4510 A 1,4551 X 6 ChMMo 18,10.1 Carcial 4510 Carcial 4527 A 1,4551 X 6 ChMMo 18,10.1 Carcial 4527 A 1,4551 X 6 ChMMo 18,10.1 Carcial 4528 A 1,4551 X 1 ChMMo 18,10.1 Carcial 4529 X 1 ChMMo 18,10.1 Carcial 4529 X 1 ChMMo 18,10.1 Carcial 4520 A 1,4552 X 1 ChMMo 18,10.1 Carcial 4520 A 1,4553 X 1 NGMo 22,27 Carcial 4530 A 1,4554 X 1 ChMMo 18,10.1 Carcial 4520 A 1,4554 A 1		1.4404	X 2 CrNiMo 17.12.2	
Increased resistance against non-coolizing acids and hologen containing media is provided by the addition of molybdenum Moterial 1.4.539 with added capper shows increased resistance to sulphuric acid. Cancad 316				
Material 1.4539 with added copper shows increased resistance to subplauric acid. Grancid 316				
Cornoid 317				tion of molybdenum
Carcid 317L Carcid 317L Carcid 317N Carcid 317 Carcid 318 Carcid 318 Carcid 318 Carcid 318 Carcid 320 Carcid 320 Carcid 321 Carcid 322 Carcid 323 Carcid 323 Carcid 323 Carcid 323 Carcid 323 Carcid 324 Carcid 324 Carcid 324 Carcid 325 Carcid 325 Carcid 326 Carcid 327 Carcid 328 Carcid 338 Carcid 348 C	Coracid 316L	1.4435	X 2 CrNiMo 18.14.3	Nitrogen-alloyed austenitic materials with high N contents are employed for the following
Corocid 317LN		1.4436		
Cornoid 317 N. N. 1.4449				
Cornect 317 1.4449 X 5 C Nikhlo 17.13 - Water resources management (high chlorine ion contents)				
Carcial 4465 Carcial 4503 Carcial 4503 Carcial 4503 Carcial 4504 Carcial 4506 Carcial 4507 Carcial 4508 Carci				
Coracid 4503				Train 10001C03 management (mgir cinomio fon comonis)
Coracid 630 1.4542 X 5 GNiCoNb 16.4 The grades with the stabilising elements titanium and niobium cannot be highly polished. Coracid 321 1.4541 X 6 GNiTh 18.10 X 6 GNiMoTh 17.12.2 Coracid 4575 1.4570 X 6 GNiMoTh 17.12.2 Coracid 4580 1.4580 X 6 GNiMoNb 17.12.2 X 1 GNiMoNb 17.12.2 X 1 GNiMoNb 17.12.2 X 1 GNiMoNb 17.12.2 X 1 GNiMoNb 18.10 Coracid 4583 Superaustenitic, high nickel and molybdenum alloy special steels with extraordinary corrosion resistance. Coracid 4580 1.4580 X 6 GNiMoNb 17.12.2 X 1 GNiMoNb 18.12 Coracid 4583 Superaustenitic, high nickel and molybdenum alloy special steels with extraordinary corrosion resistance. Coracid 4583 Superaustenitic, high nickel and molybdenum alloy special steels with extraordinary corrosion. The critical pitting temperature is thus much more fravourable with super-austenitic steels. Coracid 254 SMo 1.4572 X 1 NiGMoCuN 20.18.7 Coracid 254 SMo 1.4563 X 1 NiGMoCuN 20.18.7 Coracid 28 1.4563 X 1 NiGMoCuN 20.18.7 Coracid 28 1.4565 X 3 GNiMoN 21.75.3 Coracid 24 1.4566 X 3 GNiMoN 20.17.4 Coracid 33 1.4591 X 1 GNiMoNoCuN 33.32.1 Duplex materials Fortilic-austenitic high performance nickel-chromium molybdenum steels With high resistance to wear and good running qualities, low sensitiveness to stress corrosion cracking and impervious to intergranular corrosion. Coracid-D-22.05 1.4462 X 2 CNiMoN 22.5.3 -1.4462-A2 X 2 CNiMoN 24.5.3 Superaustenitic high performance nickel-chromium molybdenum steel with added copper. Good resistance against stress corrosion cracking and pitting corrosion.	Coracid 4503	1.4503	X 3 NiCrCuMoTi 27.23	Such alloys are also used with high degrees of purity in high vacuum engineering.
The grodes with the stabilising elements titranium and nicibium connot be highly polished. Coracid 321 Coracid 347 Coracid 347 Coracid 3480 Coracid 4580 Coracid 4583 Superoustenitic, high nickel and molybdenum alloy special steels with extraordinary corrosion resistance. Controlled addition of nitrogen for higher mechanical strength combined with good tought Chromium, molybdenum and nitrogen increase in particular the resistance against pitting corrosion. The critical pitting temperature is thus much more favourable with super-austenitic steels. Coracid 926 Coracid 4580 1.4529 X 1 NiCMoCuN 25.20.6 Coracid 224 SNo Coracid 31 1.4562 X 1 NiCMoCuN 25.20.6 Coracid 31 1.4563 X 1 NiCMoCuN 25.20.6 Coracid 31 1.4563 X 1 NiCMoCuN 25.27 Coracid 4565 1.4563 X 1 NiCMoCuN 25.27 Coracid 4565 1.4565 X 3 Criminholobin 23.17.5.3 Coracid 24 1.4566 X 3 Criminholobin 23.17.5.3 Coracid 33 1.4591 X 1 Criminhocun 33.32.1 Doplex materials Ferritic-austenitic high performance nickel-chromium molybdenum steels With high resistance to wear and good running qualities, low sensitiveness to stress corrosion cracking and impervious to intergranular corrosion. Coracid-0-27.06 Coracid-0-27.06 Coracid-0-27.06 Coracid-0-27.05 C				
Coracid 321 Coracid 347 1.4550 1.4550 1.4550 1.4575 1.4575 1.4575 1.4575 1.4575 1.4575 1.4575 1.4583 1.4580 1.4580 1.4583 1.4580 1.4583 1.4584 1.4584 1.4584 1.4584 1.4584 1.4584 1.4584 1.4584 1.4584 1.4584 1.4584 1.4585 1.4585 1.4585 1.4585 1.4585 1.4586				
Coracid 347	The grades with the stabilising elements titani	um and niobium ca	nnot be highly polished.	1
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Coracid 254 SMo Coracid 31 Coracid 28 Coracid 28 Coracid 24 Coracid 33 Coracid 39 Coracid 24 Coracid 39 Coracid 39 Coracid 24 Coracid 39 Coracid 39 Coracid 24 Coracid 39 C				
Coracid 31				good resistance against gap and wear corrosion as well as stress corrosion cracking induced by
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Duplex materials Ferritic-austenitic high performance nickel-chromium molybdenum steels With high resistance to wear and good running qualities, low sensitiveness to stress corrosion cracking and impervious to intergranular corrosion. Coracid-D-27.06 1.4460 X 3 CrNiMoN 27.5.2 Coracid-D-22.05 1.4462 X 2 CrNiMoN 22.5.3 Coracid-D-24.5.3.A1 -1.4462-A1 X 2 CrNiMoN 24.5.3 Coracid-D-24.5.3.A2 -1.4462-A2 X 2 CrNiMoN 24.5.3 Super duplex materials Stainless ferritic-austenitic nickel-chromium molybdenum steel with added copper. Good resistance against stress corrosion cracking and pitting corrosion.				
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Coracid-D-22.05 1.4462 X 2 CrNiMoN 22.5.3 contact with seawater. Coracid-D-24.5.3.A1				
Coracid-D-24.5.3.A1				
Coracid-D-24.5.3.A2 ~1.4462-A2 X 2 CrNiMoN 24.5.3 Super duplex materials Stainless ferritic-austenitic nickel-chromium molybdenum steel with added copper. Good resistance against stress corrosion cracking and pitting corrosion.				Connact will Southuld.
Super duplex materials Stainless ferritic-austenitic nickel-chromium molybdenum steel with added copper. Good resistance against stress corrosion cracking and pitting corrosion.				
Stainless ferritic-austenitic nickel-chromium molybdenum steel with added copper. Good resistance against stress corrosion cracking and pitting corrosion.	Super duplex materials			1
	Stainless ferritic-austenitic nickel-chromium ma			nst stress corrosion cracking and pitting corrosion.
High resistance in sulphuric acid media. Required surface finish: Pickled or machined.	High resistance in sulphuric acid media. Requi	red surface finish: P	ickled or machined.	
Coracid Super D-255 (UNS 32550) X 3 CrNiMoCuN 26.6.3.2 Components in the chemical industry, in flue gas desulphurising plants, the mineral oil of	Coracid Super D-255 (UNS 32550)		X 3 CrNiMoCuN 26.6.3.2	Components in the chemical industry, in flue gas desulphurising plants, the mineral oil and natural
gas industry, in dyeing, in pumps which come in contact with sea water.				gas industry, in dyeing, in pumps which come in contact with sea water.

Corrosion-resistant stainless steels – high-performance stainless steels



Material	No.	Alloy type	Application
Highest corrosion resistance and good mechanic	al properties. Good	welding properties. Excellent resistan	ce to stress corrosion cracking (SCC), vibration cracking, pitting, gap and erosion corrosion.
Coracid Super D-25.07 (UNS 32750) Coracid Super D-100 (UNS 32760)	1.4501	X 3 CrNiMoN 25.7.4 X 3 CrNiMoCuN 25.7.4.1	Components in contact with seawater, e.g. heat exchangers, feed pumps, injection pumps, chemical industry, waste water technology, mineral oil and natural gas recovery, separators, LCP components, fans.
Copper-nickel materials Copper-nickel alloy with approx. 10% nickel as well as iron and manganese additions. Good resistance to seawater, brackish and industrial water. Good resistance in clean, moving sea water (flow velocities of 1 - 3.5m/s). Good resistance against stress corrosion cracking.			
Coralloy CuNi 90-10	2.0872	CuNi 10 Fe 1 Mn	Sea-water pipeline systems on ships, oil and gas platforms. Flow pipes to sea water desalization plants, offshore power stations and refineries. Condensers and heat exchangers in power stations. Refineries and sea water desalization plants.
Copper-nickel materials Copper-nickel alloy with approx. 30% nickel as well as iron and manganese additions. Very good resistance to seawater, brackish and industrial water. Very good resistance in moving, contaminated seawater (flow velocities of 1 - 4.5 m/s). Good resistance against engine and stress corresion cracking.			

CuNi 30 Mn 1 Fe

2.0882

Creep resistant steels

Coralloy CuNi 70-30



Material	No.	Alloy type	Application		
	Up to a service temperature of approx. 600°C the heat treatable 12% chrome steels with satisfactory creep resistance and good resistance to scaling are preferentially employed. At higher temperatures				
up to approx. 750°C the austenitic nickel-chrom	ilotti steets are etti	pioyea.			
Coracid 9.1	1.4903	X 10 CrMoVNb 9.1	Bolts, nuts, valves and other components in turbine and boiler construction, turbine blades, chemical		
Coracid 4919	1.4919	X 6 CrNiMo 17.13	industry, reactor construction.		
Coracid 4921	1.4921	X 19 CrMo 12.1			
Coracid 4922	1.4922	X 20 CrMoV 12.1			
Coracid 4923	1.4923	X 22 CrMoV 12.1			
Coracid 4926	1.4926	X 21 CrMoV 12.1			
Coracid 4948	1.4948	X 6 CrNi 18.11			
Coracid 4961	1.4961	X 8 CrNiNb 16.13			
Coracid 4962	1.4962	X 12 CrNiWTi 16.13			
Coralloy A 286	1.4980	X 5 NiCrTi 26.15			
Coracid 4981	1.4981	X 8 CrNiMoNb 16.16			
Coracid 4985	1.4985	X 4 NiCrMoTi 26.15			

Nickel and cobalt materials



Material	No.	Alloy type	Standard designation*	Application
High corrosion resistant nickel-based alloy with molybdenum and reduced C-content	2.4617	NiMo 28	Hastelloy B-2	Chemical apparatus, outstandingly resistant to hydrochloric acid and a wide range of sulphuric acid concentrations.
Coralloy B-3 Coralloy B-4 Further development of B-2, better weldability	2.4600	NiMo29Cr	Hastelloy B-3 KRUPP-VDM Alloy B-4	
Coralloy C-4 High corrosion resistant nickel-based alloy with molybdenum, chromium and reduced C- content.	2.4610	NiMo 16 Cr 16 Ti	Hastelloy C-4	Chem. apparatus (high resistance requirement)
Coralloy 20 Nickel-based alloy with very good mechanical properties at high temperature	2.4660	NiCr 20 CuMo	Carpenter 20 Cb 3	Nickel-based alloy with very good mechanical properties at high temperatures.
Coralloy 22 NiCrMo alloy with W, extremely low C and Si contents, high corrosion resistanc.	2.4602	NiCr 21 Mo 14W	Hastelloy C-22	Environmental technology, chlorine plants, paper and cellulose works, acetic acid production, sour gas burden

Nickel and cobalt materials



Material	No.	Alloy type	Standard designation*	Application
Coralloy 59 NiCrMo alloy, especially low C and Si contents, high corrosion resistance, high mechanical strength	2.4605	NiCr 23 Mo 16 Al	Alloy 59	Environmental technology, organic chemistry, pharmaceutical intermediate products, paper and cellulose works, acetic acid production
Coralloy 200 Pure nickel with at least 99.2% Ni	2.4066	Ni 99.2	Nickel 99.2	Apparatus for the production and processing of mineral products, paints, enamels, exposies, detergents, acetic etc., pickling plants, petrochemistry, offshore rigs.
Coralloy 201 Pure nickel with at least 99.2% Ni and a C content of max. 0.02%	2.4068	LC-Ni 99	LC-Ni 99.2	Apparatus specifically for the production and processing of caustic soda.
Coralloy C-276 High corrosion-resistance nickel-based alloy with molybdenum and chromium	2.4819	NiMo 16 Cr 15 W	Hastelloy C-276	Chemical apparatus (high order of resistance)
Coralloy 333 High temperature-resistant Ni-Cr-Fe alloy	2.4608	NiCr 26 MoW	Alloy 333	Gas turbines (combustion chamber), petrochemistry, furnaces
Coralloy 400 Nickel-Copper-alloy	2.4360	NiCu 30 Fe	Monel 400	Offshore rigs, nuclear industry, chemical industry, mineral oil industry
Coralloy K-500 Precipitation hardenable Nickel-Copper-alloy with aluminum addition	2.4375	NiCu 30 Al	Monel K-500	Offshore rigs, deep hole drilling, pump shaftssprings, valves, electrical components
Coralloy 600 High corrosion-resistance nickel-based alloy	2.4640 2.4816	NiCr 15 Fe	Inconel 600	Chem. apparatus, industrial furnaces, nuclear industry
Coralloy 601 Mixed crystal alloy with excellent high temperature qualities	2.4851		Inconel 601	Industrial furnaces, petrochemistry, off-gas detoxifying
Coralloy 625 Nickel molybdenum niobium chrome alloy with high strength and toughness from ultra- low temperatures to 1100°C	2.4856	NiCr 22 Mo 9 Nb	Inconel 625	Aerospace, chem. process engineering, offshore rigs, nuclear industry, production of superphosphoric acid
Coralloy 686 NiCrMo alloy with tungsten, highly corrosion- resistant, easily weldable, good mechanical strength values	2.4606	NiCr 21 Mo 16 W	Inconel 686	Chemical industry, paper and cellulose works, flue gas desulphurisation
Coralloy 800/H/HT Corrosion- and heat-resistant nickel- chromium-alloyed special steel	1.4876 1.4958 1.4959	X 10 NiCrAITi 32.20 X 5 NiCrAITi 31.20 X 8 NiCrAITi 32.21	Incoloy 800 Incoloy 800 H Incoloy 800 HT	Industrial furnaces and steam boiler construction, chemical and petrochemical industry, nuclear industry
Coralloy 825 Nickel alloy with chrome, copper and molybdenum	2.4858	NiCr 21 Mo	Incoloy 825	Chem. apparatus, pumps, heat exchangers, nuclear industry

Titanium and titanium alloys



Material	No.	Application
Pure titanium		
Coralloy CP Ti-1 Aeralloy CP Ti-1 Pure titanium Gr. 1	3.7025 3.7024	Pure titanium shows an outstanding corrosion resistance in oxidizing media. The mechanical properties are basically achieved through specified oxygen contents. Used for structural parts in aircraft, the chemical industry and heat exchangers. Pure titanium variant with good ductility and cold mouldability, adequate mechanical strength. Outstanding weldability. High corrosion resistance in strongly oxidizing (e.g. HN03) to weakly reducing environments, including chlorides. Seawater-cooled condensers and coolers in power stations. Vapour heaters and condensers in sea water desalization plants. Oil and gas coolers on offshore drilling platforms. Heat exchangers, columns and strippers in the processing of chlorine gas, acetic acid, soda, urea, hypochlorite, chlorine dioxide and other oxidizing media.
Coralloy CP Ti-2 Aeralloy CP Ti-2 Pure titanium Gr. 2	3.7035 3.7034	Most usual pure titanium variant. Good availability. Good balance between mechanical strength and ductility.
Coralloy CP Ti-3 Pure titanium Gr. 3	3.7055	Pure titanium variant with improved strength.

Titanium and titanium alloys



Material	No.	Application
Coralloy CP Ti-4 Aeralloy CP Ti-4 Pure titanium Gr. 4	3.7065 3.7064	High mechanical strength and good weldability distinguish pure titanium Gr.4, accompanied by adequate corrosion resistance in neutral to oxidizing environments, including chlorides. An improvement in corrosion resistance in reducing media is achieved by the addition of about 0.2 wt% palladium (Pd) for the pure titanic variants Coralloy CP Ti-1/Ti-2/Ti-3. The mechanical properties are not influenced by this.
Coralloy CP Ti-1-Pd Pure titanium Pd-alloyed Gr. 11	3.7225	Pd-alloyed pure titanium variant of Gr. 1
Coralloy CP Ti-2-Pd Pure titanium Pd-alloyed Gr. 7	3.7235	Pd-alloyed pure titanium variant of Gr. 2
Coralloy CP Ti-3-Pd	3.7255	Pd-alloyed pure titanium variant of Gr. 3
Zirconium		
Coralloy Zirkonium 702 Coralloy Zirkonium 704	-	Highly resistant alloys for applications in highly corrosive organic media (e.g. acetic acid), also against dilute oxidizing and reducing media. These two alloys are also used outside nuclear areas of application, where Coralloy Zirconium 704 exhibits slightly improved mechanical properties. Used in plants for the production of hydrochloric acid, acetic acid and urea.

We can offer you further materials and variants on request.

*) Standard trade designations of: General Electric, Cabot, Haynes, Special Metals, Teledyne, Inco Group, VDM Nickel Technology, Republic Steel, IMI, United Technologies, Carpenter