

NiRes 450

NiRes 450 (NM450) is a wear resistant steel with good comprehensive properties like high strength, high hardness, good wear-resistance and weldability etc.

Chemical Composition (ladle analysis)

Thickness mm	C max	Si max	Mn max	P max	S max	Cr max	Ni max	Mo max	B max	CEV typv.	CET typv.
	%	%	%	%	%	%	%	%	%		
4 - 20	0.24	0.70	1.60	0.020	0.010	0.80	0.30	0.80	0.0040	0.51	0.36
(20) - 40	0.26	0.80	1.70	0.020	0.010	1.00	0.50	1.00	0.0040	0.59	0.39
(40) - (60)	0.26	0.80	1.70	0.020	0.010	1.20	0.70	1.20	0.0040	0.65	0.41
60 - 80*	0.26	0.80	1.70	0.020	0.010	1.40	1.00	1.20	0.0040	0.71	0.43

* Up to 110 mm available upon request

$$CEV = C + Mn / 6 + (Cr + Mo + V) / 5 + (Cu + Ni) / 15$$

$$CET = C + (Mn + Mo) / 10 + (Cr + Cu) / 20 + Ni / 40$$

Mechanical Properties

Hardness HBW , guaranteed	Yield Strength MPa, typical	Tensile Strength MPa, typical	Elongation A50 , % , typical
420 - 490	1150	1450	11 (transverse)

Brinell hardness on a milled surface 1 - 2.5 mm below surface, average of three test points.

At least one test specimen per batch and 35 tons, on the same grade, the same Heat No., the same thickness and the same delivery condition.

Tensile testing is performed between 4 - 60 mm.

Mechanical Properties

Impact Properties Longitudinal test, typical Charpy-V 10x10 mm test specimen	Test temperature °C	Impact energy J
	-20	30

Average of three tests . Single value minimum 70% of specified average. Impact testing is performed between 6 - 60 mm. For thicknesses less than 6 - 11.9 mm , subsize Charpy-V specimens are used.

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Delivery Condition

Q (Quenched) or Q.T. (Quenched and Tempered)

Tolerance

Thickness tolerance

According to EN 10029 Class B, and offer more narrow tolerances upon request

Shape, length, width tolerances

According to EN 10029.

Flatness Tolerance

According to EN 10029 Class-N type-H.

Surface Properties

According to EN 10163-2:2004 Class A Subclass 1.

Ultrasonic Testing

According to EN 10160:2004 Class S1E1.

Recommendations

The properties of the delivery condition cannot be retained after exposure to service or preheating temperatures in excess of 250°C.