L360NE

EN ISO 3183 · Line pipe steel for oil and gas pipeline systems

Designation: L360NE · (former: StE 360.7 TM)

Standard: EN ISO 3183:2012 (replaces EN 10208-2)

API equivalent: API 5L Grade X52 (N / Q / M) · PSL 1 / PSL 2

Designation key: L360 = min. yield strength 360 MPa · N = normalised rolling · E = electric welded or seamless

Temperature range: −50 °C to +80 °C (continuous service in ground)

Standard: EN ISO 3183 · API 5L · A/SA 333 Gr. 6 (low-temp. variant)

Delivery forms: Pipes (seamless and welded) · Fittings per ASME B16.9 / MSS SP-75

1 Material Equivalents & Comparable Grades

International Equivalents

Standard / Region	Designation	Mat. No. / Grade	Note
EN ISO 3183	L360NE	–	Normalised rolling, seamless/welded
EN ISO 3183	L360ME	–	Thermomechanically rolled
EN ISO 3183	L360QE	–	Quenched and tempered
API 5L	Grade X52N / X52M / X52Q	–	American equivalent – largely identical
ASTM	A/SA 106 Gr. B	–	General pressure pipes – not identical

Alternative Materials

Material	Mat. No.	Relation to L360NE	When to use
P265GH (1.0425)	1.0425	General pressure pipe, not pipeline spec.	For non-pipeline pressure service
L415NE (X60)	L415NE	Higher yield strength	For higher operating pressure lines
A/SA 333 Gr. 6	–	Low-temp. pipeline grade	For offshore service with low-temp. certification

2 Chemical Composition

Values in mass percent (%). Standard: EN ISO 3183.

L360NE is a normalised rolling grade with specific requirements for toughness, weldability and hydrogen-induced cracking (HIC) resistance. PSL 2 version provides tighter chemistry and CTOD testing.

Element	Sym.	Min. (Heat)	Max. (Heat)	Max. (Prod.)	Function
Carbon	C	–	0.220	0.260	Max. 0.22 % for PSL 1; 0.18 % for PSL 2
Silicon	Si	–	0.450	0.500	Deoxidation
Manganese	Mn	–	1.400	1.500	Strength, toughness
Phosphorus	P	–	0.025	0.030	Strict limit for HIC resistance
Sulphur	S	–	0.015	0.020	Very low S – key for HIC resistance
Carbon Equiv.	CE	–	0.43	0.45	Weldability index

3 Mechanical Properties

Room Temperature – Minimum Requirements

Normalised. Pipeline grade with specific toughness and HIC requirements.

Property	Sym.	Unit	Min. Value	Note
Yield strength	Rp0.2	MPa	360–510	PSL 1
Tensile strength	Rm	MPa	≥ 460	–
Elongation	A	%	≥ 22	–
Impact energy (−20 °C)	KV	J	≥ 40	PSL 2 transverse
Hardness	HV	max. 248	–	HIC-critical zones

Elevated Temperature Yield Strength Rp0.2 in MPa (indicative values)

Temp.	0 °C	20 °C	50 °C	80 °C
Rp0.2 (MPa)	355	350	340	330

4 Physical Properties

Property	Sym.	20 °C	200 °C	400 °C	Unit
Density	ρ	7.85	7.78	7.70	g/cm³
Modulus of elasticity	E	210	208	205	GPa
Thermal conductivity	λ	51	50	48	W/(m·K)
Thermal expansion	α	12.0	12.2	12.5	10^{-6}/K

5 Corrosion Behaviour

Medium / Environment	Notes	Rating
Hydrocarbons (dry, non-sour)	Buried pipeline, standard service	+
Natural gas (dry, sweet)	Standard pipeline grade	+
Sour service H_2S (wet)	PSL 2 + NACE sour service options required	o
HIC-resistant variant	Special chemistry and NACE testing required	o
External corrosion (buried)	External coating + cathodic protection required	o
Seawater (external, with coating)	Subsea pipelines – coating + CP mandatory	o

++ excellent	+ good	o limited	– not suitable

L360NE / API 5L X52 is the standard grade for onshore and offshore pipeline transport of oil and gas. PSL 2 version required for sour service, offshore, or NACE-compliant service.

6 Typical Applications

Industry / Plant	Typical Application	Operating Conditions
Oil & gas transmission pipelines	Long-distance oil and gas transport	Primary application worldwide
Offshore pipelines	Subsea trunklines, risers	PSL 2 with additional testing
Natural gas distribution	Regional distribution networks	Standard pressure class
Industrial piping (EN ISO 3183)	Where pipeline material spec. is required	Project-specified

7 Delivery Forms at Nirotec

Component	Standard (EN)	Standard (ASME/ASTM)	Note
Pipes	EN ISO 3183	API 5L · ASTM A/SA 333 Gr. 6	Seamless and welded
Elbows	MSS SP-75	ASME B16.9 · A/SA 234 WPL6	LR/SR, on request
Tees	MSS SP-75	ASME B16.9 · A/SA 234 WPL6	Equal and reducing
Reducers	MSS SP-75	ASME B16.9 · A/SA 234 WPL6	On request
Caps	MSS SP-75	ASME B16.9	On request

8 Standards, Approvals & Codes

Standard / Code	Title / Application

EN ISO 3183	Steel pipes for pipeline transportation systems in petroleum and natural gas industries
API 5L	Line Pipe Specification (US equivalent)
NACE MR0175 / ISO 15156	Sour service (H_2S-containing media)
DNV-ST-F101	Submarine pipeline systems
ASME B31.4 / B31.8	Liquid / Gas Transmission Pipeline Systems

9 Fabrication Notes

Weldability

Parameter	Requirement / Recommendation	Note
Preheat	As per CE value; typically 75–125 °C	Pipeline codes specify minimum preheat
PWHT	Not normally required for standard service	Required for some sour service specs.
Filler	ER70S-G / E7018 low-hydrogen	Low-hydrogen mandatory
Process	GTAW root + SMAW fill / cap	Standard pipeline procedure

- Delivery condition: Normalised
- CE ≤ 0.43 ensures good weldability with standard procedures
- PSL 2 required for offshore, sour service and NACE-compliant applications
- External coating + cathodic protection essential for buried and subsea service

10 Enquiry & Contact

For a project-specific quotation, please provide:

- Standard and execution (e.g. LR 90° elbow per EN 10253-4)
- Dimensions: DN / NPS and wall thickness or schedule
- Quantity and requested delivery date
- Documentation: EN 10204 Type 3.1 / 3.2, NDT, third-party inspection
- Any project-specific specifications or special requirements

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