DD12 Steel

OMEGA STEEL CO.
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1.0398 · DD12 is the drawing grade of EN 10111 hot-rolled forming steel: yield 170–320 MPa, tensile ≤ 420 MPa, elongation ≥ 30 %, carbon ≤ 0.10 %, non-ageing — for pressed and shallow-drawn hot-rolled parts where DD11 shows splits or flow lines. Material number 1.0398, old name StW 23. Supplied pickled and oiled (HRPO) in 1.5–6 mm to order; DD13 from stock as the upward substitute.

1.0398 | Yield 170–320 MPa | A80 ≥ 30 % | Non-ageing | 1.5–6 mm to order

DD12 is the step a wheel-rim or a drawn cross-member takes when DD11 is not quite ductile enough: a tighter yield window, two more points of elongation and a non-ageing guarantee, on the same pickled hot-rolled strip. Mills roll it against order; we usually deliver DD13 from stock in its place.

CHEMICAL COMPOSITION

Element	C	Mn	P	S
max. % (ladle)	0.10	0.45	0.035	0.035

Typical heat: C 0.03–0.05, Mn 0.20–0.30, Al-killed.

MECHANICAL PROPERTIES AND FORMABILITY

Property	Requirement	Typical value	Note
Yield strength ReH	170–320 MPa (≤ 340 below 2 mm)	200–260 MPa	
Tensile strength Rm	≤ 420 MPa	320–380 MPa	
Elongation A80	≥ 30 %	33–38 %	
Bend radius	0.5 × t	passes	
Ageing	non-ageing 6 months	guaranteed	

EQUIVALENT GRADES

System	Grade	Note
DIN 1614-1 (old)	StW 23	historic German
EN 10111 (1998)	DD12	previous edition
JIS G3131	SPHD	
ASTM A1011	DS Type B	
GB/T 3273 / 5213	SPHD	

SURFACE CONDITION AND WHAT IT COSTS IN THE PRESS

Condition	Process	Surface	Best for
Black (HR, as-rolled)	none — mill scale left on	blue-black oxide, 10–40 µm, flakes when bent	welded structures, plate to be blasted, hidden parts
HRPO (pickled & oiled)	HCl pickling of coil, rinse, light oil	uniform grey-metallic, scale-free, Ra ≈ 1–3 µm	forming, painting, roll-forming, tube making, visible parts
HRP / HRPO skin-passed	pickling + temper pass	flatter, tighter gauge, no Lüders lines	pressing, blanking, precision parts
Dry (pickled, unoiled)	pickling, no oil	bare, rusts within days	immediate galvanizing or welding only

For pressed parts the surface decides the tool life more than the grade does: mill scale is harder than the die. Order pickled and oiled, and specify skin-passed if the blank has to be flat enough to feed automatically.

STANDARDS

EN 10111:2008 — DD12, 1.0398 · EN 10051 — tolerances · EN 10204 3.1 · Former DIN 1614 StW 23