P460NH Steel Plate

OMEGA STEEL CO.
Istanbul · Dilovası plant

1.8935 · P460NH is the strongest grade in EN 10028-3: 460 MPa yield, 570–720 MPa tensile, normalised fine-grain with 40 J at −20 °C and guaranteed yield up to 400 °C. Designers use it to take wall thickness out of high-pressure vessels — air and gas receivers, hydraulic accumulators, CNG and hydrogen buffer vessels, heavy-wall reactors and hydro-cracker shells — where a 30 % thinner shell saves weight, welding time and PWHT. Supplied 8–80 mm to order from EU mills with 3.1 or 3.2 certificates, UT and Z-quality; elevated-temperature yield values on the certificate.

1.8935 | Yield ≥ 460 MPa | KV 40 J at −20 °C | Rp0.2 to 400 °C certified | 8–80 mm to order

A 460 MPa plate is the honest way to make a pressure vessel lighter: the same code, the same normalised fine-grain metallurgy as P355, and a third less steel in the wall.

CHEMICAL COMPOSITION

Element	C	Si	Mn	P	S	Al	Nb	V	Ti	Ni	Cr	Mo	Cu	N
max. % (ladle)	≤ 0.20	≤ 0.60	1.10–1.70	≤ 0.025	≤ 0.015	≥ 0.020	≤ 0.05	≤ 0.20	≤ 0.03	≤ 0.80	≤ 0.30	≤ 0.10	≤ 0.70	≤ 0.025

Nb + Ti + V ≤ 0.22 %. CEV typically 0.48–0.53 — preheat is required for most thicknesses.

MECHANICAL PROPERTIES

Thickness	Yield ReH min (MPa)	Tensile Rm (MPa)	Elongation A min	Impact KV
≤ 16 mm	460	570–720	17 %	40 J at −20 °C (long.) / 27 J trans.
> 16–40 mm	445	570–720	17 %	40 J at −20 °C
> 40–60 mm	430	570–720	17 %	40 J at −20 °C
> 60–80 mm	415	550–700	17 %	40 J at −20 °C
Rp0.2 at 200 / 300 / 400 °C	≥ 370 / 345 / 290	—	—	certified (NH)

EQUIVALENT GRADES

System	Grade	Note
DIN 17102	WStE 460	direct predecessor
EN 10028-3	P460N / P460NL1 / P460NL2	siblings: without ET values / −40 / −50 °C
EN 10025-3	S460N / S460NL	structural equivalents, no pressure certification
ASTM	A737 Gr. C	Nb-V normalised pressure plate, 415 MPa
ASTM	A612 (approx.)	high-strength normalised C-Mn-Si
EN 10028-6	P460Q / P460QH	quenched-and-tempered route to the same strength

WALL-THICKNESS SAVING AGAINST P355

Vessel	Design pressure	Inside Ø	P355NH wall	P460NH wall	Steel saved
Air receiver 8 m³	40 bar	1 800 mm	22 mm	17 mm	≈ 23 %
Nitrogen accumulator	100 bar	1 000 mm	30 mm	24 mm	≈ 20 %
Process column	25 bar at 300 °C	2 800 mm	28 mm	21 mm	≈ 25 %
Reactor shell	60 bar at 350 °C	3 000 mm	68 mm	52 mm	≈ 24 %
CNG buffer	250 bar	600 mm	45 mm	35 mm	≈ 22 %

Illustrative only — the vessel designer's calculation to the applicable code governs; savings shrink where thickness is set by external pressure, nozzles or fatigue.

STANDARDS

EN 10028-3:2017 — P460NH, 1.8935 (also P460N, P460NL1, P460NL2) · PED 2014/68/EU; AD 2000 W1 · EN 10160 UT; EN 10164 Z15/Z25/Z35 · DIN 17102 — WStE 460 (withdrawn)