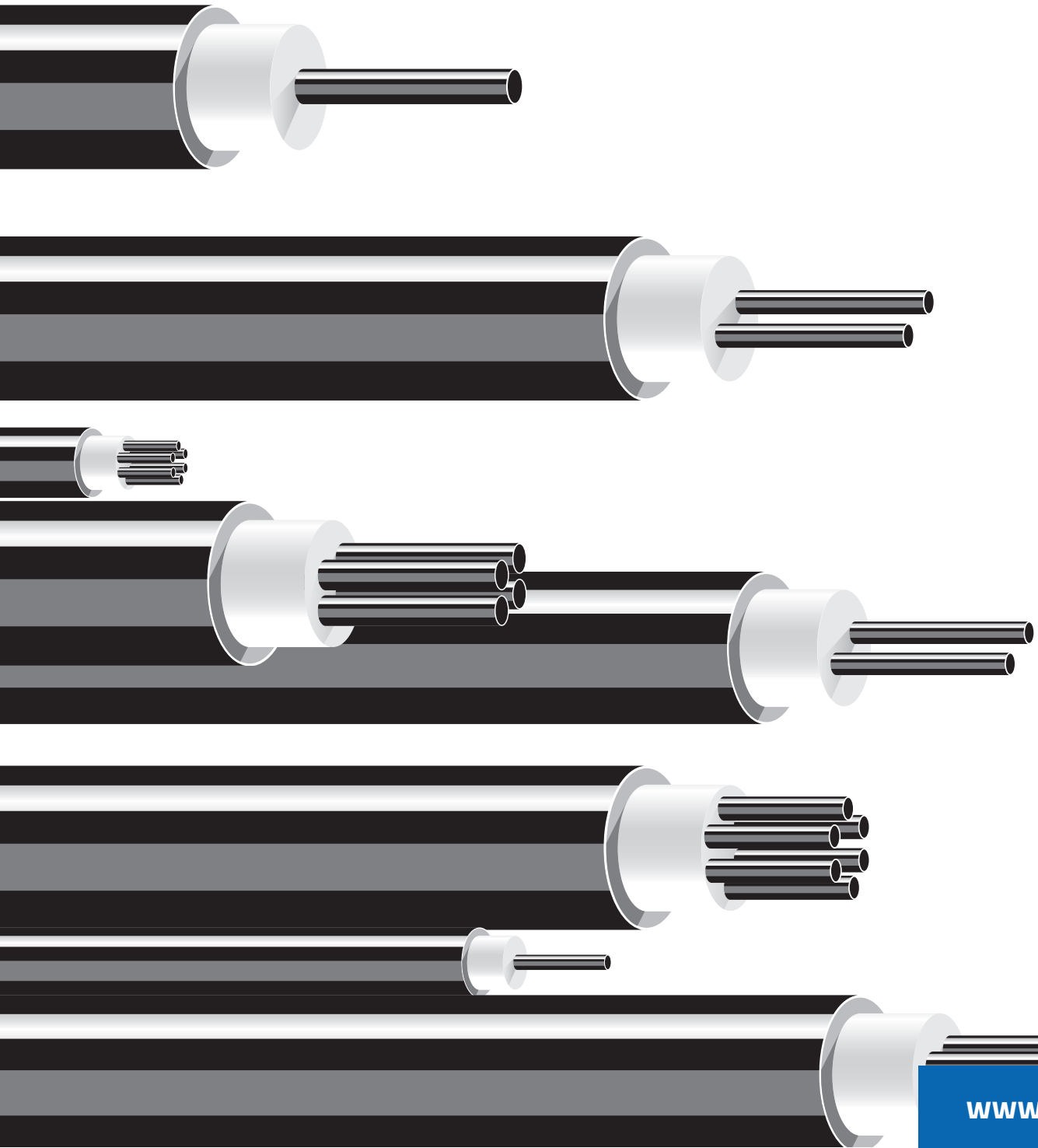
ISOMIL®

KNOW-HOW

> SELECTION OF SUITABLE SHEATH QUALITY



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Selection of Suitable Sheath Quality

AISI 321

Corrosion and heat resistance:
This material possesses excellent resistance to a number of aggressive media including hot crude oil products, steam and combustion gases. When operated in air it is oxidation resistant up to 900°C and with temperature variation resistant up to 800°C. It is resistant to carbon dioxide up to 650°C.

Welding and mechanical properties:
Suitable for all the known welding techniques. It is alloyed with Ti, a carbide former, and is thus resistant to grain disintegration in accordance with DIN 50914. Consequently, irrespective of the cross-section no heat-treatment is required subsequent to welding. The material is highly ductile. Machine-cutting may only be performed with very sharp tools otherwise work hardening of the surface occurs making further processing difficult.

Field of application:
Nuclear power (also liquid sodium), reactor instrumentation, construction of chemical instruments (highly resistant), e.g. in the production of acetyl acid and nitric acids, heat exchangers, annealing furnaces, paper and textile industry, crude oil refinement and petrochemistry, fat and soap industry, food processing, dairy and fermentation works.

AISI 316 TI / AISI 316

Corrosion and heat resistance:
Additions of molybdenum make these steels superior to molybdenum-free types as regards increased corrosion resistance to certain acids such as acetic acid, phosphoric acid, sulphuric acid, and other similar acids. Furthermore, these steels are more or less insensitive to pitting corrosion and withstand salt-water and aggressive industrial media. They can be used in continuous operation in air up to approx. 900°C and with temperature variation up to 800°C.

Welding and mechanical properties:
Suitable for all the known welding techniques. Heattreatment subsequent to welding is generally not necessary. In special circumstances when stresses from welding should be reduced to avoid stress-corrosion-cracking heat-treatment should be conducted (e.g. 1/2 h at 900°C). Highly ductile. As with 1.4541 only very sharp tools should be used for machine cutting. The steels can be polished.

Field of application:
Due to its high level of resistance to corrosion and pitting corrosion this alloy is ideally suited to applications in the field of chemical instrument construction. Other fields are: nuclear power plants, reactor instrumentation, furnace construction, sulphite, chemical pulp, textile, dye, fatty acid, photochemical and pharmaceutical industries.

AISI 304L

Corrosion and heat resistance:
This steel is also highly resistant to a number of aggressive media e.g. crude oil products, steam, combustion gases, colouring agents and liquid sodium. In contrast to alloys such as 1.4301, it is less prone to intercrystalline corrosion due to the lower carbon content. It can be subjected to continuous operation in air up to 900°C and under temperature variation up to 800°C.

Welding and mechanical properties:
Suitable for all the known welding techniques. Heattreatment subsequent to welding is generally not necessary. In special circumstances when stresses from welding should be reduced to avoid stress-corrosion-cracking heat-treatment should be conducted (e.g. 1/2h at 900°C). Highly ductile. As with 1.4541 only very sharp tools should be used for machine-cutting. The steels can be polished.

Selection of Suitable Sheath Quality

Field of application:
Nuclear power plants, construction of chemical equipment, textile and paper industry, fat, soap and nitric acid industries, food processing, dairy and brewery works.

AISI 310

Corrosion and heat resistance:
Excellent corrosion resistance. Can be operated in an atmosphere with carbon dioxide content up to 900°C. Resistant to concentrated nitric acid at 200°C and molten nitrates up to 420°C. Continuous operation in air up to approx. 1150°C and with temperature variation up to approx. 1000°C. Not recommended - the use of the material in continuous operation between 550°C and 850°C, because the material has a tendency to aphase precipitation and is consequently brittle after cooling to room temperature.

Welding and mechanical properties:
Arc-welding techniques are used on this material. Neither pre-heating nor heat-treatment subsequent to welding are required. Perfect for hot and cold working processes. Following hot or cold work heat-treatment is recommended (1050°C - 1100°C, cooling in water or in air). Machine-cutting can be performed providing high quality tools are used and the correct cutting conditions are selected. Hard metal tools are recommended.

Field of application:
In all fields where excellent scaling resistance and simultaneous hot tensile strength are of advantage. The high Ni content results in sensitivity to furnace gases with a sulphur content, in particular in reducing atmospheres. Particularly in: nuclear power plants, crude oil and petrochemistry, furnace construction, heat exchangers, air preheaters, cement kilns, brick kilns and glass works.

INCONEL 600

Corrosion and heat resistance:
Highly resistant to general corrosion and stress-corrosioncracking. The limit for use in carbon dioxide is around 500°C, as from 650°C corrosion increases drastically. Inconel 600 should not be used in liquid sodium above 750°C because higher temperatures cause material disintegration. Excellent oxidation resistance up to 1150°C. Not for application above 550°C in a S-containing atmosphere. Can be operated in water free of Cl up to 590°C.

Welding and mechanical properties:
Suitable for all known welding techniques. Annealing should precede welding. Suitable for brazing and soldering. Very highly ductile. Inconel 600 is a high nickel content alloy thus exhibiting excellent mechanical properties at higher temperatures. The material is soft and robust and facilitates machining-cutting providing it is not machined in the annealed condition but in the rolled condition.

Field of application: Standard material for the construction of PWR plants, nuclear power plants, furnace construction, man-made fibre production, synthetic material production, paper industry, food processing, steam boilers, column stills, aircraft engines.