DOCOL®
THE AUTOMOTIVE STEEL

Docol Tube 980DP

General Product Description

Docol® Tube 980 is advanced ultra-high-strength precision tube made from dual-phase steel. Available in circular, square and rectangular shapes, it comes either with cold rolled (uncoated) or galvanized surface. Customized shapes and other tailoring options are available upon request. Typical uses include automotive safety parts, where lightness and energy absorption are important.

Dimension Range

Docol Tube 980DP is available at circular, square and rectangular shapes.

Circular	28- 60 mm
Square	30x30- 50x50 mm
Rectangular	40x20- 60x40 mm
Wall thickness	1.0- 2.0 mm
Mill length	5000- 8000 mm

Other shapes and sizes are available upon request.

Dimensions

Circular

Diameter	1.0 mm (kg/m)	1.25 mm (kg/m)	1.5 mm (kg/m)	2.0 mm (kg/m)
28 mm	0.666	0.825	0.980	
30 mm	0.715	0.886	1.05	
32 mm	0.765	0.948	1.13	
35 mm	0.838	1.04	1.24	1.63
36 mm	0.863	1.07	1.28	1.68
38 mm	0.912	1.13	1.35	1.78
40 mm		1.20	1.42	1.87
41 mm		1.22	1.46	1.92
44 mm		1.32	1.57	2.07
48 mm		1.44	1.72	2.27
50 mm		1.50	1.79	2.37
55 mm			1.98	2.61
57 mm			2.05	2.71
60 mm			2.16	2.86

Square

Height x Width	1.0 mm (kg/m)	1.25 mm (kg/m)	1.5 mm (kg/m)	2.0 mm (kg/m)
30 x 30 mm	0.890	1.10	1.30	1.68
32 x 32 mm		1.18	1.39	1.80
35 x 35 mm		1.29	1.53	1.99
40 x 40 mm		1.49	1.77	2.31
50 x 50 mm			2.24	2.93

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Rectangular

Height x Width	1.0 mm (kg/m)	1.25 mm (kg/m)	1.5 mm (kg/m)	2.0 mm (kg/m)
40 x 20 mm	0.890	1.10	1.30	1.68
40 x 25 mm	0.969	1.20	1.42	1.84
40 x 30 mm		1.29	1.53	1.99
45 x 15 mm	0.890	1.10	1.30	1.68
50 x 20 mm		1.29	1.53	1.99
50 x 25 mm		1.39	1.65	2.15
50 x 30 mm		1.49	1.77	2.31
50 x 40 mm		1.69	2.00	2.62
50.8 x 25.4 mm		1.42	1.68	2.19
60 x 20 mm			1.77	2.31
60 x 30 mm			2.00	2.62
60 x 40 mm			2.24	2.93

Mechanical Properties

Grade	Yield strength $R_{p0.2}$ (min MPa)	Tensile strength R_m (MPa)	Elongation A (min %)
CR750Y980T-DP	750	980	5

Chemical Composition

Grade	C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Nb+Ti (max %)	Cr+Mo (max %)	B (max %)	Cu (max %)
	0.20	1.00	2.90	0.050	0.010	0.15	1.40	0.005	0.20

Chemical composition meets the requirements of VDA 239-100.

Tolerances

Circular

Characteristic	Circular precision tubes Tolerances based on the requirements of EN 10305-3
Outside diameter (D) [1)]	
20 ≤ D < 32 32 ≤ D < 44 44 ≤ D < 55 55 ≤ D < 70	±0.15 mm ±0.20 mm ±0.25 mm ±0.30 mm
Out-of-roundness	The diameter tolerances include the out-of-roundness
Thickness (T)	T≤ 1.5 mm: ±0.15 mm T>1.5 mm: ±10% of nominal thickness or ±0.35 mm whichever is the smaller
Straightness	Maximum 0.20% of measured length
Height of internal weld bead, g;	
Bead removed Bead not removed	g ≤ 0.3 mm g < 1.0 mm, when T ≤ 1.5 mm g < 0.8 x T, when 1.5 mm < T ≤ 4.0 mm
Mill length	0/+50 mm, 5000 ≤ L ≤ 8000 mm (standard length 6000 mm)
Exact length, single cutting	
30 ≤ L ≤ 1500 mm 1500 < L ≤ 4000 mm	±0.5 mm ±1.0 mm
Exact length, bundle cutting	
1000 ≤ L ≤ 5000 mm 5000 < L ≤ 10000 mm	±2 mm ±3 mm

1) For a maximum distance of 100 mm, the ends may, due to the cutting method, have diameters outside the tolerances

Square

Characteristic	Square, rectangular, flat oval and ellipse precision tubes Tolerances based on the requirements of EN 10305-5
Outside dimensions (H) and (B), longer side [1)]	
H < 25 mm 25 ≤ H < 40 mm 40 ≤ H < 60 mm 60 ≤ H <70 mm 70 ≤ H < 80 mm 80 ≤ H < 90 mm 90 ≤ H < 100 mm 100 ≤ H < 120 mm H ≥ 120 mm	±0.20 mm ±0.25 mm ±0.30 mm ±0.35 mm ±0.40 mm ±0.50 mm ±0.60 mm ±0.65 mm ±0.70 mm
Side concavity and convexity	Included in outside dimension tolerance
Thickness (T)	T≤ 1.5 mm: ±0.15 mm T>1.5 mm: ±10% of nominal thickness or ±0.35 mm whichever is the smaller
Straightness	Maximum 0.15% of measured tube length when shorter side length > 30 mm Maximum 0.25% of measured tube length when the shorter side length ≤ 30 mm
Location of weld seam from the centre line	On narrow side for square and rectangular, optionally on wide side. On wide side for flat oval and ellipse. ± 10% of side length or ± 3 mm, whichever is greater.
Height of internal weld bead (g)	
Bead removed Bead not removed	g ≤ 0.3 mm g < 1.0 mm, when T ≤ 1.5 mm g < 0.8 x T, when 1.5 mm < T ≤ 4.0 mm
Squareness of sides	90° ± 1°
Corner profile	R ≤ 4.0 x T, typically R ≤ 3.0 x T
Twist (V)	V ≤ 3 mm for B and H ≤ 30 mm V ≤ B/10 or ≤ H/10 for B or H > 30 mm
Mill length	0/+50 mm, 5000 ≤ L ≤ 8000 mm (standard length 6000 mm)
Exact length, single cutting	
30 ≤ L ≤ 1500 mm 1500 < L ≤ 4000 mm	±0.5 mm ±1.0 mm
Exact length, bundle cutting	
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Rectangular

Characteristic	Square, rectangular, flat oval and ellipse precision tubes Tolerances based on the requirements of EN 10305-5
Outside dimensions (H) and (B), longer side [1)]	
H < 25 mm 25 ≤ H < 40 mm 40 ≤ H < 60 mm 60 ≤ H <70 mm 70 ≤ H < 80 mm 80 ≤ H < 90 mm 90 ≤ H < 100 mm 100 ≤ H < 120 mm H ≥ 120 mm	±0.20 mm ±0.25 mm ±0.30 mm ±0.35 mm ±0.40 mm ±0.50 mm ±0.60 mm ±0.65 mm ±0.70 mm
Side concavity and convexity	Included in outside dimension tolerance
Thickness (T)	T≤ 1.5 mm: ±0.15 mm T>1.5 mm: ±10% of nominal thickness or ±0.35 mm whichever is the smaller
Straightness	Maximum 0.15% of measured tube length when shorter side length > 30 mm Maximum 0.25% of measured tube length when the shorter side length ≤ 30 mm
Location of weld seam from the centre line	On narrow side for square and rectangular, optionally on wide side. On wide side for flat oval and ellipse. ± 10% of side length or ± 3 mm, whichever is greater.
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Coatings and Surfaces

Surface designation and general usability		
UC	Uncoated (cold rolled)	Paintability or chromium plating are required
GI	Zinc coated (zinc 99%)	Corrosion resistance is required
GA	Galvannealed coated (zinc 90%-iron 10%)	Corrosion resistance and paintability are required

Surface is lightly oiled to protect it from corrosion during transportation and short-term storaging. By request, tubes can be delivered dry, however in that case SSAB will not be responsible for any possible rust.

Surface roughness, Ra	
UC	< 0,6 µm

Different metal coatings and minimum coating mass		
Coating thickness	**Zinc (GI)**	**Galvannealed (GA)**
µm [2)]	g/m2 [1)]	g/m2 [1)]
7	GI50/50	GA50/50
8	GI60/60	GA60/60

1) Minimum coating mass- g/m2 refers the coating mass for each side in g/m^2 according to VDA 239-100.

2) Theoretical guidance values for coating thickness per surface.

Coating mass [g/m2]	**Coating life - marine [year]**	**Properties**
50/50	10	Good weldability and formability with tolerable corrosion resistance.
60/60	15	Good combination of corrosion resistance and usability.
50/50	15	Superior paint adhesion and corrosion reistance as painted. Weldability in same level as cold rolled material under proper welding conditions.
60/60	17	Superior paint adhesion and corrosion reistance as painted. Weldability in same level as cold rolled material under proper welding conditions.

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7	GI50/50	GA50/50
8	GI60/60	GA60/60

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60/60	17	Superior paint adhesion and corrosion reistance as painted. Weldability in same level as cold rolled material under proper welding conditions.

Delivery Conditions

The tubes are not intended to undergo any heat treatment after welding and sizing as that may alter the mechanical properties of the material.
The tubes are oiled with anti-corrosive oil.

Fabrication and Other Recommendations

For information concerning fabrication, see SSAB´s brochures on www.ssab.com/downloads or consult Tech Support, techsupport@ssab.com.
Appropriate health and safety precautions must be taken when welding, cutting, grinding or otherwise working on the product.

Contact Information

www.ssab.com/contact

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