TECHNICAL DATA SHEET

Steel Grade: E355 +SR
(EN 10305-1 – Seamless Precision Steel Tubes, cold drawn, stress-relieved)

General Description

E355 +SR is a high-strength, low-alloy seamless steel tube grade that has undergone cold drawing followed by stress relieving (SR). This treatment improves dimensional precision, surface quality, and mechanical consistency, making it ideal for hydraulic cylinders, mechanical components, and structural applications where high strength and good machinability are required.

Manufacturing Process

- **Cold drawn**: Ensures tight dimensional tolerances and smooth surface finish.
- **+SR (Stress Relieved)**: Heat treatment at controlled temperatures to reduce internal stresses without affecting mechanical integrity.

CHEMICAL COMPOSITION (*% by weight*)

Element	C	Si (max)	Mn	P (max)	S (max)	Al (min)
%	≤ 0.22	≤ 0.55	≤ 1.60	≤ 0.025	≤ 0.015	≥ 0.020

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MECHANICAL PROPERTIES (*typical for +SR condition*)

Property	Value
Yield Strength (Rp0.2)	≥ 355 MPa
Tensile Strength (Rm)	490–630 MPa
Elongation (A5)	≥ 22%
Hardness (HBW)	~160–200 HB
Impact Toughness (+20°C)	≥ 27 J (ISO V-notch, Ø ≤ 63 mm)

Dimensional Tolerances

According to EN 10305-1, cold drawn tubes in +SR condition typically comply with:

- Outer Diameter Tolerance: ±0.1 mm (or per agreement)
- Wall Thickness Tolerance: ±10%
- Straightness: ≤ 0.5 mm per meter
- Surface Roughness (Ra): ≤ 2.5 µm

Physical Properties

- Density: 7.85 g/cm³
- Modulus of Elasticity: ~210 GPa
- Thermal Conductivity: ~50 W/m·K
- Specific Heat Capacity: ~460 J/kg·K

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Applications

- Hydraulic and pneumatic cylinders
- Mechanical and structural parts
- Automotive components
- Machine construction and lifting equipment

Heat Treatment Status: +SR

- Stress Relieving Temperature: ~500–650°C
- Purpose: To eliminate residual stresses after cold drawing, ensuring mechanical stability and better machinability.

Standards and Equivalents

- EN: E355 (1.0580) +SR
- DIN: St 52-3
- ISO: E355
- Material Number: 1.0580
- ASTM Equivalent: A519 Grade 1026 (approx.)

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