



# 3.5% Ni toughcore

Cost reduction and increased safety for e.g. ethylene and LPG tank manufacturing

## References

The material is in full compliance with DNV Rules for Classification Ships, Part 2 Ed. July 2021. NV 3.5Ni toughcore® is suitable for the use instead of NV 5Ni/a but with even increased tensile strength.

## Delivery Condition

The material will be delivered in the thermomechanically rolled and tempered condition.

## Available dimensions

Steel grade	Max. plate thickness [mm]	Max. width [mm]	Max. lengths [mm]	Max. weight [t]
3.5% Ni toughcore	50	3,850	16,000	21.5

## Chemical composition: Heat analysis in mass %

Steel grade		C	Si	Mn	S	P	Ni	Al	Cr	Mo
3.5% Ni toughcore	Min.		0.10	0.30			3.25	0.02		
	Max.	0.12	0.35	0.70	0.025	0.025	3.75		0.30	0.15

## Mechanical properties: Tensile test

Testing will be carried out in transverse direction acc. to DNV Rules for Classification Ships, Part 2 Ed. July 2021 for NV 5Ni/a.

Steel grade	Tensile strength $R_m$ 1)		Yield strength $R_{p0,2}$ 2)	Tensile strength $R_m$ 2)	Elongation A5
	[MPa]		[MPa] min.	[MPa]	[%]
3.5% Ni toughcore	Min.	570	390	380	22
	Max.	690			

- 1) Additional testing in the simulated stress relieved condition can be agreed at a temperature of max. 580°C. Tensile strength min. 610MPa upon request.
- 2) Optional min. yield strength 450MPa

## Mechanical properties: Notch impact energy <sup>3)</sup>

Testing will be carried out acc. to DNV Rules for Classification Ships, Part 2 Ed. July 2021 for NV 5Ni/a.

Steel grade	Thickness [mm]	Test temperature [°C]	Notch impact energy Min. average value	
			Transverse [J]	Longitudinal [J]
3.5% Ni toughcore	≤ 25	-110	27	41
	25 < t ≤ 30	-115		
	30 < t ≤ 35	-120		
	35 < t ≤ 40	-125		
	40 < t ≤ 45	-130		
	45 < t ≤ 50	-135		

- 3) Additional testing in the simulated stress relieved condition can be agreed at a temperature of max. 580°C.

## Welding Pre-Qualification

Material is pre-qualified under the following conditions:

- heat inputs 1.5 kJ/mm and 2.5 kJ/mm as welded (unless otherwise agreed).
- Charpy V-Notch at -135°C in the heat affected zone
- Additional testing in the simulated stress relieved condition can be agreed at a temperature of max. 580°C.

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