

16Mo3

Mat. No. 1.5415 · Molybdenum-alloyed creep-resistant steel

Mat. No.: 1.5415

EN designation: 16Mo3

ASTM/ASME equiv.: Pipes: A/SA 335 P1 · Fittings: A/SA 234 WP1 · Flanges: A/SA 182 F1

Temperature range: Up to +530 °C (creep-resistant)

Standard: EN 10216-2 · EN 10253-2

Delivery forms: Elbows · Tees · Reducers · Caps · Flanges · Pipes

1 Material Equivalents & Comparable Grades

International Equivalents

Standard / Region	Designation	Mat. No. / Grade	Note
EN	16Mo3	1.5415	Mo-alloyed creep steel
ASTM	A/SA 335 P1	–	Seamless pipes
ASTM	A/SA 234 WP1	–	Fittings
ASTM	A/SA 182 F1	–	Flanges
DIN (old)	15 Mo 3	–	Superseded by EN

Alternative Materials

Material	Mat. No.	Relation to 16Mo3	When to use
P265GH	1.0425	No Mo addition	For service up to 400 °C only
13CrMo4-5	1.7335	Cr+Mo alloy	For temperatures above 530 °C

2 Chemical Composition

Values in mass percent (%). Standard: EN 10216-2.

Mo addition (0.25–0.35 %) significantly improves creep resistance. First step in the CrMo steel ladder.

Element	Sym.	Min. (Heat)	Max. (Heat)	Max. (Prod.)	Function
Carbon	C	0.12	0.200	0.220	Moderate for creep resistance
Silicon	Si	–	0.350	0.400	Deoxidation
Manganese	Mn	0.40	0.900	1.000	Strength
Phosphorus	P	–	0.025	0.030	Limit

Sulphur	S	–	0.020	0.025	Limit
Molybdenum	Mo	0.25	0.350	0.380	Key element: creep resistance

3 Mechanical Properties

Room Temperature – Minimum Requirements

Normalised or N+T.

Property	Sym.	Unit	Min. Value	Note
Yield strength	Rp0.2	MPa	≥ 275	t ≤ 16 mm
Tensile strength	Rm	MPa	440–590	–
Elongation	A	%	≥ 22	–
Impact energy (0 °C)	KV	J	≥ 40	–

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

Temp.	200 °C	300 °C	400 °C	500 °C	530 °C
Rp0.2 (MPa)	240	218	196	165	152

4 Physical Properties

Property	Sym.	20 °C	200 °C	400 °C	Unit
Density	ρ	7.85	7.75	7.65	g/cm ³
Modulus of elasticity	E	210	197	183	GPa
Thermal conductivity	λ	48	45	40	W/(m·K)
Thermal expansion	α	12.0	13.2	14.0	10 ⁻⁶ /K

5 Corrosion Behaviour

Medium / Environment	Notes	Rating
Steam (up to 530 °C, treated)	Standard high-temp. carbon/Mo steel	+
Hydrocarbons (dry)	Refinery service	+
H ₂ service	Nelson curve check required	o
Acids / chlorides	Not suitable	-

++ excellent + good o limited - not suitable

16Mo3 bridges the gap between P265GH (up to 400 °C) and Cr-Mo alloy steels (from 450 °C).

6 Typical Applications

Industry / Plant	Typical Application	Operating Conditions
Power plants	Boiler tubes, steam headers	400–530 °C
Refineries	High-temperature process lines	Dry hydrocarbons
Chemical industry	High-temperature process piping	Non-corrosive media

7 Delivery Forms at Nirotec

Component	Standard (EN)	Standard (ASME/ASTM)	Note
Elbows	EN 10253-2	ASME B16.9 · A/SA 234 WP1	LR/SR, 90°/45°
Tees	EN 10253-2	ASME B16.9 · A/SA 234 WP1	Equal and reducing
Reducers	EN 10253-2	ASME B16.9 · A/SA 234 WP1	Concentric and eccentric
Caps	EN 10253-2	ASME B16.9 · A/SA 234 WP1	Ellipsoidal
Flanges	EN 1092-1 Type 11	ASME B16.5 · A/SA 182 F1	PN 16–400
Pipes	EN 10216-2	A/SA 335 P1	Seamless

8 Standards, Approvals & Codes

Standard / Code	Title / Application
EN 10216-2	Seamless steel tubes – elevated temperature
EN 10253-2	Butt-welding fittings
AD 2000-W2	Creep-range steel
PED 2014/68/EU	Pressure Equipment Directive
ASME B31.1/B31.3	Power/Process Piping

9 Fabrication Notes

Weldability

Parameter	Requirement / Recommendation	Note
Preheat	150–200 °C recommended	Prevents hydrogen cracking
PWHT	Required: 690–730 °C	Stress relief and tempering
Filler	ER80S-B2 / E8018-B2	1Cr-½Mo type filler

Process	GTAW, SMAW	Low-hydrogen mandatory
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- Delivery condition: Normalised or N+T
- PWHT mandatory for pressure service
- Low-hydrogen welding consumables (E8018-B2 type)

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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All information is provided without warranty. Applicable standards and project specifications at time of order are authoritative.