

Dogal Roll

Hot dip coated high strength steels for roll-forming

Product

Dogal Roll is a group of steels which in the first place are designed for applications where roll-forming is used as a forming method. The steels are subjected to special heat treatment, giving a material which can be roll formed into narrow radii.

Dogal Roll is characterized by

- High yield stress - a high yield stress prevents unflatness problems of flat areas. The plastic deformation will be confined to the radii.
- High YS/TS ratio - a high YS/TS ratio means that stresses in heavily formed regions are comparable to the stresses in slightly formed regions. Small differences in residual stresses over the cross section reduce the tendency for bending and twisting.

Typical applications for Dogal Roll are safety components in cars e.g. side impact beams and bumper reinforcements.

Mechanical properties

Steel grade	Yield Strength N/mm ²		Tensile Strength N/mm ²		Elongation A _{80%} min	Min radius - Rollforming
	min	max	min	max		
Dogal Roll 800	620	770	800	950	8	0,8xt*
Dogal Roll 1000	850	1050	1000	1200	5	2,0xt

* t = Thickness

The minimum radius is only valid when rollforming. In a well designed rollforming line it is possible to achieve a much smaller radius.

Chemical composition

(max values)

Steel grade	C % max	Si % max	Mn % max	P % max	S % max	Al _{tot} % min	Other alloying elements
Dogal Roll 800	0,16	0,25	1,90	0,020	0,0040	0,015	Cr, Nb
Dogal Roll 1000	0,195	0,25	1,90	0,020	0,0040	0,020	Cr, Mb

Dimension range

Thickness: 0.50 - 2.00 mm

Width: max 1500 mm

The maximum width is depending on steel grade and thickness.

Tolerances

The Dogal Roll grades are supplied to tolerances in accordance with EN 10131.

Forming

Dogal Roll grades are meant for cold forming and the grades are characterized by both a high yield strength and an improved cleanliness, which allows for a tight radius. In most forming processes a low yield strength is beneficial from a forming point of view. In deep drawing the material should have a low yield strength to tensile strength ratio, but in roll forming it is actually beneficial to use a material with a high yield strength in order to avoid unwanted longitudinal plastic strains in the product.

Shearing and punching

When shearing and punching Dogal Roll it is particularly important to use the right cutting clearances. Factors ruling this are sheet thickness, strength and the demand on the cut surface shape. A cutting clearance of 10-12% of sheet thickness is recommended for Dogal Roll steels.

Welding

Laser welding can be used for Dogal Roll. Both laser butt-welding and overlap welding can be used for closing the profile in the end of the roll-forming line. In the case of butt-welding a good quality edge and a good fit-up are needed to achieve good results after laser welding. To achieve good laser welded overlap joints a small gap (0,1-0,2 mm) between the sheets is recommended. In this way the zinc does not get trapped in the melt and pores and other defects in the weld can be avoided. Laser welding can also be used when assembling other parts to the rollformed component.

Other welding methods which can be used for Dogal Roll are electrical resistance welding (spot welding, projection welding and seam welding). When resistance spot welding is used it is recommended that increased electrode forces and longer weld times are used.

Technical service and information

Knowledge Service Center will be pleased to assist with additional information concerning this product from SSAB Tunnpåt.

The particulars in this data sheet are correct at the time of going to print and are intended to give general guidance for the use of the product. Subject to changes arising from continual product development. The information and data must not be regarded as guaranteed values, unless specially confirmed in writing.



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