

# QUICK REFERENCE GUIDE

THE ALLOY SPECIALISTS

# SOLUTIONS TO MATERIALS PROBLEMS

Special Metals is a world leader in the development and production of nickel-based and other high-performance alloys with high-temperature strength, corrosion-resistance and other critical properties, used in virtually every industry, worldwide. We produce the largest range of nickel alloys and product forms available from any one manufacturer anywhere. We have production facilities in the USA and Europe, sales offices in North America, Europe and Australia, and distributors around the world. This publication is an introduction to the markets we serve and to the alloy products available from Special Metals.

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### GENERAL INDUSTRIES



#### AEROSPACE ENGINEERING

The first of the NIMONIC® alloys made the prototype jet engines of the early 1940s a practical reality. Today, the superalloys of the INCONEL®, NIMONIC®, INCOLOY® and UDIMET® series are used for their hot strength in civil and military engines—from combustors, through power turbines, to exhaust systems. The NILO® alloys are used for tooling in the production of composites. Our alloys are specified for applications in commercial jets, supersonic military aircraft, helicopters and space exploration programs.



#### AUTOMOTIVE ENGINEERING

New engine ratings and pollution control requirements are creating new applications for the INCOLOY®, INCONEL®, NIMONIC® and other high-nickel alloys in exhaust systems, valves, ignition equipment, sensors, electrical and electronic switchgear and safety devices.



#### THE CHEMICAL & PROCESS INDUSTRIES NIMONIC

Wrought nickel and the alloys of the INCOLOY®, INCONEL®, NIMONIC® and MONEL® series are used for their corrosion-resistance in process applications from vessels, piping and heat-exchangers, to pumps and valves.



#### MARINE ENGINEERING

This is one of the longest established applications for nickel alloys; MONEL® was first registered as a trademark in 1906. Today our products are used for their resistance to seawater corrosion in marine and submarine applications, on land and offshore platforms as well as in power and process plants, using seawater as a coolant.



#### POLLUTION CONTROL & WASTE PROCESSING

Helping meet new standards for clean-up and conservation, our products are used in power utilities and municipal and hazardous waste management systems, calling for the highest known performance from metallic materials working in aggressively corrosive environments. Applications include stack linings, scrubbers, boiler tubing and heat-exchangers.



#### THERMAL PROCESSING & HEAT TREATMENT

With high-temperature strength and resistance to corrosion by furnace atmospheres, INCOLOY®, INCONEL® and NIMONIC® alloys are used for furnace components such as radiant tubes, muffles, retorts, belts and hearths, and for the jigs and carriers that support the work through the heat-treatment processes. INCOTHERM™ alloy seamless tubing is used for thermocouples.



#### WELDING

Our Welding Products Company produces a range of coated electrodes, filler metals and flux-cored filler wires, weldstrip and fluxes for joining nickel alloys, high-performance steels, dissimilar metals and cast irons. Welding Products Company's trademarks include INCO-WELD®, INCOFLUX® and NI-ROD®.

### ENERGY INDUSTRY

Special Metals supplies critical alloys to the energy industry as a member of PCC Energy Group, a collection of companies that leverages the top names in the industry to push what's possible with metals for demanding energy applications.



#### OIL & GAS

On land and offshore, the INCONEL®, INCOLOY® and MONEL® alloys are used for applications ranging from downhole tubulars and tools through well-head hardware and processing equipment to flare booms. Some of these alloys are particularly useful for wells where sour gas and oil products at high-temperatures could create major operating problems.



#### PETROCHEMICAL PROCESSING

The INCOLOY® and INCONEL® high-temperature corrosion-resistant alloys are used for vessels, reactors, heat-exchangers, pyrolysis tubing, pigtails, headers and transfer piping. In this largely continuous process industry, the predictably reliable performance of these alloys is a major benefit to plant designers and operators.



#### POWER GENERATION

From superalloys for land-based gas turbines, to feedwater and superheater tubing in coal and gas-fired utilities, to nuclear engineering, the INCONEL®, INCOLOY®, NIMONIC®, MONEL® and UDIMET® alloys are used for their corrosion-resistance and high-temperature strength. And we have alloy and welding products used for solar and nuclear power generation.

## CORROSION-RESISTANT ALLOYS

Other alloy compositions and product forms may be available. Inquire for details.

	Billet	Rod and/or Bar Products	Hot-Rolled Plate	Sheet and/or Strip	Pipe and/or Tubing	Wire and/or Wire Rod
<b>NICKEL 200 (UNS N02200, W.Nr. 2.4060/2.4066)</b> <b>[Ni 99.6, C 0.04]</b> Commercially pure wrought nickel with good mechanical properties and corrosion-resistance. Used for chemical and process plant such as caustic soda and synthetic fiber production as well as for food handling.						
<b>NICKEL 201 (UNS N02201, W.Nr. 2.4061/2.4068)</b> <b>[Ni 99.6, C 0.02 MAX]</b> Similar to Nickel 200 but with the carbon content controlled to prevent intergranular embrittlement at service temperatures above 600°F [315°C]. Used for chemical and process plant applications.						
<b>DURANICKEL® ALLOY 301 (UNS N03301)</b> <b>[Ni 94.0, Al 4.5, Ti 0.5]</b> An age-hardenable nickel grade combining the corrosion-resistance of Nickel 200 with greater strength and hardness. Used for extrusion dies in the plastics industry and in the chemical and process industries.						
<b>MONEL® ALLOY 400 (UNS N04400, W.Nr. 2.4360/2.4366)</b> <b>[Ni 65.1, Cu 32.0, Fe 1.6, Mn 1.1]</b> A Ni-Cu alloy with high strength and excellent resistance to a range of media including seawater, hydrofluoric and sulfuric acids, and alkalis. Used in marine and offshore engineering, salt production and chemical and hydrocarbon processing.						
<b>MONEL® ALLOY R-405 (UNS N04405)</b> <b>[Ni 65.0, Cu 32.5, Fe 1.2, Mn 1.1, S 0.04]</b> Similar to MONEL alloy 400 but with controlled sulfur to improve machining characteristics.						
<b>MONEL® ALLOY K-500 (UNS N05500, W.Nr. 2.4375)</b> <b>[Ni 64.7, Cu 30.2, Al 2.7, Fe 1.0, Ti 0.6]</b> Similar to MONEL alloy 400 but age-hardenable for improved strength and hardness. Used for pump shafts, oil well tools, doctor blades, springs, fasteners and marine propeller shafts.						
<b>INCONEL® ALLOY 600 (UNS N06600, W.Nr. 2.4816)</b> <b>[Ni 76.0, Cr 15.0, Fe 8.0]</b> A Ni-Cr-Fe alloy, with good high-temperature strength and oxidation-resistance, and resistance to stress corrosion cracking and caustic corrosion. Used in chemical, petrochemical and thermal processing as well as commercial and military nuclear power generation.						
<b>INCONEL® ALLOY 22 (UNS N06022, W.Nr. 2.4602)</b> <b>[Ni 59.0, Cr 20.5, Mo 14.2, Fe 2.3, W 3.2]</b> A Ni-Cr-Mo alloy with corrosion resistance in a wide range of reducing and oxidizing media, and resistance to localized corrosion and stress-corrosion cracking.						
<b>INCONEL® ALLOY 625 (UNS N06625, W.Nr. 2.4856)</b> <b>[Ni 61.0, Cr 21.5, Mo 9.0, Nb 3.6, Fe 2.5]</b> A Ni-Cr-Mo alloy with resistance to severely corrosive environments, particularly to pitting, crevice corrosion and high-temperature oxidation, and with high strength from cryogenic temperatures up to 1500°F [815°C]. Used in aerospace engineering, gas turbines, chemical processing, oil and gas extraction, pollution control, and marine and nuclear engineering.						
<b>INCONEL® ALLOY 625LCF® (UNS N06626)</b> <b>[Ni 61.0, Cr 21.5, Mo 9.0, Nb 3.6, Fe 2.5]</b> Similar to INCONEL alloy 625 but with composition and processing controlled for optimum resistance to mechanical and thermal fatigue up to 1200°F [650°C].						

## CORROSION-RESISTANT ALLOYS

Other alloy compositions and product forms may be available. Inquire for details.

	Billet	Rod and/or Bar Products	Hot-Rolled Plate	Sheet and/or Strip	Pipe and/or Tubing	Wire and/or Wire Rod
<b>INCONEL® ALLOY 686 (UNS N06686, W.Nr. 2.4606)</b> <b>[Ni 58.0, Cr 20.5, Mo 16.3, W 3.8, Fe 1.0]</b> Offering optimum resistance to localized corrosion in acid chloride environments and excellent resistance to oxidizing, reducing and mixed acids. Used in a range of aggressively corrosive environments in marine, pollution control, waste processing and process industry applications.						
<b>INCONEL® ALLOY 690 (UNS N06690, W.Nr. 2.4642)</b> <b>[Ni 61.5, Cr 29.0, Fe 9.0]</b> An alloy with excellent resistance to corrosion in applications such as nuclear steam generators, coal gasification, sulfuric, nitric and nitric/hydrofluoric acid processing. Resistant to PWSCC in nuclear service.						
<b>INCONEL® ALLOY C-276 (UNS N10276, W.Nr. 2.4819)</b> <b>[Ni 57.0, Mo 16.0, Cr 16.0, Fe 5.0, W 4.0]</b> An alloy with excellent resistance to reducing and mildly oxidizing environments. Resistant to localized attack and stress-corrosion cracking. Used extensively in pollution control applications and throughout the chemical and process industries.						
<b>INCONEL® ALLOY G-3 (UNS N06985, W.Nr. 2.4619)</b> <b>[Ni 44.0, Cr 22.0, Fe 19.5, Mo 7.0, Cu 2.0]</b> An alloy that is readily weldable and resistant to intergranular corrosion in the welded condition. Used for gas well downhole tubulars, and handling phosphoric and sulfuric acids.						
<b>INCOLOY® ALLOY 800 (UNS N08800, W.Nr. 1.4876)</b> <b>[Fe 46.0, Ni 32.5, Cr 21.0, C 0.05]</b> An alloy with high strength and corrosion-resistance used in chemical, petrochemical and food processing, in nuclear engineering, and for the sheathing of electric heating elements. Applications generally at temperatures below 1200°F [650°C].						
<b>INCOLOY® ALLOY 825 (UNS N08825, W.Nr. 2.4858)</b> <b>[Ni 42.0, Fe 28.0, Cr 21.5, Mo 3.0, Cu 2.0, Ti 1.0]</b> A Ni-Fe-Cr alloy with excellent resistance to sulfuric and phosphoric acids. Resistant to oxidizing and reducing acids, stress-corrosion cracking, pitting and intergranular corrosion, it is used in chemical and petrochemical processing, oil and gas extraction, pollution control, waste processing and pickling applications.						
<b>INCOLOY® ALLOY 864™ (UNS S35135)</b> <b>[Fe 39.0, Ni 34.0, Cr 21.0, Mo 4.2, Si 0.8, Ti 0.6]</b> An alloy with excellent fatigue resistance, thermal stability and resistance to hot salt corrosion pitting and chloride stress-corrosion cracking. Developed for automotive exhaust system flexible couplings, EGR tubes, manifolds and tailpipes.						
<b>INCOLOY® ALLOY 20 (UNS N08020, W.Nr. 2.4660)</b> <b>[Fe 37.0, Ni 35.0, Cr 20.0, Cu 3.5, Mo 2.5, Nb 0.6]</b> An alloy with resistance to general corrosion, pitting and crevice corrosion in media containing chlorides and sulfuric, phosphoric and nitric acids. Used in chemical and process plants.						
<b>INCOLOY® ALLOY 25-6HN (UNS N08367)</b> <b>[Fe 45.0, Ni 25.0, Cr 20.0, Mo 6.5, Cu 0.9, N 0.20]</b> An austenitic 6% Mo alloy resistant to pitting and crevice corrosion in media containing chlorides and other halides. Applications include handling sulfuric and phosphoric acids, chemical plant, marine and offshore engineering, pulp and paper production, pollution control and nuclear service water piping.						

## A GUIDE TO AQUEOUS CORROSION-RESISTANCE





























































All alloys listed are resistant to chloride cracking.

	Sulfuric Acid	Hydrochloric Acid	Hydrofluoric Acid	Phosphoric Acid	Nitric Acid	Organic Acids	Alkalies and Salts	Seawater
NICKEL 200	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Not Suitable	Good to Excellent	Good to Excellent	Good to Excellent
NICKEL 201	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Not Suitable	Good to Excellent	Good to Excellent	Good to Excellent
DURANICKEL® ALLOY 301	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Not Suitable	Good to Excellent	Good to Excellent	Good to Excellent
MONEL® ALLOY 400	Good to Excellent	Acceptable	Good to Excellent	Good to Excellent	Not Suitable	Good to Excellent	Good to Excellent	Good to Excellent
MONEL® ALLOY R-405	Good to Excellent	Acceptable	Good to Excellent	Good to Excellent	Not Suitable	Good to Excellent	Good to Excellent	Good to Excellent
MONEL® ALLOY K-500	Good to Excellent	Acceptable	Good to Excellent	Good to Excellent	Not Suitable	Good to Excellent	Good to Excellent	Good to Excellent
INCONEL® ALLOY 600	Acceptable	Not Suitable	Acceptable	Acceptable	Not Suitable	Good to Excellent	Good to Excellent	Acceptable
INCONEL® ALLOY 22	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent
INCONEL® ALLOY 625	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent
INCONEL® ALLOY 625LCF®	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent
INCONEL® ALLOY 686	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent
INCONEL® ALLOY 690	Acceptable	Acceptable	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Acceptable
INCONEL® ALLOY C-276	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Acceptable	Good to Excellent	Good to Excellent	Good to Excellent
INCONEL® ALLOY G-3	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent
INCOLOY® ALLOY 800	Acceptable	Not Suitable	Not Suitable	Acceptable	Good to Excellent	Good to Excellent	Not Suitable	Acceptable
INCOLOY® ALLOY 825	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent
INCOLOY® ALLOY 864	Acceptable	Acceptable	Acceptable	Acceptable	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent
INCOLOY® ALLOY 20	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent
INCOLOY® ALLOY 25-6HN	Good to Excellent	Good to Excellent	Acceptable	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent	Good to Excellent

Good to Excellent  Acceptable  Not Suitable 

## HEAT-RESISTANT ALLOYS

Other alloy compositions and product forms may be available. Inquire for details.

	Billet	Rod and/or Bar Products	Hot-Rolled Plate	Sheet and/or Strip	Pipe and/or Tubing	Wire and/or Wire Rod
<b>INCOLOY® ALLOY 330 [UNS N08330, W.Nr. 1.4333]</b> <b>[Fe 44.0, Ni 35.5, Cr 18.5, Si 1.1]</b> An alloy with good resistance to oxidation and carburization, for thermal processing and heat treatment applications.						
<b>INCOLOY® ALLOY 800 [UNS N08800, W.Nr. 1.4876]</b> <b>[Fe 46.0, Ni 32.5, Cr 21.0, C 0.05]</b> An alloy with high strength and corrosion-resistance used for applications in chemical and petrochemical processing, and for the sheathing of electric heating elements.						
<b>INCOLOY® ALLOY 800H [UNS N08810, W.Nr. 1.4958 &amp; 1.4876]</b> <b>[Fe 46.0, Ni 32.5, Cr 21.0, Al+Ti 0.3-1.2, C 0.08]</b> Similar to INCOLOY alloy 800 but with improved creep and stress-rupture properties for applications above 1200°F (650°C). Resistant to high-temperature oxidation, carburization and nitridation, it is widely used in petrochemical and thermal processing.						
<b>INCOLOY® ALLOY 800HT® [UNS N08811, W.Nr. 1.4959 &amp; 1.4876]</b> <b>[Fe 46.0, Ni 32.5, Cr 21.0, Al+Ti 0.85-1.2, C 0.08]</b> Similar to INCOLOY alloy 800H but with even more precisely controlled composition and higher ASME allowable design stresses.						
<b>INCOLOY® ALLOY 803 [UNS S35045]</b> <b>[Fe 37.0, Ni 35.0, Cr 25.0, Al+Ti 0.3-1.2, C 0.08]</b> A Fe-Ni-Cr heat-resistant alloy with improved resistance to oxidation, carburization and sulfidation due to its content of chromium. Alloy 803 is typically used in refining, petrochemical and thermal processing applications and as internally finned tubes for ethylene pyrolysis.						
<b>INCOLOY® ALLOY 840 [W.Nr. 1.4847]</b> <b>[Fe 60.0, Ni 20.0, Cr 20.0]</b> An Fe-Ni-Cr alloy specially developed for the seam-welded tubing used for the sheathing of electrical heating elements.						
<b>INCOLOY® ALLOY 890 [UNS N08890]</b> <b>[Ni 42, Cr 24, Fe 28, Si 1.7, Mo 1.2, Nb 0.5, Ta 0.2]</b> Alloy 890 is SMC's latest addition to the INCOLOY family of heat resistant alloy products offering high strength along with excellent resistance to oxidation, carburization and sulfidation at temperatures up to 2200°F (1200°C). It is especially well suited use as smooth bore or internally finned ethylene pyrolysis furnace tubes.						
<b>INCONEL® ALLOY 600 [UNS N06600, W.Nr. 2.4816]</b> <b>[Ni 76.0, Cr 15.0, Fe 8.0]</b> A Ni-Cr-Fe alloy with good high-temperature strength and oxidation-resistance, and resistance to stress-corrosion cracking and caustic corrosion. Used for chemical and petrochemical processing, heat treatment applications, and in nuclear and automobile engineering.						
<b>INCONEL® ALLOY 601 [UNS N06601, W.Nr. 2.4851]</b> <b>[Ni 60.5, Cr 23.0, Fe 14.4, Al 1.4]</b> A nickel-chromium-iron alloy with an addition of aluminum for enhanced resistance to oxidation and other forms of high-temperature corrosion. It also has high mechanical properties at elevated temperatures. Alloy 601 products are used for industrial furnaces, heat-treating equipment and refining, petrochemical and other process equipment.						
<b>INCONEL® ALLOY 617 [UNS N06617, W.Nr. 2.4663]</b> <b>[Ni 52.0, Cr 22.0, Co 12.5, Mo 9.5, Fe 1.5, Al 1.2]</b> An alloy with an exceptional combination of high-temperature strength, stability and oxidation-resistance. Also resistant to carburizing gases, it is used in petrochemical and thermal processing, nitric acid production and gas turbine engineering.						

## HEAT-RESISTANT ALLOYS

Other alloy compositions and product forms may be available. Inquire for details.

	Billet	Rod and/or Bar Products	Hot-Rolled Plate	Sheet and/or Strip	Pipe and/or Tubing	Wire and/or Wire Rod
<b>INCONEL® ALLOY 625 (UNS N06625, W.Nr. 2.4856)</b> <b>[Ni 61.0, Cr 21.5, Mo 9.0, Nb 3.6, Fe 2.5]</b> A Ni-Cr-Mo alloy with resistance to a range of severely corrosive environments, particularly to pitting, crevice corrosion and high-temperature oxidation, and with high strength from cryogenic temperatures up to 1500°F (815°C). Used in aerospace engineering, gas turbines, chemical processing, oil and gas extraction, pollution control and marine and nuclear engineering.	■	■	■	■	■	■
<b>INCONEL® ALLOY 625LCF® (UNS N06626)</b> <b>[Ni 61.0, Cr 21.5, Mo 9.0, Nb 3.6, Fe 2.5]</b> Similar to INCONEL alloy 625 but with composition and processing controlled for optimum resistance to mechanical and thermal fatigue at up to 1200°F (650°C).	□	□	■	■	□	□
<b>INCONEL® ALLOY 690 (UNS N06690, W.Nr. 2.4642)</b> <b>[Ni 61.5, Cr 29.0, Fe 9.0]</b> An alloy with excellent resistance to high-temperature corrosion in applications such as nuclear steam generators, coal gasification and sulfuric, nitric and nitric/hydrofluoric acid processing.	■	■	■	■	■	□
<b>INCONEL® ALLOY HX (UNS N06002, W.Nr. 2.4665)</b> <b>[Ni 47.0, Cr 22.0, Fe 18.0, Mo 9.0, Co 1.5, W 0.6, C 0.1]</b> An alloy with an excellent balance of strength, fabricability and oxidation-resistance at up to 2000°F (1100°C). Used for aircraft, marine and land-based gas turbine engine combustors and other fabricated components, and in thermal processing and nuclear engineering.	■	■	■	■	■	■

## A GUIDE TO HIGH-TEMPERATURE CHARACTERISTICS

	Strength & Stability	Oxidation Resistance	Carburization Resistance	Sulfidation Resistance	Nitriding Resistance	Carbonitriding Resistance	Resistance to Molten Salts
INCONEL® ALLOY 600	■	■	■	□	■	■	■
INCONEL® ALLOY 601	■	■	■	■	■	■	■
INCONEL® ALLOY 617	■	■	■	■	■	■	■
INCONEL® ALLOY 625	■	■	■	□	■	■	■
INCONEL® ALLOY 625LCF®	■	■	■	□	■	■	■
INCONEL® ALLOY 690	■	■	■	■	■	■	■
INCONEL® ALLOY HX	■	■	■	□	■	■	■
INCOLOY® ALLOY 330	■	■	■	■	■	■	■
INCOLOY® ALLOY 800	■	■	■	■	■	■	■
INCOLOY® ALLOY 800H	■	■	■	■	■	■	■
INCOLOY® ALLOY 800HT®	■	■	■	■	■	■	■
INCOLOY® ALLOY 803	■	■	■	■	■	■	■
INCOLOY® ALLOY 840	■	■	■	■	■	■	■
INCOLOY® ALLOY 890	■	■	■	■	■	■	■

Good to Excellent ■ Acceptable ■ Not Suitable □

## HIGH-PERFORMANCE & SPECIAL PURPOSE ALLOYS

Other alloy compositions and product forms may be available such as specific information on high-temperature mechanical, creep- and stress-rupture properties under different heat-treatment conditions and information on high-temperature corrosion-resistance alloys. Visit [www.specialmetals.com](http://www.specialmetals.com) for more information.

	Billet	Rod and/or Bar Products	Hot-Rolled Plate	Sheet and/or Strip	Pipe and/or Tubing	Wire and/or Wire Rod
<b>INCONEL® ALLOY 706 [UNS N09706]</b> [Ni 41.5, Fe 37.0, Cr 16.0, Nb 2.9, Ti 1.8, Al 0.2] A superalloy for gas turbine applications, particularly for shafts, discs and spacers of land-based gas turbines for power generation.						
<b>INCONEL® ALLOY 718 [UNS N07718, W.Nr. 2.4668]</b> [Ni 54.0, Fe 18.5, Cr 18.0, Nb 5.0, Mo 3.0, Ti 1.0] An age-hardenable alloy combining high strength up to 1300°F (700°C) with corrosion-resistance and excellent weldability. Used in aerospace, gas turbines, oil and gas extraction and nuclear engineering.						
<b>INCONEL® ALLOY 718SPF™ [UNS N07719]</b> [Ni 54.0, Fe 18.5, Cr 18.0, Nb 5.0, Mo 3.0, Ti 1.0] A development of INCONEL alloy 718 with composition and processing controlled to create a high-strength, nickel-base superalloy with exceptional fatigue-resistance and amenable to superplastic forming.						
<b>INCONEL® ALLOY X-750 [UNS N07750, W.Nr. 2.4669]</b> [Ni 73.0, Cr 15.5, Fe 7.0, Ti 2.5, Nb 1.0, Al 0.7] An age-hardenable Ni-Cr-Fe alloy with high tensile and creep-rupture properties up to 1300°F (700°C). Applications include gas turbine engineering, tooling, fasteners and springs.						
<b>INCONEL® ALLOY 783 [UNS R30783]</b> [Co 34.0, Ni 28.5, Fe 26.0, Al 5.4, Nb 3.0, Cr 3.0, Ti 0.1] A Co-base superalloy with a low coefficient of thermal expansion, good oxidation- and impact-resistance, and metallurgical stability. Used for gas turbine engine casings, rings and seals.						
<b>INCOLOY® ALLOY 903 [UNS N19903]</b> [Fe 42.0, Ni 38.0, Co 15.0, Nb 3.0, Ti 1.4, Al 0.9] An age-hardenable alloy with a low and constant coefficient of thermal expansion up to 800°F (430°C). It has high strength, a constant modulus of elasticity and resistance to thermal shock from cryogenic temperatures up to 1200°F (650°C).						
<b>INCOLOY® ALLOY 909 [UNS N19909, W.Nr. 2.4692]</b> [Fe 42.0, Ni 38.0, Co 13.0, Nb 4.7, Ti 1.5, Si 0.4, Al 0.03] Similar to INCOLOY alloy 903 but with improved notch-rupture and tensile properties at high temperatures and improved processing characteristics. Used for gas turbine casings, shrouds, vanes and shafts.						
<b>INCOLOY® ALLOY A-286 [UNS S66286, W.Nr. 1.4980]</b> [Fe 56.5, Ni 25.5, Cr 15.0, Ti 2.1, Mo 1.25] An age-hardenable alloy with good strength and oxidation-resistance up to 1300°F (700°C). Applications include aircraft construction, automotive components and gas turbine engineering.						
<b>UDIMET® ALLOY 188 [UNS R30188]</b> [Co 38.0, Ni 22.0, Cr 22.0, W 14.0, Fe 3.0, Mn 1.25] A high-strength, thermally stable, oxidation- and sulfidation-resistant, cobalt-base superalloy used for gas turbine combustors and other key components.						

# PRODUCTS

## SMC PRODUCTS FOR OIL & GAS

### Oil Country Tubular Goods (Downhole Casing & Coupling Stock)

- Cold Reduced Alloys  
INCOLOY® alloys 28 & 825; INCONEL® alloys G-3 & C-276
- Precipitation Hardened Alloys  
INCOLOY® alloy 945X

### Mechanical Tubing

INCOLOY® alloys 925, 945 & 945X; INCONEL® alloy 725

### Completion & Wellhead Equipment

INCOLOY® alloys 925, 945 & 945X  
INCONEL® alloys 718 & 725

### Corrosion-Resistant Alloys

INCOLOY® alloy 925, 945, 945X & 725

## SMC PRODUCT FORMS & CAPABILITIES

### BILLET AND BAR PRODUCTS

#### Billet and Bar

Diameters 0.5 in. to 15 in. [12.7 mm to 2,380 mm] and weights up to ca. 20,000 lb. [9,000 kg]

#### Round Cornered Squares

4 in. to 14 in. [102 mm to 356 mm] across flats and weights up to approx. 20,000 lb. [9,000 kg]

#### Hot Rolled Rod

Diameters 0.5 in. to 12 in. [13 mm to 305 mm] and lengths up to ca. 20 ft. [6 m]. Longer lengths on application

#### Hot Rolled Wire Rod

Diameters 0.217 in. to 1 in. [5.51 mm to 25 mm] in coil form

#### Cold Drawn Rounds

Diameters 0.5 in. to 4 in. [13 mm to 102 mm] and lengths up to approx. 32 ft. [10 m]

#### Cold Drawn Hexagons

0.5 in. to 4 in. [13 mm to 101.6 mm] across flats and lengths up to ca. 20 ft. [6 m]

#### Cold Drawn Wire

Diameters from 0.2 in. to 0.59 in. [0.8 mm to 15 mm] available in coil, on reels and in "pay-off packs"

#### Ingot

Diameter up to 44 in.

### TUBULAR PRODUCTS

#### Cold Worked Seamless Pipe and Tube

0.75 in. to 8.625 in. [19.1 mm to 219 mm] O.D. range

#### Hot Worked (Extruded) Seamless Pipe and Tube

3.5 in. to 8.625 in. [88.9 mm to 219.1 mm] O.D. range

### FLAT PRODUCTS

#### Hot Rolled Plate

Thickness from 0.187 in. to 4 in. [4.76 mm to 102 mm] and widths from 48 in. to 98 in. [1,220 mm to 2,500 mm]

#### Cold Rolled Sheet

Thickness from 0.008 in. to 0.25 in. [0.20 mm to 6.4 mm] and widths to 48 in. [1,219 mm]

#### Cold Rolled Strip

Thickness from 0.008 in. to 0.125 in. [0.20 mm to 3.2 mm] and widths down to 0.75 in. [19 mm]

### WELDING PRODUCTS

#### Filler Metals

Diameters from 0.030 in. to 0.125 in. [0.8 mm to 3.2 mm] in 36 in. [915 mm] straight lengths and on 30 lb. [13.6 kg] spools

#### Welding Electrodes

Diameters from 0.094 in. to 0.188 in. [2.4 mm to 4.8 mm] in 10 lb. [4.54 kg] hermetically sealed containers

#### Weldstrip

1.18 in. to 4.72 in. [30 mm to 120 mm] on 60 lb. [27.22 kg] coils

#### Submerged Arc and Electroslag Welding Fluxes

50 lb. to 60 lb. [22.68 kg to 27.22 kg] hermetically sealed polyethylene buckets and 44 lb. [20 kg] polyethylene bags



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#### **A CENTURY OF ALLOY INNOVATION**

For over 100 years, Special Metals has been a world leader in the invention and production of highly engineered nickel alloys for demanding applications. In fact, Special Metals has invented over 80 percent of the nickel alloys in the market today—offering the industry's widest range of nickel alloys, cobalt alloys and product forms. As part of Precision Castparts Corporation (PCC), Special Metals can leverage the capabilities of other leaders in metal to offer an unmatched range of alloy components and products.