

P235GH

Mat. No. 1.0345 · Non-alloy carbon steel for pressure purposes

Mat. No.: 1.0345
EN designation: P235GH
ASTM/ASME equiv.: Pipes: A/SA 106 Gr. A · Fittings: A/SA 234 WPA · Flanges: A/SA 181 Cl.60
Temperature range: -10 °C to +300 °C
Standard: EN 10216-1/-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	P235GH	1.0345	Pressure purposes
ASTM	A/SA 106 Gr. A	–	Seamless pipes
ASTM	A/SA 234 WPA	–	Fittings
DIN (old)	St 35.8	–	Superseded by EN

Alternative Materials

Material	Mat. No.	Relation to P235GH	When to use
P265GH	1.0425	Higher strength	For higher pressure classes
16Mo3	1.5415	Mo-alloyed	For service above 300 °C

2 Chemical Composition

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

Base grade for general pressure service. No alloy additions – good weldability.

Element	Sym.	Min. (Heat)	Max. (Heat)	Max. (Prod.)	Function
Carbon	C	–	0.170	0.200	Strength; limited for weldability
Silicon	Si	–	0.350	0.400	Deoxidation
Manganese	Mn	0.60	1.200	1.300	Strength, toughness
Phosphorus	P	–	0.025	0.030	Limit

Sulphur	S	–	0.020	0.025	Limit
Molybdenum	Mo	–	0.080	0.090	Residual

3 Mechanical Properties

Room Temperature – Minimum Requirements

Normalised.

Property	Sym.	Unit	Min. Value	Note
Yield strength	Rp0.2	MPa	≥ 235	t ≤ 16 mm
Tensile strength	Rm	MPa	360–500	–
Elongation	A	%	≥ 25	–
Impact energy (0 °C)	KV	J	≥ 27	–

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

Temp.	100 °C	200 °C	300 °C
Rp0.2 (MPa)	210	190	162

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	51	48	44	W/(m·K)
Thermal expansion	α	12.0	13.0	13.8	10 ⁻⁶ /K

5 Corrosion Behaviour

Medium / Environment	Notes	Rating
Water / steam (treated)	Standard carbon steel application	+
Hydrocarbons (dry)	Oil, gas	+
Wet H ₂ S / Sour service	Not suitable	–
Acids / chlorides	Not suitable	–
Atmospheric corrosion	External coating required	o

++ excellent + good o limited – not suitable

P235GH: base grade for general pressure service. No corrosion resistance to aggressive media.

6 Typical Applications

Industry / Plant	Typical Application	Operating Conditions
Power plants	Feed lines, utility steam	Up to 300 °C, treated water
General plant engineering	Low-pressure process piping	Standard applications
Pressure vessels	Nozzles, connecting pipes	PED-compliant

7 Delivery Forms at Nirotec

Component	Standard (EN)	Standard (ASME/ASTM)	Note
Elbows	EN 10253-2	ASME B16.9 · A/SA 234 WPA	LR/SR, 90°/45°
Tees	EN 10253-2	ASME B16.9 · A/SA 234 WPA	Equal and reducing
Reducers	EN 10253-2	ASME B16.9 · A/SA 234 WPA	Concentric and eccentric
Caps	EN 10253-2	ASME B16.9 · A/SA 234 WPA	Ellipsoidal
Flanges	EN 1092-1 Type 11	ASME B16.5 · A/SA 181	PN 10–100
Pipes	EN 10216-1/-2	A/SA 106 Gr. A	Seamless

8 Standards, Approvals & Codes

Standard / Code	Title / Application
EN 10216-1/-2	Seamless steel tubes for pressure purposes
EN 10253-2	Butt-welding fittings – non-alloy steels
AD 2000	German pressure vessel code
PED 2014/68/EU	Pressure Equipment Directive
ASME B31.1/B31.3	Power/Process Piping

9 Fabrication Notes

Weldability

Parameter	Requirement / Recommendation	Note
Preheat	Not required ($t \leq 30$ mm)	CE check recommended
PWHT	Not mandatory; 580–620 °C for $t > 30$ mm	Stress relief

Filler	ER70S-X / E7018	Match base metal
Process	GTAW, SMAW, GMAW	Standard

- Delivery condition: Normalised
- Good weldability
- Standard carbon steel consumables applicable

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.