



### Technical Information

### Material analysis

#### NIHARD 4

From today's series of wear resistant alloys, *NIHARD 4* is the toughest, most resistant one.

Apart from its wear resistance, it also provides best resistance against shock impacts. This makes *NIHARD 4* extremely suitable for dredging pumps, where rocks and other hard solids are likely to get in the pump.

The presence of chrome and nickel gives *NIHARD 4* more resistance against corrosion than cast iron PH 5-8.

*NIHARD 4* consists of chrome-iron carbides  $(Cr,Fe)_7C_3$ , embedded in a martensitic/bainitic base structure.

Chemical analysis	
<b>C</b>	2.6 - 3.2 %
<b>Si</b>	1.8 - 2.0 %
<b>Mn</b>	0.4 - 0.6 %
<b>S</b>	max. 0.1 %
<b>P</b>	max. 0.06 %
<b>Ni</b>	5.0 - 6.5 %
<b>Cr</b>	8.0 - 9.0 %

Mechanical analysis	
<b>Brinell hardness</b>	550 - 700 HBr
<b>Rockwell hardness</b>	53 - 63 HRc
<b>Tensile strength</b>	500 - 600 N/mm <sup>2</sup>
<b>Modulus of elasticity</b>	196 kN/mm <sup>2</sup>
<b>Bending strength</b>	62 - 75 Nm
<b>Impact value</b>	35 - 42 Nm

Wear figures for various materials tested with wet quartz-sand.

Material	HBr	Wear factor
Armo-steel	90	1.4
Cast iron	200	1.0 - 1.5
Carbon steel (0.2 % C)	107	1.0 (reference material)
Duplex steel	250 - 260	0.7 - 0.8
Bainitic cast iron	380 - 430	0.75
12 % chrome iron	400 - 500	0.4 - 0.75
NIHARD 4	550 - 700	0.25 - 0.6