DD13 Steel

OMEGA STEEL CO.
Istanbul · Dilovası plant

1.0335 · DD13 is the deep-drawing grade of EN 10111 hot-rolled steel: Al-killed, carbon ≤ 0.08 %, yield 170–310 MPa, tensile ≤ 400 MPa, elongation ≥ 33 %, non-ageing — the strip for wheel rims, gas cylinders, drawn cups and housings in 1.5–6 mm where cold-rolled sheet is too thin. Material number 1.0335, old name StW 24. We stock it pickled and oiled at Dilovası as the drawing grade of the hot-rolled range.

1.0335 | Yield 170–310 MPa | A80 ≥ 33 % | Non-ageing | 1.5–6 mm HRPO stock

DD13 is the hot-rolled counterpart of DC04: the sheet that draws a wheel rim, an LPG cylinder half or a 4 mm cup without a crack. Turkish mills make it well and often, we keep it pickled in the common gauges, and it is what we deliver against most DD12 and many "deep-drawing HRPO" enquiries.

CHEMICAL COMPOSITION

Element	C	Mn	P	S
max. % (ladle)	0.08	0.40	0.030	0.030

Typical heat: C 0.02–0.04, Mn 0.20–0.30, Al 0.03–0.06 (killed).

MECHANICAL PROPERTIES AND DEEP-DRAWING BEHAVIOUR

Property	Requirement	Typical value	Note
Yield strength ReH	170–310 MPa (≤ 330 below 2 mm)	190–250 MPa	
Tensile strength Rm	≤ 400 MPa	300–360 MPa	
Elongation A80	≥ 33 %	35–40 %	
r / n (typical)	not specified	≈ 1.3 / 0.20	
Bend radius	0 × t	passes	
Ageing	non-ageing 6 months	guaranteed	

EQUIVALENT GRADES

System	Grade	Note
DIN 1614-1 (old)	StW 24	historic German
EN 10111 (1998)	DD13	previous edition
JIS G3131	SPHE	
ASTM A1011	DDS Type A	
GB/T 3273 / 5213	SPHE	

WHY A DRAWING GRADE IS ORDERED PICKLED

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

A drawing grade is almost always pickled: scale cracks off in the draw, embeds in the die and marks every following part. Ask for a temper pass as well when the stretch is deep enough to raise Lüders lines.

STANDARDS

EN 10111:2008 — DD13, 1.0335 · EN 10051 — tolerances · EN 10204 3.1 · Former DIN 1614 StW 24

Updated 22 September 2026 · figures are nominal; the mill certificate governs