

DOCOL TUBE R8

PRODUCTION RANGES AND STANDARD DIMENSIONS



PRODUCT INFORMATION

GENERAL

Docol Tube R8 is developed especially for the racing industry. High strength high alloy material has been used for many years to build strong chassis structures and save weight. For the Automotive industry SSAB has for many years been a leading partner when it comes to develop strong steels, that are also formable. Strength is an important characteristic for light weight designs. Formability and ductility are important characteristics for safety.

Docol Tube R8 are roll formed and welded, which give the product very consistent properties and narrow tolerances, even over the weld and HAZ.

Docol Tube R8 is approved as allowable material according to SFI specification for drag racing vehicles.

MECHANICAL PROPERTIES

Docol Tube R8 is produced from a low alloy steel with clean a composition. Despite the high strength, and the low elongation values, the tubes can be formed.

Tensile test performed on full tube sections ($\varnothing < 40$ mm). Values from test with full sections often differ from tests with coupons. For more information and support in comparing the values, contact SSAB.

	Yield Strength (Mmin pa / ksi)	Tensile Strength (MPa / ksi, min)	Elongation (A50%, min), typical
Docol Tube R8	690 / 100	800 / 116	11–15

Thickness	C % max	Si % max	Mn % max	P % max	S % max	Al % min	Other alloying elements
0.8–2.1	0.16	0.4	1.7	0.02	0.004	0.015	Nb, Ti
2.5–4.0	0.12	0.10	2.10	0.025	0.010	0.015	Nb, Ti, V

STANDARD SHAPES

A selection of dimensions and thicknesses of circular tubes made from Docol Tube R8 can be acquired from stock, both in Imperial and Metric measurement.

Docol Tube R8 is primarily sold through distributors in the Nordic countries and US, but direct sales from SSAB is also possible.

There is no minimum order quantity from stock.

THE WINNING EDGE

- ▶ Approved as allowable material according to SFI
- ▶ High strength material for strong constructions
- ▶ Formable and ductile for safe constructions
- ▶ Cost efficient throughout entire whole life cycle



The tubes are TIG welded and both outer and inner weld beads are removed.



ADDITIONAL SERVICES

CUSTOMIZED PRODUCTION

If the tubes in stock do not match the specific needs, Docol Tube R8 can be delivered in several more dimensions and thicknesses. Additional products with higher strength can also be offered.

Docol Tube R8 can even be offered as stream line tube (through distributor).

OTHER R-PRODUCTS

Racing vehicles don't just contain tubes. There are many other applications where SSAB steels can fulfill the extreme demands from this industry.

OTHER TUBES AND PROTOTYPES

SSAB can also offer tubes from other steel grades, both as branded tube products or as development/prototype products.

SSAB TUBES FOR UNIQUE PRODUCT POSSIBILITIES

SSAB can produce tubes made from Docol, Domex, Hardox and Weldom in a great variety of dimensions and qualities. We can develop tubes to meet your specific needs, or we can produce short series of tubes for trials or prototypes.

Steel Grades: Most SSAB high strength steel grades

Dimensions: Only circular, \varnothing 14 – 133 mm

Thickness: 0.5 – 6.3 mm

With a great variety of tools and strong machines to handle extreme steels, SSAB can offer unique products for trials and prototypes.

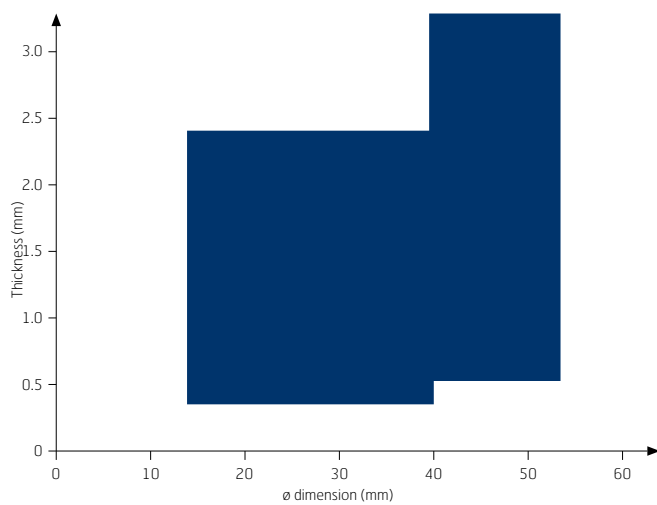
CIRCULAR PRODUCTION RANGE

DIMENSION PROGRAM CIRCULAR

The blue area indicates possible production range. Limitations may occur.

Thickness can be varied according to what's possible on the base material.

Dimensions /diameters are restricted to available tools.
See the list to the right.



Possible Range
ø 14 – 54 mm, ø 5/8 – 2 1/8"
0.5 – 4.0 mm, 0.019 – 0.157"

TOLERANCES ACCORDING TO EN 10305-3

Diameter: As stated in table
Thickness: +/- 0.15 mm (up to 1.5 mm)
Straightness: 0.20 %, or max 3 mm/m length

DELIVERY CONDITIONS ACCORDING TO EN 10305-3

Steel Grade: Chemical composition in data sheet
Delivery Condition: +CR2 (not intended for heat treatment)
Appearance: Ink marked and oiled

WHAT DIMENSIONS ARE POSSIBLE TOOLS/DIMENSIONS

For customized production (not specified as standard dimensions) special requirements regarding order quantities may apply.

Diameter ø inch	Tolerances	Corresponds to in mm	Diameter ø mm	Tolerances
Ø 5/8	+/- 0.0047	Ø 15.9	Ø 14.0	+/- 0.12
Ø 11/16		Ø 17.5	Ø 15.0	
Ø 3/4		Ø 19.1	Ø 16.0	
Ø 27/32		Ø 21.4	Ø 18.0	
Ø 55/64	+/- 0.0059	Ø 21.8	Ø 19.0	+/- 0.15
Ø 7/8		Ø 22.2	Ø 20.0	
Ø 1.0		Ø 25.4	Ø 22.0	
Ø 1 3/64		Ø 26.6	Ø 23.0	
Ø 1 1/16	+/- 0.0078	Ø 26.9	Ø 24.0	+/- 0.20
Ø 1 1/8		Ø 28.6	Ø 25.0	
Ø 1 1/4		Ø 31.8	Ø 28.0	
Ø 1 5/16		Ø 33.4	Ø 29.0	
Ø 1 21/64	+/- 0.0098	Ø 33.7	Ø 30.0	+/- 0.25
Ø 1 1/3		Ø 34.9	Ø 32.0	
Ø 1 1/2		Ø 38.1	Ø 33.0	
Ø 1 5/8		Ø 41.3	Ø 34.0	
Ø 1 3/4	+/- 0.0098	Ø 44.5	Ø 35.0	+/- 0.30
Ø 1 29/32		Ø 48.4	Ø 36.0	
Ø 2.0		Ø 50.8	Ø 38.0	
			Ø 40.0	
			Ø 41.0	+/- 0.20
			Ø 42.0	
			Ø 45.0	
			Ø 50.0	
			Ø 51.0	+/- 0.25
			Ø 52.0	
			Ø 53.0	
			Ø 54.0	



CIRCULAR FABRICATION

BENDING CIRCULAR TUBES

Bending with Docol Tube R8 can be performed using most commonly used bending tools. Depending on slenderness value of the tube (diameter/thickness), mandrel and balls may be needed to avoid buckling or wrinkling.

Minimum bending radius for a 90° bend is $2.5 \times \phi$.

Maximum allowable diameter reduction in the bend is 5 %

For further recommendations, contact SSAB Tech Support.

WELDING

Docol Tube R8 has very good weldability and a low risk for welding defects due to the low CE-value, a low amount of impurities and a clean, oxide free surface.

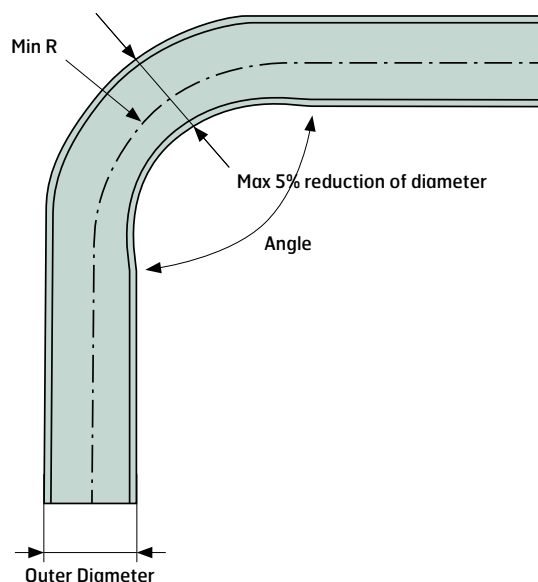
To reduce the width of the HAZ as much as possible it is recommended to keep the heat input as low as possible. The maximum heating temperature is 300° C.

For both TIG/TAW and MAG/MIG, the following filler material is recommended: AWS A5.28 ER80X-X and ASW A5.28 ER110X-X.

Welding parameters may need to be adjusted.

SURFACE TREATMENT

Docol Tube R8 has a surface roughness of typically 0.25 – 0.75 mm and is suitable for both chrome plating and painting.



R/ ϕ Without wiper

ϕ/t	2.5	3	4	5
12	P	P	N/A	N/A
15	P	P	P	N/A
20	1	1	P	P
25	1	1	1	P
30	2	2	1	1
40	3	2	2	1

■ N/A, Mandrel not recommended

■ P, Plug mandrel recommended

■ 1-, 2- or 3-ball regular pitch mandrel recommended

ϕ/t Outer diameter of tube/wall thickness

R/ ϕ Centerline radius of the bend /outer diameter of tube

The chart shows recommendations for tubes within the standard program. Recommendations in the chart are based on a 180-degree bend.

TUBE STOCK

DIMENSIONS IN STOCK

There are different dimensions in both imperial and metric available at SSAB or our distributors. Contact your local distributor or SSAB for more information and further details.



Approved by SFI for roll cages in drag racing vehicles.

DIFFERENCE THAT SHOWS

Two designs, both similar in construction and weight. The same dimensions and thickness in the roll cages and chassis. One built of high alloy seamless tubes, the other one of Docol Tube R8.

What is the difference, and when will it show?

CONSTRUCTING VEHICLES THAT WILL BE, AND ACT, ALIKE

Docol Tube R8 is very consistent in properties, and the wall thickness is the same all through the tube as well as in between tubes. Chassis that are built with the same design will act the same on the race track.

BREAK WITH FRACTURE, OR DEFORM DURING ENERGY ABSORPTION

High strength tubes have been commonly used in racing vehicles in order to obtain more light weight designs. When high strength is reached by adding alloys, the material becomes more brittle. With brittleness the risk of sudden fractures is increased.

Now you can design your racing vehicle with Docol Tube R8, a high strength steel tube that is developed to collapse, or deform, during impact instead of fracture. This means improved personal safety for the driver in case of impact.

Now, where do you want to be seated?

FACTS ABOUT DOCOL HIGH STRENGTH STEELS

High strength low alloy steels that are ductile enough to absorb impact energy has been developed for the automotive industry, and these materials dominate safety components and structural parts of almost all automotive brands sold in Europe and North America.

FACTS ABOUT DOCOL R-SERIES

Docol Tube R8 is developed to meet the mechanical properties of seamless high strength steel tubes, but with the exception of having higher ductility. Docol Tube R8 is more likely to deform than snap in case of impact, which will absorb a larger amount of the energy and keep the driver more safe.

That it's also a high quality product that is easy to work with goes without saying.

CONTACTS AND HOW TO ORDER

HOW TO BUY

Docol Tube R8 can be provided as it is, from stock, through chosen distributors or directly from SSAB. Trial orders and small quantities can also be obtained directly from SSAB.

CONDITIONS

Certificates (3.1 according to EN 10204) can be supplied.

CONTACT

STANDARD DIMENSIONS

Standard dimensions in standard lengths can be ordered directly from stock.

Contact tubes@ssab.com or any SSAB sales manager.

PROCESSING OPTIONS AND CUSTOMIZED PRODUCTION/SETUPS

A number of different processing options are available upon request for an extra fee.

Contact tubes@ssab.com or any SSAB sales manager.

FULL PROGRAM OF TUBES AND PROTOTYPE STOCK ITEMS

We can provide you with more information about all our tube and profile products – all branded products, standard dimensions, total production ranges, and processing options.

Contact tubes@ssab.com or any SSAB sales manager.

TECHNICAL SUPPORT

SSAB Tech Support can assist in all technical matters, such as dimensioning, upgrading questions, bending and welding. Knowledge Service Center can assist in upgrading projects.

Contact help@ssab.com or any SSAB sales manager..

SSAB is a global leader in value added, high strength steel. SSAB offers products developed in close cooperation with its customers to reach a stronger, lighter and more sustainable world.

SSAB has employees in over 45 countries and operates production facilities in Sweden and the US. SSAB is listed on the NASDAQ OMX Nordic Exchange, Stockholm.

For more information, contact us or visit www.ssab.com

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