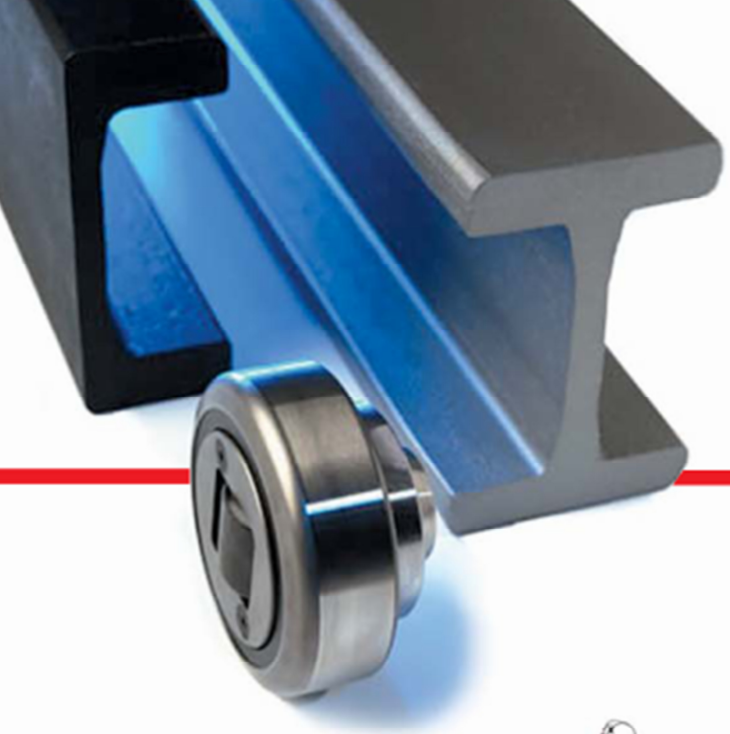


FSG

FSG
GmbH & Co.KG

Bearings
Profiles
Special machines

ISO 9001
EINGETRAGENE FIRMA

FSG
GmbH & Co.KG

Certified since 2007

Our customers have been appreciating cooperation as partners with FSG for many years now. There are several reasons for this.

Our products have always been produced according to the highest standards of quality, and achieve excellent service lives.

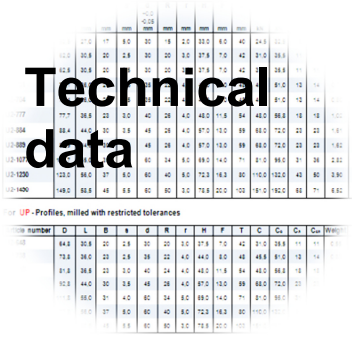
Several manufacturing locations guarantee this as well as good availability.

Our high degree of delivery flexibility means that a quick solution can quickly be found.

It goes without saying that FSG and our regularly trained sales partners provide qualified advice.

Our open, comprehensible business and product policy is set to remain the guarantee for a solid partnership in future, too

Sales-program survey



Tolerances:

Size, form and bearing tolerances according to DIN 620

- Tolerance class: PN
- Load factors: C = dyn. load rating ISO 281/1
  Co = stat. load rating ISO 76

Materials:

Bearing rings and rolling elements are made of high quality chrome steel with high purity.

- Outer rings: 20 CrMnTi
  Härte 58-60 HRC
- Roll barrel: 100 Cr6
  Härte 58-60 HRC
- Inner raceway: 100 Cr6
  Härte 58-60 HRC
- Welded bolt: C22E / CK 22

►►► use screws with screw locking agent ◄◄◄

Lubrication:

In 2013, all FSG rollers are being brought up to the state-of-the-art: from the end of 2013, all FSG rollers can be built in either in a version whereby they are lubricated for life or whereby they need re-lubricating. **ElkaLub GL966** is to be used to re-lubricate the latter.
By using this high-performance grease, the default role in the temperature range

temperature range -40°C to +170°C briefly up +200°C

is used.

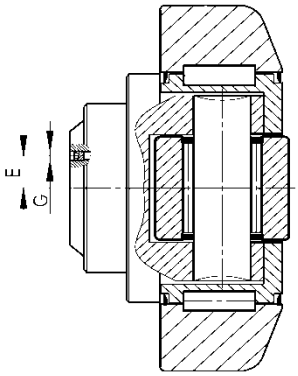
Rollers which are built in such that they do not need re-lubrication have a lubrication consumption duration of approximately 3 years. If the roller is still operational at the end of its service life, it can be re-lubricated. To do this, the roller must be dismantled, all individual parts are to be cleaned using suitable cleaning agents (cleaning solvent, petroleum, chlorinated hydrocarbon or alkaline cleaners, etc.). The roller parts must be dried immediately and protected against corrosion.
When putting the roller back together, the void should be filled up to approximately 80% with rolling bearing grease. Use the FSG original **ElkaLub GL 966** grease

►►► Bearings with other lubricants can be manufactured upon request and economic numbers ◄◄◄

Rolling bearing sealing:

The operational safety and service life of each rolling bearing depends essentially on the effectiveness of the sealing in stopping foreign bodies and moisture getting into it as well as protecting against the loss of the lubricant.

with lubrication hole



Welding application:

Directives for processing particularly killed structural steels, e.g. 18MnNb6 DIN EN 10021 with minimum yield strength values equal to or greater than 355 N/mm² in the lowest thickness range in each case.

General:

Moreover, application of this directive may also be stipulated for other steel grades in the corresponding Standards or material specification sheets.

The steels discussed here are suitable for welding. The aim of welding is to create connections allowing full utilisation of the loadbearing capacity of the base metal. The loadbearing capacity of welded joints is influenced decisively by the mechanical and technological properties of base metal, heat-affected zone and weld metal. In Order to ensure an adequate loadbearing capacity, it is necessary to weld in such a manner that the connection has no impermissible flaws and the mechanical properties of weld metal and heat-affected zone meet the anticipated stresses and strains.

Welding processes:

Experience shows that temperature control appropriate to the steels considered here can most easily be achieved by manual arc welding, submerged-arc welding and gas-shielded welding. This is why preference is given to these processes.

Welding recommendation for welding in roller bolts and our steel 18MnNb6

Normal wire G4Si1
Wire gauge 1,0 mm or higher
With little heat input

Thanks to our high standard of quality, our combined and radial rollers do not necessarily need to be dismantled before welding in – by a qualified welder.

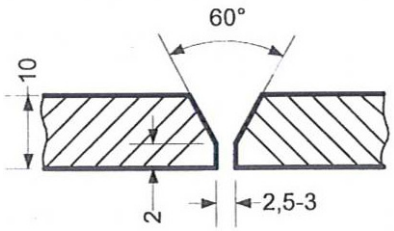
If the roller is to be dismantled nevertheless, lock the bolts with "medium-strength" **screw locking agent**. Please clean bolts and threads in order to remove oil and grease residue.

Welding Procedure Specification (WPS)

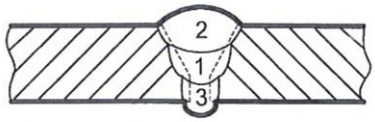
corresponding to ÖNORM EN ISO 15607, EN ISO 15612

Instructions:	AA
Welding process:	135/BW/3L/PA/2
WPQR No.:	R10010
Manufacturer:	FSG GmbH & Co.KG
Welding process:	135
Type of weld:	BW
Comment, joint preparation:	see sketch below
Parent Material Designation:	1.2 (S355 J2H) 18 MnNb6 + 25 MnVs mod
Material Thickness (mm):	t 8 – 40 mm
Welding Positions:	PA = But weld

Joint Design



Welding Sequences



Welding Details

Torch position: Run 1+2: P/20°-30°-sch
Backing: S/n

Run	Welding Process	Size of Filler Material mm	Current *) A	Voltage *) V	Type of Current/ Polarity +/-/~	Wire Feed Speed*) m/min	Travel Speed cm/min	Heat Input kJ/cm
1	135	1,2	112 - 118	16,9 - 17,1	DC +	2,9 – 3,1	10,8 - 11,6	≈ 10,5
2	135	1,2	204 - 216	20,7 - 21,7	DC +	6,2 – 6,7	15,3 - 16,5	≈ 16,8
Backing	135	1,2	192 - 204	19,9 - 20,7	DC +	5,8 – 6,2	16,7 - 17,9	≈ 13,9

*) Setting value

Filler Material:	EN ISO 14341-A: G4Si1
Designation and Make:	Run 1-3
Designation Gas/Flux:	ISO 14175-M21
-Shielding Gas:	82% Ar + 18% CO2
Gas Flow Rate:	
-Shielding Gas:	13 l/min
Details of Gauging/Backing:	
Preheat Temperature:	RT + 100°C ab s=50

Weld Details:	ml, bs additional X-ray
Power Source:	TPS (i) TransSteel 3500-5000
Characteristic: Steel:	Ø 1,0=2487; Ø 1,2=2488
Signs and Symbols:	S = stringeer W = weave bead st = stinging; t = tracking n = neutral
Distance contact tube/work piece:	15-20 mm
Adjustment of the Arc:	0

Type of recognition: DIN EN ISO 15610
Examination certificate

FSG GmbH & Co. KG
Bertha-Benz-Strasse 5
72141 Walddorfhäslach
Tel. 07127/811 67-0
Fax 07127/811677

Date: 16.12.2011

Signature and stamp:

Welding Procedure Qualification Record form (WPQR)

Welding procedure qualification – Test certificate

Manufacturer's WPQR No.:	R10010	Examiner or examining body:	Baier-Consulting
		Reference No.:	11092009

Manufacturer:	FSG GmbH & Co.KG
Address:	72141 Walddorfhäslach, Bertha-Benz-Str. 5
Code/Testing Standard:	EN ISO 15614-1

Range of qualification:

Welding Process(es):	135
Type of joint and weld:	BW, ss nb, ss mb, bs
Parent material group(s) and sub group(s)	1.1 und 1.2: S355 J2, 18 MnNb6 und 25 MnV5 mod
Parent Material Thickness (mm)	8 – 40 mm
Single run/Multi run:	multi
Filler Material Designation:	EN ISO 14341-A: G4Si1
Filler Material Make:	solid wire electrode
Filler Material Size:	1,2 mm
Designation of Shielding Gas/Flux::	ISO 14175-M21: 82% Ar + 18% CO_2
Type of Welding Current and Polarity:	DC +
Mode of Metal Transfer:	short/inter
Heat Input:	W: ≈8,1; F + D: 8,1 – 15,0 kJ/cm
Welding Position:	PA
Preheat Temperature:	100°C from 50 mm or weld layers
Mechanical Properties:	qualified
Other Information:	CO_2: 16,2 to 19,8%

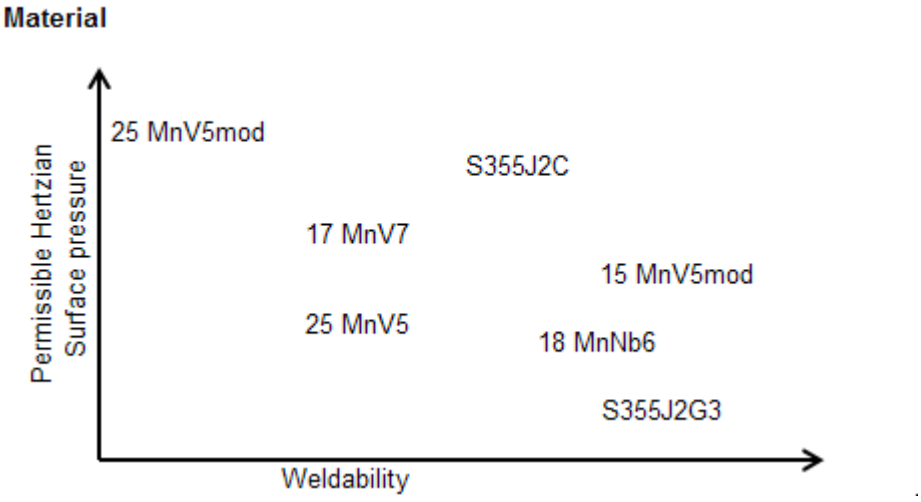
See also page 65/66 (SEM-Profile Information)

Certified that test welds prepared, welded and tested satisfactorily in accordance with the requirements of the code/testing standard indicated above.

Nürtingen,	11.09.2009	Baier Consulting
Location	Date of issue	Expert of the BG to ZH 1/573

Surface pressure on curved surfaces:
(Hertzian equation)

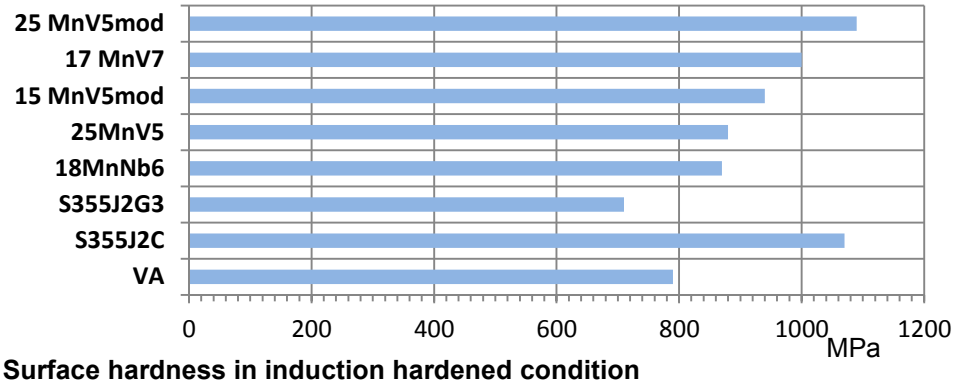
The surface pressure between bodies with bent (curved) surfaces can be calculated using Hertzian equations. This kind of stressing occurs, for instance, between the rolling bodies (balls, rollers, reels, needles) and bear races of rolling bearings as well as between the outer ring of the rolling bearing and the guide profile.
The Hertzian surface pressure depends on the load, the geometry in the contact between the track and track roller as well as the elasticity properties of the used materials. A difference must always be made between line contact, i.e. track roller with cylindrical outer ring and point contact in the event of crowned outer ring.



Material	Minimum yield strength MPa	Minimum hardness HB	Permissible Hertzian. surface-pressure decarburisation free MPa	Minimum-surface hardness-decarburisation free inductive tempered Hv	Minimum-toughness KV at 0°C J	A_{c3} tempe-rature C°	C %	Mn %	V %	CEV %
25 MnV5mod	550	210	1090	520	27	825	0,28	1,60	0,10	≤0,66
17 MnV7	500	190	1000	430	40	850	0,18	1,60	0,12	≤0,60
25 MnV5	440	180	880	500	27	825	0,26	1,30	0,08	≤0,60
S355J2C	540	170	1070	370	12	875	0,15	1,45	--	≤0,45
15 MnV5mod	470	163	940	410	40	850	0,15	1,25	0,08	≤0,45
18MnNb6	430	160	860	370	40	870	0,12	1,50	0,05	≤0,49
S355J2G3	355	145	710	360	50	875	0,11	1,40	0,05	≤0,45

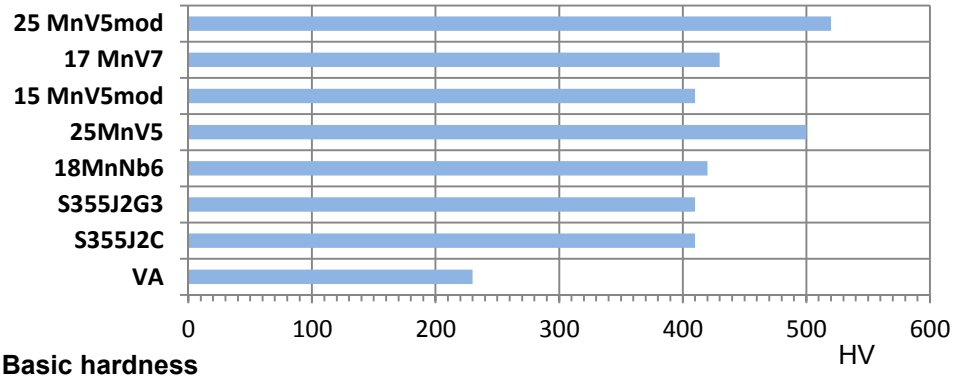
Comparison of materials
As regards the mechanical properties

Permissible Hertzian surface pressure
(minimal representation)



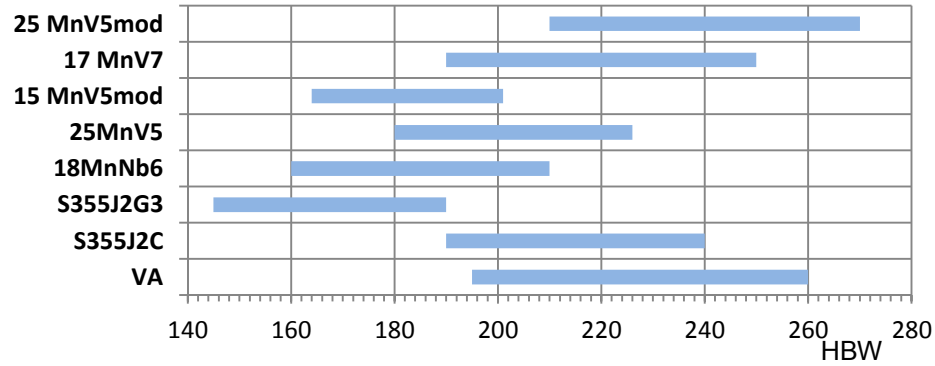
Permissible Hertzian surface pressure

Surface hardness in induction hardened condition
(milled version = without surface decarburization,
min display in response to the C-content)



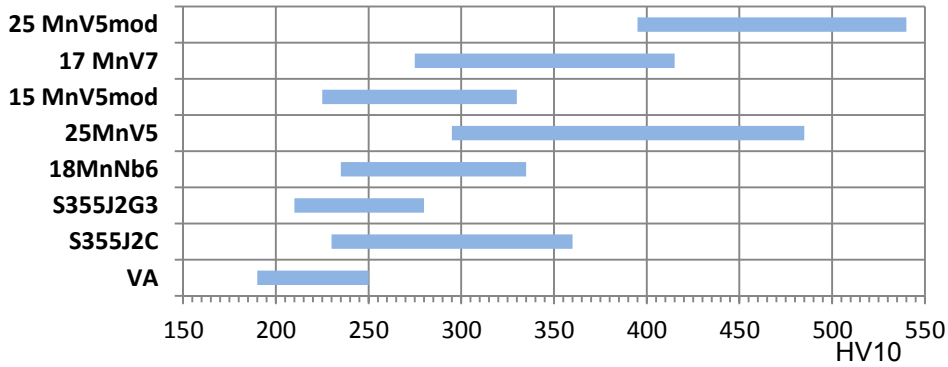
Diamond penetrator hardness

Basic hardness
min-max display in response to the analysis



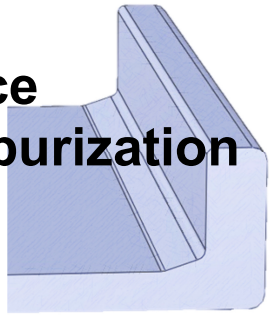
Brinell hardness

Maximum hardness in the heat affected zone,
Calculated according Yurioka, t8 / 5 = 5 .. 30 seconds,
min-max display in response to the analysis



Diamond penetrator hardness

Surface decarburization



Definition and facts

Surface decarburisation is a process which takes place during thermoforming (e.g. rolling, forging) or heat treatment including the annealing and tempering of workpieces.

The oxygen present in the ambient atmosphere extracts the carbon from the annealing material.

++++++++++++++++++++++++++++

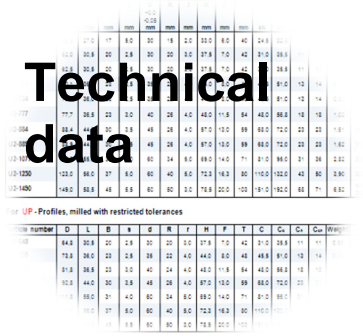
One consequence of surface decarburisation is a reduction in the hardness in the edge zones of the workpiece, since the carbon responsible for the hardness diffuses out of the workpiece surface into the oxidising atmosphere.

Surface decarburisation results in a change to the structure (ferrite formation).
This results in a reduced permissible surface pressure – the profiles can “shrink” – and, under certain conditions, can cause flaking in the bearing surfaces.

Depending on the materials usually used for lifting profiles and the generated geometries, the surface decarburisation can amount to up to 0.5 mm following hot-rolling of the special profiles. The surface sticks to the bearing surface of the profile and comes to a standstill. No long-term investigation of our rollers or our steel has been carried out to date. Neither are we aware of any case of rolling off, even on the machinery which runs on a two-shift system.

The precondition for this is: The processor must be sure that his calculation, design and manufacturing method are compatible with the material, comply with the state of the art and are suitable for the planned purpose.

An alternative to our manufactured 18MnNb6 steel with higher Hertzian pressure is our SEM profile 25MnV5mod. Milled, or milled and tempered.



Storage temperature:

The rolling bearings in the catalogue can generally be used at a temperature between -40°C and +170°C, or even at 220°C for a short time.

High temperatures:

Combi-rollers, sealed and lubricated with high-temperature grease, can be used at an ambient temperature of up to 250°C. Higher temperatures are available upon request.

Permanent operating temperatures in excess of +170°C cause changes to the structure and dimensions of the material. The resulting reduction in hardness influences the dynamic load-bearing capacity of the bearings and must be taken into account.

At a temperature in excess of +300°C, please note that a tensile strength loss of approximately 40% occurs in the profile material.

The static load-bearing capacity, however, is only influenced to a negligible degree and, hence, can be ignored up to temperatures of up to +300°C.

Use of vacuum:

We can offer you a tribologically optimised and, hence, economic solution for practically all of the friction points (combi-rollers) in vacuum technology.

The requirements need to be discussed in a meeting.

The (under) pressure areas are divided in practice into:

Low vacuum – medium vacuum – high vacuum

100 Pa = 10 daPa = 1 hPa = 1 mbar
1,000,000 Pa = 1 MPa = 10 bar = 1 N/mm²

Thermal galvanisation of the profiles:

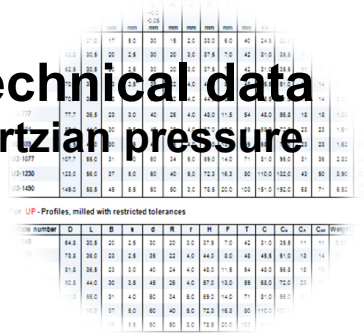
Definition of the term
Metal spraying of zinc is a protective method whereby, by means of the thermal spraying onto steel components, zinc coatings are produced. It has the advantage that it is applied at low temperatures.

Application
Large steel components in the fields of steel structural engineering, of hydraulic engineering, bridge building, canal and harbour construction, and for the construction of greenhouses and conservatories, as well as in industry and in the construction of power stations. Apart from on new parts, rework and renewal of the corrosion protection are galvanised by spraying.

Layer thickness and protection length
The standard layer thicknesses are between 80 and 150 µm. The protection length of the zinc spray is also proportional to the layer thickness, since the spaces and pores of the layer “grow” with zinc corrosion products, thereby protecting it from corrosion from the outside.

There are no problems with adhesion for additional coatings on the rough surface of a thermally galvanised zinc coating.
Various different paint systems can be used, offering perfect corrosion protection for all areas.

! Please consult us for further information pertaining to the flame-galvanising process !



Permitted Hertzian surface pressure:

The relevant, permitted Hertzian surface pressure must be noted in each case when selecting the material for the track

Maximum permitted Hertzian surface pressure in the best case for our listed in the catalogue

Profiles made of 18MnNb6 charged with p_{hzul} **= 800 N/mm²**

Avoid impact load when running over joints; possibly plan a sprung blade in the design
To facilitate the selection, we have determined in the following table, the maximum load per radial bearing and profile type

Bearing	Bearing-diameter mm	U-Profiles	max radial load per bearing stat. Fr kN
U2 U2EX U2E U1	52,5	300-K 530	6,0
	62,0	300-0	8,1
	62,5	300-0	8,1
	64,8	314-0	8,4
	70,1	300-1	9,7
	70,4	300-1	9,8
	73,8	314-1	9,9
	77,7	300-2	10,1
	81,8	314-2	11,4
	88,4	300-3	17,7
	88,9	300-3	17,8
	92,8	314-3	18,6
	107,7	300-4	18,7
	111,8	314-4	19,5
	123,0	300-5	26,8
	127,8	314-5	27,8
	149,0	300-6	46,7
	153,8	314-6	48,2
	180,0	300-8	76,0

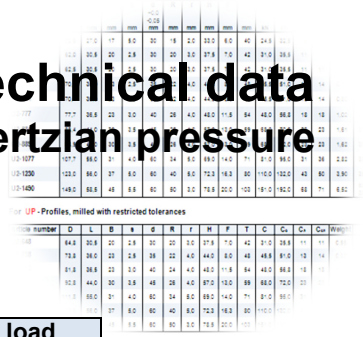
Bearing	Bearing-diameter mm	I-Profiles	max radial load per bearing stat. Fr kN
I2 I2EX I2E I1	70,4	301-0	9,8
	77,7	301-1	10,1
	88,9	301-2	17,8
	101,2	301-3	17,6
	108,5	301-4	18,9
	123,0	301-5	26,8

Bearing	Bearing-diameter mm	IMS + UMS-Profiles	max radial load per bearing stat. Fr kN
I2S	165,0	302-0 315-0	44,6
	190,0	302-1 315-1	64,6
	220,0	302-2 315-2	95,0
	250,0	302-3 315-3	113,0
	280,0	302-4 302-5 315-4	156,0

Higher Hertzian surface pressure in the best case for our listed in the catalogue

Profiles made of 25MnV5 charged with p_{hzul} **= 1100 N/mm²**

Bearing	Bearing-diameter mm	SEM-Profiles	max radial load per bearing stat. Fr kN
U2	73,8	314-1-SEM	18,2
	81,8	314-2-SEM	21,5
	92,4	314-3-SEM	35,0
	111,4	314-4-SEM	36,7
	126,8	314-5-SEM	52,2
	153,1	314-6-SEM	90,8



Bearing	max axial load per bearing stat. Fa kN
U2-525	1,7
U2-620 U2-625 U2-648	3,1
U2-701 U2-704 U2-738	4,5
U2-777 U2-818	5,6
U2-884 U2-889 U2-928	6,5
U2-1077 U2-1118	10,2
U2-1230 U2-1278	14,4
U2-1490 U2-1538	20,1
U2EX-620 U2EX-625 U2Ex-648 U2EX-701 U2EX-704 U2EX-738	4,0
U2EX-777 U2EX-818	6,2
U2EX-884 U2EX-889 U2EX-928	6,0
U2EX-1077 U2EX-1118	8,2
U2EX-1230 U2EX-1278	10,4
U2EX-1490 U2EX-1538	10,8
U2EX-1800	22,8

Bearing	max axial load per bearing stat. Fa kN
I2S-1650	19,2
I2S-1900	24,5
I2S-2200	38,9
I2S-2500	40,1
I2S-2800	48,1

Bearing	max axial load per bearing stat. Fa kN
U2E-620 U2E-625 U2E-648	2,2
U2E-701 U2E-704 U2E-738	2,1
U2E-777 U2E-818 U2E-884 U2E-889 U2E-928	4,1
U2E-1077 U2E-1118	8,5
U2E-1230 U2E-1278	9,2
U2E-1490 U2E-1538	20,1
I2-704	4,5
I2-777 I2-884	4,1
I2-1012	8,3
I2-1085	10,2
I2E-701 I2E-704 I2E-738	2,1
I2E-777 I2E-781	4,1
I2E-1012 I2E-1085	8,5
I2EX-884	6,0
I2EX-777 I2EX-781	6,2
I2EX-1016 I2EX-1085	8,2

Criterion:
Load cycles and load population when using fork-lift trucks

The permitted values are specified in the relevant specialist literature in the case of other applications.

Surface pressure between cylinder and plane surface after Hertz

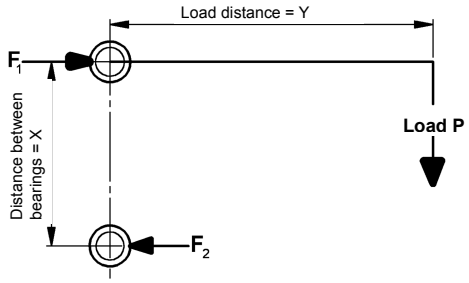
$$p_o = 0{,}418 * \sqrt{\frac{F * E}{r * l}}$$

p_o	= p_{max}	Pressure at the centre of the contact face in N/mm²
E	=	Modulus of elasticity in N/mm² (steel = 210000 N/mm²)
l	=	Width oft he contact face in mm
F	=	Compressive force (radial) in N
r	=	Radius oft he bearing in mm

Determining the necessary distance between bearings

$$X = \frac{P * Y}{2 * F_1}$$

P	=	Total load (payload + own weight) in N at centered loading distribution
Y	=	Load distance (centre of bearings to center of load) in mm
X	=	Distance between bearings in mm
F_1	$=F_2$	max load carrying capacity of the bearing in N with due consideration to Hertzian stress between bearing profile



Determining the necessary load carrying capacity of the bearings

$$F_1 = \frac{P * Y}{2 * X}$$

P	=	Total load (payload + own weight) in N
Y	=	Load distance (centre of bearings to center of load) in mm
X	=	Distance between bearings in mm
F_1	$=F_2$	max load carrying capacity oft he bearing in N with due consideration to Hertzian stress between bearing profile

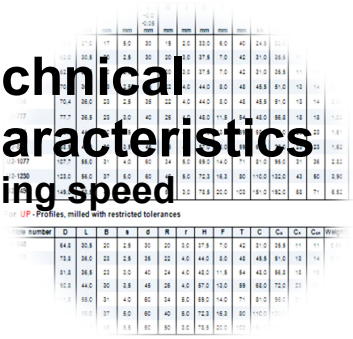
Coefficient of friction

$$M_R = f * F * \frac{d_M}{2}$$

d_M	=	Mean bearing diameter (d+D)/2
f	=	Friction factor at cylindrical bearings 0.0020,002
F	=	Radial load

For most operating conditions, the approximate friction power is sufficient.
Depending on the grease, the values can be exceeded or undershot.

Technical characteristics
ceiling speed



The permissible operating temperature essentially determines the maximum possible speed for rolling bearings.

The criteria for calculating the speeds are:

- Correct installation
- Normal duty cycle
- Constant operating conditions
- Ambient temperature
- Load
- Viscosity of the lubricant

ceiling speed for grease lubrication Rev/min max										
Bearing diameter D mm			Bearing type							
			Combined bearings		Bearings with plastic bolt		Heavy duty bearings		Radial bearings	
up		to	under 0°C	0 - 120°C	under 0°C	0 - 120°C	under 0°C	0 - 120°C	under 0°C	0 - 120°C
51,0	-	60,0	560	800	560	800	-		560	800
61,1	-	70,0	630	900	630	900	-		630	900
70,1	-	75,0	630	900	630	900	-		630	900
75,1	-	80,0	560	800	560	800	-		560	800
80,1	-	90,0	490	700	490	700	-		490	700
90,1	-	100,0	455	650	455	650	-		455	650
100,1	-	110,0	420	650	420	650	-		420	650
110,1	-	120,0	385	550	385	550	-		385	550
120,1	-	130,0	350	500	350	500	-		350	500
130,1	-	140,0	315	450	315	450	-		315	450
140,1	-	150,0	280	450	280	450	-		280	450
160,1	-	170,0	-	-	-	-	80	120	-	-
170,1	-	190,0	-	-	-	-	70	100	-	-
190,1	-	220,0	-	-	-	-	60	90	-	-
220,1	-	250,0	-	-	-	-	50	70	-	-
250,1	-	290,0	-	-	-	-	40	55	-	-

Range of Application and Operative range

- ***Façade access equipment***
  Profile and rollers for the horizontal and vertical motion of the equipment.

- ***Conveyor equipment for civil engineering, cement works, etc.***
  High stress by, e.g. cement dust, daily evaporation with high-pressure cleaners, truck transport for soil excavation, deep drilling machinery, soil compression.

- ***Foundries***
  Use in the blast furnace up to approx. 150°-170°C. Guide pulley on the furnace door.

- ***Construction of fork-lift trucks / forks 1-40 tons***
  High-bay trucks, FTS.
  Fork rollers and chain pulleys.

- ***Wire industry***
  In wire coiling and drawing machines. Stress caused by severe crust abrasion.

- ***Painting equipment***
  Use in trolleys through the dipping bath.
  Demands on the density and chemical stability.

- ***Paper industry***
  Paper manufacturing, in offset printing machines.
  Extreme stress of the guide pulleys, fine paper dust.
  High demands on the density and wear resistance.

- ***Theatre construction***
  Stage construction, specifically in revolving stages as guide pulleys.
  High stress caused by moving the individual stage sets.

- ***Automatic car parks***
  Rollers and profiles are coordinated with each other in order to attain the necessary small tolerances in the guides during the parking / reversing of the vehicles. Maintenance-free, long service life.

- ***Lift construction***
  Passenger and freight lifts.
  High demands on the guide profile.

- ***Packaging industry***
  In packaging machines, pallet-changing equipment.

- ***Steel industry***
  In pulley and roller frames, in bending and sheet metal levelling equipment as support rollers. High demands on the density and wear resistance.

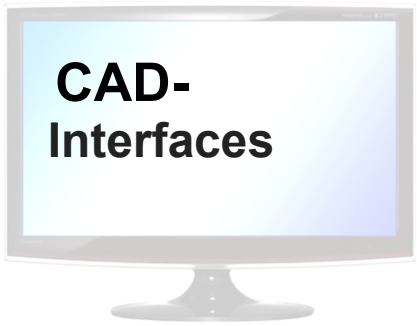
- ***Loading technology***
  In loading bridges, lifting platforms as support rollers. High load-carrying capacity.

- ***Agricultural and forestry machinery***
  In trailers, combine harvesters and in wood processing as support rollers. High demands on the density.

- ***Conveying technology***
  Horizontal movement of an 80-ton melting crucible, extreme strain on the guide profile and the support rollers.
  High demands on the density and the temperature stability.

- ***Special machine construction***
  Feeding equipment for workpiece mounts.

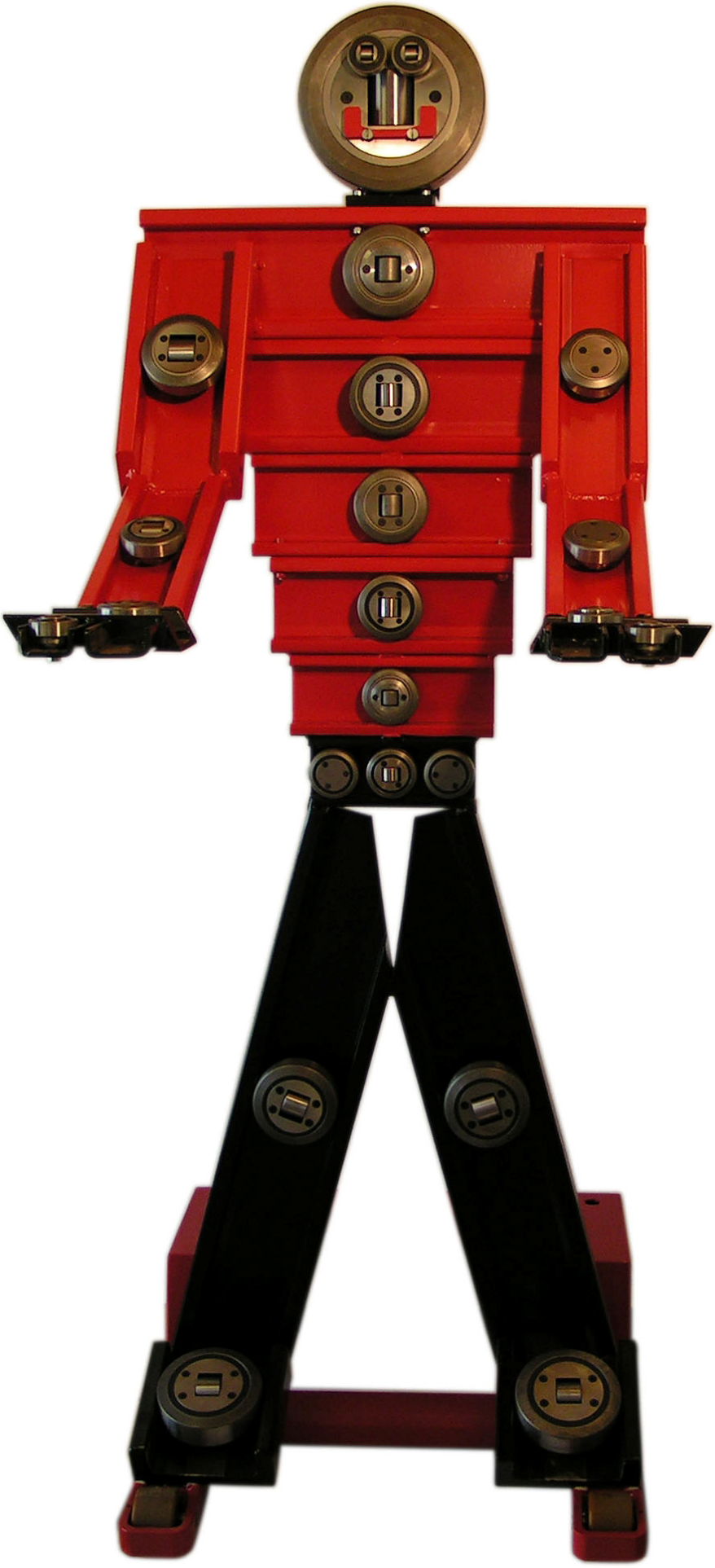
- ***Stone sawing machines***
  Horizontal feed of slabs to the saw.
  High demand due to high incidence of dirt.



Many of our products have now been digitally registered and are available for your constructive further processing. Hence, we offer you our data for various CAD systems:

The following table shows the data translation methods which are available for SolidWorks documents:

Application	Parts		Assemblies		Drawings	
	Import	Export	Import	Export	Import	Export
ACIS	X	X	X	X		
CATIA graphics	X		X			
IGES	X	X	X	X		
JPEG		X		X		X
Parasolid	X	X	X	X		
Pro/ENGINEER	X	X	X	X		
STEP	X	X	X	X		
STL		X		X		
TIFF (graphics)		X		X		X
VDAFS	X	X				
VRML to version 2.0	X	X	X	X		
UG II	X		X			
DWG/DXF					X	X



Combined bearings
Overview

Radial bearings U1

Combined bearings U2

Heavy duty bearings

Combined bearings U2EX

Combined bearings U2E/U2EK

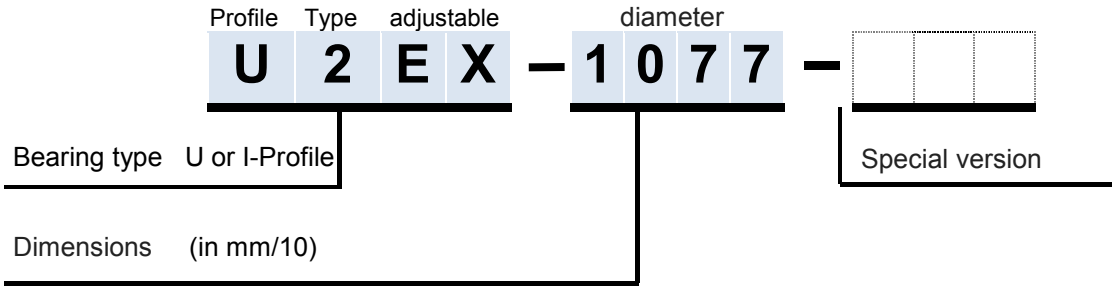
Combined bearings	fixed	for U / UP -profiles	**page 21**
Combined bearings	fixed	for I -profiles	**page 22**
Combined bearings EX	adjustable by eccentric bolt	for U / UP -profiles	**page 23**
Combined bearings EX	adjustable by eccentric bolt	for I -profiles	**page 24**
Combined bearings E	adjustable by washer	for U / UP -profiles	**page 25**
Combined bearings E	adjustable by washer	for I -profiles	**page 26**
Bearings with plastic bolt	adjustable by washer	for U / UP -profiles	**page 27**
Bearings with plastic bolt	adjustable by washer	for I -profiles	**page 28**
Heavy duty bearings	adjustable by eccentric bolt	for U - welded profiles (UMS-profiles) for I - welded profiles (IMS-profiles)	**page 29**
SEM-bearings	fixed	for SEM-profiles	**page 30**
Radial bearings	fixed	for U / UP -profiles	**page 31**
Radial bearings	fixed with ball bearing	for U / I -profiles	**page 32**
Combined bearings HT	high temperature	for U -profiles	**page 33**

! Special bearings are available on request !

Ordering-example Bearings

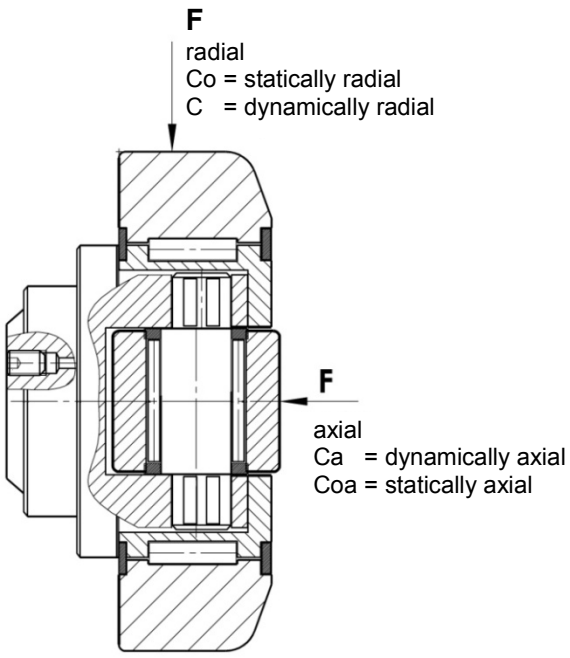
The ordering code (part number) describes the product in an abbreviated form with the appropriate characteristics.

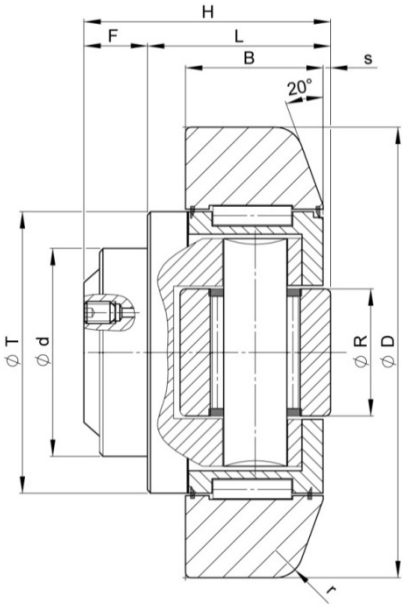
for example



Notes on ordering example:

Bearing type:	Each bearing that is listed in the chart is assigned a abbreviation
Dimensions:	Dimension-related part e.g. outside Ø or bearing width
Packing:	Type of seal of the bearing FSG-Packing
Special version:	Bearings in special design have special traits and characteristics that differ from the standard version. To differentiate we forgive abbreviations that describe the difference.





Combined bearings
fixed
for U / UP -Profiles

FSG combi-rollers make your design easier, reducing costs at the same time.

For the axial roller to ideally perform its function, it may only rest gently on the profile.

C = dynamically radial
C_a = dynamically axial

C_o = statically radial
C_{oa} = statically axial

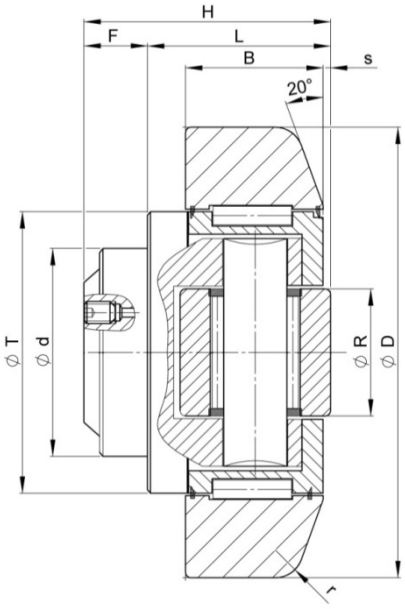
For U - Profiles

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	r mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile U Type
U2-525	52,5	27,0	17	5,0	30	15	2,0	33,0	6,0	40	24,5	32,5	6	6	0,36	300-K 530
U2-620	62,0	30,5	20	2,5	30	20	3,0	37,5	7,0	42	31,0	35,5	11	11	0,50	300-0
U2-625	62,5	30,5	20	2,5	30	20	3,0	37,5	7,0	42	31,0	35,5	11	11	0,53	300-0
U2-701	70,1	36,0	23	2,5	35	22	4,0	44,0	8,0	48	45,5	51,0	13	14	0,78	300-1
U2-704	70,4	36,0	23	2,5	35	22	4,0	44,0	8,0	48	45,5	51,0	13	14	0,80	300-1
U2-777	77,7	36,5	23	3,0	40	26	4,0	48,0	11,5	54	48,0	56,8	18	18	1,02	300-2
U2-884	88,4	44,0	30	3,5	45	26	4,0	57,0	13,0	59	68,0	72,0	23	23	1,61	300-3
U2-889	88,9	44,0	30	3,5	45	26	4,0	57,0	13,0	59	68,0	72,0	23	23	1,62	300-3
U2-1077	107,7	55,0	31	4,0	60	34	5,0	69,0	14,0	71	81,0	95,0	31	36	2,82	300-4
U2-1230	123,0	56,0	37	5,0	60	40	5,0	72,3	16,3	80	110,0	132,0	43	50	3,90	300-5
U2-1490	149,0	58,5	45	5,5	60	50	3,0	78,5	20,0	103	151,0	192,0	68	71	6,52	300-6 303-6

For UP - Profiles, milled with restricted tolerances

Article number	D	L	B	s	d	R	r	H	F	T	C	C_o	C_a	C_{oa}	Weight	UP
U2-648	64,8	30,5	20	2,5	30	20	3,0	37,5	7,0	42	31,0	35,5	11	11	0,55	314-0
U2-738	73,8	36,0	23	2,5	35	22	4,0	44,0	8,0	48	45,5	51,0	13	14	0,83	314-1
U2-818	81,8	36,5	23	3,0	40	24	4,0	48,0	11,5	54	48,0	56,8	18	18	1,09	314-2
U2-928	92,8	44,0	30	3,5	45	26	4,0	57,0	13,0	59	68,0	72,0	23	23	1,68	314-3
U2-1118	111,8	55,0	31	4,0	60	34	5,0	69,0	14,0	71	81,0	95,0	31	36	2,94	314-4
U2-1278	127,8	56,0	37	5,0	60	40	5,0	72,3	16,3	80	110,0	132,0	43	50	4,10	314-5
U2-1538	153,8	58,5	45	5,5	60	50	3,0	78,5	20,0	103	151,0	192,0	68	71	6,80	314-6

Fixing elements see page 41 to 45



Combined bearings
fixed
for I -Profiles

FSG combi-rollers make your design easier, reducing costs at the same time.

For the axial roller to ideally perform its function, it may only rest gently on the profile.

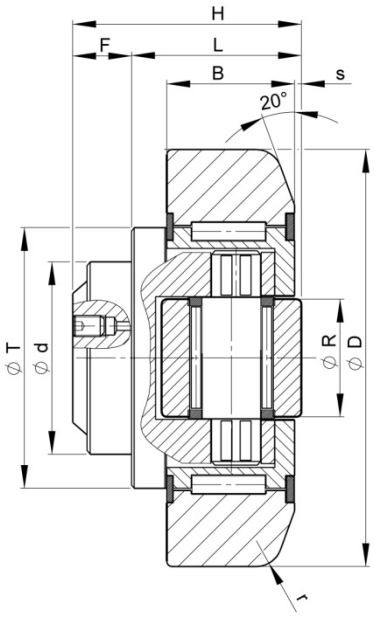
C = dynamically radial
C_a = dynamically axial

C_o = statically radial
C_{oa} = statically axial

For I – Profiles

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	r mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile I Type
I2-704	70,4	32,5	23	2,5	35	22	4,0	40,5	8,0	48	45,5	51,0	13	14	0,80	301-0
I2-777	77,7	34,0	23	3,0	40	24	4,0	44,0	10,0	54	48,0	56,8	18	18	0,90	301-1
I2-884	88,9	44,0	30	3,5	45	26	4,0	57,0	13,0	59	68,0	72,0	23	23	1,62	301-2
I2-1012	101,2	33,0	28	2,5	50	30	5,0	46,0	13,0	67	73,0	82,0	25	27	1,80	301-3
I2-1085	108,5	39,0	31	2,5	55	34	5,0	53,0	14,0	71	81,0	95,0	31	36	2,30	301-4
I2-1230	123,0	47,0	37	5,0	60	40	5,0	60,0	13,0	80	110,0	132,0	43	50	3,70	301-5

Fixing elements see page 41 to 45



Combined bearings

adjustable by eccentric bolt for U / UP -Profiles

The axial roller is revealed by removing the front cover. By turning the axle, dimension H, L and s can be adjusted between 1.5 mm and 4.0 mm, depending on the size of the roller.
See column L.
Once the selected setting has been correctly set, the front cover is replaced. Secure and tighten screws by means of the screw locking device.

Attention!
For the axial roller to ideally perform its function, it may only rest gently on the profile.

C = dynamically radial
C_a = dynamically axial

C_o = statically radial
C_{oa} = statically axial

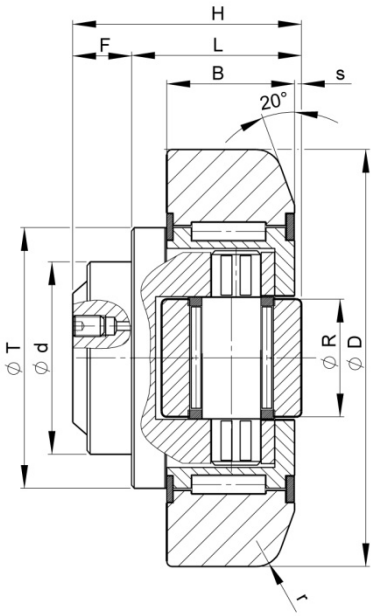
For U - Profiles

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	r mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile U Type
U2EX-620	62,0	30,5-32,0	20	4,0-5,5	30	20	3,0	37,5-39,0	7,0	42	31,0	35,5	11	11	0,53	300-0
U2EX-625	62,5	30,5-32,0	20	4,0-5,5	30	20	3,0	37,5-39,0	7,0	42	31,0	35,5	11	11	0,55	300-0
U2EX-701	70,1	36,0-37,5	23	4,0-5,5	35	20	4,0	44,0-45,5	8,0	48	45,5	51,0	11	11	0,80	300-1
U2EX-704	70,4	36,0-37,5	23	4,0-5,5	35	20	4,0	44,0-45,5	8,0	48	45,5	51,0	11	11	0,81	300-1
U2EX-777	77,7	37,0-38,5	23	3,5-5,0	40	26	4,0	48,0-49,5	11,0	54	48,0	56,8	17	17	1,00	300-2
U2EX-884	88,4	44,0-45,5	30	4,0-5,5	45	26	4,0	57,0-58,5	13,0	59	68,0	72,0	23	23	1,61	300-3
U2EX-889	88,9	44,0-45,5	30	4,0-5,5	45	26	4,0	57,0-58,5	13,0	59	68,0	72,0	23	23	1,62	300-3
U2EX-1077	107,7	55,0-57,0	31	4,0-6,0	60	30	5,0	69,0-71,0	14,0	69	81,0	95,0	31	36	2,82	300-4
U2EX-1230	123,0	56,0-60,0	37	5,0-9,0	60	34	5,0	72,3-76,3	16,3	80	110,0	132,0	43	50	3,70	300-5
U2EX-1490	149,0	58,5-62,5	45	6,0-10,0	60	34	3,0	78,5-82,5	20,0	108	151,0	192,0	68	71	6,50	300-6 303-6
U2EX-1800	180,0	76,3-79,3	57,3	6,5-9,5	100	60	4,0	95,7-98,7	19,4	124	207,0	243,0	73	83	11,50	300-8

For UP - Profiles, milled with restricted tolerances

Article number	D	L	B	s	d	R	r	H	F	T	C	C_o	C_a	C_{oa}	Weight	UP
U2EX-648	64,8	30,5-32,0	20	4,0-5,5	30	20	3,0	37,5-39,0	7,0	42	31,0	35,5	11	11	0,55	314-0
U2EX-738	73,8	36,0-37,5	23	4,0-5,5	35	20	4,0	44,0-45,5	8,0	48	45,5	51,0	11	11	0,80	314-1
U2EX-818	81,8	37,0-38,5	23	3,5-5,0	40	26	4,0	48,0-49,5	11,0	54	48,0	56,8	17	17	1,05	314-2
U2EX-928	92,8	44,0-45,5	30	4,0-5,5	45	26	4,0	57,0-58,5	13,0	59	68,0	72,0	23	23	1,65	314-3
U2EX-1118	111,8	55,0-57,0	31	4,0-6,0	60	30	5,0	69,0-71,0	14,0	69	81,0	95,0	31	36	2,85	314-4
U2EX-1278	127,8	56,0-60,0	37	5,0-9,0	60	34	5,0	72,3-76,3	16,3	80	110,0	132,0	43	50	4,01	314-5
U2EX-1538	153,8	58,5-62,5	45	6,0-10,0	60	34	3,0	78,5-82,5	20,0	108	151,0	192,0	68	71	6,68	314-6

Fixing elements see page 41 to 45



Combined bearings
adjustable by eccentric bolt
for I -Profiles

The axial roller is revealed by removing the front cover. By turning the axle, dimension H, L and s can be adjusted between 1.5 mm and 4.0 mm, depending on the size of the roller.
See column L.
Once the selected setting has been correctly set, the front cover is replaced. Secure and tighten screws by means of the screw locking device.

For the axial roller to ideally perform its function, it may only rest gently on the profile.

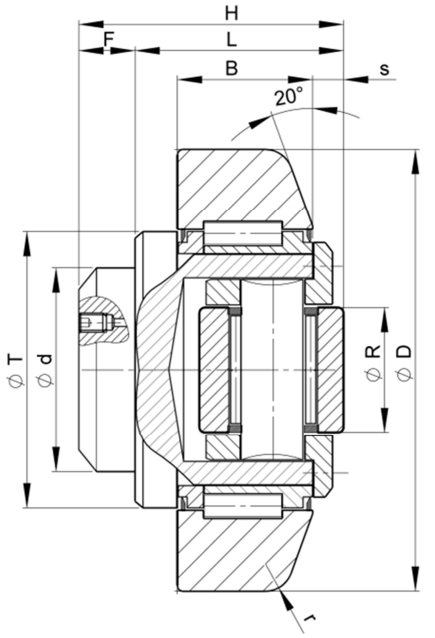
C = dynamically radial
C_a = dynamically axial

C_o = statically radial
C_{oa} = statically axial

For I - Profiles

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	r mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile I Type
I2EX-704	70,4	32,5-34,0	23	4,0-5,5	35	20	4,0	40,5-42,0	8	48	45,5	51,0	11	11	0,81	301-0
I2EX-777	77,7	34,0-35,5	23	3,5-5,0	40	26	4,0	44,0-45,5	10	54	48,0	56,8	17	17	0,87	301-1
I2EX- 884	88,4	44,0-45,5	30	4,0-5,5	45	26	4,0	57,0-58,5	13	59	68,0	72,0	23	23	1,62	301-2
I2EX-1012	101,2	33,0-35,0	26	4,5-6,5	50	30	3,0	46,0-48,0	13	69	73,0	82,0	18	19	1,80	301-3
I2EX-1085	108,5	40,0-42,0	31	4,0-6,0	55	30	5,0	54,0-56,0	14	69	81,0	95,0	31	36	2,30	301-4

Fixing elements see page 41 to 45



For the axial roller to ideally perform its function, it may only rest gently on the profile.

Combined bearings

adjustable by washer

for U / UP -Profiles

Distance plates can change the dimension H, L and s by up to 2.5 m. **Distance plates are included in the scope of the delivery. Per roller, 2 x 1 mm, 1 x 0,5 mm.**

For distance plates, see page 40

Instructions:

- Loosen the screws on the cover
- Remove the cover with axial roller or plastic insert from the roller bolt
- Insert distance ring between the roller bolt and the cover
- Replace the cover with axial roller or plastic insert
- Insert and tighten screws by means of the screw locking device.

C = dynamically radial
C_a = dynamically axial

C_o = statically radial
C_{oa} = statically axial

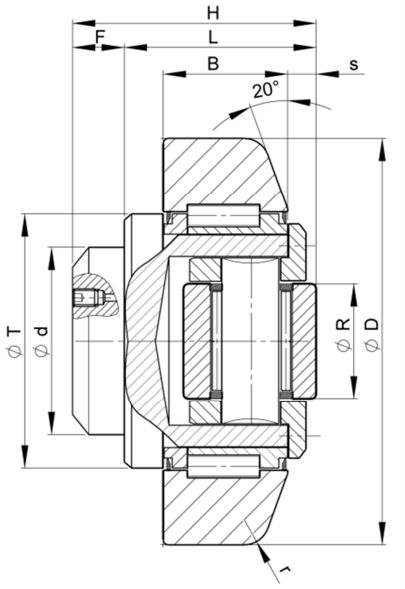
For U - Profiles

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	r mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile U Type
U2E-620	62,0	33,0-35,5	20	5,5-8,0	30	16	3,0	43,0-45,5	10,0	42	31,0	35,5	8	8	0,52	300-0
U2E-625	62,5	33,0-35,5	20	5,5-8,0	30	16	3,0	43,0-45,5	10,0	42	31,0	35,5	8	8	0,56	300-0
U2E-701	70,1	40,0-42,5	23	6,5-9,0	35	16	4,0	48,0-50,5	8,0	48	45,5	51,0	14	14	0,85	300-1
U2E-704	70,4	40,0-42,5	23	6,5-9,0	35	16	4,0	48,0-50,5	8,0	48	45,5	51,0	14	14	0,87	300-1
U2E-777	77,7	39,5-42,0	23	7,0-9,5	40	21	4,0	51,0-53,5	11,5	54	48,0	56,8	15	15	1,05	300-2
U2E-884	88,4	48,0-50,5	30	7,0-9,5	45	21	4,0	61,0-63,5	13,0	59	68,0	72,0	15	15	1,69	300-3
U2E-889	88,9	48,0-50,5	30	7,0-9,5	45	21	4,0	61,0-63,5	13,0	59	68,0	72,0	15	15	1,75	300-3
U2E-1077	107,7	55,0-57,5	31	8,0-10,5	60	33	5,0	69,0-71,5	14,0	71	81,0	95,0	31	36	2,80	300-4
U2E-1230	123,0	59,5-62,0	37	8,0-10,5	60	33	5,0	75,8-78,3	16,3	79	110,0	132,0	35	38	4,10	300-5
U2E-1490	149,0	69,0-71,5	45	15,0-17,5	60	50	3,0	89,0-91,5	20,0	103	151,0	192,0	68	71	6,70	300-6 303-6

For UP - Profiles, milled with restricted tolerances

Article number	D	L	B	s	d	R	r	H	F	T	C	C_o	C_a	C_{oa}	Weight	UP
U2E-648	64,8	33,0-35,5	20	5,5-8,0	30	16	3,0	43,0-45,5	10,0	42	31,0	35,5	8	8	0,60	314-0
U2E-738	73,8	40,0-42,5	23	6,5-9,0	35	16	4,0	48,0-50,5	8,0	48	45,5	51,0	14	14	0,93	314-1
U2E-818	81,8	39,5-42,0	23	7,0-9,5	40	21	4,0	51,0-53,5	11,5	54	48,0	56,8	15	15	1,12	314-2
U2E-928	92,8	48,0-50,5	30	7,0-9,5	45	21	4,0	61,0-63,5	13,0	59	68,0	72,0	15	15	1,89	314-3
U2E-1118	111,8	55,0-57,5	31	8,0-10,5	60	33	5,0	69,0-71,5	14,0	71	81,0	95,0	31	36	3,05	314-4
U2E-1278	127,8	59,5-62,0	37	8,0-10,5	60	33	5,0	75,8-78,3	16,3	79	110,0	132,0	35	38	4,45	314-5
U2E-1538	153,8	69,0-71,5	45	15,0-17,5	60	50	3,0	89,0-91,5	20,0	103	151,0	192,0	68	71	7,30	314-6

Fixing elements see page 41 to 45



Combined bearings
adjustable by washer
for I -Profile

Distance plates can change the dimension H, L and s by up to 2.5 m. **Distance plates are included in the scope of the delivery. Per roller, 2 x 1 mm, 1 x 0,5 mm.**

For distance plates, see page 40

For the axial roller to ideally perform its function, it may only rest gently on the profile.

Instructions:

- Loosen the screws on the cover
- Remove the cover with axial roller or plastic insert from the roller bolt
- Insert distance ring between the roller bolt and the cover
- Replace the cover with axial roller or plastic insert
- Insert and tighten screws by means of the screw locking device.

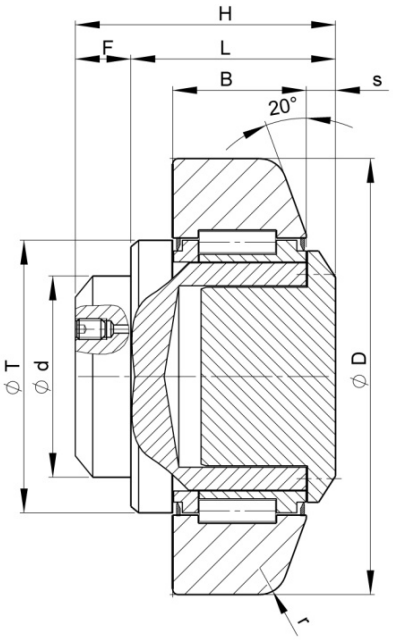
C = dynamically radial
C_a = dynamically axial

C_o = statically radial
C_{oa} = statically axial

For I - Profiles

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	r mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile I Type
I2E-704	70,4	36,0-38,5	23	6,5-9,0	35	16	4,0	44,0-46,5	8,0	48	45,5	51,0	14	14	0,87	301-0
I2E-777	77,7	35,5-38,0	23	7,0-9,5	40	21	4,0	47,0-49,5	11,5	54	48,0	56,8	15	15	1,30	301-1
I2E-884	88,4	48,0-50,5	30	7,0-9,5	45	21	4,0	61,0-63,5	13,0	59	68,0	72,0	15	15	1,69	301-2
I2E-1012	101,2	37,5-40,0	28	7,0-9,5	50	21	3,0	50,5-53,0	13,0	67	73,0	82,0	18	19	1,85	301-3
I2E-1085	108,5	44,5-47,0	31	8,0-10,5	55	33	5,0	58,5-61,0	14,0	71	81,0	95,0	31	36	2,35	301-4

Fixing elements see page 41 to 45



Bearings
with Axial-plastic bolt adjustable by washer
for U / UP -Profiles

Distance plates can change the dimension H, L and s by up to 2.5 m. **Distance plates are included in the scope of the delivery. Per roller, 2 x 1 mm, 1 x 0,5 mm.**

For distance plates, see page 40

Instructions:

- Loosen the screws on the cover
- Remove the cover with axial roller or plastic insert from the roller bolt
- Insert distance ring between the roller bolt and the cover
- Replace the cover with axial roller or plastic insert
- Insert and tighten screws by means of the screw locking device.

C = dynamically radial C_o = statically radial

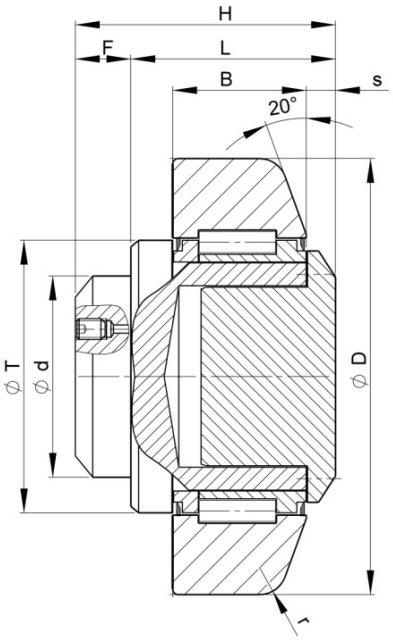
For U – Profiles

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	r mm	H mm	F mm	T mm	C kN	C_o kN	Weight kg	Profile U Type
U2E-620-K	62,0	33,0-35,5	20	5,5-8,0	30	3,0	43,0-45,5	10,0	42	31,0	35,5	0,46	300-0
U2E-625-K	62,5	33,0-35,5	20	5,5-8,0	30	3,0	43,0-45,5	10,0	42	31,0	35,5	0,48	300-0
U2E-701-K	70,1	40,0-42,5	23	6,5-9,0	35	4,0	48,0-50,5	8,0	48	45,5	51,0	0,73	300-1
U2E-704-K	70,4	40,0-42,5	23	6,5-9,0	35	4,0	48,0-50,5	8,0	48	45,5	51,0	0,74	300-1
U2E-777-K	77,7	39,5-42,0	23	7,0-9,5	40	4,0	51,0-53,5	11,5	54	48,0	56,8	0,93	300-2
U2E-884-K	88,4	48,0-50,5	30	7,0-9,5	45	4,0	61,0-63,5	13,0	59	68,0	72,0	1,55	300-3
U2E-889-K	88,9	48,0-50,5	30	7,0-9,5	45	4,0	61,0-63,5	13,0	59	68,0	72,0	1,60	300-3
U2E-1077-K	107,7	55,0-57,5	31	8,0-10,5	60	5,0	69,0-71,5	14,0	71	81,0	95,0	2,69	300-4
U2E-1230-K	123,0	59,5-62,0	37	8,0-10,5	60	5,0	75,8-78,3	16,3	79	110,0	132,0	3,86	300-5

For UP - Profiles, milled with restricted tolerances

Article number	D	L	B	s	d	r	H	F	T	C	C_o	Weight	UP
U2E-648-K	64,8	33,0-35,5	20	5,5-8,0	30	3,0	43,0-45,5	10,0	42	31,0	35,5	0,59	314-0
U2E-738-K	73,8	40,0-42,5	23	6,5-9,0	35	4,0	48,0-50,5	8,0	48	45,5	51,0	0,75	314-1
U2E-818-K	81,8	39,5-42,0	23	7,0-9,5	40	4,0	51,0-53,5	11,5	54	48,0	56,8	0,97	314-2
U2E-928-K	92,8	48,0-50,5	30	7,0-9,5	45	4,0	61,0-63,5	13,0	59	68,0	72,0	1,65	314-3
U2E-1118-K	111,8	55,0-57,5	31	8,0-10,5	60	5,0	69,0-71,5	14,0	71	81,0	95,0	2,65	314-4
U2E-1278-K	127,8	59,5-62,0	37	8,0-10,5	60	5,0	75,8-78,3	16,3	79	110,0	132,0	3,90	314-5
U2E-1538-K	153,8	69,0-71,5	45	15,0-17,5	60	3,0	89,0-91,5	20,0	103	151,0	192,0	6,45	314-6

Fixing elements see page 41 to 45



Bearings
with Axial-plastic bolt adjustable by washer for I -Profiles

Distance plates can change the dimension H, L and s by up to 2.5 m. **Distance plates are included in the scope of the delivery. Per roller, 2 x 1 mm, 1 x 0,5 mm.**

For distance plates, see page 40

Instructions:

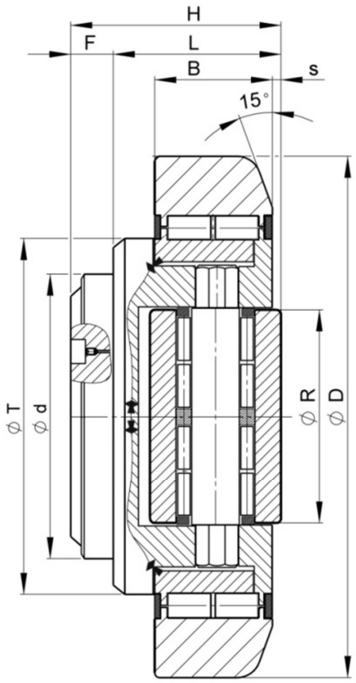
- Loosen the screws on the cover
- Remove the cover with axial roller or plastic insert from the roller bolt
- Insert distance ring between the roller bolt and the cover
- Replace the cover with axial roller or plastic insert
- Insert and tighten screws by means of the screw locking device.

C = dynamically radial C_o = statically radial

For I – Profiles

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	r mm	H mm	F mm	T mm	C kN	C_o kN	Weight kg	Profile I Type
I2E-704-K	70,4	36,0-38,5	23	6,5-9,0	35	4,0	44,0-46,5	8,0	48	45,5	51,0	0,87	301-0
I2E-777-K	77,7	35,5-38,0	23	7,0-9,5	40	4,0	47,0-49,5	11,5	54	48,0	56,8	1,30	301-1
I2E-884-K	88,4	48,0-50,5	30	7,0-9,5	45	4,0	61,0-63,5	13,0	59	68,0	72,0	1,69	301-2
I2E-1012-K	101,2	37,5-40,0	28	7,0-9,5	50	3,0	50,5,53,0	13,0	67	73,0	82,0	1,85	301-3
I2E-1085-K	108,5	44,5-47,0	31	8,0-10,5	55	5,0	58,5-61,0	14,0	71	81,0	95,0	3,10	301-4

Fixing elements see page 41 to 45



Heavy duty Bearings

adjustable by eccentric bolt for UMS / IMS -Profiles

By turning the axle of the axial roller, the dimension H, L and s can be changed by up to 4 mm, depending on the size of the roller.

8 adjusting positions

The bearing is sealed by means of plastic rings with double sealing lip and an additional metal cover.

This special type of sealing enables lubrication at a later date.

For the axial roller to ideally perform its function, it may only rest gently on the profile.

Radial bearings
with relubrication

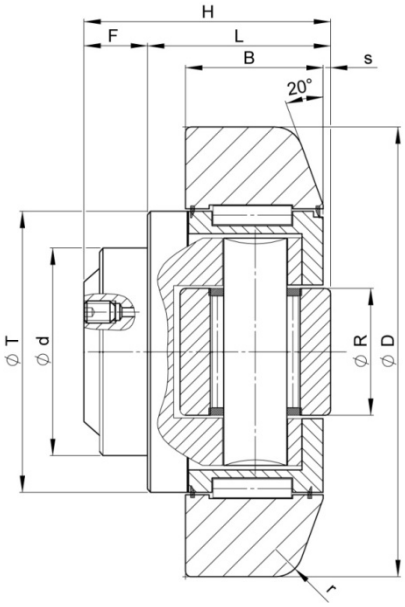
C = dynamically radial
C_a = dynamically axial

C_o = statically radial
C_{oa} = statically axial

For U and I - welded profiles

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile I MS UMS Type
I2S-1650	165,0	53,0-56,0	40	3,0-6,0	80	50	69,0-72,0	16,0	113	190	230	68	71	6,7	302-0 315-0
I2S-1900	190,0	64,5-67,5	48	4,0-7,0	100	60	84,5-87,5	20,0	124	207	243	73	83	11,6	302-1 315-1
I2S-2200	220,0	74,5-77,5	58	5,0-8,0	110	75	94,5-97,5	20,0	146	313	387	105	136	18,0	302-2 315-2
I2S-2500	250,0	77,0-80,0	60	5,0-8,0	120	75	102,0-105,0	25,0	168	327	434	105	136	23,9	302-3 315-3
I2S-2800	280,0	89,5-93,5	72	5,0-9,0	150	90	119,5-123,5	30,0	188	421	625	144	210	37,5	302-4 302-5 315-4

Fixing elements see page 41 to 45



SEM-bearings
fixed
for SEM –Profiles

FSG combi-rollers make your design easier, reducing costs at the same time.

For the axial roller to ideally perform its function, it may only rest gently on the profile.

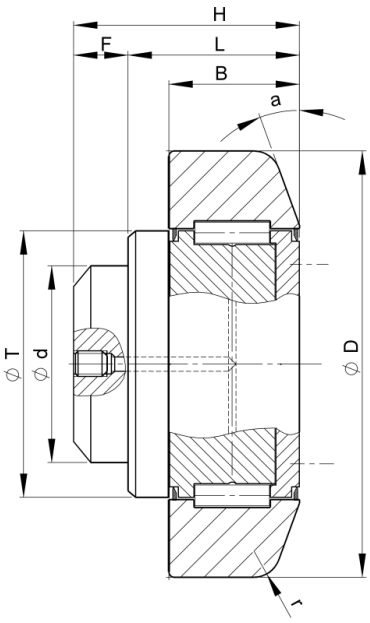
C = dynamically radial
C_a = dynamically axial

C_o = statically radial
C_{oa} = statically axial

For SEM - Profiles, milled with restricted tolerances

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	r mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile SEM Type
U2-738	73,8	36,0	23	2,5	35	22	4,0	44,0	8,0	48	45,5	51,0	13	14	0,83	314-1-SEM
U2-818	81,8	36,5	23	3,0	40	24	4,0	48,0	11,5	54	48,0	56,8	18	18	1,09	314-2-SEM
U2-924	92,4	44,0	30	3,5	45	26	4,0	57,0	13,0	59	68,0	72,0	23	23	1,66	314-3-SEM
U2-1114	111,4	55,0	31	4,0	60	34	5,0	69,0	14,0	71	81,0	95,0	31	36	2,92	314-4-SEM
U2-1268	126,8	56,0	37	5,0	60	40	5,0	72,3	16,3	80	110,0	132,0	43	50	4,08	314-5-SEM
U2-1532	153,2	58,5	45	5,5	60	50	3,0	78,5	20,0	103	151,0	192,0	68	71	6,70	314-6-SEM

Fixing elements see page 41 to 45



Radial bearings
fixed
for U / UP -Profiles

In a modified version of the roller bolt, the bearings can also be used for I profiles.

Please do not hesitate to contact us should you require advice.

C = dynamically radial C_o = statically radial

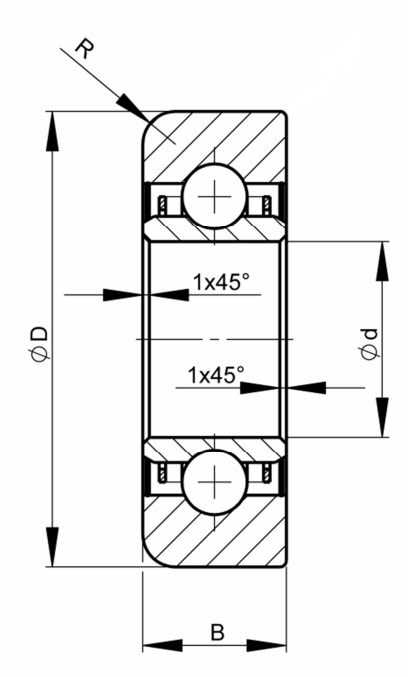
For U -Profiles

Article number	D mm	L mm	B mm	d +0,0 -0,05 mm	r mm	H mm	F mm	T mm	a grad	C kN	C_o kN	Weight kg	Profile U Type
U1-525	52,5	25,0	17	30	2,0	31,0	6,0	40	20°	24,5	32,5	0,35	300-K 530
U1-620	62,0	29,5	20	30	3,0	36,5	7,0	42	20°	31,0	35,5	0,55	300-0
U1-625	62,5	29,5	20	30	3,0	36,5	7,0	42	20°	31,0	35,5	0,57	300-0
U1-701	70,1	34,0	23	35	4,0	42,0	8,0	48	20°	45,5	51,0	1,00	300-1
U1-704	70,4	34,0	23	35	4,0	42,0	8,0	48	20°	45,5	51,0	1,01	300-1
U1-777	77,7	34,0	23	40	4,0	45,5	11,5	53	20°	48,0	56,8	1,20	300-2
U1-884	88,4	41,0	30	45	4,0	54,0	13,0	59	20°	68,0	72,0	1,70	300-3
U1-889	88,9	41,0	30	45	4,0	54,0	13,0	59	20°	68,0	72,0	1,72	300-3
U1-1077	107,7	51,5	31	60	5,0	65,5	14,0	71	20°	81,0	95,0	2,90	300-4
U1-1230	123,0	51,5	37	60	5,0	67,8	16,3	80	20°	110,0	132,0	4,05	300-5
U1-1490	149,0	54,0	45	60	3,0	74,0	20,0	103	15°	151,0	192,0	6,90	300-6

For UP - Profiles, milled with restricted tolerances

Article number	D	L	B	d	r	H	F	T	a	C	C_o	Weight	UP
U1-648	64,8	29,5	20	30	3,0	36,5	7,0	42	20°	31,0	35,5	0,60	314-0
U1-738	73,8	34,0	23	35	4,0	42,0	8,0	48	20°	45,5	51,0	0,90	314-1
U1-818	81,8	34,0	23	40	4,0	45,5	11,5	53	20°	48,0	56,8	1,10	314-2
U1-928	92,8	41,0	30	45	4,0	54,0	13,0	59	20°	68,0	72,0	1,80	314-3
U1-1118	111,8	51,5	31	60	5,0	65,5	14,0	71	20°	81,0	95,0	3,05	314-4
U1-1278	127,8	51,5	37	60	5,0	67,8	16,3	80	20°	110,0	132,0	4,35	314-5
U1-1538	153,8	54,0	45	60	3,0	74,0	20,0	103	15°	151,0	192,0	7,10	314-6

Fixing elements see page 41 to 45



Radial bearings
fixed
with ball bearing for lower load ratings
for U / I –Profiles

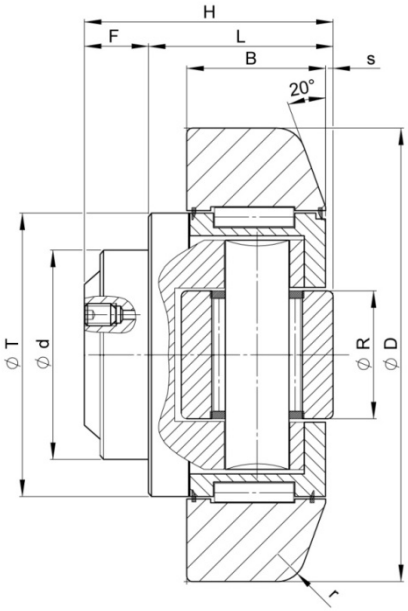
Our radial rollers with ball bearings are manufactured in accordance with DIN620 and are particularly suitable for light loads. The outer ring made from tempered steel can be used in both U and I profiles (see table).

C = dynamically radial C_o = statically radial

For U and I - welded profiles

Article number	D mm	B mm	d +0,0 -0,05 mm	R mm	C kN	C_o kN	Weight kg	Profile U Type
U1-624-S	62,4	20	25	3,0	14,3	9,7	0,50	300-0
U1-700-S	70,0	22	30	5,0	19,6	13,7	0,60	300-1 301-0
U1-780-S	78,0	22	30	5,0	19,6	13,7	0,65	300-2 301-1

Fixing elements see page 41 to 45



Combined bearings
fixed
high temperature
for U -Profiles

High-temperature durable lubricating grease

For the axial roller to ideally perform its function, it may only rest gently on the profile.

One of the proven strengths is the lubrication of thermally high-loaded bearings and guides. The low evaporating rate enables long grease times / re-lubricating intervals.

Further advantages are the increased availability of the machine and the reduced maintenance costs

- At very high operating temperatures (up to +250°C)
- Under the influence of aggressive chemicals and vapours
- If other lubricants have a negative influence on sensitive plastic friction partners

Typical areas of application:

- Conveyors (track rollers, deflection rollers)
- Fuel carriages
- Calenders
- Fans
- Foil stretching machinery

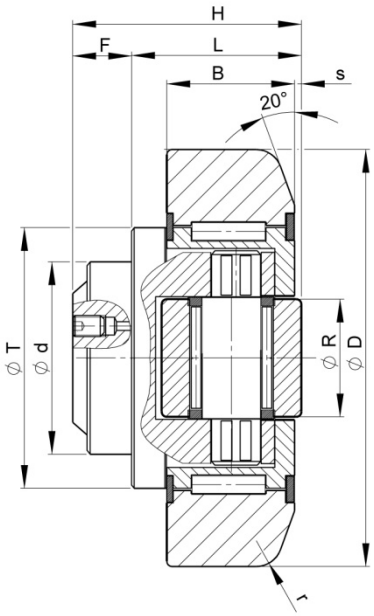
C = dynamically radial
C_a = dynamically axial

C_o = statically radial
C_{oa} = statically axial

For U –Profiles at high operating temperatures

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	r mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile U Type
U2-525-HT	52,5	27,0	17	5,0	30	15	2,0	33,0	6,0	40	24,5	32,5	6	6	0,36	300-K 530
U2-620-HT	62,0	30,5	20	2,5	30	20	3,0	37,5	7,0	42	31,0	35,5	11	11	0,50	300-0
U2-625-HT	62,5	30,5	20	2,5	30	20	3,0	37,5	7,0	42	31,0	35,5	11	11	0,53	300-0
U2-701-HT	70,1	36,0	23	2,5	35	22	4,0	44,0	8,0	48	45,5	51,0	13	14	0,78	300-1
U2-704-HT	70,4	36,0	23	2,5	35	22	4,0	44,0	8,0	48	45,5	51,0	13	14	0,80	300-1
U2-777-HT	77,7	36,5	23	3,0	40	26	4,0	48,0	11,5	54	48,0	56,8	18	18	1,02	300-2
U2-884-HT	88,4	44,0	30	3,5	45	26	4,0	57,0	13,0	59	68,0	72,0	23	23	1,61	300-3
U2-889-HT	88,9	44,0	30	3,5	45	26	4,0	57,0	13,0	59	68,0	72,0	23	23	1,62	300-3
U2-1077-HT	107,7	55,0	31	4,0	60	34	5,0	69,0	14,0	71	81,0	95,0	31	36	2,82	300-4
U2-1230-HT	123,0	56,0	37	5,0	60	40	5,0	72,3	16,3	80	110,0	132,0	43	50	4,50	300-5
U2-1490-HT	149,0	58,5	45	5,5	60	50	3,0	78,5	20,0	103	151,0	192,0	68	71	6,52	300-6 303-6

Fixing elements see page 41 to 45



Combined bearings

adjustable by eccentric bolt high temperature for U -Profiles

High-temperature durable lubricating grease

For the axial roller to ideally perform its function, it may only rest gently on the profile.

One of the proven strengths is the lubrication of thermally high-loaded bearings and guides. The low evaporating rate enables long grease times / re-lubricating intervals.

Further advantages are the increased availability of the machine and the reduced maintenance costs

- At very high operating temperatures (up to +250°C)
- Under the influence of aggressive chemicals and vapours
- If other lubricants have a negative influence on sensitive plastic friction partners

Typical areas of application:

- Conveyors (track rollers, deflection rollers)
- Fuel carriages
- Calenders
- Fans
- Foil stretching machinery

The axial roller is revealed by removing the front cover. By turning the axle, dimension H, L and s can be adjusted between 1.5 mm and 4.0 mm, depending on the size of the roller.
See column L.
Once the selected setting has been correctly set, the front cover is replaced. Secure and tighten screws by means of the screw locking device.

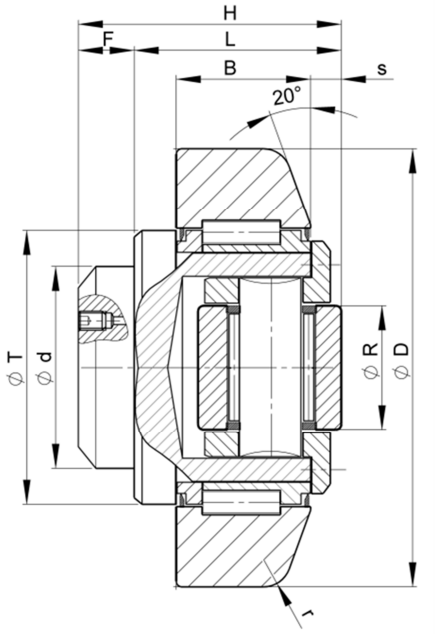
Attention!
For the axial roller to ideally perform its function, it may only rest gently on the profile.

C = dynamically radial
C_a = dynamically axial
C_o = statically radial
C_{oa} = statically axial

For U – Profiles at high operating temperatures

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	r mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile U Type
U2EX-620-HT	62,0	30,5-32,0	20	4,0-5,5	30	20	3,0	37,5-39,0	7,0	42	31,0	35,5	11	11	0,53	300-0
U2EX-625-HT	62,5	30,5-32,0	20	4,0-5,5	30	20	3,0	37,5-39,0	7,0	42	31,0	35,5	11	11	0,55	300-0
U2EX-701-HT	70,1	36,0-37,5	23	4,0-5,5	35	20	4,0	44,0-45,5	8,0	48	45,5	51,0	11	11	0,80	300-1
U2EX-704-HT	70,4	36,0-37,5	23	4,0-5,5	35	20	4,0	44,0-45,5	8,0	48	45,5	51,0	11	11	0,81	300-1
U2EX-777-HT	77,7	37,0-38,5	23	3,5-5,0	40	26	4,0	48,0-49,5	11,0	54	48,0	56,8	17	17	1,00	300-2
U2EX-884-HT	88,4	44,0-45,5	30	4,0-5,5	45	26	4,0	57,0-58,5	13,0	59	68,0	72,0	23	23	1,61	300-3
U2EX-889-HT	88,9	44,0-45,5	30	4,0-5,5	45	26	4,0	57,0-58,5	13,0	59	68,0	72,0	23	23	1,62	300-3
U2EX-1077-HT	107,7	55,0-57,0	31	4,0-6,0	60	30	5,0	69,0-71,0	14,0	69	81,0	95,0	31	36	2,82	300-4
U2EX-1230-HT	123,0	56,0-60,0	37	5,0-9,0	60	34	5,0	72,3-76,3	16,3	80	110,0	132,0	43	50	3,70	300-5
U2EX-1490-HT	149,0	58,5-62,5	45	6,0-10,0	60	34	3,0	78,5-82,5	20,0	108	151,0	192,0	68	71	6,50	300-6 303-6
U2EX-1800-HT	180,0	76,3-79,3	57,3	6,5-9,5	100	60	4,0	95,7-98,7	19,4	124	207,0	243,0	73	83	11,5	300-8

Fixing elements see page 41 to 45



Combined bearings
adjustable by washer
high temperature
for U -Profiles

Typical areas of application:

- Conveyors (track rollers, deflection rollers)
- Fuel carriages
- Calenders
- Fans
- Foil stretching machinery

For the axial roller to ideally perform its function, it may only rest gently on the profile.

C = dynamically radial
C_a = dynamically axial

C_o = statically radial
C_{oa} = statically axial

High-temperature durable lubricating grease

For the axial roller to ideally perform its function, it may only rest gently on the profile.

One of the proven strengths is the lubrication of thermally high-loaded bearings and guides. The low evaporating rate enables long grease times / re-lubricating intervals.

Further advantages are the increased availability of the machine and the reduced maintenance costs

- At very high operating temperatures (up to +250°C)
- Under the influence of aggressive chemicals and vapours
- If other lubricants have a negative influence on sensitive plastic friction partners

Distance plates can change the dimension H, L and s by up to 2.5 m. **Distance plates are included in the scope of the delivery. Per roller, 2 x 1 mm, 1 x 0,5 mm.**

For distance plates, see page 40

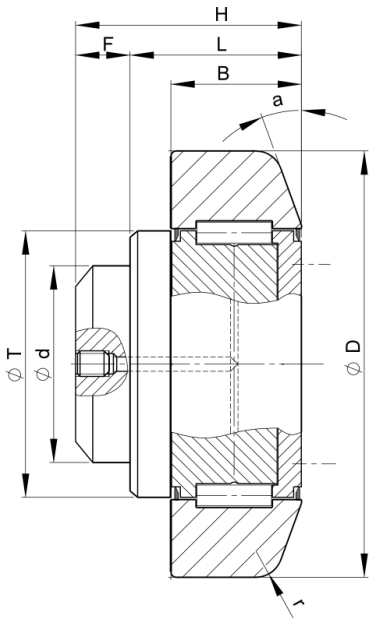
Instructions:

- Loosen the screws on the cover
- Remove the cover with axial roller or plastic insert from the roller bolt
- Insert distance ring between the roller bolt and the cover
- Replace the cover with axial roller or plastic insert
- Insert and tighten screws by means of the screw locking device.

For U – Profiles at high operating temperatures

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	r mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile U Type
U2E-620-HT	62,0	33,0-35,5	20	5,5-8,0	30	16	3,0	43,0-45,5	10,0	42	31,0	35,5	8	8	0,52	300-0
U2E-625-HT	62,5	33,0-35,5	20	5,5-8,0	30	16	3,0	43,0-45,5	10,0	42	31,0	35,5	8	8	0,56	300-0
U2E-701-HT	70,1	40,0-42,5	23	6,5-9,0	35	16	4,0	48,0-50,5	8,0	48	45,5	51,0	14	14	0,85	300-1
U2E-704-HT	70,4	40,0-42,5	23	6,5-9,0	35	16	4,0	48,0-50,5	8,0	48	45,5	51,0	14	14	0,87	300-1
U2E-777-HT	77,7	39,5-42,0	23	7,0-9,5	40	21	4,0	51,0-53,5	11,5	54	48,0	56,8	15	15	1,05	300-2
U2E-884-HT	88,4	48,0-50,5	30	7,0-9,5	45	21	4,0	61,0-63,5	13,0	59	68,0	72,0	15	15	1,69	300-3
U2E-889-HT	88,9	48,0-50,5	30	7,0-9,5	45	21	4,0	61,0-63,5	13,0	59	68,0	72,0	15	15	1,75	300-3
U2E-1077-HT	107,7	55,0-57,5	31	8,0-10,5	60	33	5,0	69,0-71,5	14,0	71	81,0	95,0	31	36	2,80	300-4
U2E-1230-HT	123,0	59,5-62,0	37	8,0-10,5	60	33	5,0	75,8-78,3	16,3	79	110,0	132,0	35	38	4,10	300-5
U2E-1490-HT	149,0	69,0-71,5	45	15,0-17,5	60	50	3,0	89,0-91,5	20,0	103	151,0	192,0	68	71	6,70	300-6 303-6

Fixing elements see page 41 to 45



Radial bearings
fixed
high temperature
for U -Profiles

High-temperature durable lubricating grease

For the axial roller to ideally perform its function, it may only rest gently on the profile.

One of the proven strengths is the lubrication of thermally high-loaded bearings and guides. The low evaporating rate enables long grease times / re-lubricating intervals.

Further advantages are the increased availability of the machine and the reduced maintenance costs

- At very high operating temperatures (up to +250°C)
- Under the influence of aggressive chemicals and vapours
- If other lubricants have a negative influence on sensitive plastic friction partners

Typical areas of application:

- Conveyors (track rollers, deflection rollers)
- Fuel carriages
- Calenders
- Fans
- Foil stretching machinery

In a modified version of the roller bolt, the bearings can also be used for I profiles.

Please do not hesitate to contact us should you require advice.

C = dynamically radial C_o = statically radial

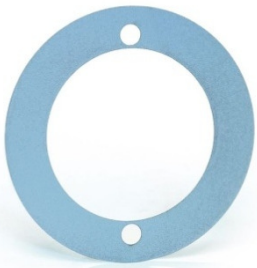
For U – Profiles at high operating temperatures

Article number	D mm	L mm	B mm	d +0,0 -0,05 mm	r mm	H mm	F mm	T mm	a Grad	C kN	C_o kN	Weight kg	Profile U Type
U1-525-HT	52,5	25,0	17	30	2,0	31,0	6,0	40	20°	24,5	32,5	0,35	300-K 530
U1-620-HT	62,0	29,5	20	30	3,0	36,5	7,0	42	20°	31,0	35,5	0,55	300-0
U1-625-HT	62,5	29,5	20	30	3,0	36,5	7,0	42	20°	31,0	35,5	0,57	300-0
U1-701-HT	70,1	34,0	23	35	4,0	42,0	8,0	48	20°	45,5	51,0	1,00	300-1
U1-704-HT	70,4	34,0	23	35	4,0	42,0	8,0	48	20°	45,5	51,0	1,01	300-1
U1-777-HT	77,7	34,0	23	40	4,0	45,5	11,5	53	20°	48,0	56,8	1,20	300-2
U1-884-HT	88,4	41,0	30	45	4,0	54,0	13,0	59	20°	68,0	72,0	1,70	300-3
U1-889-HT	88,9	41,0	30	45	4,0	54,0	13,0	59	20°	68,0	72,0	1,72	300-3
U1-1077-HT	107,7	51,5	31	60	5,0	65,5	14,0	71	20°	81,0	95,0	2,90	300-4
U1-1230-HT	123,0	51,5	37	60	5,0	67,8	16,3	80	20°	110,0	132,0	4,05	300-5
U1-1490-HT	149,0	54,0	45	60	3,0	74,0	20,0	103	15°	151,0	192,0	6,90	300-6

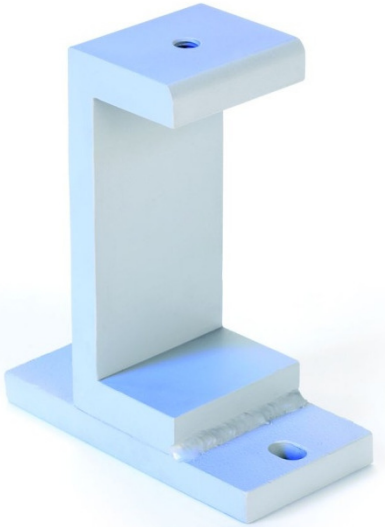
Fixing elements see page 41 to 45

Accessories
Overview

Washer



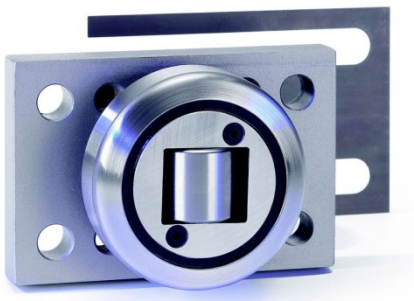
Fixing flanges



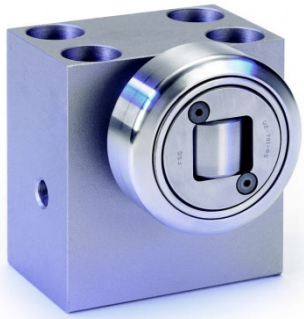
Special bolt with eccentric

Automatic grease pump

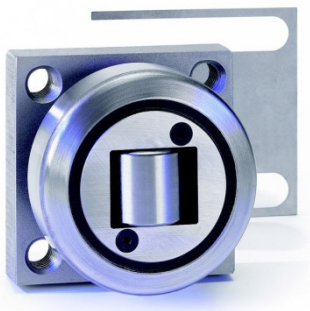
Screwed-on flanges with washer



Fixing block



Screwed on flanges **Q** with washer



Automatic grease pump	Automatic lubrication pump		**page 38**
Washers	Selection table	for adjustable Combined bearings	**page 40**
Screwed-on flanges	Selection table	for all bearings	**page 41**
Washers	Rectangle / Square	for washer for flanges	**page 45**
Fixing flanges	Dimension sheet	for U - Profiles	**page 46**

! Special bolts, swing axles, fixing blocks and other special constructions are available on request !

Figure: FSG grease automatic 2501

Technical Data generally:

- Dimensions, max width x height x depth: 112 x 196 x 94 mm
- Power supply : 3,6 V (battery pack) or 24 VDC (grid)
- Outlets : up to 4
- Lubricant: oil or grease up to NLGI 3
- Storage/volume: grease 400 cm³ (cartride), oil 500 ml
- Delivery rate per stroke 0,15 cm³
- Operating pressure: max 70 bar
- Operating temperature: -20° C to +70° C
- Hose connection: 6 x 4 mm (grease); 4 x 2,5 mm (oil)
- Electronics: Control of the cycles and output quantity; monitoring of lubricating pressure and filling level, display of disruptions
- Protective system: IP 65

Arguments for the FSG automatic lubricator

The product

The FSG 2501 automatic lubricator is an economical, compact lubricating feed mechanism which can be operated either independently with 1 or 2 outlets or integrated in the machine control with up to 4 outlets. By using a central control, an extremely variable lubricating system with up to 4 pumps can be constructed.

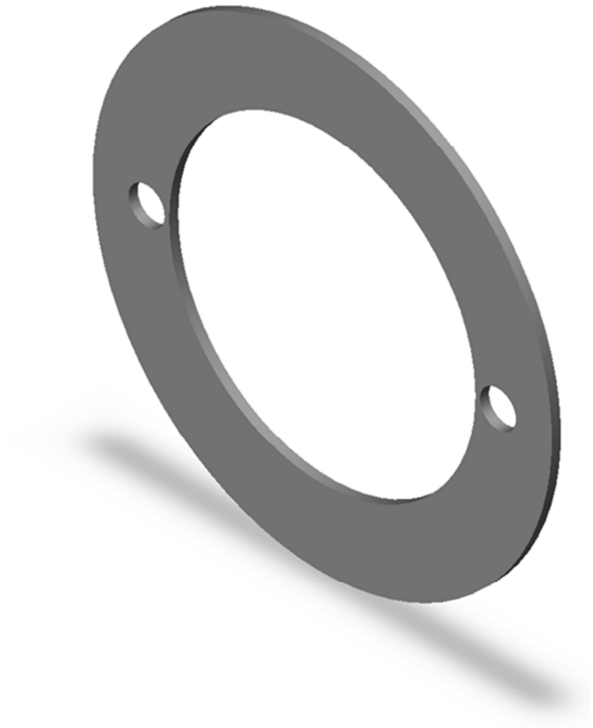
Applications

The FSG 2501 automatic lubricator is frequently connected directly to lubricating points which are located outside of machines. Typical applications are e-motors, fans and bearing pedestals. However, lubricating gearwheels, lubricating chain wheels, lubricating rollers or brushes for open lubricating points are further widely-used applications. Automatic lubrication in accordance with determined cycles ensures a permanent lubrication film and low consumption.

Your advantage

The high-performance lubricants are carefully transported to the lubrication point by means of this optimally adjustable lubricator, starting with low quantities. The optimum supply of the lubrication point increases the availability of the machines and systems, reducing the amount of lubricant required in many cases, and reducing the maintenance costs.

Washers



for the following Combined Bearings

- **U2E** (adjustable for U / UP - Profiles)
- **I2E** (adjustable for I - Profiles)
- **I2E** (adjustable for IM –Profiles welded, with restricted tolerances)
- **U2E / I2E** (with Axial plastic insert, adjustable for U / I – Profiles)

The axial clearance is changed by enclosing or removing the washer(s)

Material quality: DC 01 or equivalent

Instructions:

- Loosen the screws on the cover
- Remove the cover with axial roller or plastic insert from the roller bolt
- Insert distance ring between the roller bolt and the cover
- Replace the cover with axial roller or plastic insert
- Insert and tighten screws by means of the screw locking device.

Article number	washer thickness mm	Combined bearings U2E / I2E / K Outer diameter mm
DS-738-0,5 / DS-738-1,0	0,5 / 1,00	Ø 62,0 - Ø 73,8
DS-1019-0,5 / DS-1019-1,0	0,5 / 1,00	Ø 77,7 - Ø 101,9
DS-1278-0,5 / DS-1278-1,0	0,5 / 1,00	Ø 107,7 - Ø 127,8
DS-1538-0,5 / DS-1538-1,0	0,5 / 1,00	Ø 149,0 - Ø 153,8

Screwed-on flanges

Selection table

	Combined bearings								
Fixing flanges	fixed (U2.. / I2..)			adjustable by eccentric bolt (U2EX.. / I2EX..)			adjustable by washer (U2E.. / I2E..)		
	Profile type			**Profile type**			**Profile type**		
Article number	**„U“ „UM“ „IM“**	**„I“**	**„P“ /„SEM“**	**„U“ „UM“ „IM“**	**„I“**	**„P“**	**„U“ „UM“ „IM“**	**„I“**	**„P“**
F-00 F-00 Q	U2-525 U2-620 U2-625		U2-648	U2EX-620 U2EX-625		U2EX-648	U2E-620 U2E-625		U2E-648
F-01 F-01 Q	U2-525 U2-620 U2-625		U2-648	U2EX-620 U2EX-625		U2EX-648	U2E-620 U2E-625		U2E-648
F-02 F-02 Q	U2-701 U2-704	I2-704	U2-738 /U2-738	U2EX-701 U2EX-704		U2EX-738	U2E-701 U2E-704		U2E-738
F-03 F-03 Q	U2-777	I2-777 I2-781	U2-818 /U2-817	U2EX-777	I2EX-777 I2EX-781	U2EX-818	U2E-777	I2E-777 I2E-781	U2E-818
F-04 F-04 Q	U2-884 U2-889	I2-884 I2-889	U2-928 /U2-924	U2EX-884 U2EX-889	I2EX-889	U2EX-928	U2E-884 U2E-889		U2E-928
F-05 F-05 Q	U2-1077 U2-1230 U2-1490		U2-1118/U2-1114 U2-1278/U2-1268 U2-1538/U2-1531	U2EX-1077 U2EX-1230 U2EX-1490		U2EX-1118 U2EX-1278 U2EX-1538	U2E-1077 U2E-1230 U2E-1490		U2E-1118 U2E-1278 U2E-1538
F-05/1 F-05/1 Q	I2-1085			I2EX-1085			I2E-1085		
F-06 F-06 Q	U2-1077 U2-1230 U2-1490		U2-1118/U2-1114 U2-1278/U2-1268 U2-1538/U2-1531	U2EX-1077 U2EX-1230 U2EX-1490		U2EX-1118 U2EX-1278 U2EX-1538	U2E-1077 U2E-1230 U2E-1490		U2E-1118 U2E-1278 U2E-1538

	Bearings with axial plastic bolt			Radial bearings		
Fixing flanges	adjustable by washer			fixed		
	Profile type			**Profile type**		
Article number	**„U“ „UM“ „IM“**	**„I“**	**„P“**	**„U“ „UM“ „IM“**	**„I“**	**„P“**
F-00 F-00 Q	U2E-620 U2E-625		U2E-648	U1-525 U1-620 U1-625		U1-648
F-01 F-01 Q	U2E-620 U2E-625		U2E-648	U1-525 U1-620 U1-625		U1-648
F-02 F-02 Q	U2E-701 U2E-704		U2E-738	U1-701 U1-704	U1-701 U1-704	U1-738
F-03 F-03 Q	U2E-777	I2E-777 I2E-781	U2E-818	U1-777	U1-777	U1-818
F-04 F-04 Q	U2E-884 U2E-889		U2E-928	U1-884 U1-889		U1-928
F-05 F-05 Q	U2E-1077 U2E-1230 U2E-1490		U2E-1118 U2E-1278 U2E-1538	U1-1077 U1-1230 U1-1490	U1-1077 U1-1230	U1-1118 U1-1278 U1-1538
F-05/1 F-05/1 Q	I2E-1085					
F-06 F-06 Q	U2E-1077 U2E-1230 U2E-1490		U2E-1118 U2E-1278 U2E-1538	U1-1077 U1-1230 U1-1490	U1-1077 U1-1230	U1-1118 U1-1278 U1-1538

Heavy duty bearings	
adjustable by eccentric bolt	
Article number	**Profile type „U“ „UMS“ „IMS**
F-165 Q	I2S-1650
F-180 Q	U2EX-1800
F-190 Q	I2S-1900
F-220 Q	I2S-2200
F-250 Q	I2S-2500
F-280 Q	I2S-2800

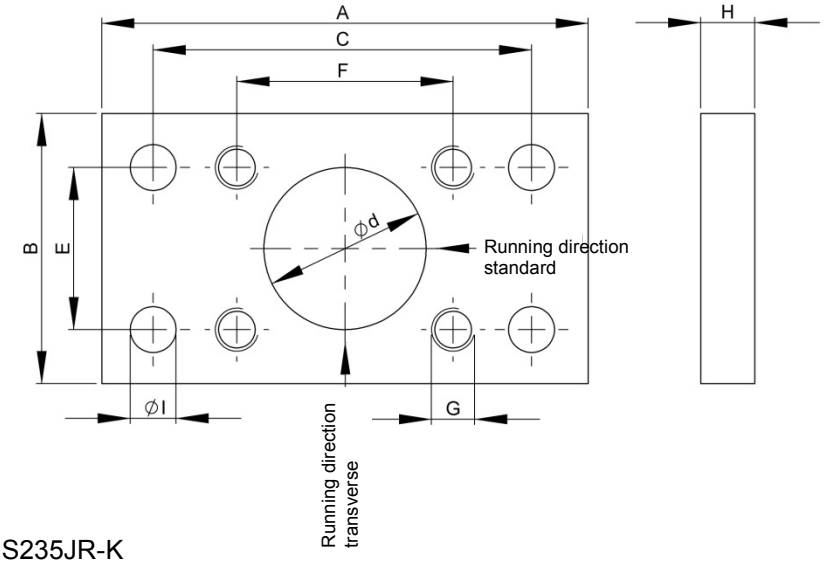
Screwed-on flanges
for radial- and Combined bearings

The mounting flange from FSG with sealed FSG roller is available in a multitude of designs, offering an alternative, fast screw connection.
All flanges come in a lubricated version.
An adjustment in the axial direction can be carried out with plug-in FSG distance plates.

– see page 45 –

FSG screw-on flanges are available in **steel** – **flame galvanised** – **coated** and in **stainless steel**.

Rectangular flange
e.g.: **F-00**



Material quality: S235JR-K

Coating types : FSG Flame galvanizing - see page 11
FSG DNC - see page 68
FSG CB - see page 68

Article number	d mm	A mm	B mm	C mm	l mm	E mm	F mm	G mm	H mm	Weight kg
F-00	30	90	50	70	8,5	30	40	M8	10	0,26
F-01	30	100	60	80	10,5	40	40	M10	10	0,36
F-02	35	120	80	90	12,5	50	50	M12	15	0,90
F-03	40	120	80	90	12,5	50	50	M12	15	0,87
F-04	45	160	100	120	17,0	60	60	M16	20	2,00
F-04/1	50	160	100	120	17,0	60	60	M16	20	1,95
F-05	60	180	120	140	17,0	80	80	M16	20	2,70
F-05/1	55	180	120	140	17,0	80	80	M16	20	2,75
F-06	60	200	150	160	17,0	100	100	M16	20	4,00

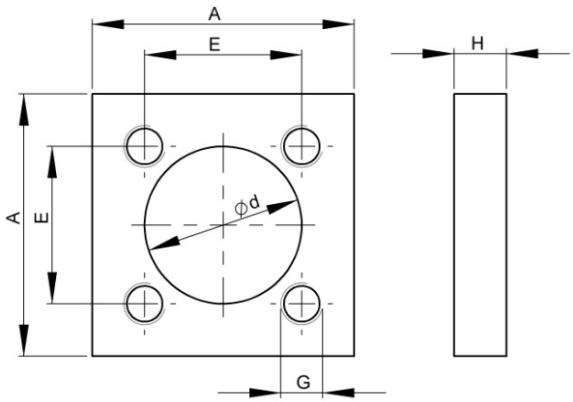
Screwed-on flanges
for radial- and Combined bearings

The mounting flange from FSG with sealed FSG roller is available in a multitude of designs, offering an alternative, fast screw connection.
All flanges come in a lubricated version.
An adjustment in the axial direction can be carried out with plug-in FSG distance plates.

– see page 45 –

FSG screw-on flanges are available in **steel** – **flame galvanised** – **coated** and in **stainless steel**.

Square flange
e.g.: **F-00 Q**



Material quality: S235JR-K

Coating types
FSG Flame galvanizing - see page 11
FSG DNC - see page 68
FSG CB - see page 68

Article number	d mm	A mm	B mm	C mm	I mm	E mm	F mm	G mm	H mm	Weight kg
F-00 Q	30	50	-	-	-	30	-	M8	10	0,13
F-01 Q	30	60	-	-	-	40	-	M10	10	0,20
F-02 Q	35	80	-	-	-	50	-	M12	15	0,59
F-03 Q	40	80	-	-	-	60	-	M12	15	0,55
F-04 Q	45	120	-	-	-	90	-	M16	20	1,89
F-04/1 Q	50	120	-	-	-	90	-	M16	20	1,85
F-05 Q	60	140	-	-	-	80	-	M16	20	2,45
F-05/1 Q	55	120	-	-	-	80	-	M16	20	2,60
F-06 Q	60	160	-	-	-	100	-	M16	20	3,50
F-165 Q	80	175	-	-	-	125	-	M20	23	4,91
F-180 Q	100	190	-	-	-	150	-	M20	28	5,92
F-190 Q	100	210	-	-	-	160	-	M20	28	7,88
F-220 Q	110	240	-	-	-	180	-	M24	35	13,10
F-250 Q	120	245	-	-	-	200	-	M24	38	15,10
F-280 Q	150	290	-	-	-	220	-	M30	38	20,50

Screwed-on flanges

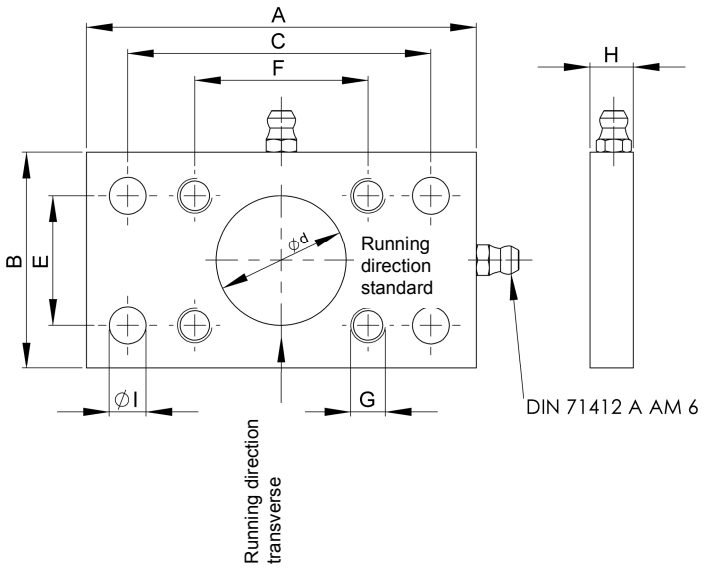
for radial- and Combined bearings lubricateable

The mounting flange from FSG with sealed FSG roller is available in a multitude of designs, offering an alternative, fast screw connection.
All flanges come in a lubricated version.
An adjustment in the axial direction can be carried out with plug-in FSG distance plates.

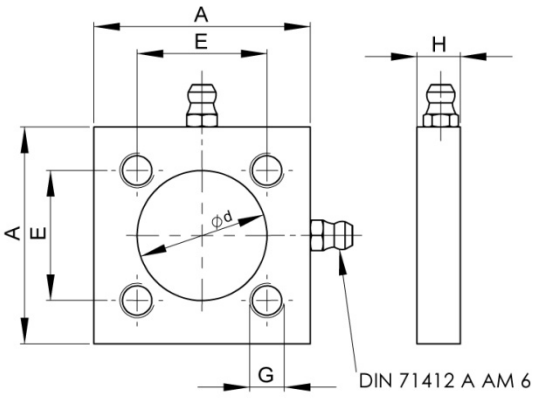
– see page 45 –

FSG screw-on flanges are available in **steel** – **flame galvanised** – **coated** and in **stainless steel**.

Rectangular flange
e.g..: **F-03 B**



Square flange
e.g.: **F-03 Q B**



Material quality: S235JR-K

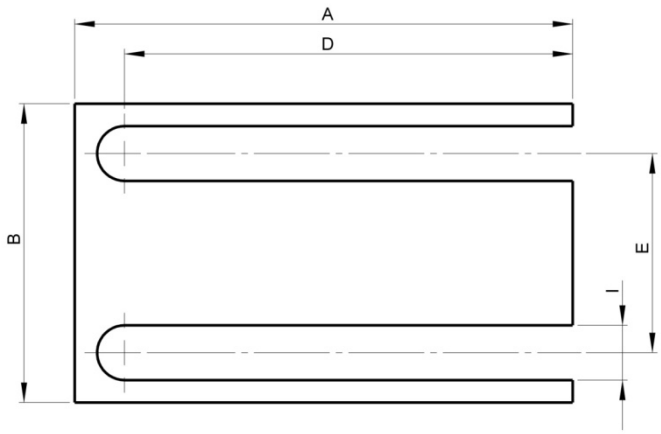
Coating types

FSG Flame galvanizing - see page 11
FSG DNC - see page 68
FSG CB - see page 68

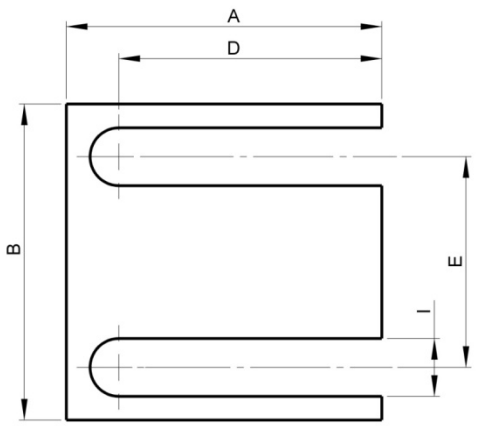
Article number	d mm	A mm	B mm	C mm	I mm	E mm	F mm	G mm	H mm	Weight kg
F-03 B	40	120	80	90	12,5	50	50	M12	15	0,87
F-04 B	45	160	100	120	17,0	60	60	M16	20	2,00
F-04/1 B	50	160	100	120	17,0	60	60	M16	20	1,95
F-05 B	60	180	120	140	17,0	80	80	M16	20	2,70
F-05/1 B	55	180	120	140	17,0	80	80	M16	20	2,75
F-06 B	60	200	150	160	17,0	100	100	M16	20	4,00
F-03 Q B	40	80	-	-	-	60	-	M12	15	0,55
F-04 Q B	45	120	-	-	-	90	-	M16	20	1,89
F-04/1 Q B	50	120	-	-	-	90	-	M16	20	1,85
F-05 Q B	60	140	-	-	-	80	-	M16	20	2,45
F-05/1 Q B	55	120	-	-	-	80	-	M16	20	2,60
F-06 Q B	60	160	-	-	-	100	-	M16	20	3,50

For bearings with screw-on flange

The distance plates are inserted between the screw-on flange and its mounting device in order to set the axial play between axial roller and the guide profile. These distance plates are available in steel and stainless steel.



Rectangular DB



Square DB**Q**

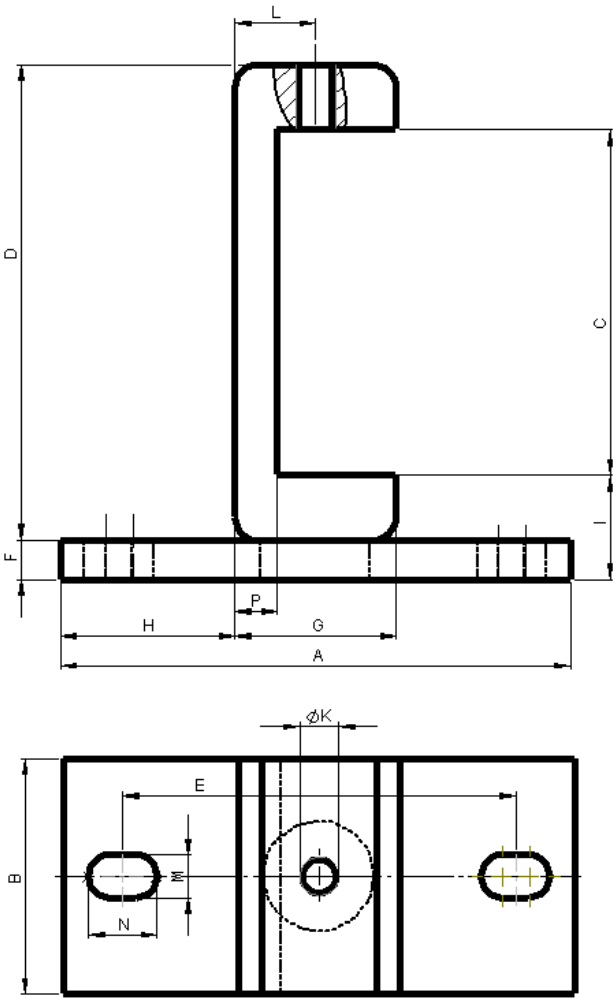
Article number	plate thickness mm	for screwed-on flange	A mm	B mm	D mm	I mm	E mm
DB-30-0.5 / DB-30-1.0	0,5 / 1,0	F-00	90	50	80	9	30
DB-40-0.5 / DB-40-1.0	0,5 / 1,0	F-01	100	60	90	11	40
DB-50-0.5 / DB-50-1.0	0,5 / 1,0	F-02 F-03	120	80	105	14	50
DB-90-0.5 / DB-90-1.0	0,5 / 1,0	F-04	160	100	140	18	60
DB-80-0.5 / DB-80-1.0	0,5 / 1,0	F-05 F-05/1	180	120	160	18	80
DB-100-0.5 / DB-100-1.0	0,5 / 1,0	F-06	200	150	180	18	100
DBQ-30-0.5 / DBQ-30-1.0	0,5 / 1,0	F-00 Q	50	50	40	9	30
DBQ-40-0.5 / DBQ-40-1.0	0,5 / 1,0	F-01 Q	60	60	50	11	40
DBQ-50-0.5 / DBQ-50-1.0	0,5 / 1,0	F-02 Q	80	80	65	14	50
DBQ-60-0.5 / DBQ-60-1.0	0,5 / 1,0	F-03 Q	80	80	70	14	60
DBQ-90-0.5 / DBQ-90-1.0	0,5 / 1,0	F-04 Q F-04/1 Q	120	120	105	18	90
DBQ-80-0.5 / DBQ-80-1.0	0,5 / 1,0	F-05 Q	140	140	110	18	80
DBQ-80/1-0.5 / DBQ-80/1-1.0	0,5 / 1,0	F-05/1 Q	120	120	100	18	80
DBQ-100-0.5 / DBQ-100-1.0	0,5 / 1,0	F-06 Q	160	160	130	18	100
DBQ-125-0.5 / DBQ-125-1.0	0,5 / 1,0	F-165 Q	175	175	149	22	125
DBQ-150-0.5 / DBQ-150-1.0	0,5 / 1,0	F-180 Q	190	190	170	22	150
DBQ-160-0.5 / DBQ-160-1.0	0,5 / 1,0	F-190 Q	210	210	184	22	160
DBQ-180-0.5 / DBQ-180-1.0	0,5 / 1,0	F-220 Q	240	240	209	26	180
DBQ-200-0.5 / DBQ-200-1.0	0,5 / 1,0	F-250 Q	245	245	222	26	200
DBQ-220-0.5 / DBQ-220-1.0	0,5 / 1,0	F-280 Q	290	290	254	32	220

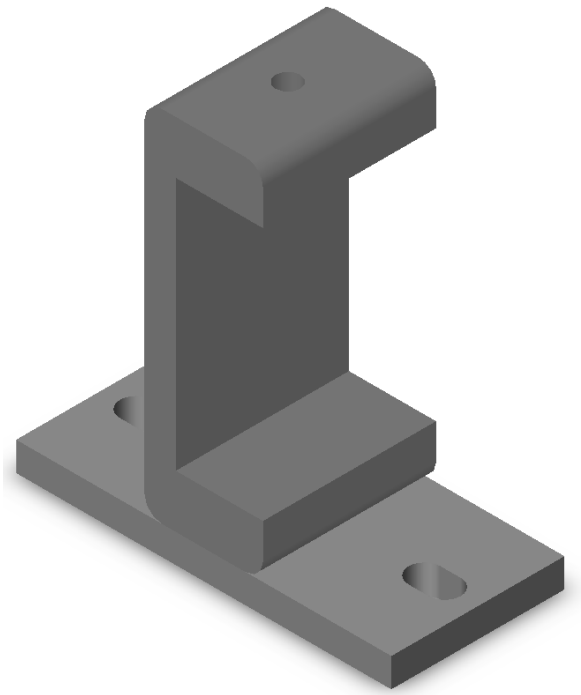
Fixing-flanges

For U-rolled steel sections in various versions

The FSG mounting flange is used primarily for attaching U profiles to the floors of halls, steel structures, machine components, etc. For longer guide lengths, the FSG mounting flange can also be used in the case of an extension of the U profiles.

Upon request, the mounting flange is available primed or flame-galvanised. Additional finishing of the mounting flange according to a customer drawing is also possible (drilling, milling, welding-on of elements, etc.) at any time.

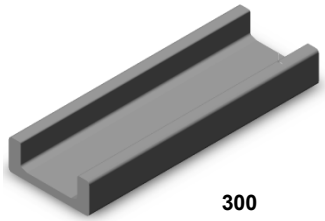




Article number	A mm	B mm	C +0,5 mm	D mm	E mm	F mm	G mm	H mm	I mm	K mm	L mm	M mm	N mm	P mm	Weight kg
300-K/0BF	130	60	66,5	86,5	100	10	36,0	47,0	20,00	M8	18,0	11	18	7,0	1,12
300-0/2BF	130	60	88,0	121,3	100	10	41,0	44,5	26,65	M10	20,5	11	18	10,8	1,20
300-1/3BF	130	60	105,0	135,4	100	10	53,0	38,5	25,20	M10	26,5	11	18	12,7	1,80
300-2/4BF	160	80	123,0	157,2	130	15	61,2	49,4	32,10	M12	30,6	13	18	14,0	3,70
300-3/5BF	160	80	137,5	175,0	130	15	66,2	46,9	33,75	M12	33,1	13	18	16,2	4,10
300-4/6BF	160	80	159,0	201,5	130	15	71,2	44,4	36,25	M12	35,6	13	18	19,4	5,10

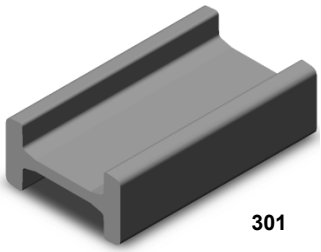
Profiles
Overview

U - Profile



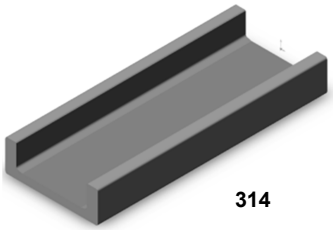
300

I - Profile



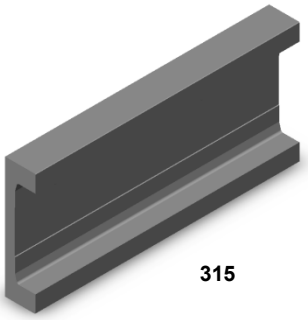
301

UP - Profile



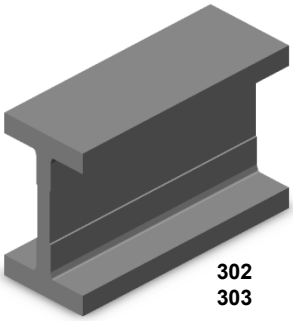
314

UMS - Profile



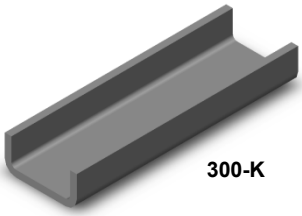
315

IMS - Profile



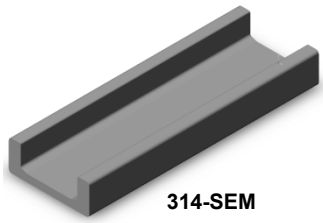
302
303

U – Special Profile



300-K

SEM - Profile



314-SEM

Bent Profile

U – Profiles	**300**	one-piece	U – Profile	hot-rolled	**page 48**
I – Profiles	**301**	one-piece	I – Profile	hot-rolled	**page 52**
UP – Profiles	**314**	one-piece	U – Precision profile	hot-rolled and machined	**page 55**
UMS – Profiles	**315**	multipart	U - Heavy duty profile	welded and machined	**page 58**
IMS – Profiles	**302 /303**	multipart	I - Heavy duty profile	welded and machined	**page 59**
Bent Profiles		on axis and leg			**page 60**
U – Special Profiles	**300-K**	one-piece	U – Profile	canted	**page 61**
SEM – Profiles	**314-SEM**	one-piece	U - Profile	restricted tolerances	**page 62**

! Other profiles are available on request !

Hot-rolled U-profile

FSG U - profiles are hot-rolled from 18MnNb6 in lengths of up to approx. 12 metres. The yield strength is more than 400 N/mm². Significantly higher than that of a steel classification S355J2G3. Also, the tensile strength is increased to approx. 700 N/mm². FSG profiles are aligned as standard and can also be finely adjusted with our CNC straightening machine to tolerances of 0,2 mm per metre at the customer´s request.

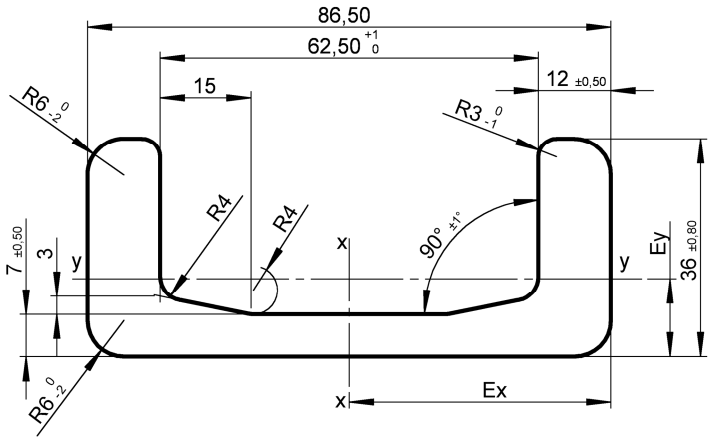
On request, the profiles can be primed or flame galvanised.
A complete processing of the profiles to the customer´s technical drawings and/or specifications can be arranged e.g. drilling, milling, welded elements.

We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 12 m).

300-0

U - Profile no.: 300-0

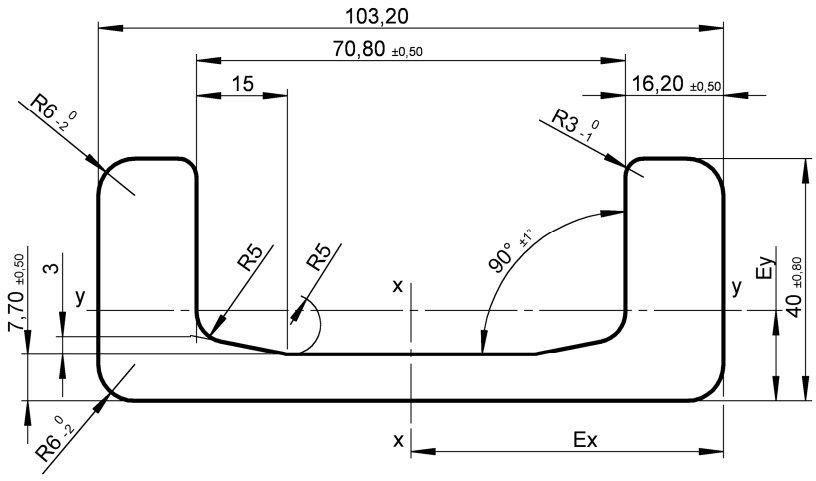
kg/m:	10,50	kg
Wx:	32,00	cm3
Wy:	6,00	cm3
Ix:	137,00	cm4
Iy:	15,00	cm4
Ex:	43,25	mm
Ey:	12,87	mm



300-1

U - Profile no.: 300-1

kg/m:	14,78	kg
Wx:	53,00	cm3
Wy:	11,00	cm3
Ix:	273,00	cm4
Iy:	27,00	cm4
Ex:	51,60	mm
Ey:	14,99	mm



Fixing elements see page 46

Hot-rolled U-profile

FSG U - profiles are hot-rolled from 18MnNb6 in lengths of up to approx. 12 metres. The yield strength is more than 400 N/mm². Significantly higher than that of a steel classification S355J2G3. Also, the tensile strength is increased to approx. 700 N/mm². FSG profiles are aligned as standard and can also be finely adjusted with our CNC straightening machine to tolerances of 0,2 mm per metre at the customer´s request.

On request, the profiles can be primed or flame galvanised.
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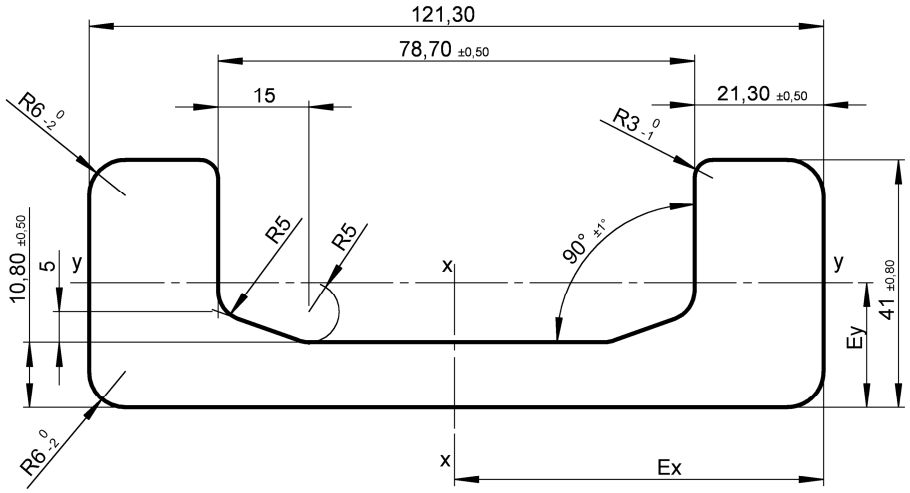
We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 12 m).

300-2

U - Profile no.: 300-2

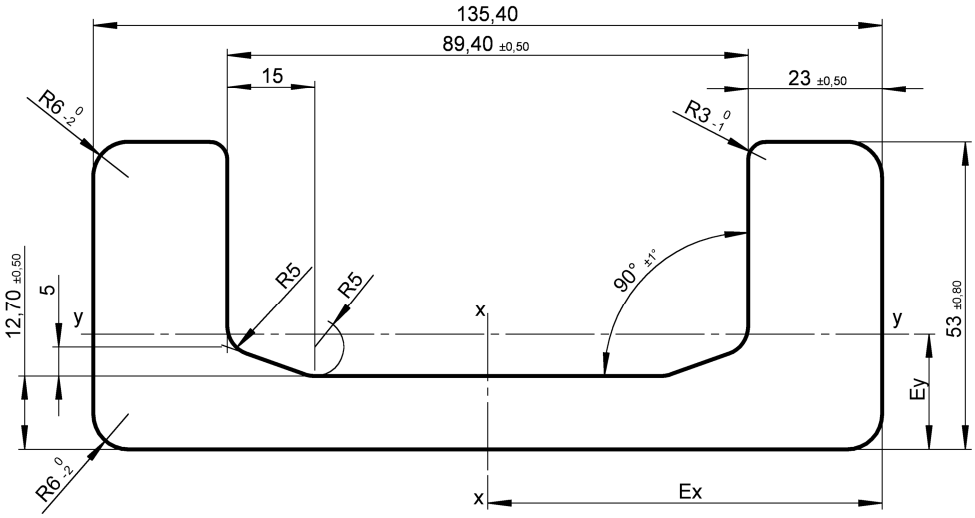
kg/m:	20,93	kg
Wx:	81,00	cm3
Wy:	15,43	cm3
Ix:	493,58	cm4
Iy:	37,92	cm4
Ex:	60,65	mm
Ey:	15,43	mm



300-3

U - Profile no.: 300-3

kg/m:	28,60	kg
Wx:	127,80	cm3
Wy:	27,03	cm3
Ix:	865,23	cm4
Iy:	89,47	cm4
Ex:	67,70	mm
Ey:	19,90	mm



Fixing flanges see page 46

Hot-rolled U-profile

FSG U - profiles are hot-rolled from 18MnNb6 in lengths of up to approx. 12 metres. The yield strength is more than 400 N/mm². Significantly higher than that of a steel classification S355J2G3. Also, the tensile strength is increased to approx. 700 N/mm². FSG profiles are aligned as standard and can also be finely adjusted with our CNC straightening machine to tolerances of 0,2 mm per metre at the customer´s request.

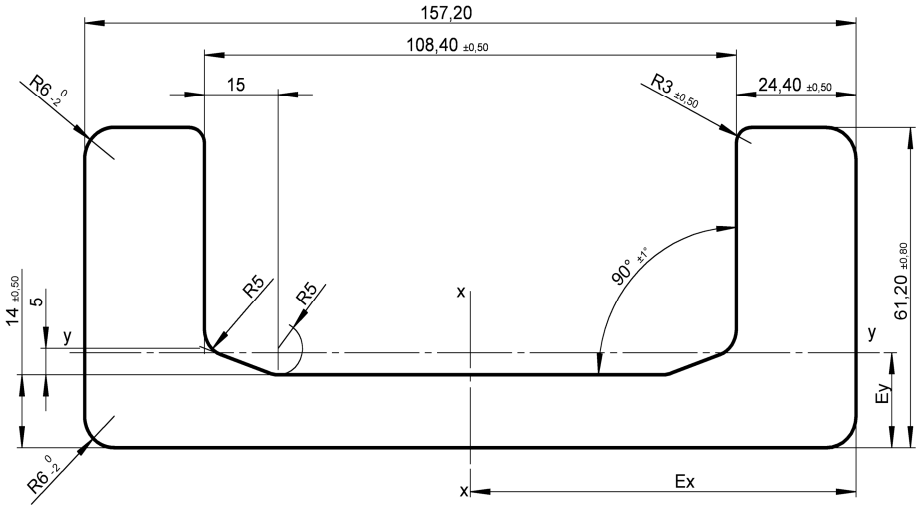
On request, the profiles can be primed or flame galvanised.
A complete processing of the profiles to the customer´s technical drawings and/or specifications can be arranged e.g. drilling, milling, welded elements.

We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 12 m).

300-4

U - Profile no.: 300-4

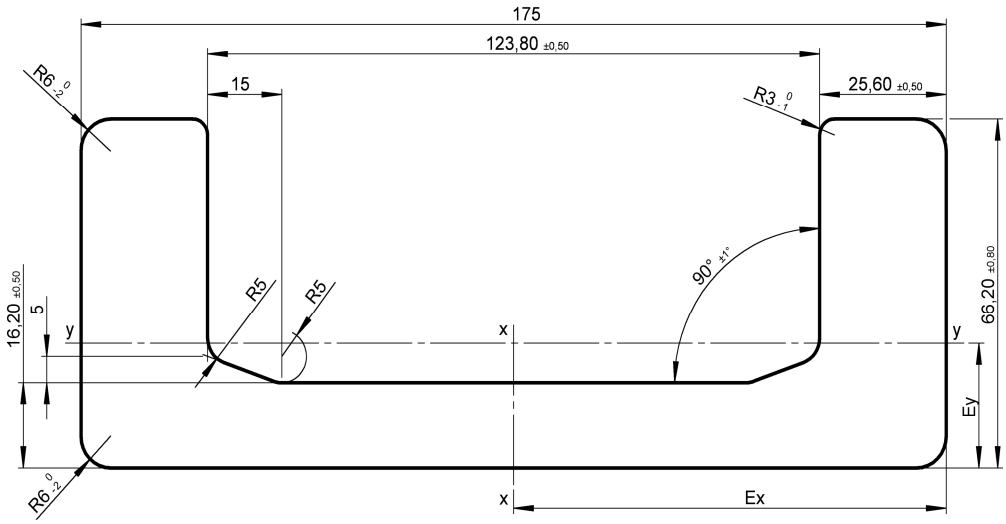
kg/m:	35,90	kg
Wx:	190,12	cm3
Wy:	39,00	cm3
Ix:	1494,32	cm4
Iy:	150,98	cm4
Ex:	78,60	mm
Ey:	22,49	mm



300-5

U - Profile no.: 300-5

kg/m:	42,90	kg
Wx:	249,75	cm3
Wy:	48,42	cm3
Ix:	2185,32	cm4
Iy:	205,84	cm4
Ex:	87,50	mm
Ey:	19,41	mm



Fixing flanges see page 46

Hot-rolled U-profile

FSG U - profiles are hot-rolled from 18MnNb6 in lengths of up to approx. 12 metres. The yield strength is more than 400 N/mm². Significantly higher than that of a steel classification S355J2G3. Also, the tensile strength is increased to approx. 700 N/mm². FSG profiles are aligned as standard and can also be finely adjusted with our CNC straightening machine to tolerances of 0,2 mm per metre at the customer´s request.

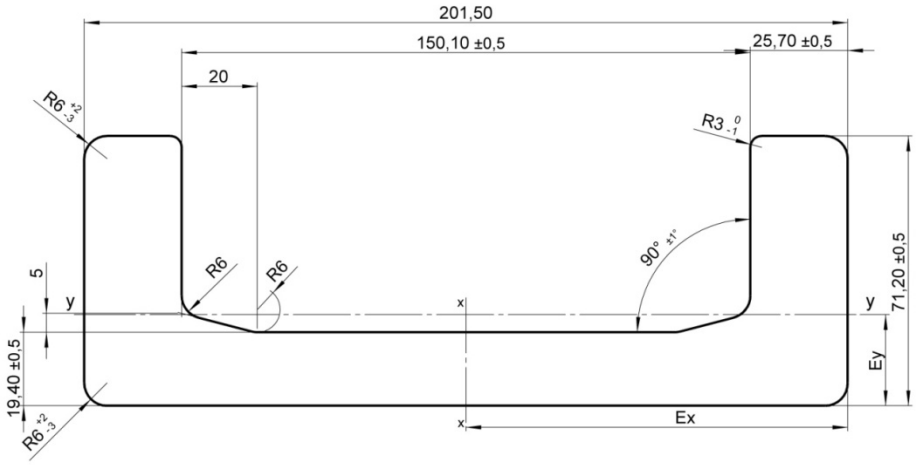
On request, the profiles can be primed or flame galvanised.
A complete processing of the profiles to the customer´s technical drawings and/or specifications can be arranged e.g. drilling, milling, welded elements.

We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 12 m).

300-6

U - Profile no.: 300-6

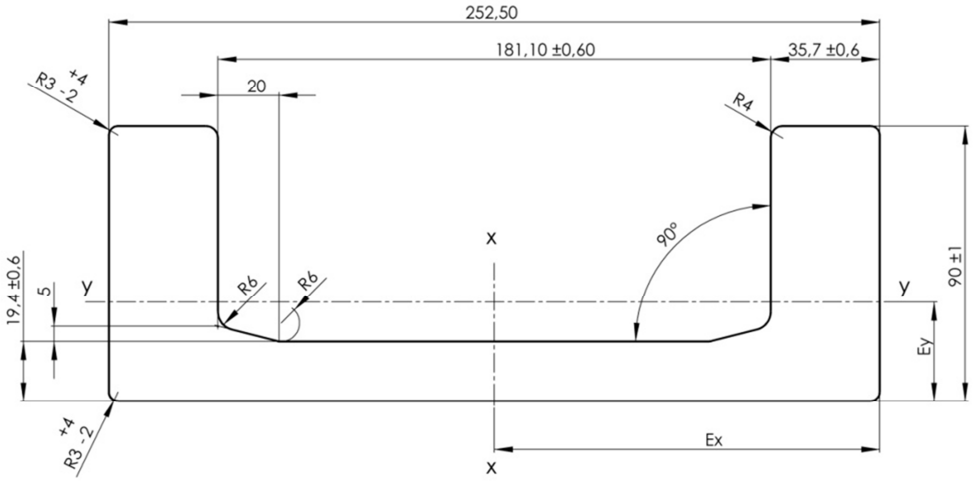
kg/m:	52,25	kg
Wx:	339,76	cm3
Wy:	57,15	cm3
Ix:	3423,08	cm4
Iy:	269,52	cm4
Ex:	100,75	mm
Ey:	20,01	mm



300-8

U - Profile no.: 300-8

kg/m:	78,51	kg
Wx:	682,18	cm3
Wy:	124,67	cm3
Ix:	8612,57	cm4
Iy:	720,20	cm4
Ex:	126,25	mm
Ey:	32,22	mm



Fixing flanges see page 46

Hot-rolled I-profile

FSG I - profiles are hot-rolled from 18MnNb6 in lengths of up to approx. 12 metres. The yield strength is more than 400 N/mm². Significantly higher than that of a steel classification S355J2G3. Also, the tensile strength is increased to approx. 700 N/mm². FSG profiles are aligned as standard and can also be finely adjusted with our CNC straightening machine to tolerances of 0,2 mm per metre at the customer´s request.

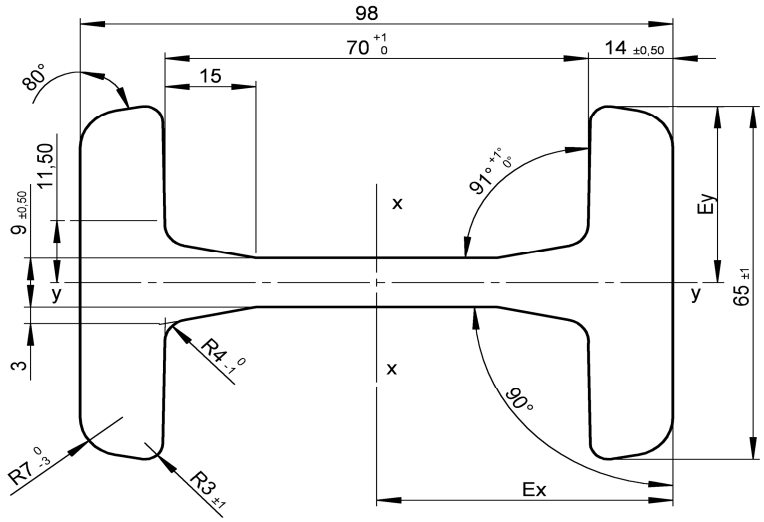
On request, the profiles can be primed or flame galvanised.
A complete processing of the profiles to the customer´s technical drawings and/or specifications can be arranged e.g. drilling, milling, welded elements.

We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 12 m).

301-0

I - Profile no.: 301-0

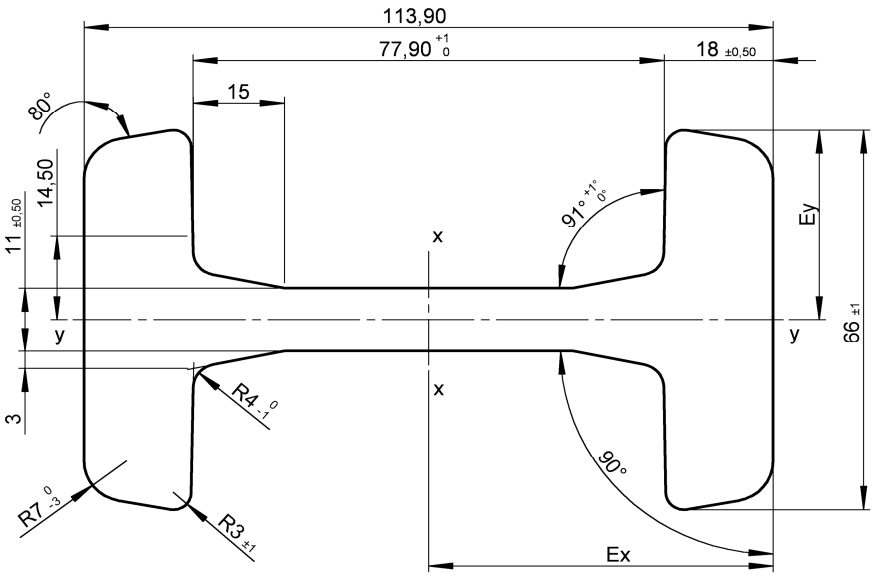
kg/m:	19,40	kg
Wx:	70,26	cm3
Wy:	17,73	cm3
Ix:	344,29	cm4
Iy:	57,63	cm4
Ex:	49,00	mm
Ey:	32,50	mm



301-1

I - Profile no.: 301-1

kg/m:	25,30	kg
Wx:	104,92	cm3
Wy:	23,27	cm3
Ix:	597,54	cm4
Iy:	76,79	cm4
Ex:	56,95	mm
Ey:	33,00	mm



Fixing flanges see page 46

Hot-rolled I-profile

FSG I - profiles are hot-rolled from 18MnNb6 in lengths of up to approx. 12 metres. The yield strength is more than 400 N/mm². Significantly higher than that of a steel classification S355J2G3. Also, the tensile strength is increased to approx. 700 N/mm². FSG profiles are aligned as standard and can also be finely adjusted with our CNC straightening machine to tolerances of 0,2 mm per metre at the customer´s request.

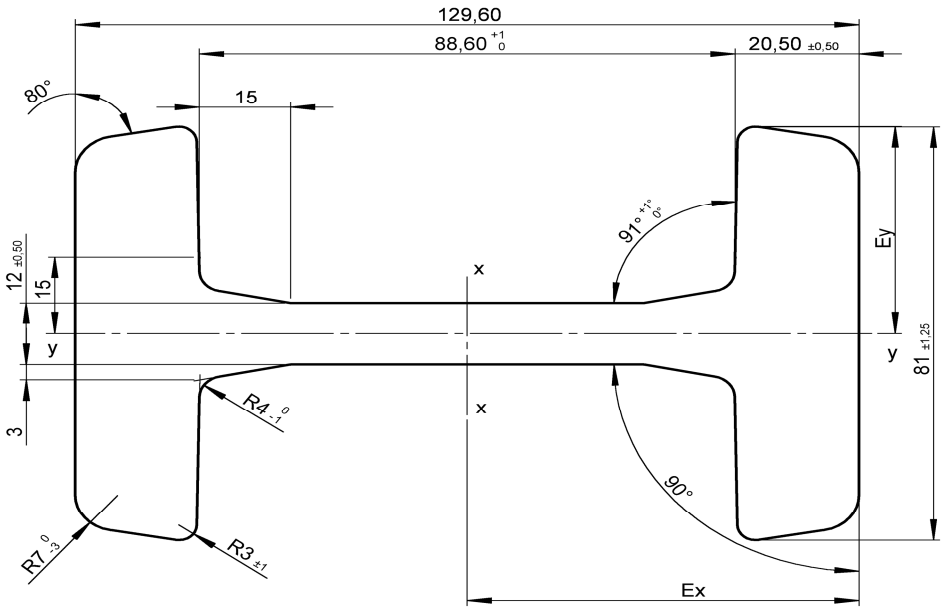
On request, the profiles can be primed or flame galvanised.
A complete processing of the profiles to the customer´s technical drawings and/or specifications can be arranged e.g. drilling, milling, welded elements.

We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 12 m).

301-2

I - Profile no.: 301-2

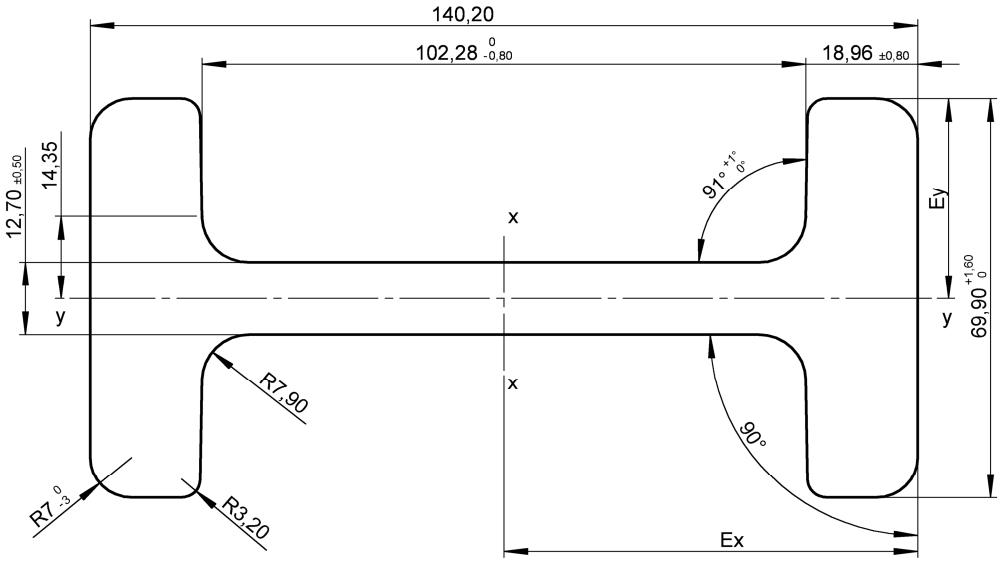
kg/m:	34,05	kg
Wx:	160,07	cm3
Wy:	39,97	cm3
Ix:	1037,22	cm4
Iy:	161,89	cm4
Ex:	64,80	mm
Ey:	40,50	mm



301-3

I - Profile no.: 301-3

kg/m:	31,17	kg
Wx:	156,62	cm3
Wy:	30,56	cm3
Ix:	1097,89	cm4
Iy:	106,81	cm4
Ex:	70,01	mm
Ey:	34,95	mm



Fixing flanges see page 46

Hot-rolled I-profile

FSG I - profiles are hot-rolled from 18MnNb6 in lengths of up to approx. 12 metres. The yield strength is more than 400 N/mm². Significantly higher than that of a steel classification S355J2G3. Also, the tensile strength is increased to approx. 700 N/mm². FSG profiles are aligned as standard and can also be finely adjusted with our CNC straightening machine to tolerances of 0,2 mm per metre at the customer´s request.

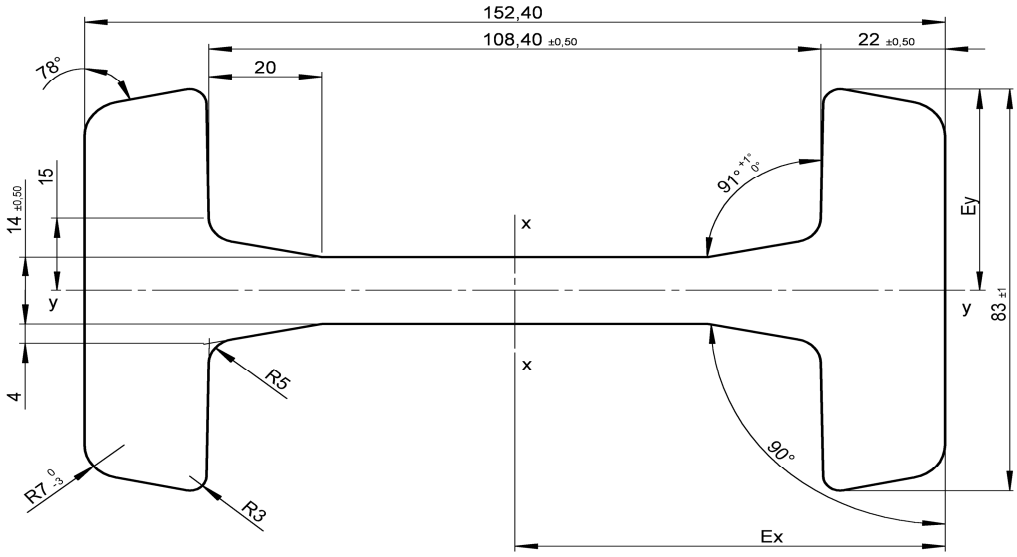
On request, the profiles can be primed or flame galvanised.
A complete processing of the profiles to the customer´s technical drawings and/or specifications can be arranged e.g. drilling, milling, welded elements.

We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 12 m).

301-4

I - Profile no.: 301-4

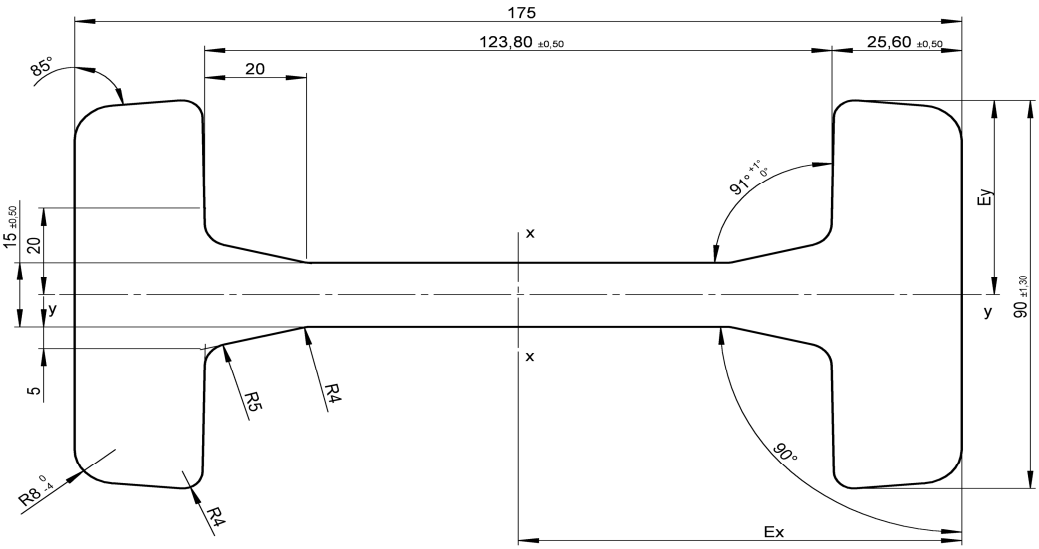
kg/m:	40,54	kg
Wx:	219,17	cm3
Wy:	44,46	cm3
Ix:	1670,08	cm4
Iy:	184,51	cm4
Ex:	76,20	mm
Ey:	41,50	mm



301-5

I - Profile no.: 301-5

kg/m:	51,40	kg
Wx:	322,07	cm3
Wy:	64,71	cm3
Ix:	2818,15	cm4
Iy:	291,19	cm4
Ex:	87,50	mm
Ey:	45,00	mm



Fixing flanges see page 46

Precision profiles hot-rolled and machined

FSG UP - profiles are hot-rolled from 18MnNb6 in lengths of up to approx. 9 metres. The yield strength is more than 400 N/mm². Significantly higher than that of a steel classification S355J2G3. Also, the tensile strength is increased to approx. 700 N/mm². FSG profiles are aligned as standard and can also be finely adjusted with our CNC straightening machine to tolerances of 0,2 mm per metre at the customer´s request.

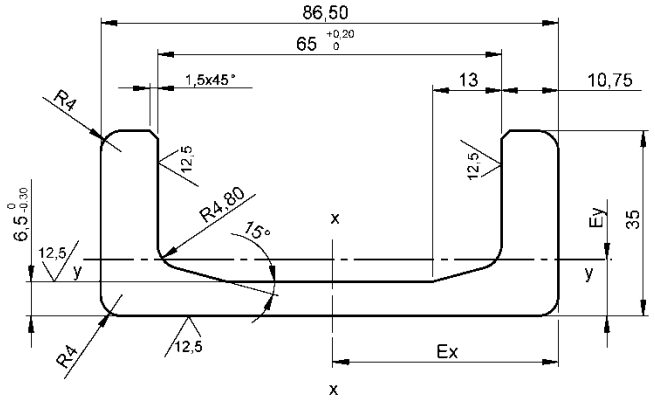
On request, the profiles can be primed or flame galvanised.
A complete processing of the profiles to the customer´s technical drawings and/or specifications can be arranged e.g. drilling, milling, welded elements.

We supply many, various profiles in fixed lengths, also in manufactured lengths (approx. 9 m).

314-0

UP - Profile no.: 314-0

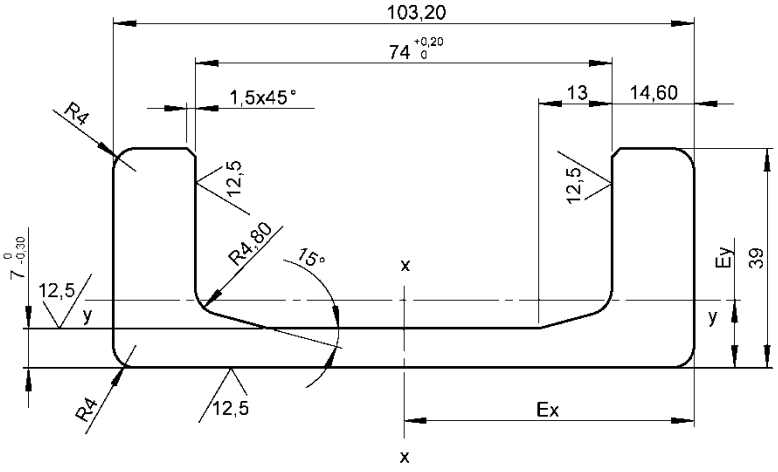
kg/m:	9,44	kg
Wx:	28,9	cm3
Wy:	10,7	cm3
Ix:	125,1	cm4
Iy:	12,9	cm4
Ex:	43,25	mm
Ey:	12,09	mm



314-1

UP - Profile no.: 314-1

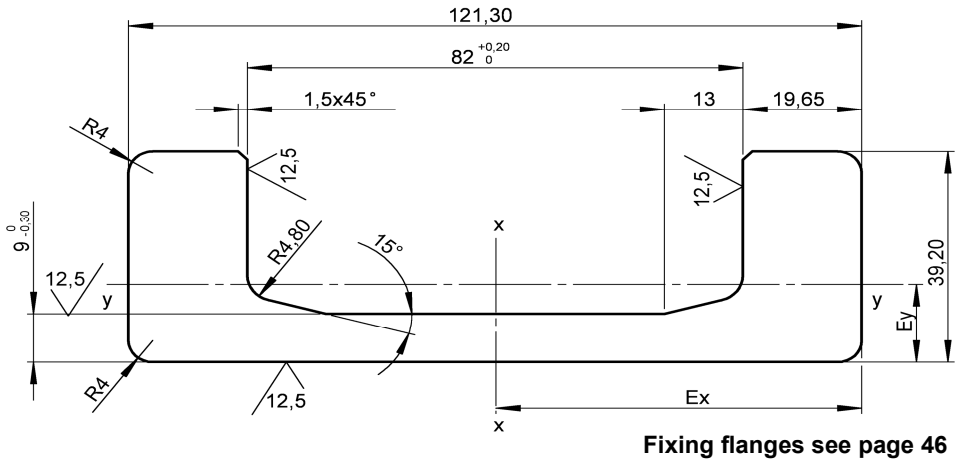
kg/m:	13,14	kg
Wx:	48,3	cm3
Wy:	16,30	cm3
Ix:	248,90	cm4
Iy:	23,20	cm4
Ex:	51,50	mm
Ey:	14,22	mm



314-2

UP - Profile no.: 314-2

kg/m:	17,87	kg
Wx:	73,4	cm3
Wy:	21,40	cm3
Ix:	439,10	cm4
Iy:	30,30	cm4
Ex:	60,50	mm
Ey:	14,44	mm



Fixing flanges see page 46

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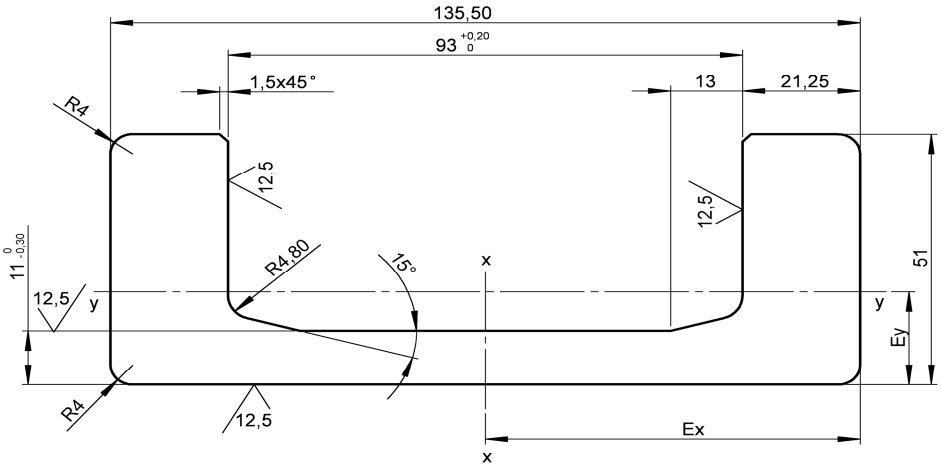
also in manufactured lengths (approx. 9 m).

314-3

UP - Profile no.: 314-3

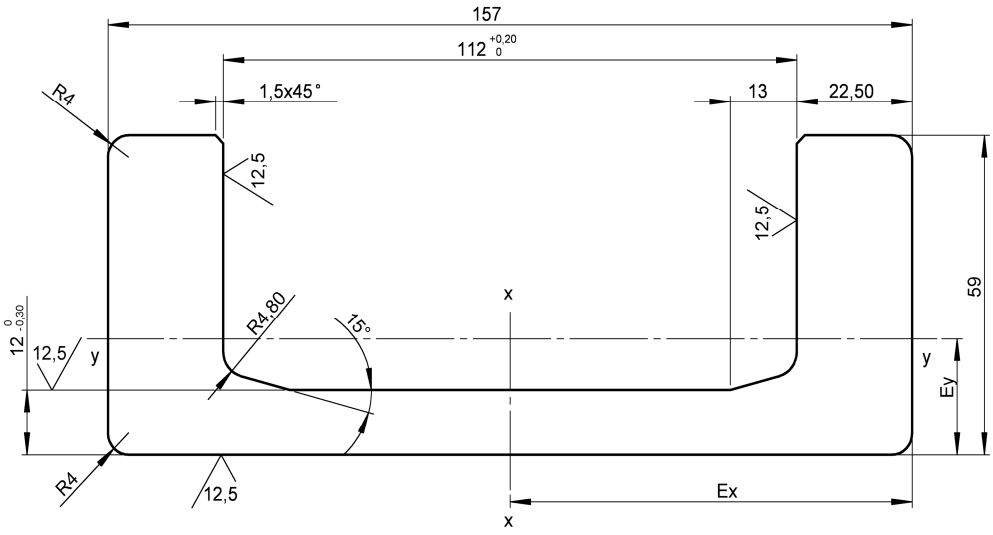
kg/m	25,16	kg
Wx =	116,9	cm3
Wy =	39,60	cm3
Ix =	792,20	cm4
Iy =	75,00	cm4
Ex =	67,75	mm
Ey =	18,94	mm



314-4

UP - Profile no.: 314-4

kg/m	31,47	kg
Wx =	172,9	cm3
Wy =	59,10	cm3
Ix =	1357,50	cm4
Iy =	126,80	cm4
Ex =	78,50	mm
Ey =	21,46	mm



Fixing flanges see page 46

Precision profiles hot-rolled and machined

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On request, the profiles can be primed or flame galvanised.
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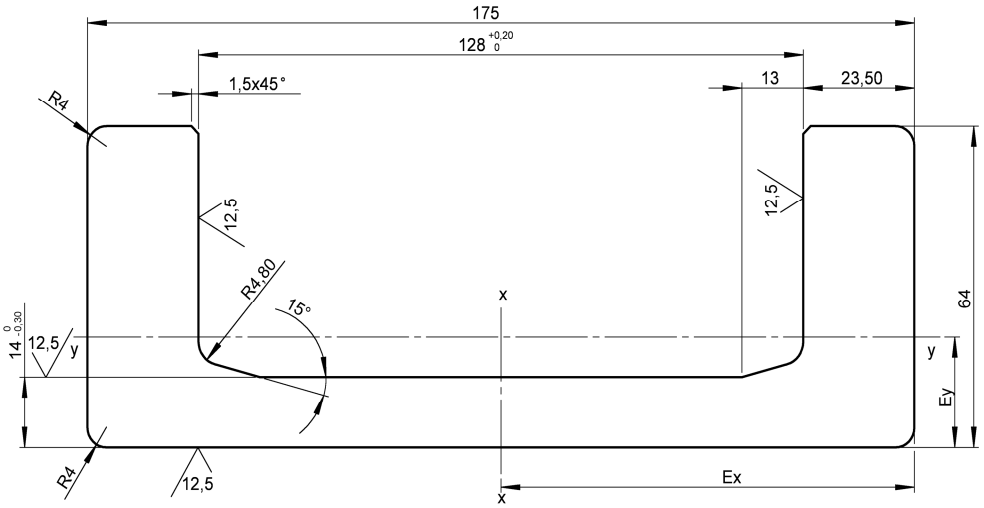
We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 9 m).

314-5

UP - Profile no.: 314-5

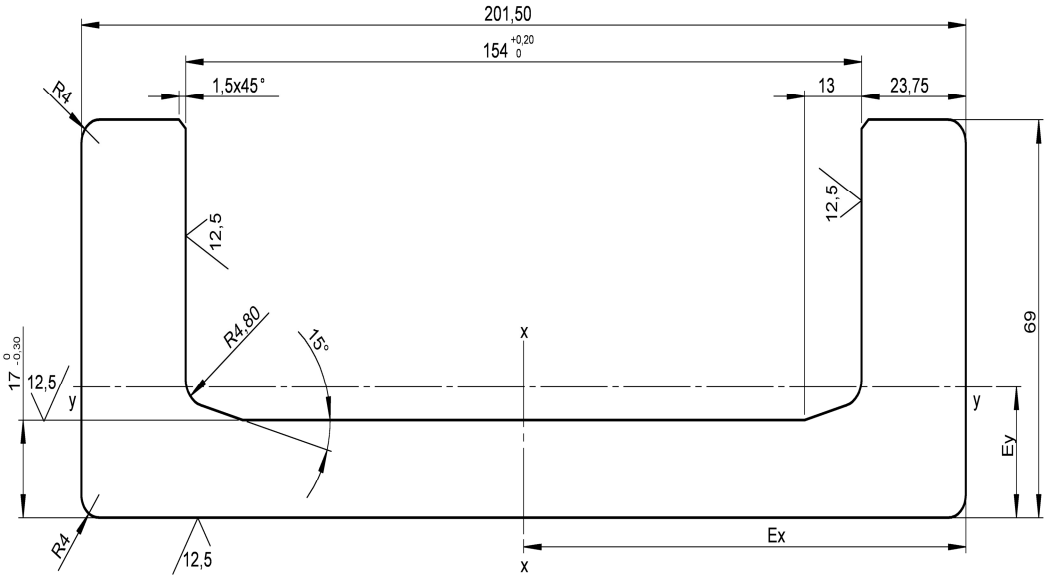
kg/m	37,71	kg
Wx =	227,60	cm3
Wy =	77,40	cm3
Ix =	1.991,50	cm4
Iy =	174,20	cm4
Ex =	87,00	mm
Ey =	22,00	mm



314-6

UP - Profile no.: 314-6

kg/m	45,98	kg
Wx =	308,30	cm3
Wy =	101,20	cm3
Ix =	3.098,70	cm4
Iy =	230,80	cm4
Ex =	100,75	mm
Ey =	22,80	mm



Fixing flanges see page 46

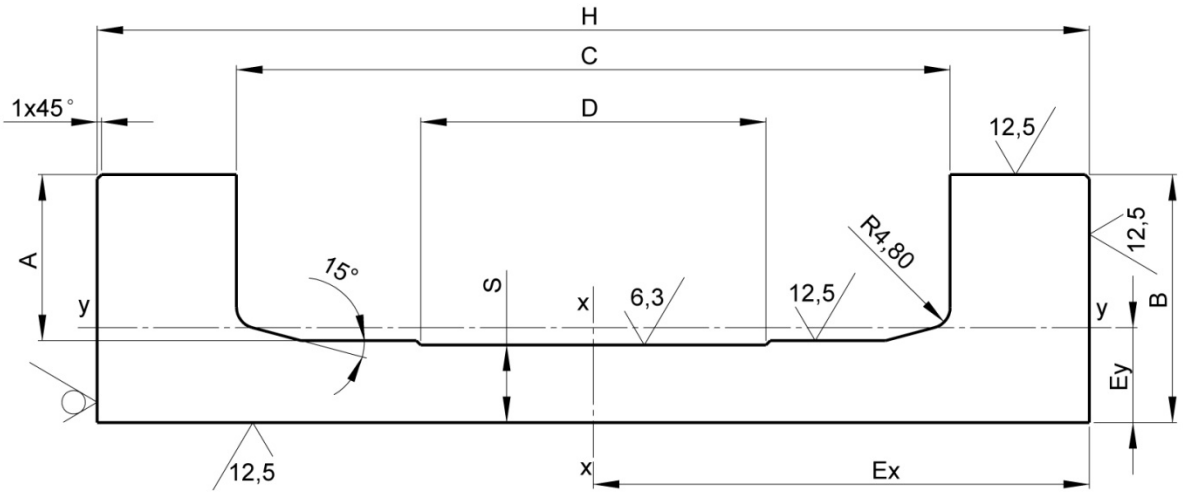
Sectional, welded and machined
U-Heavy duty profiles

Our sectional profiles are formed, welded and processed from S355J2G in lengths up to approx. 9 m.

On request, the profiles can be primed or flame galvanised.
A complete processing of the profiles to the customer´s technical drawings and/or specifications can be arranged e.g. drilling, milling, welded elements.

We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 9 m).

If you have any questions relating to our products, we would be pleased to hear from you.



Article number	H $^{-1,5}$ mm	C $^{+0,2}$ mm	B $^{\pm0,5}$ mm	A mm	S $^{\pm0,3}$ mm	D mm	Ex mm	Ey mm	Jx cm^4	Jy cm^4	Wx cm^3	Wy cm^3	Weight kg/m
315-0	230,0	165,4	67,5	48,5	18,0	80	115,0	23,6	5.047,3	281,8	439,90	119,40	58,4
315-1	255,0	190,4	77,0	53,0	22,0	80	127,5	25,9	7.631,6	434,2	598,60	167,70	73,7
315-2	295,0	220,4	85,0	62,5	20,0	125	147,5	29,0	12.632,7	672,4	856,50	231,70	86,1
315-3	344,0	250,4	94,0	65,5	26,5	125	172,0	32,4	23.371,6	1.117,4	1.358,80	344,90	122,8
315-4	394,0	280,4	114,0	85,5	26,5	125	197,0	40,8	42.473,4	2.354,8	2.156,01	577,03	161,9

Sectional, welded and machined
I-Heavy duty profiles

Our sectional profiles are formed, welded and processed from S355J2G in lengths up to approx. 9 m.

On request, the profiles can be primed or flame galvanised.
A complete processing of the profiles to the customer´s technical drawings and/or specifications can be arranged e.g. drilling, milling, welded elements.

We supply many, various profiles in fixed lengths,
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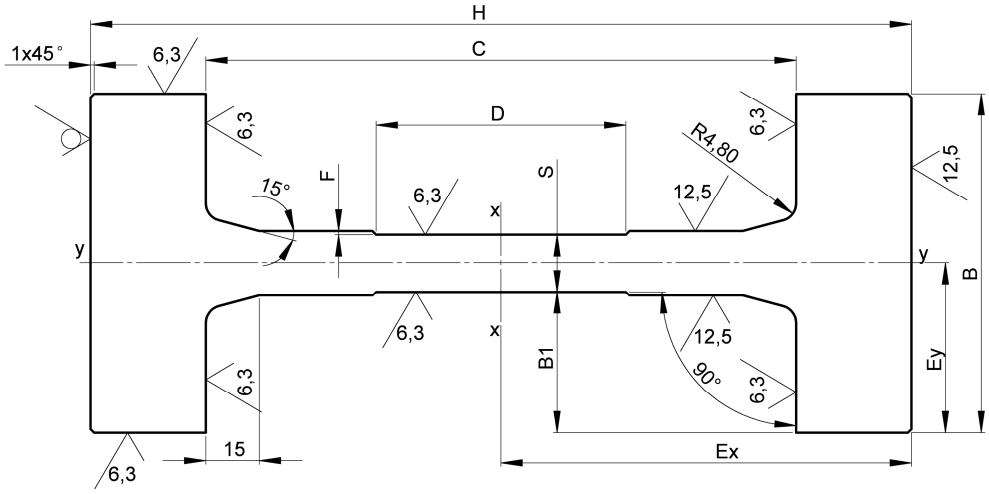
If you have any questions relating to our products, we would be pleased to hear from you.



Article number	H $^{-1,5}$ mm	C $^{+0,2}$ mm	B $^{\pm0,8}$ mm	B_1 mm	S $^{\pm0,3}$ mm	F mm	D mm	Ex mm	Ey mm	Jx cm^4	Jy cm^4	Wx cm^3	Wy cm^3	Weight kg/m
303-6	205,0	149,4	118	51,0	16,0	2	60	100,0	59,0	5.146	700	514	118	67,60
302-0	230,0	165,4	95	39,5	16,0	1	70	115,0	47,5	6.894	472	600	99	72,70
302-1	255,0	190,4	130	55,0	20,0	2	70	127,5	65,0	12.003	1.203	941	185	100,40
302-2	295,0	220,4	150	65,0	20,0	2	90	147,5	75,0	20.991	2.119	1.423	283	126,30
302-3	345,0	250,4	160	67,5	25,0	2	90	171,5	80,0	37.838	3.274	2.206	409	172,70
302-4	375,0	280,4	190	80,0	30,0	2	120	187,5	95,0	55.163	5.492	2.942	578	212,80
302-5	395,0	280,4	190	80,0	30,0	2	120	197,5	95,0	69.247	6.634	3.506	698	242,40

Bent Profiles

Bends of FSG profiles:

- with minimal deformation
- with the greatest possible accuracy
- with the smallest possible radii
- short
- in small series and single-part production

Bent I-Profile

1

Rounds about the easy axis

2

Rounds about the hard axis

Bent U-Profile

3

Leg outwardly

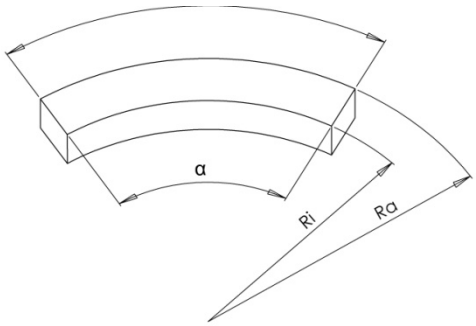
4

Leg inwardly

5

Legs up or down

Arc length
= Working length



Please specify as:

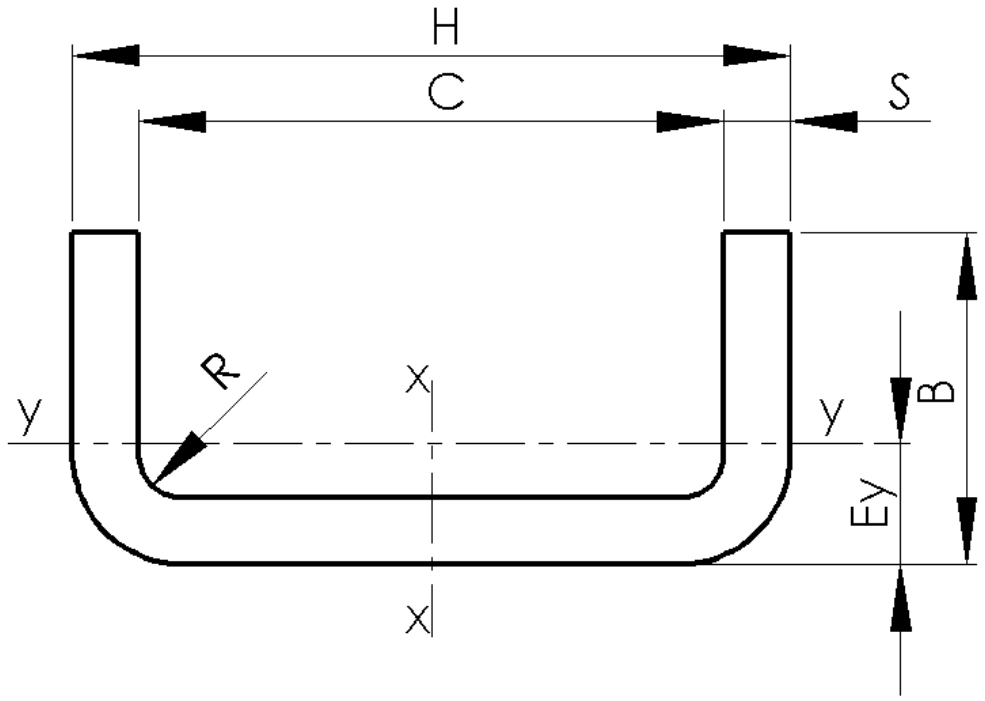
- Bending direction as image no.
- Profile Shape Dimensions
- Bending radius Ra in mm
- Bending radius Ri in mm
- Working length in mm
- alpha angle α in degrees

Rolled U-Profile

Our U-Special Profiles are cured from S235JR and rolled in lengths of up to 6 m.

On request, the profiles can be primed or flame galvanised.
A complete processing of the profiles to the customer´s technical drawings and/or specifications can be arranged e.g. drilling, milling, welded elements.

We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 6 m).



Article number	H mm	C mm	S mm	Ey mm	B mm	R mm	Iy cm^4	Ix cm^4	Wy cm^3	Wx cm^3	Weight kg/m
300-K 530	65,00	53,00	6	10	30	6	5,20	38,80	2,50	11,90	5,30
300-K 630	75,00	63,00	6	12	33	6	6,90	54,40	3,10	14,50	5,80
300-K 1020	114,00	102,00	6	11	34	6	14,00	178,70	4,80	31,40	8,30
300-K 1260	142,00	126,00	8	16	48	8-10	49,80	499,70	12,40	70,40	14,30
300-K 1445	160,50	144,50	8	16	58	8-10	83,00	758,90	17,50	94,90	16,90
300-K 1800	200,00	180,00	10	20	60	10	126,10	1626,80	24,60	162,70	24,10

SEM – Profiles

Unprecedented levels of precision and quality

**Our SEM profile has been patented since 2009,
with a material characteristic of 25 MnV5mod,
they partially replace our standard profile, 18 MnNb6.**

Without decarburization by new milling technology
Restricted tolerances 0,2 mm

Production length:	up to 8800 mm	
Supplied length:	Fixed length	
	On request:	production length
Processing:	Standard:	sawn
	Optional:	Full machining: drilling, cutting, welding on elements
Manufacturing process	hot-rolled	
Material:	25MnV5 mod.	

Typical values for the mechanical properties
Material:

Tensile strength:	775 RM (MPa)
Yield strength:	>575 N/mm^2
Elongation at fracture:	>19 %
Minimum hardness:	230 HB
Survace pressure	1110 (MPa)

Welding recommendation:	Normal wire G4Si1, two-pass or preheat approx.100°C	
Surface:	Standard:	Rolling scale on outside, hobbed on inside
	Optional:	sandblasted, primed, painted, flame galvanised

Longitudinal curvature about x axis: edgewise 1 mm/m
Longitudinal curvature about y axis: flatwise 1 mm/m
Torsion: 0,5°/m

On request, the profiles can be primed or flame galvanised.

If you have any questions relating to our products, we would be pleased to hear from you.

Conclusion

SEM profiles display <u>essential advantages</u>:

Significantly lower residual stresses
- Simplification of mast production
- Reduction of the indicative expenditure for alignment after welding

Minimising chamber tolerances
- Reduction of roller variety
- Increased mast stability

Optimum surface hardness
- Wear minimisation
- Reducing the service intervals

Optimum surface appearance
- Improved running performance of the rollers
- Precise start-up position is possible
- High lifting heights

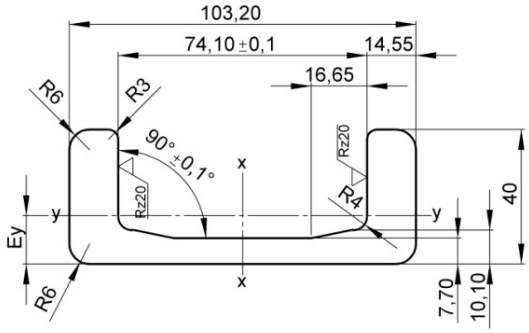
SEM-Profiles

Production lengths up to 8800 mm

314-1-SEM

SEM - Profile no.: 314-1-SEM

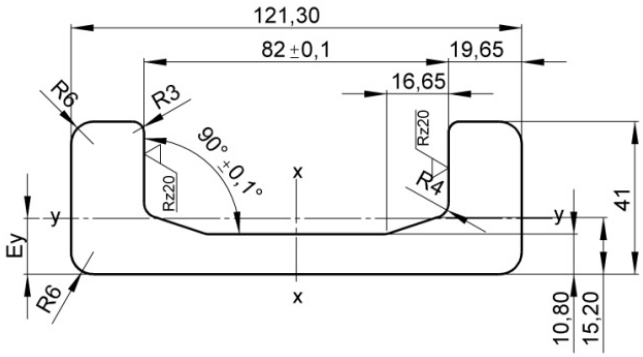
kg/m	13,97	kg
Wx =	50,42	cm3
Wy min.=	9,94	cm3
Wy max.=	17,63	cm3
Ix =	260,19	cm4
Iy =	25,43	cm4
Ey =	14,43	mm



314-2-SEM

SEM - Profile no.: 314-2-SEM

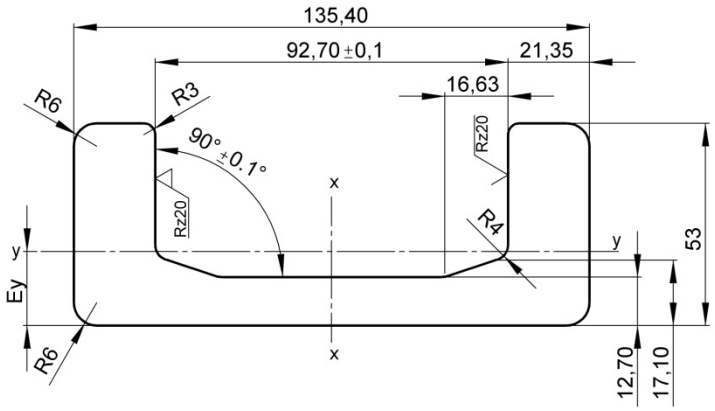
kg/m	20,24	kg
Wx =	79,07	cm3
Wy min.=	13,83	cm3
Wy max.=	23,97	cm3
Ix =	479,55	cm4
Iy =	35,96	cm4
Ey =	15,00	mm



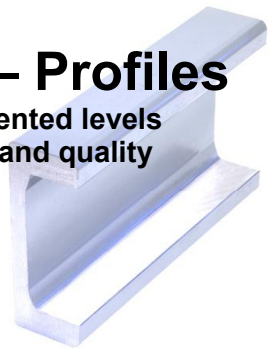
314-3-SEM

SEM - Profile no.: 314-3-SEM

kg/m	27,65	kg
Wx =	124,12	cm3
Wy min.=	25,40	cm3
Wy max.=	43,91	cm3
Ix =	840,30	cm4
Iy =	85,28	cm4
Ey =	19,42	mm



Fixing flanges see page 46



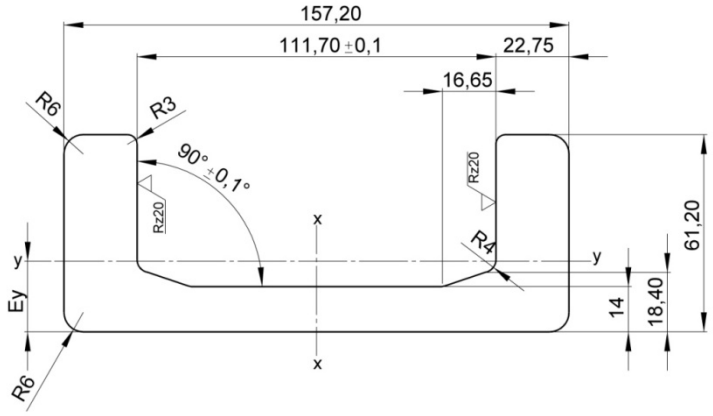
SEM-Profiles

Production lengths up to 8800 mm

314-4-SEM

SEM - Profile no.: 314-4-SEM

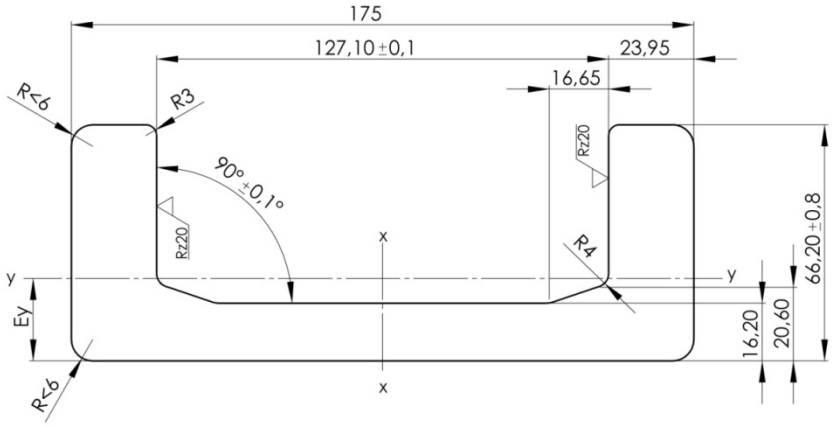
kg/m	34,77	kg
Wx =	184,61	cm3
Wy min.=	36,75	cm3
Wy max.=	65,78	cm3
Ix =	1451,01	cm4
Iy =	144,29	cm4
Ey =	21,93	mm



314-5-SEM

SEM - Profile no.: 314-5-SEM

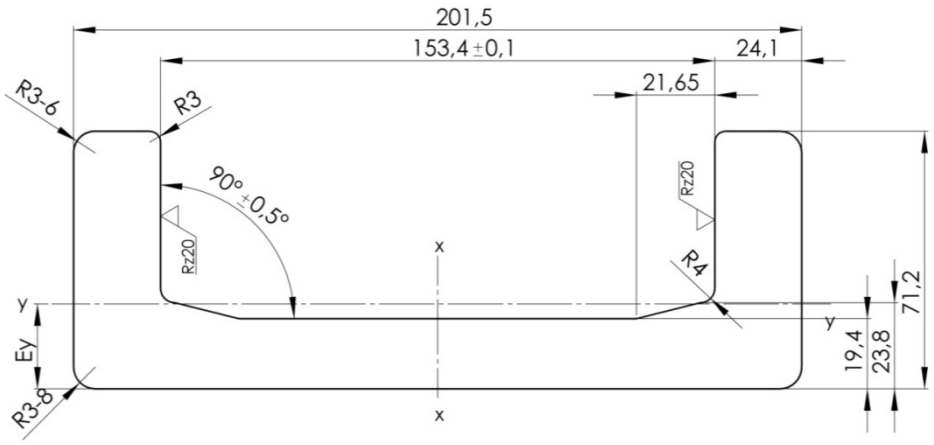
kg/m	41,69	kg
Wx =	242,90	cm3
Wy min.=	45,73	cm3
Wy max.=	85,21	cm3
Ix =	2125,39	cm4
Iy =	197,01	cm4
Ey =	23,12	mm



314-6-SEM

SEM - Profile no.: 314-6-SEM

kg/m	50,99	kg
Wx =	330,76	cm3
Wy min.=	53,97	cm3
Wy max.=	109,80	cm3
Ix =	3332,37	cm4
Iy =	257,62	cm4
Ey =	23,46	mm



Fixing flanges see page 46

Investigation report; Welding samples for guide profiles

3 works samples of heavy duty profiles, which were fabricated in our company, were subjected to an analysis for metallography and hardness testing. The samples were identified by the letters A, B and C. The welding process was executed without preheating.

Samples Overview

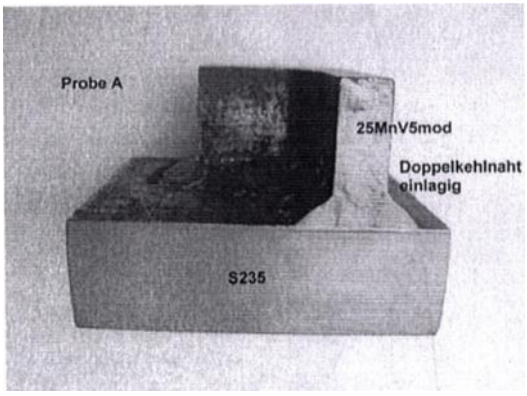


Figure 1: Profile of 25 MnV5mod and S235 single-layered, double-fillet welds

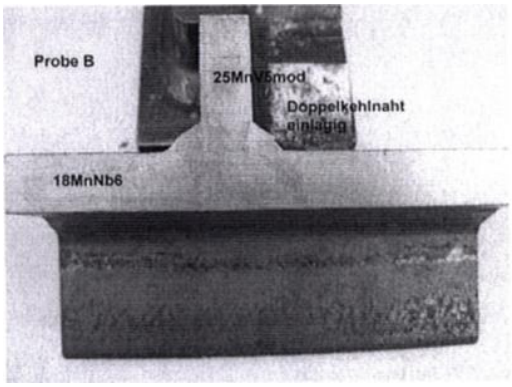


Figure 2: Profile of 25MnV5mod and 18MnNb6 single-layered, double-fillet welds

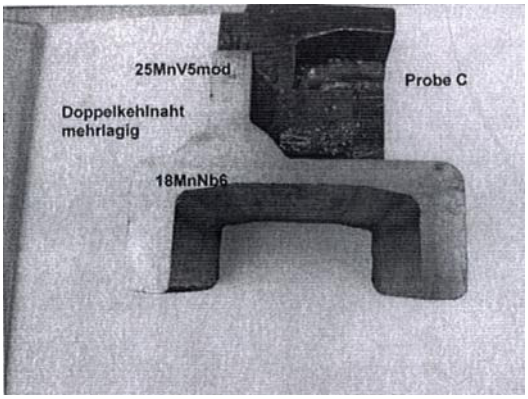


Figure 3: Profile of 25 MnV5mod and 18MnNb6 multiple-layering double-fillet weld

Optical inspection

The welded joints were welded with the MAG (135) process. In addition, a wire electrode according to EN 440-G46 4 M (C) G4Si1 1.2 mm was utilised with the corresponding approval in accordance with TUV and DB (42.014.14/11). The welded joints correspond externally to the evaluation group C according to EN 5817

Microscopic evaluation

The sectional areas of the three samples also comply with the evaluation group C because there were small pores on two of the joints. Otherwise, the welded joints could not be faulted. Image documentation from the macro and micro sections are attached. The welded joint thickness (a-measurement) was measured for the Sample A with 5-6 mm, for Sample B with 5.5 mm and for Sample C with an acceptable 7 mm, due to the multi-layered welded joint.

Measurement of hardness

Sample A: Each welded joint was subjected to a hardening process in accordance with the Vickers process (HV1.0). A hardness value of approx. 250 HV was measured in the area of the profile of 25 MnV5mod which corresponds to a non-graded value for the tensile strength of approx. 800Mpa in accordance with DIN 50150. A correspondingly lower hardness/strength was determined in the area of the S235. The welding material is also just under 250 HV. This rather high value for this welding material is achieved by alloying with the base material and accelerated cooling. Hardness peak-levels of almost 450 HV were measured in the heat affected zone of the guide profile constructed of 25 MnV5mod. This value is close to the limit value for the permitted hardness for high-tensile steels which is set at 450 HV.

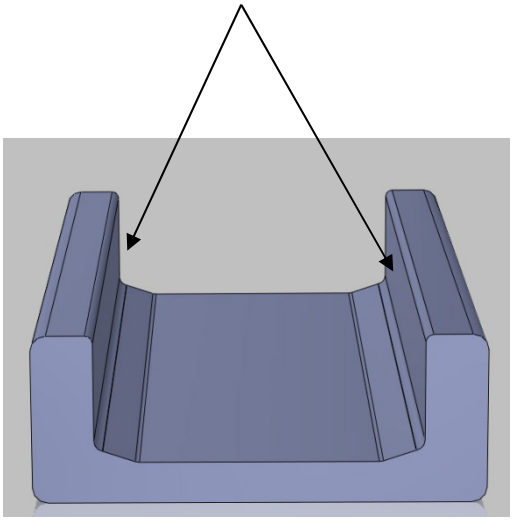
Sample B: The same Vickers hardening process was utilised here once for each welded joint. The welding material is also just under 250 HV. There is again a significant hardening which can be observed in the area of the heat affected zone next to the welded joints. In this area, however, there is a slight difference between the two joints where a value of over 450 HV was measured at one joint, a value which exceeds the permitted level of 450 HV

Sample C: This sample, which corresponds to the material combination utilised for Sample B, was welded in 3 welded layers (multiple-layering). 4 hardening processes were evaluated and determined in this instance, two processes for the 1st layer (root) and the other two for the two covering layers. Approx. 250 HV was measured again in the area of the 25 MnV5mod, therefore approx. 800 MPa hardness, and almost 200 HV in the area of the 18MnNb6 which equates to a tensile strength of 640 Mpa. The welding material was measured as 200 HV in this instance which corresponds to the manufacturers´ instructions. It is interesting to note that there is almost no increase in the hardening in the heat affected zone. This can be traced back to the fact that due to the multiple-layered welding, much more heat is introduced so even the 1st welded layer is heated again during the welding process for the next, subsequent layer so that increased hardening does not occur.

Evaluation of the results

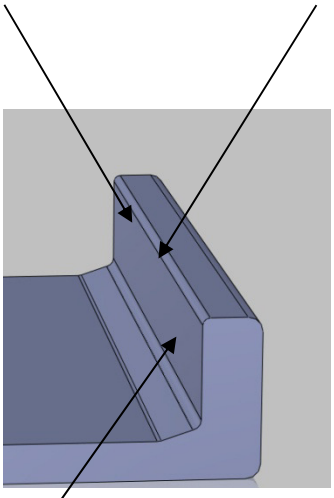
The determined hardness increases for the single-layered, double-fillet welds are within the limit values for high-tensile steels. There were no cracks observed in the microsections although this only applies for this one position. Increased hardening in areas above 450 HV can lead to cracking since, at these higher values, there is insufficient ductility present. Due to the increased hardening which was determined in single-layer welding without pre-heating, it would be advisable to either pre-heat to approx. 100 to 120 C or to utilise multiple-layered welding. The values for the tensile strength of the 25MnV5mod and 18MNNb6 are within the values as stated in the manufacturers´ instructions.

Tolerance zone (chamber dimension) = 0.2 mm



Edge, free of decarburisation

The basic hardness of the material is present



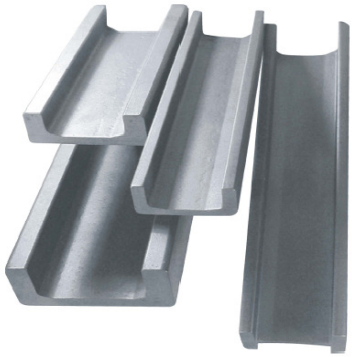
Surface finish roughness < Rz20

Coating & Stainless steel
Overview

Bearings

Stainless steel bearings

Profiles



Chrome coating - CB	Information	for Radial- und Combined bearings	**page 68**
Combined bearings	chromecoated	U2EX-620-CB to U2EX-1490-CB	**page 69**
Stainless steel bearings	with weld-on bolt or srewed		**page 70**
U - Profiles	Stainless steel	U - Profiles 300-K VA to 300-2 VA	**page 71**

! Other stainless steel versions are available on request !

The characteristics of the CB-Coating

The CB-Coating consists of more than 98% of pure chrome. It is an extremely hard, tear-free, crest-shaped, precise, very thin and highly pure chrome coating that, on all metals, exempt magnesium and titanium, aluminium dependent on the circumstances, is sheared by a highly energetic procedure. Through the reduced, process temperature of under 80° C, there are no structural changes in the base material. This essential advantage of the procedure guarantees form stability and hardness stability. CB-Coatings generally have the appearance of satinised platinum. When required and requested from FSG, the surface can be polished to a mirror finish.

The most important characteristic is the excellent corrosion protection, which can be determined by the salt spray test and is easily simulated. While a standard bearing in a salt spray test displays approx. 95% of corrosion after 24 hours, a bearing of stainless steel only displays approx. 25%.
The CB-Coated roller from FSG has only 1% (!) of corrosion on the surface.

Surface hardness and application temperature

The CB-layered hardness is between 75-78 HRC (1200-1300 HV), and remains neutral in a temperature range of approx. -230° C to +800° C without any significant changes in the adhesion and structure.

Layer thickness and precision

The optimum layer thickness is within 2 and 12 µm, depending on material, surface quality and geometry of the part. Due to the small layer thickness and tolerance, there is almost no edge build-up.

Surface finish and friction coefficient

The CB-Process can achieve a slight improvement in the surface roughness depending on the roughness measurement value. The inherent roughness of the coating is approximately Ra 0,25 µm. The extremely high, surface-slip characteristics of the CB-Coating correlate to a considerable decrease in friction. The coefficient of friction between two CB-Chromium layers is reduced by up to 60% compared to steel/steel. The coefficient of friction for CB/CB is about 0,12 – 0,14.

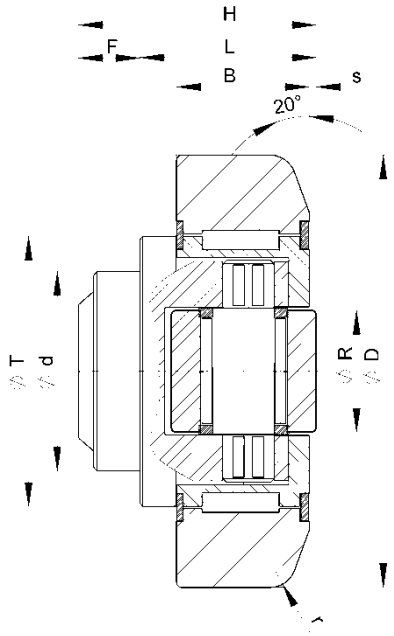
Why CB-Thin chrome-coating

The CB-Coating solves many economically-based problems CB-Coatings often prevent the need for expensive, specialised materials. The insight, to protect surfaces by applying a CB-Coating against environmental influences and thereby extending the service life of component as well as reducing downtimes on machinery, represents a considerable technical development and effective, economical material savings and energy savings. A reworking is not necessary in the predominant majority of the applications.

DNC-Coating

Chemical-based, nickel coatings withstand the most organic and inorganic media, except for oxidizing acids. The resistance and sustainability is particularly high for neutral and alkaline solutions.
5 µm thick, protective coverings provide steel or aluminium with many years of protection, even with aggressive industrial climates or marine climates. A defined, layer thickness value will be recommended depending on the corrosion stress requirements.

Mechanical-technological characteristics:
Chemically deposited nickel coverings can also be deposited by residual tensile stress as well as with a slight compressive stress. The Micro-hardness of the covering in the deposited state lies in the range of between 500 and 700 HV 0.1. The plastic and elastic ductility amounts to, according to covering method, of 0.1 until more than 2%.



CB Coating
Combined bearings adjustable by eccentric bolt for U - Profiles

C = dynamically radial
C_a = dynamically axial

C_o = statically radial
C_{oa} = statically axial

CB - coated Combined bearings with Eccentric for U - Profiles

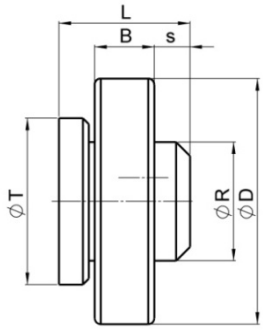
Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	r mm	H mm	F mm	T mm	C kN	C_o kN	C_a kN	C_{oa} kN	Weight kg	Profile U Type
U2EX-620-CB	62,0	30,5-32,0	20	4,0-5,5	30	20	3,0	37,5-39,0	7,0	42	31	35,5	11	11	0,53	300-0
U2EX-625-CB	62,5	30,5-32,0	20	4,0-5,5	30	20	3,0	37,5-39,0	7,0	42	31	35,5	11	11	0,55	300-0
U2EX-701-CB	70,1	36,0-37,5	23	4,0-5,5	35	20	4,0	44,0-45,5	8,0	48	45,5	51,0	11	11	0,80	300-1
U2EX-777-CB	77,7	37,0-38,5	23	3,5-5,0	40	26	4,0	48,0-49,5	11,0	54	48,0	56,8	17	17	1,00	300-2
U2EX-884-CB	88,4	44,0-45,5	30	4,0-5,5	45	26	4,0	57,0-58,5	13,0	59	68,0	72,0	23	23	1,61	300-3
U2EX-889-CB	88,9	44,0-45,5	30	4,0-5,5	45	26	4,0	57,0-58,5	13,0	59	68,0	72,0	23	23	1,62	300-3
U2EX-1077-CB	107,7	55,0-57,0	31	4,0-6,0	60	30	5,0	69,0-71,0	14,0	69	81,0	95,0	31	36	2,82	300-4
U2EX-1230-CB	123,0	56,0-60,0	37	5,0-9,0	60	34	5,0	72,3-76,3	16,3	80	110,0	132,0	43	50	3,90	300-5
U2EX-1490-CB	149,0	58,5-62,5	45	6,0-10,0	60	34	3,0	78,5-82,5	20,0	108	151,0	192,0	68	71	6,50	300-6 303-6

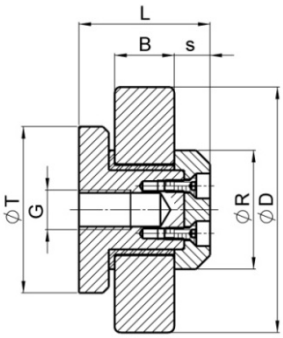
Matching Fixing plates with appropriate designation suffix CB - see page 41-45

! Other bearings and accessories in CB or VA version are available on request !

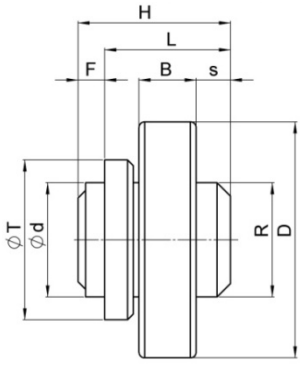
Stainless steel bearings

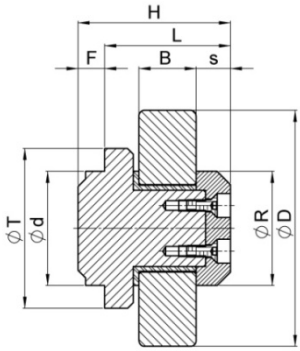
with bolts for screwing





with bolts for welding





FSG stainless steel bearings with friction bearing

For temperatures up to +250° C

High wear resistance especially at high radial loads

High sliding speed

High edge pressure associated with higher surface pressures

Stainless steel bearings -for screwing- for U - Profiles

Article number	D mm	L mm	B mm	s mm	R mm	G	F mm	T mm	F_R kN	F_A kN	Weight kg	Profile U Type
U2E-525-ES-S	52,5	27,0	15	6,5	30	M10	5,5	40	4,0	2,0	0,28	300-K VA
U2E-620-ES-S	62,0	33,0	15	9,0	30	M10	9,0	42	4,8	2,6	0,42	300-0 VA
U2E-704-ES-S	70,4	40,0	24	8,0	45	M12	8,0	50	6,1	3,0	0,79	300-1 VA
U2E-780-ES-S	78,0	40,0	24	8,0	45	M16	11,0	54	8,0	4,0	0,85	300-2 VA
U2E-884-ES-S	88,4	48,0	24	9,5	45	M16	13,0	59	10,0	4,0	1,30	300-3 VA

Stainless steel bearings -for welding- for U - Profiles

Article number	D mm	L mm	B mm	s mm	d +0,0 -0,05 mm	R mm	H mm	F mm	T mm	F_R kN	F_A kN	Weight kg	Profile U Type
U2E-525-ES	52,5	27,0	15	6,5	30	30	33,0	6,0	40	4,0	2,0	0,32	300-K VA
U2E-620-ES	62,0	33,0	15	9,0	30	30	40,0	7,0	42	4,8	2,6	0,47	300-0 VA
U2E-704-ES	70,4	40,0	24	8,0	35	45	48,0	8,0	50	6,1	3,0	0,86	300-1 VA
U2E-780-ES	78,0	40,0	24	8,0	40	45	51,0	11,0	54	8,0	4,0	0,91	300-2 VA
U2E-884-ES	88,4	48,0	24	9,5	45	45	61,0	13,0	59	10,0	4,0	1,48	300-3 VA

Stainless steel profiles, see page 71 and 72

Matching Fixing plates with additional stainless steel see page 41 - 45

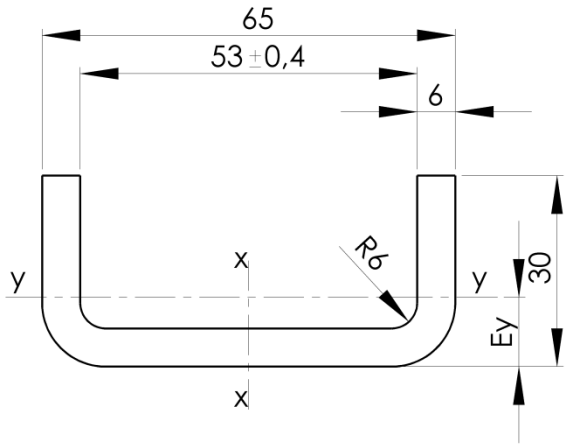
Stainless steel U-Profiles

We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 7 m).

300-K VA

U –Profile no.: 300-K VA

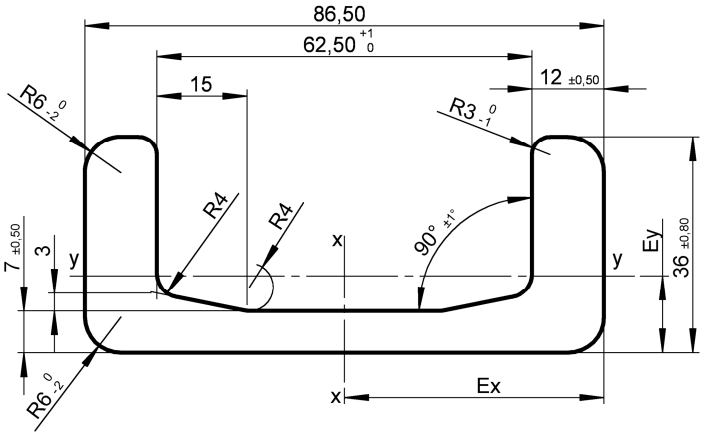
kg/m:	5,30	kg
Wx:	11,90	cm3
Wy:	2,50	cm3
Ix:	38,8	cm4
Iy:	5,20	cm4
Ex:	32,50	mm
Ey:	9,40	mm



300-0 VA

U –Profile no.: 300-0 VA

kg/m:	10,50	kg
Wx:	32,00	cm3
Wy:	6,00	cm3
Ix:	137,00	cm4
Iy:	15,00	cm4
Ex:	43,25	mm
Ey:	12,87	mm



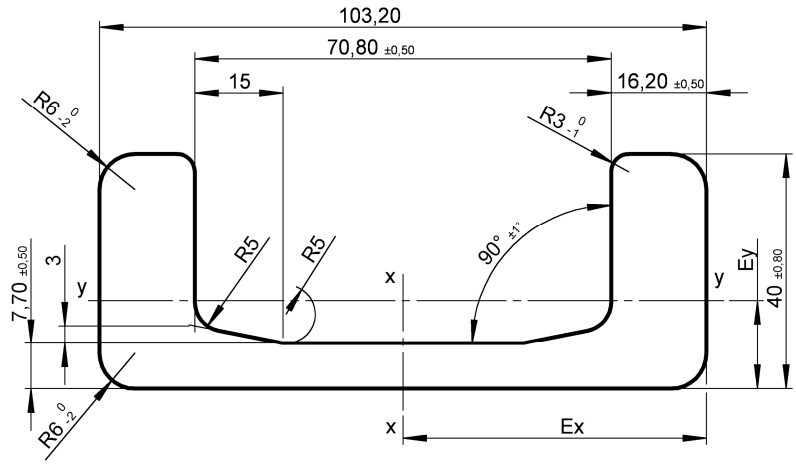
Stainless steel U-Profiles

We supply many, various profiles in fixed lengths,
also in manufactured lengths (approx. 7 m).

300-1 VA

U –Profile no.: 300-1 VA

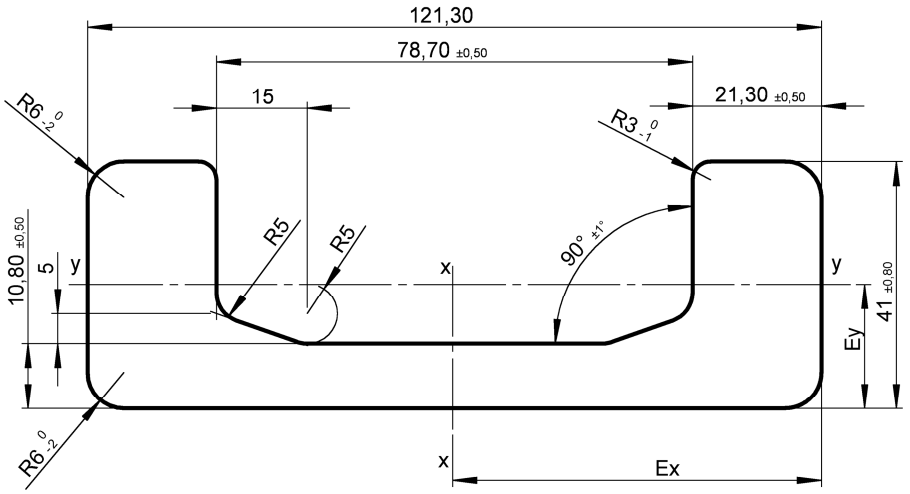
kg/m:	14,78	kg
Wx:	53,00	cm3
Wy:	11,00	cm3
Ix:	273,00	cm4
Iy:	27,00	cm4
Ex:	51,60	mm
Ey:	14,99	mm



300-2 VA

U –Profile no.: 300-2 VA

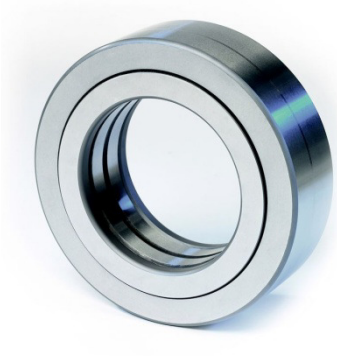
kg/m:	20,93	kg
Wx:	81,00	cm3
Wy:	15,43	cm3
Ix:	493,58	cm4
Iy:	37,92	cm4
Ex:	60,65	mm
Ey:	15,43	mm



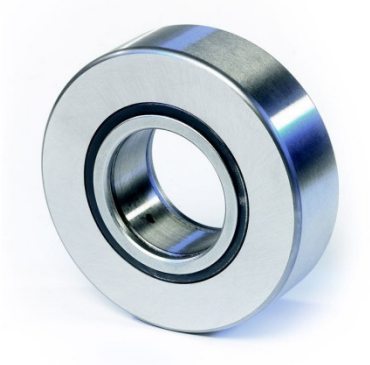
Special bearings
Overview

Track rollers for curved profiles

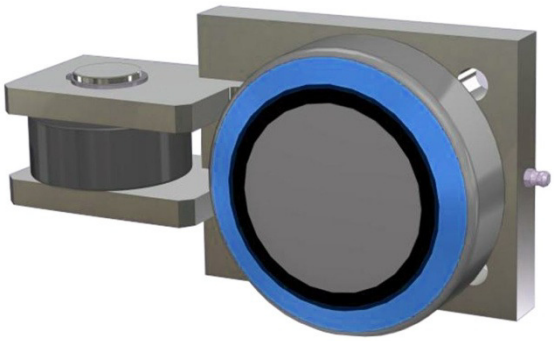
Supporting roller as track roller



Supporting roller axial guide

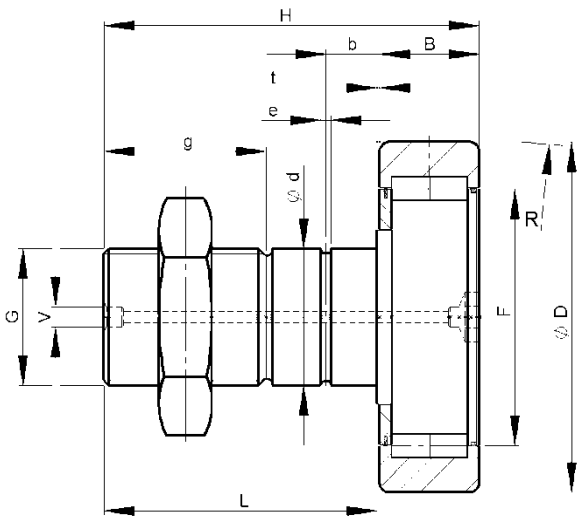


Combined Bearing Unit



! Vulkollan bearings are available on request !

Track rollers
for curved profiles



FSG cam rollers are comprised of a solid, collar stud, a thick-walled outer ring, and a full-rolled, rolling body component. Similar to the construction of cylinder, roller bearings; the thick-walled outside ring is positioned over the rolling body. Due to the thick-walled outer ring, these curved rollers are especially suitable for sustaining increased, radial loads.

2 hexagon nuts included!

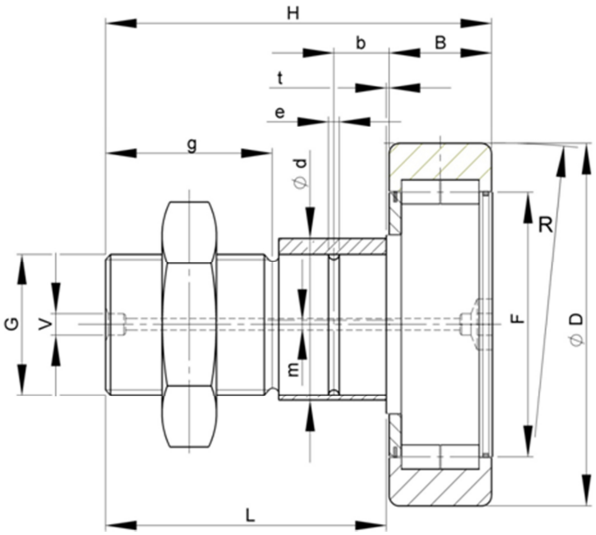
Article number	D mm	d mm	B mm	R mm	H mm	L mm	F mm	t mm	G mm	v mm	b mm	e mm	g mm	C kN	C_o kN	Speed max n1/min^{-1}
KR1G-35	35	16	18	500	52	32,5	20	0,8	M16x1,5	6	8	3	17	24	31	6.500
KR1G-40	40	18	20	500	58	36,5	23	0,8	M18x1,5	6	8	3	19	27	33	5.500
KR1G-47	47	20	24	500	66	40,5	33	0,8	M20x1,5	8	9	4	21	37	47	4.200
KR1G-52	52	20	24	500	66	40,5	37	0,8	M20x1,5	8	9	4	21	43	55	3.400
KR1G-62	62	24	28	500	80	49,5	36	0,8	M24x1,5	8	11	4	25	51	66	2.000
KR1G-72	72	24	28	500	80	49,5	51	0,8	M24x1,5	8	11	4	25	56	86	2.000
KR1G-80	80	30	35	500	100	63,0	51	1,0	M30x1,5	8	15	4	32	93	138	1.800
KR1G-90	90	30	35	500	100	63,0	52	1,0	M30x1,5	8	15	4	32	95	143	1.800
KR1G-100	100	36	35	500	115	78,0	61	1,0	M36x1,5	8	20	5	40	115	187	1.310
KR1G-110	110	36	35	500	115	78,0	61	1,0	M36x1,5	8	20	5	40	125	195	1.230
KR1G-120	120	42	40	500	136	88,0	71	1,0	M42x1,5	8	24	5	44	166	257	1.150
KR1G-130	130	42	48	500	136	88,0	71	1,0	M42x1,5	8	24	5	44	177	303	1.000
KR1G-140	140	45	48											191	352	920
KR1G-150	150	50	48											225	391	840
KR1G-160	160	55	54											299	479	770
KR1G-170	170	60	54											313	508	700
KR1G-180	180	70	63											400	697	630
KR1G-190	190	55	54											299	479	770
KR1G-200	200	80	63											429	728	580
KR1G-215	215	95	63											473	749	550
KR1G-230	230	100	75											585	978	520

on request

n1/min Bearing speed in the current operating state

! Other diameters are available on request !

Track rollers
for curved profiles



FSG cam rollers are comprised of a solid, collar stud, a thick-walled outer ring, and a full-rolled, rolling body component. Similar to the construction of cylinder, roller bearings; the thick-walled outside ring is positioned over the rolling body. Due to the thick-walled outer ring, these curved rollers are especially suitable for sustaining increased, radial loads.

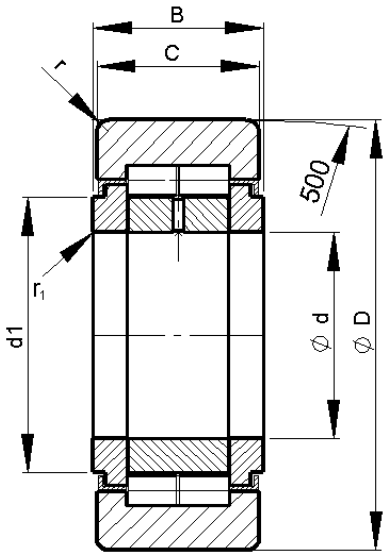
Excentrc until D 72 mm = 1,0 mm
Excentrc until D 110 mm = 1,5 mm

2 hexagon nuts included!

Article number	D mm	d mm	B mm	R mm	H mm	L mm	F mm	t mm	G mm	v mm	b mm	e mm	g mm	m mm	C kN	C_o kN	Speed max n1/min^{-1}
KR1G-35-E	35	27	18	500	52	32,5	20	0,8	M16x1,5	6	8	3	17	1,0	24	31	6.500
KR1G-40-E	40	30	20	500	58	36,5	23	0,8	M18x1,5	6	8	3	19	1,0	27	33	5.500
KR1G-47-E	47	27	24	500	66	40,5	33	0,8	M20x1,5	8	9	4	21	1,0	37	47	4.200
KR1G-52-E	52	31	24	500	66	40,5	37	0,8	M20x1,5	8	9	4	21	1,0	43	55	3.400
KR1G-62-E	62	38	29	500	80	49,5	36	0,8	M24x1,5	8	11	4	25	1,0	51	66	2.000
KR1G-72-E	72	44	29	500	80	49,5	51	0,8	M24x1,5	8	11	4	25	1,0	56	86	2.000
KR1G-80-E	80	47	35	500	100	63,0	51	1,0	M30x1,5	8	15	4	32	1,5	93	138	1.800
KR1G-90-E	90	47	35	500	100	63,0	52	1,0	M30x1,5	8	15	4	32	1,5	95	143	1.800
KR1G-100-E	100		35	500	115	78,0	61	1,0	M36x1,5	8	20	5	40		115	187	1.310
KR1G-110-E	110		35	500	115	78,0	61	1,0	M36x1,5	8	20	5	40		125	195	1.230
KR1G-120-E	120		40	500	136	88,0	71	1,0	M42x1,5	8	24	5	44		166	257	1.150
KR1G-130-E	130		48	500	136	88,0	71	1,0	M42x1,5	8	24	5	44		177	303	1.000
KR1G-140-E	140		48												191	352	920
KR1G-150-E	150		48												225	391	840
KR1G-160-E	160		54												299	479	770
KR1G-170-E	170		54												313	508	700
KR1G-180-E	180		63												400	697	630
KR1G-190-E	190		54												299	479	770
KR1G-200-E	200		63												429	728	580
KR1G-215-E	215		63												473	749	550
KR1G-230-E	230		75												585	978	520

n1/min Bearing speed in the current operating state

! Other diameters are available on request !



Supporting roller
axial guide

STG-rollers have a high radial load capacity in the radial area.
To be also able to absorb and support axial loads, the inner ring and board ring must be tensioned.
For example, by utilising a washer and locking ring or washer and nut.

Permissible radial load under dynamic loading
The following applies for dynamically-loaded - circumferential - bearings:-
■ The effective, basic dynamic load rating C_w (measurement table).

At the same time, the permissible dynamic radial load $F_{r\,zul}$ may not be exceeded (measurement table).
If $F_{r\,zul}$ is not quoted, then the basic dynamic load rating Cw is an alternative. This may also not exceed the existing radial load.

Permissible radial load with a static load
The following is valid for static, burdened bearings - at a standstill or with other rarely occurring turning moments:-
■ The effective, static basic dynamic load rating C_{0w} (measurement table).

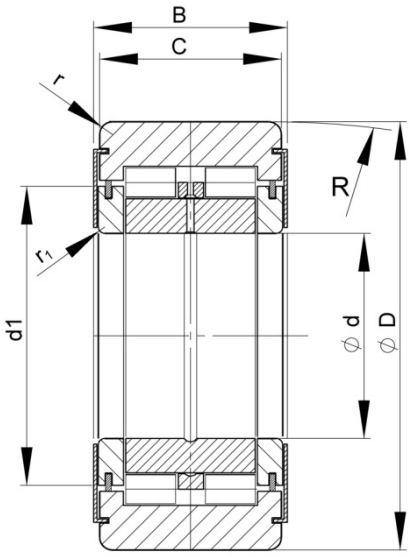
At the same time, the permissible static radial load $F_{0r\,zul}$ may not be exceeded (measurement chart).
If $F_{0r\,zul}$ perm is not specified, then the alternative static basic dynamic load C_{0w}. will apply. This may also not exceed the radial load.

Article number	d	D	B	C	r	r_1	d_1	Supporting roller				Weight	Speed max
								C_w	C_{ow}	F_r.	F_{or}		
	mm	mm	mm	mm	mm	min	min	kN	kN	zul	zul	kg	n1/min^{-1}
STG-3515	15	35	19	18	0,6	0,3	24	16,0	18,3	8,3	16,4	0,10	6.500
STG-4017	17	40	21	20	1,0	0,3	27	18,5	22,8	13,2	22,8	0,15	5.500
STG-4215	15	42	19	18	0,6	0,3	24	19,4	23,8	23,9	23,9	0,16	6.500
STG-4717	17	47	21	20	1,0	0,3	27	21,3	28,0	28,0	28,0	0,22	5.500
STG-4720	20	47	25	24	1,0	0,3	32	27,0	35,0	16,5	33,0	0,25	4.200
STG-5220	20	52	25	24	1,0	0,3	32	31,5	41,0	38,5	41,0	0,32	4.200
STG-5225	25	52	25	24	1,0	0,3	37	29,0	37,5	17,3	34,5	0,28	3.400
STG-6225	25	62	25	24	1,0	0,3	37	35,5	50,0	50,0	50,0	0,45	3.400
STG-6230	30	62	29	28	1,0	0,3	44	40,0	51,0	23,6	47,0	0,47	2.600
STG-7230	30	72	29	28	1,0	0,3	44	48,0	65,0	65,0	65,0	0,70	2.600
STG-7235	35	72	29	28	1,1	0,6	50	45,0	61,0	32,0	61,0	0,63	2.100
STG-8035	35	80	29	28	1,1	0,6	50	51,0	72,0	72,0	72,0	0,84	2.100
STG-8040	40	80	32	30	1,1	0,6	55	56,0	76,0	30,5	60,0	0,82	1.600
STG-8545	45	85	32	30	1,1	0,3	60	56,0	79,0	31,5	61,0	0,88	1.400
STG-9040	40	90	32	30	1,1	0,6	55	66,0	96,0	84,0	96,0	1,13	1.600
STG-9050	50	90	32	30	1,1	0,6	65	57,0	81,0	32,0	63,0	0,95	1.300
STG-10045	45	100	32	30	1,1	0,6	60	72,0	108,0	106,0	108,0	1,40	1.400
STG-11050	50	110	32	30	1,1	0,6	65	76,0	121,0	121,0	121,0	1,69	4.200

n1/min Bearing speed in the current operating state

! Other diameters are available on request !

Supporting roller



Support rollers are single or double-rowed, massive components which are mounted on axles. They consist of outer and inner rings and rib-guided, cylindrical rollers.

Support rollers have to resist high, radial loads as well as axial loads which occur from slight misalignment and dynamic skew and are, for example, suitable for cam mechanism, guide rails and conveying equipment.

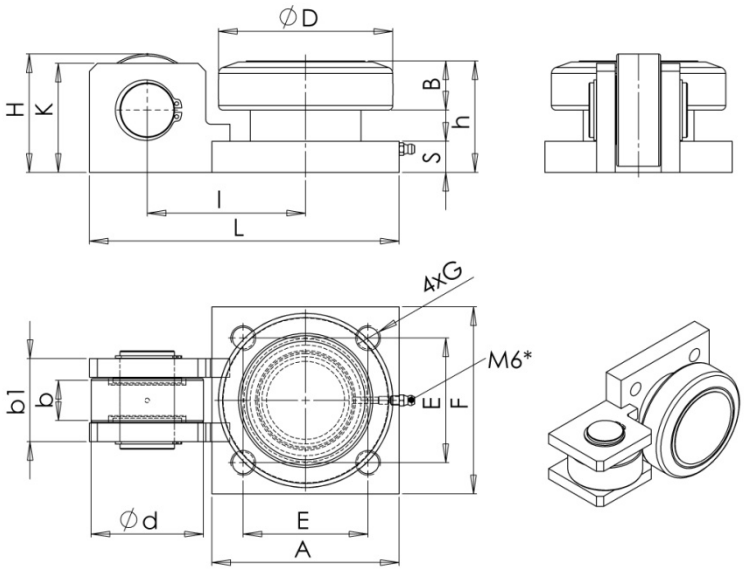
C_{rw} Effective dynamic load rating as track roller (radial)
C_{orw} Effective static load rating as track roller (radial)

Article number	d mm	D mm	B mm	C mm	r mm	r_1 min	d_1 min	R mm	F_r kN	F_{or} kN	C_{rw} kN	C_{orw} kN	Weight kg	Speed max n1/min^{-1}
STB-130	50	130	65	63	3	2,0	63	10000	265	265	193	265	5,2	1100
STB-140	55	140	70	68	3	2,0	73	10000	280	315	226	315	6,4	850
STB-150	60	150	75	73	3	2,0	78	10000	330	365	255	365	7,8	800
STB-160	65	160	75	73	3	2,0	82	10000	350	395	280	395	8,8	700
STB-180	70	180	85	83	3	2,0	92	10000	465	510	355	510	13,0	600
STB-200	80	200	90	88	4	2,0	102	10000	550	610	415	610	16,8	500
STB-220	90	220	100	98	4	2,5	119	10000	600	750	500	750	22,5	400
STB-240	100	240	105	103	4	2,5	132	10000	710	870	560	870	28,0	340
STB-260	110	260	115	113	4	2,5	143	10000	820	1050	670	1050	35,6	300
STB-290	120	290	135	133	4	3,0	155	15000	1110	1400	880	1400	52,8	260
STB-310	130	310	146	144	5	3,0	165	15000	1280	1630	1010	1630	65,2	240
STB-340	140	340	162	160	5	3,5	186	15000	1590	2150	1190	2150	86,6	210
STB-360	150	360	173	171	5	3,5	196	15000	1680	2580	1300	2580	102,7	190

F_r permissible dynamic radial load
F_{or} permissible static radial load
n1/min Bearing speed in the current operating state

! Other diameters are available on request !

Combined bearing Unit



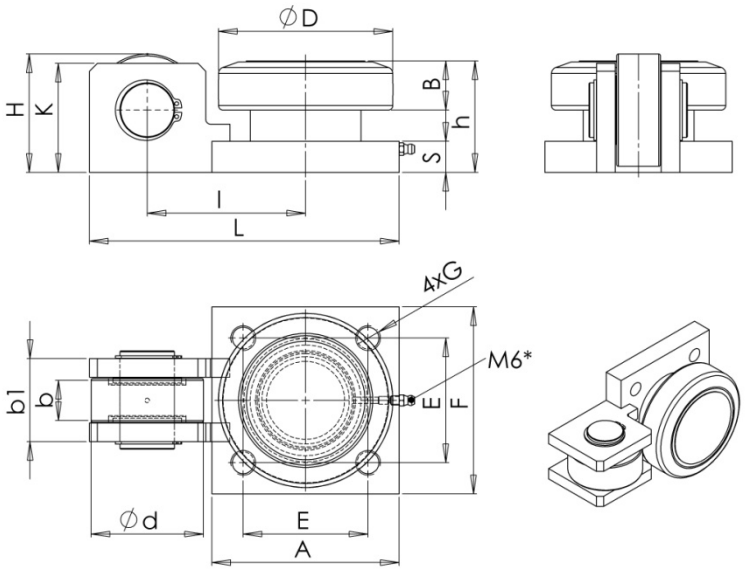
FSG axial roller skids absorb high forces on the radial and axial rollers and are well suited for use in harsh environments.

Adjustable by implementing shims.

Grease nipple M6 mounted in the running direction
Alternatively, up or down
v = velocity

Article number	D mm	d mm	B mm	H mm	h mm	K mm	L mm	l mm	F mm	A mm	E mm	S mm	G mm	b mm	b1 mm	v max m/min
U1-620/4017	62,0	40	20	40,5	39,5	35	117,0	66,0	60	75	40	10	M10	18,0	41,4	175
U1-625/4017	62,5	40	20	40,5	39,5	35	117,0	66,0	60	75	40	10	M10	18,0	41,4	175
U1-648/4017	64,8	40	20	40,5	39,5	35	117,0	66,0	60	75	40	10	M10	18,0	41,4	180
U1-701/4720	70,1	47	23	52,0	49,0	45	130,5	65,5	80	80	50	15	M12	22,0	45,4	200
U1-704/4720	70,4	47	23	52,0	49,0	45	130,5	65,5	80	80	50	15	M12	22,0	45,4	200
U1-738/4720	73,8	47	23	52,0	49,0	45	130,5	65,5	80	80	50	15	M12	22,0	45,4	210
U1-777/4720	77,7	47	23	52,0	49,0	45	130,5	65,6	80	80	50	15	M12	22,0	45,4	195
U1-818/4720	81,8	47	23	52,0	49,0	45	130,5	65,5	80	80	50	15	M12	22,0	45,4	180
U1-884/6230	88,4	62	30	64,0	61,0	57	182,0	90,0	120	120	90	20	M16	26,0	49,4	195
U1-889-6230	88,9	62	30	64,0	61,0	57	182,0	90,0	120	120	90	20	M16	26,0	49,4	195
U1-928/6230	92,8	62	30	64,0	61,0	57	182,0	90,0	120	120	90	20	M16	26,0	49,4	190
U1-1077/7235	107,7	72	31	76,0	71,5	70	198,5	101,5	120	120	80	20	M16	25,8	53,4	200
U1-1118/7235	111,8	72	31	76,0	71,5	70	198,5	101,5	120	120	80	20	M16	25,8	53,4	193
U1-1230/7235	123,0	72	37	76,0	71,5	70	198,5	101,5	120	120	80	20	M16	25,8	53,4	193
U1-1278/7235	127,8	72	37	76,0	71,5	70	198,5	101,5	120	120	80	20	M16	25,8	53,4	200
U1-1490/7235	149,0	72	45	76,0	74,0	70	223,0	116,0	150	150	100	20	M16	25,8	53,4	187
U1-1538/7235	153,8	72	45	76,0	74,0	70	223,0	116,0	150	150	100	20	M16	25,8	53,4	190

Load levels, see page 79



Permissible loads between rollers and profile 18MnNb6mod

F_R kN static basic dynamic load rating, radial roller
Fa kN static basic dynamic load rating, axial roller

FSG axial roller skids absorb high forces on the radial and axial rollers and are well suited for use in harsh environments.

Adjustable by implementing shims.

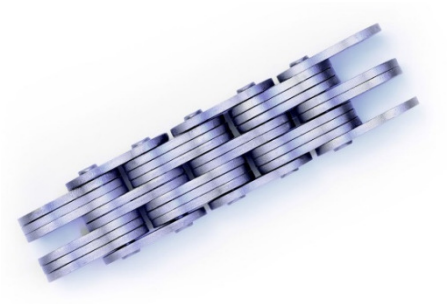
C = dynamically radial
C_a = dynamically axial
C_o = statically radial
C_{oa} = statically axial

Article number	D mm	d mm	C radial kN	C_O radial kN	C axial kN	C_O axial kN	F_R kN	F_a kN	Weight kg
U1-620/4017	62,0	40	31,0	36,0	18,5	22,8	8,1	6,27	1,20
U1-625/4017	62,5	40	31,0	36,0	18,5	22,8	8,2	6,27	1,20
U1-648/4017	64,8	40	31,0	36,0	18,5	22,8	8,5	6,27	1,30
U1-701/4720	70,1	47	45,0	50,5	27,0	35,0	9,8	9,10	2,20
U1-704/4720	70,4	47	45,0	50,5	27,0	35,0	9,9	9,10	2,20
U1-738/4720	73,8	47	45,0	50,5	27,,0	35,0	10,3	9,10	2,30
U1-777/4720	77,7	47	45,0	50,5	27,0	35,0	10,2	9,10	2,30
U1-818/4720	81,8	47	48,0	58,0	27,0	35,0	10,2	9,10	2,30
U1-884/6230	88,4	62	70,0	73,0	40,0	51,0	17,8	14,10	4,60
U1-889-6230	88,9	62	70,0	73,0	40,0	51,0	17,9	14,10	4,60
U1-928/6230	92,8	62	70,0	73,0	40,0	51,0	18,6	14,10	4,60
U1-1077/7235	107,7	72	81,0	96,0	45,0	61,0	18,8	16,20	7,70
U1-1118/7235	111,8	72	81,0	96,0	45,0	61,0	19,5	16,20	7,80
U1-1230/7235	123,0	72	113,0	135,0	45,0	61,0	26,8	16,20	7,80
U1-1278/7235	127,8	72	113,0	135,0	45,0	61,0	27,9	16,20	7,80
U1-1490/7235	149,0	72	154,0	195,0	45,0	61,0	46,8	16,20	11,80
U1-1538/7235	153,8	72	154,0	195,0	45,0	61,0	48,3	16,20	12,00


AREA 47
highest-built spring tower
27 meters high

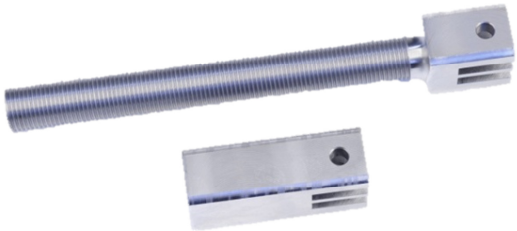
Chain pulley

Leaf chain



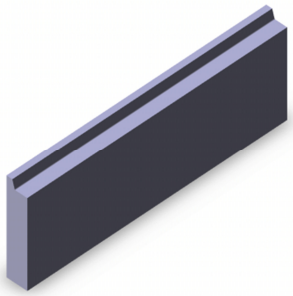
Roller chain

Chain anchor



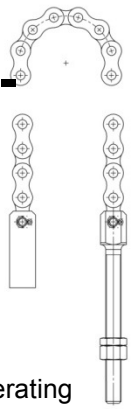
Forks

Fork carrier profile



! Other chains and accessories are available on request !

Ordering-example
Leaf chain



Design of leaf chains and roller chains

The selection of the leaf chains is determined according to the load which is to be carried and the operating conditions, i.e. the load mode, the chain speed, the movement frequency of the chain, the size of the occurring impacts and the operating temperature.
The permissible dynamic tension is dependent on the operating hardness taken into account a sufficient safety factor. Chain mode and execution determine the level of the sufficient safety factor which has to be selected. For the interpretation and implementation of the load chains, the dynamic tension, tensile forces F and the operating conditions for evaluating additional, dynamic stresses and requirements must be well known. From the tensile force F, the factor f_1 for the operating conditions and the sufficient safety factor S, the required minimum breaking force F_B for the chain can be determined.
The relevant local authority regulations are valid for the safety factor S for lifting gear. If there are no applicable, set rules, then the factor S will be determined in accordance with the type of chain and its design (link combination) usually selected as between 7 and 12.

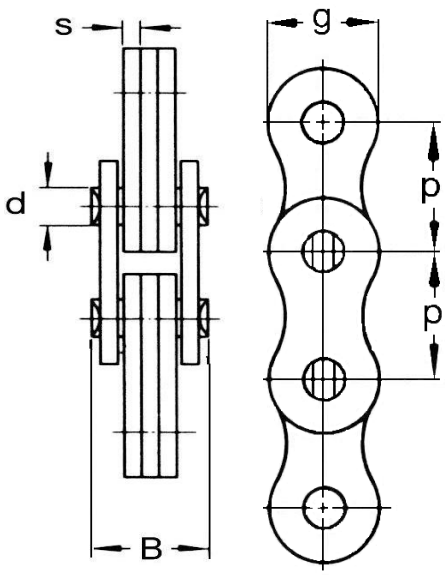
FSG can supply the correct chain for your lifting gear

1. **in accordance with the original No.**
   or
2. **according to your specifications**

Division	p	_____	mm
Bolt diameter	d	_____	mm
Link width	g	_____	mm
Total width	B	_____	mm
Link thickness	s	_____	mm
Chain length or number of links		_____	mm or Item

Link connection I = Inside A = Outside

Link combination refer to Page 86

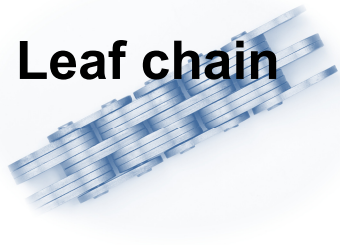


Final digits

Rivet bolts	– 01	Connecting bolts	– 02
Outer link	– 03	Intermediate link	– 04
External link	– 05	External link with cotter pin	– 06
Link end unit, external	– 07	Link end unit, internal	– 08

When ordering the chain accessories, please enter the relevant last digits for your desired product after the order number.

Example: 13 FK 0444 - 01 for rivet bolts



Determining a leaf chain and roller chain

Static security = S min cable and roller chains
5-fold safety in lifting gear.
8-fold safety for stationary devices with driver.
10-fold security with stationary device when people are working below
Lifting gear with a driver room arrangement must be equipped with 2 lifting chains.
The total breaking strength of both chains must be **at least 10** times the load =**F**
Amount (equal to rated load and movable mast section.)
If there are no applicable, set rules, then the factor S will be determined in accordance with the type of chain and its link combination, usually selected as between 6 and 12.
The decisive factor is the continuous fatigue failure resistance. This is determined by the manufacturers´quality and the selected link combination with great differences.

Existing link surface pressing
The link surface pressing for a 3X4 chain should not be higher than 16000N/cm².
Calculation: Load F = [nominal force+mobile mast part] **:** A = [joint surface]
Example: p =F 20 000N **:** A 1.48 = 13 514N/cm² approx. 15% under the permissible value.

Chain wheel determination
Roller contact surface Overall width of the chain [bolt length] x 1.15 = interior width **G**
Roller diameter **D** should be a minimum of 3.5 times the chain separation. A **D** of 4.5 to 5 times the chain separation is ideal.
In machine tools, a D from 6- to 8-times the chain separation is ideal.

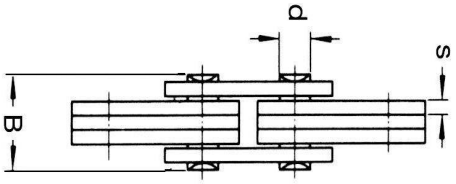
Minimum fatigue failure resistance –FB- in leaf chains for pre-selection
FB = Load F x Operating Factor F1 x safety factor S. FB and F in Newtons

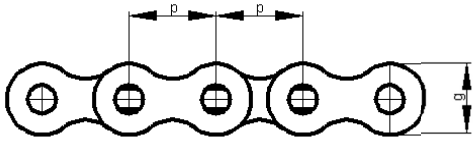
Operating Factor f1	Fatigue failure safety factor S	
f1 counter weight =1.1	to 5m/min under 100	load tolerance per day
f1 Forklifts = 1,3	to 10m/min under 100	load tolerance per day
f1 Earth movers = 1.5	to 30m/min under 1000	load tolerance per day

When selecting a leaf chain for lifting equipment and the like, a chain from the American heavy series LH is preferable. As an alternative, the American light series AL is also available.
For machine tools and equipment, the factory standard chain of the European Standard, light series is to be preferred.

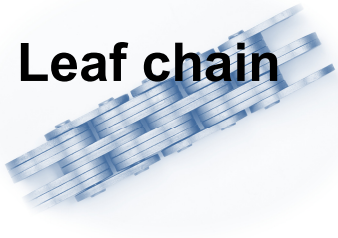
Article number	Link combination				
	2 x 3	3 x 4	4 x 4	4 x 6	6 x 6
	Maximum permissible load in Newton				
FK 01	5 100	6 400	6 600	7 600	7 900
FK 02	7 100	9 000	9 100	12 500	12 900
FK 03	12 400	15 800	16 000	21 800	22 500
FK 04	18 300	23 400	23 700	32 200	33 300
FK 05	25 700	33 000	33 400	45 200	46 800
FK 06	34 700	44 100	44 600	60 900	63 000

These permissible values are governing for the application of lifting equipment.
They comply with a static safety of S: 5





Leaf chain

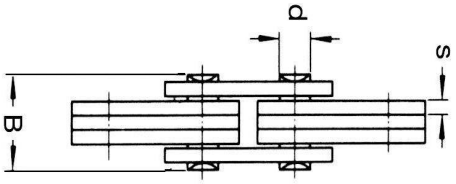


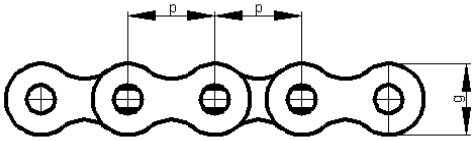
Extract from DIN 8152

The chains can be constructed out of parts of the chains according to DIN 8187. The actual pitch may therefore differ from the nominal pitch. The permissible length deviation is related to the length specified by the manufacturer and is + / - 0.25% under measured load.

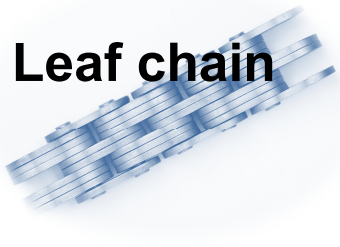
Article-number	Pitch p		Link combination	Bolts d max	Link height g max	Link thickness s	Total width B max	Link-surface A	Breaking force DIN min F_B	Weight ≈q
	Inch	mm		mm	mm	mm	mm	cm²	N	kg/m
Heavy series, American Standard LH DIN 8152										
13 FK 0123	½	12,700	2 x 3	5,08	12,0	2,00	13,16	0,30	22 200	0,65
13 FK 0134			3 x 4				17,40	0,41	33 300	0,90
13 FK 0144			4 x 4				19,51	0,41	44 400	1,02
13 FK 0146			4 x 6				23,75	0,61	44 400	1,26
13 FK 0166			6 x 6				27,99	0,61	66 600	1,51
13 FK 0223	⅝	15,875	2 x 3	5,94	15,0	2,42	15,37	0,43	32 600	0,90
13 FK 0234			3 x 4				20,32	0,57	48 900	1,32
13 FK 0244			4 x 4				22,78	0,57	65 200	1,51
13 FK 0246			4 x 6				27,74	0,86	65 200	1,86
13 FK 0266			6 x 6				32,18	0,86	97 800	2,24
13 FK 0323	¾	19,050	2 x 3	7,92	18,0	3,25	20,73	0,76	48 900	1,76
13 FK 0334			3 x 4				27,43	1,00	73 400	2,43
13 FK 0344			4 x 4				30,78	1,00	97 800	2,76
13 FK 0346			4 x 6				37,49	1,50	97 800	3,43
13 FK 0366			6 x 6				44,20	1,50	146 700	4,10
13 FK 0423	1	25,400	2 x 3	9,53	24,0	4,00	25,48	1,11	84 500	3,00
13 FK 0434			3 x 4				33,76	1,48	126 700	4,15
13 FK 0444			4 x 4				37,90	1,48	169 000	4,72
13 FK 0446			4 x 6				46,18	2,22	169 000	5,86
13 FK 0466			6 x 6				54,46	2,22	253 500	7,00
13 FK 0523	1¼	31,750	2 x 3	11,10	30,0	4,80	30,33	1,56	115 700	4,35
13 FK 0534			3 x 4				40,23	2,09	173 600	6,05
13 FK 0544			4 x 4				49,19	2,09	231 400	6,90
13 FK 0546			4 x 6				55,09	3,12	231 400	8,50
13 FK 0566			6 x 6				65,00	3,12	347 200	10,25
13 FK 0623	1½	38,100	2 x 3	12,70	35,70	5,60	35,43	2,10	151 200	5,80
13 FK 0634			3 x 4				47,07	2,79	226 800	8,00
13 FK 0644			4 x 4				52,88	2,79	302 400	9,10
13 FK 0646			4 x 6				64,52	4,20	302 400	11,40
13 FK 0666			6 x 6				76,15	4,20	453 600	13,60

! Additional leaf chains of various kinds are available on request !



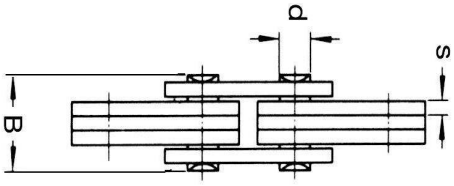


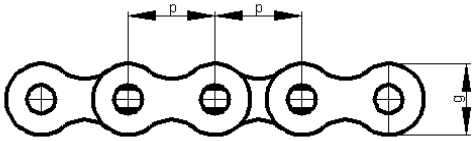
Leaf chain



Article-number	Pitch p		Link combination	Bolts d max	Link height g max	Link thickness s	Total width B max	Link-surface A	Breaking force DIN min F_B	Weight ≈q
	Inch	mm		mm	mm	mm	mm	cm²	N	kg/m
High performance chain LL DIN 8152										
13 FK 0944 **13 FK 0966**	½	12,700	4 x 4 6 x 6	4,45	10,60	1,60	14,40 20,50	0,27 0,40	36 000 54 000	0,83 1,25
13 FK 1044 **13 FK 1066**	⅝	15,875	4 x 4 6 x 6	5,08	13,70	1,65	16,10 22,90	0,30 0,46	44 800 67 200	0,92 1,40
13 FK 4022 **13 FK 4044** **13 FK 4066**	¾	19,050	2 x 2 4 x 4 6 x 6	5,72	14,70	1,83	10,70 18,10 25,40	0,21 0,42 0,63	33 000 66 000 99 000	0,59 1,15 1,70
13 FK 1144 **13 FK 1166**	**1**	25,400	4 x 4 6 x 6	8,28	21,00	3,20	30,20 43,20	0,99 1,49	120 000 180 000	2,90 4,30
13 FK 1244 **13 FK 1266**	1¼	31,750	4 x 4 6 x 6	10,19	26,40	3,70	30,20 43,20	1,42 2,12	190 000 285 000	4,30 6,40
13 FK 1344 **13 FK 1366**	1½	38,100	4 x 4 6 x 6	14,63	33,20	5,20	49,40 70,40	2,91 4,37	320 000 480 000	8,20 12,20
Light series, American Standard DIN 8152 AL										
13 FK 1822 **13 FK 1844** **13 FK 1866**	½	12,700	2 x 2 4 x 4 6 x 6	3,97	10,40	1,50	7,90 14,40 20,50	0,12 0,23 0,35	14 100 28 200 42 300	0,35 0,67 1,00
13 FK 1922 **13 FK 1944** **13 FK 1966**	⅝	15,875	2 x 2 4 x 4 6 x 6	5,08	12,85	1,97	10,20 18,90 26,90	0,20 0,40 0,60	22 000 44 000 66 000	0,60 1,20 1,80
13 FK 2022 **13 FK 2044** **13 FK 2066** **13 FK 2088**	¾	19,050	2 x 2 4 x 4 6 x 6 8 x 8	5,94	15,30	2,44	12,40 22,40 32,40 42,20	0,28 0,57 0,85 1,14	37 000 63 600 95 400 127 200	0,90 1,70 2,50 3,30
13 FK 2144 **13 FK 2166**	1	25,400	4 x 4 6 x 6	7,92	20,70	3,10	29,30 42,40	1,01 1,52	113 400 170 100	3,00 4,50
13 FK 2244 **13 FK 2266**	1¼	31,750	4 x 4 6 x 6	9,53	25,60	4,01	35,94 52,33	1,52 2,29	177 000 265 500	4,90 7,30
13 FK 2344 **13 FK 2366**	1½	38,100	4 x 4 6 x 6	11,10	30,50	4,83	43,83 62,96	2,08 3,12	254 000 381 000	6,40 9,50

! Additional leaf chains of various kinds are available on request !



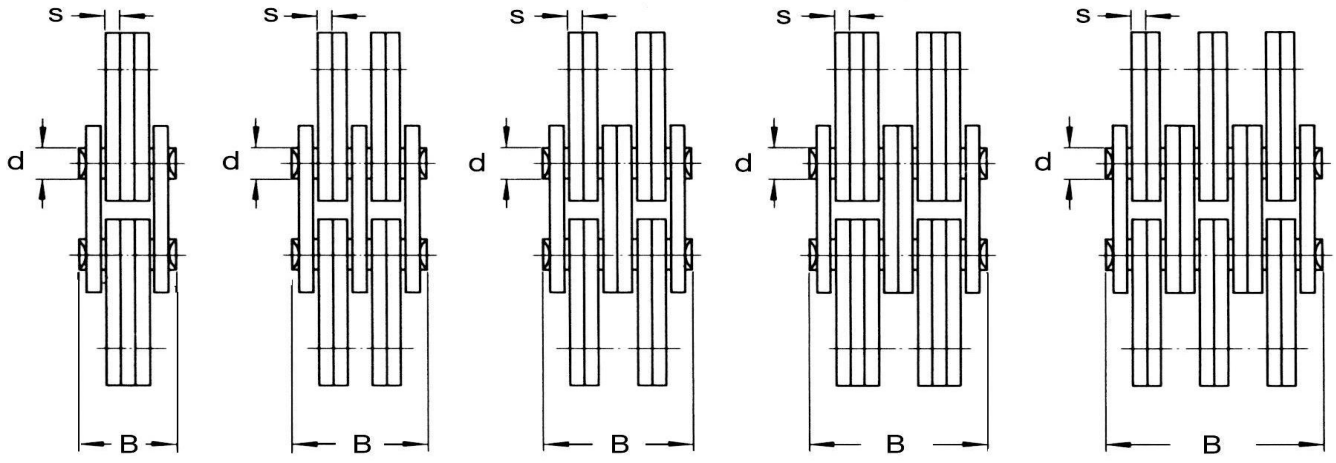


Leaf chain

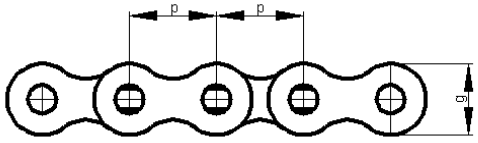
Article-number	Pitch p		Link-combination	Bolts d max	Link height g max	Link thickness s	Total width B max	Link-surface A	Breaking force DIN min F_B	Weight ≈q
	Inch	mm		mm	mm	mm	mm	cm²	N	kg/m
Specialised, leaf chains										
13 FK 2623	⅝	15,875	2 x 3	4,75	14,60	2,50	14,90	0,24	30 300	1,00
13 FK 2844 **13 FK 2866**	¾	19,050	4 x 4 6 x 6	6,50	15,20	2,35	22,80 32,70	0,61 0,91	71 000 106 000	1,70 2,50
13 FK 2934 **13 FK 2966**	1	25,400	3 x 4 6 x 6	10,85	23,40	IL / AL 3,05/4,00	28,40 44,40	1,37 2,06	125 000 250 000	3,60 5,90
13 FK 3144 **13 FK 3166**	⅝	15,875	4 x 4 6 x 6	5,95	15,10	1,70	17,00 24,00	4,05 6,07	65 000 100 000	1,40 1,88
13 FK 3266 **13 FK 3288**	⅝	15,875	6 x 6 8 x 8	5,08	14,80	1,70	23,50 30,70	5,03 6,71	87 000 116 000	2,10 2,20
13 FK 3388	⅝	15,875	8 x 8	5,95	15,10	1,70	31,40	8,09	128 000	2,48
13 FK 341010	¾	19,050	10 x 10	5,72	16,50	1,80	40,05	10,29	175 000	3,05
13 FK 351010	¾	19,050	10 x 10	5,72	14,50	1,80	40,50	10,29	150 000	2,80

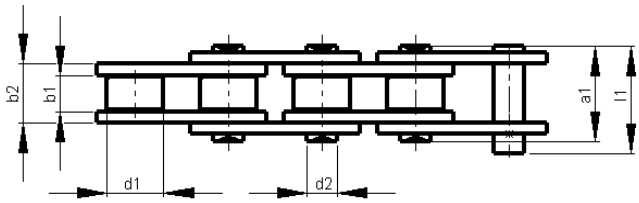
! Additional leaf chains of various kinds are available on request !

Link combination



2 x 3 **3 x 4** **4 x 4** **4 x 6** **6 x 6**





Roller chain

Our chain service includes, with a few exceptions, the supply of original pre-cut lifting chains with and without fasteners and/or connecting elements.

Article number	Pitch p		Light Width b_1 min	Rollers d_1 max	Bolts d_1 max	Inside link-width b_2 max	Link height g max	Bolt lengths a_1 max	Sealing bolt lengths l_1 max	Link-surface A	Breaking force DIN min F_B	Weight ≈q
	Inch	mm	mm	mm	mm	mm	mm	mm	mm	cm^2	N	kg/m
13 RB 16	1	25,400	17,02	11,71	8,28	25,40	20,50	35,40	42,40	2,10	60 000	2,20
13 RB A105	1¼	31,750	19,05	13,84	9,53	27,46	29,20	39,40	44,90	2,62	88 500	3,18
13 RKAE 60	¾	19,050	12,57	11,91	5,94	17,70	17,70	25,70	28,60	1,15	31 800	1,97
13 RKAE 80	1	25,400	15,75	15,88	7,92	22,50	23,50	33,00	38,00	1,94	56 700	3,20
13 RKAE 100	1¼	31,750	18,90	19,05	9,53	27,40	29,20	29,40	44,90	2,76	88 500	4,40
13 RKAHE 50	⅝	15,875	9,53	10,16	5,08	14,44	14,50	22,00	26,00	0,70	22 200	1,01
13 RKE 04		6,000	2,80	4,00	1,85	4,10	5,00	7,40	10,30	0,08	3 000	0,12
13 RKE 05		8,000	3,00	5,00	2,31	4,77	7,10	8,60	11,70	0,11	5 000	0,18
13 RKE 08	½	12,700	7,75	8,51	4,45	11,30	11,60	16,70	19,00	0,50	18 000	0,70
13 RKE 083	½	12,700	4,88	7,75	4,09	7,90	10,30	12,90	14,40	0,32	12 000	0,42
13 RKE 084	½	12,700	4,88	7,75	4,09	8,80	11,10	14,80	16,30	0,32	16 000	0,59
13 RKE 10	⅝	15,875	9,65	10,16	5,08	13,28	14,60	18,90	22,00	0,67	22 400	0,90
13 RKE 12	¾	19,050	11,68	12,07	5,72	15,62	15,90	22,30	25,10	0,89	29 000	1,15
13 RKE 16	1	25,400	17,02	15,88	8,28	25,40	20,50	35,40	42,40	2,10	60 000	2,60
13 RKE 20	1¼	31,750	19,56	19,05	10,19	29,00	25,70	40,40	47,60	2,96	95 000	3,70
13 RKE 24	1½	38,100	25,40	25,40	14,63	37,90	33,00	53,80	60,60	5,54	160 000	6,90
13 RKW 001	1	25,400	12,70	12,70	7,00	20,20	20,60	27,10	32,80	1,33	45 000	1,59
13 RKZ 05		8,000	3,00	5,00	2,31	4,77	7,10	14,10	17,40	0,22	6 000	0,36
13 RKZ 06		9,526	5,72	6,35	3,28	8,53	8,30	23,80	27,10	0,55	16 000	0,78
13 RKZ 08	½	12,700	7,75	8,51	4,45	11,30	11,60	30,60	33,00	1,00	32 000	1,40
13 RKZ 10	⅝	15,875	9,65	10,16	5,08	13,28	14,60	35,50	38,60	1,34	40 000	1,80
13 RKZ 16	1	25,400	17,02	15,88	8,25	25,40	20,50	67,40	74,00	4,21	106 000	5,30

Final digits

Connecting link with spring - 11
Connection link with cotter pin - 12
Elbowed link with cotter pin - 13

When ordering the chain accessories, please enter the relevant last digits for your desired product after the order number.

Example: 13 RKE 05 – 12 for a connecting link with cotter pin

! Other roller chains are available on request !

Chain lineal for inspection of wear and tear

General points relating to the chain lineal

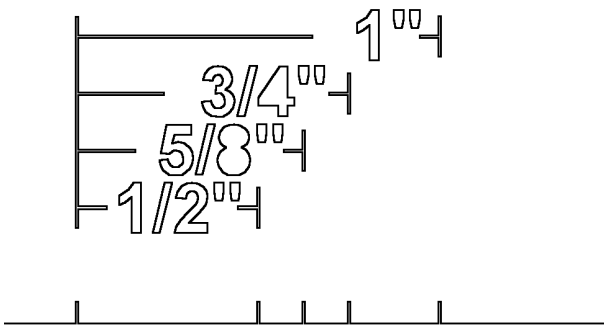
The wear and tear lineal serves for length inspection and/or inspection of wear and tear for roller chains and leaf chains.

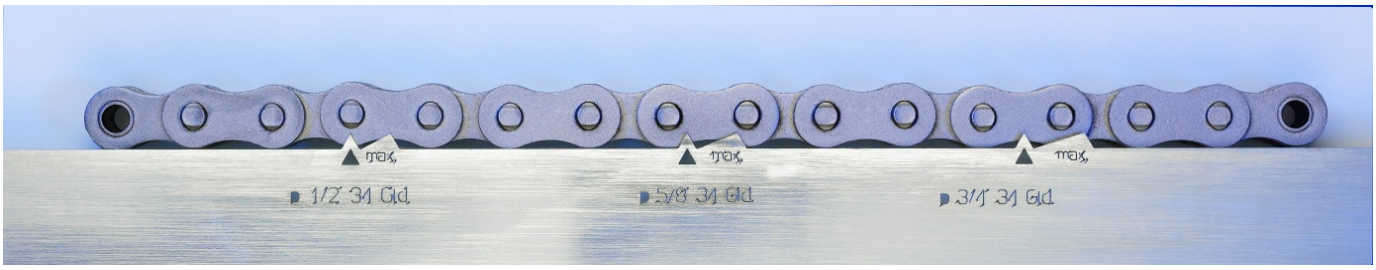
- The measurement should incorporate at least 17 double links = 34 pitches in the working area of the chain.

Handling the chain lineal

With the help of the pitch marking on the lineal, it is possible to determine the pitch of the chain.
Hereby, the formed area of the chain lineal will be held on the tested chain and the pitch of the to chain which is to be inspected will be evaluated.
Thereafter, 34 pitches of the test chain will be identified.
The depth gauge is set by the lineal for every pitch from 1/2", 5/8", 3/4"and 1". If the chain which is in operation has more than one pitch above the initial dimension, then the chain must be replaced. The depth gauge and/or initial dimension comprises hereby only 33 or less chain pitches, which relates to a chain length of approx. 3%, respectively.

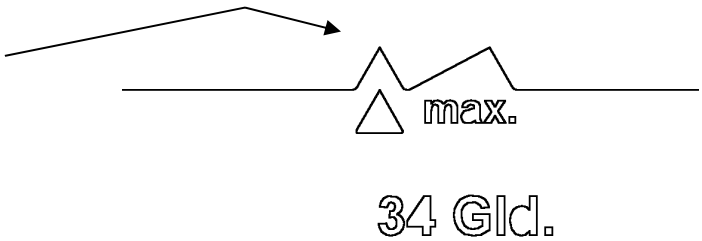
Extract from the FSG chain lineal





Extract from the FSG chain lineal

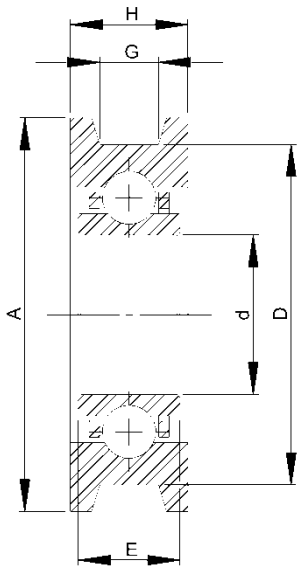
This area of the chain lineal is used to determine the chain length e.g. as illustrated here in a 1/2" chain.
If after 34 chain links, this mark is on the chain bolt middle, then the chain is in the working area without wear and tear.



The chain lineal from FSG simultaneously includes the wear limit (refer to maximum)

Order Number 13 KL

Chain pulley



Chain guide rollers are normally utilised, among other applications, in forklift lifting gear as pulleys on the pull chains. The pull chains are turned around the chain rollers, which are fixed on the lifting cylinder or internal mast. Depending on the lifting gear construction, the wrap-around may be up to 180°. The requirements for the rollers depends on the number of the chains, the wrap-around angle as well as the load capacity of the fork-lift truck.

The solid, outer ring of the bearing is adapted for the leaf chains. The bearings in this construction series are built as a full complement bearing and can sustain very high radial forces. The resulting axial force from the chain is absorbed by the precise bearing position of the roller cylinder heads on the ground surfaces of the rings. The chain guide rollers are manufactured as sealed units and lubricated for life.

This system also works reliably under extreme, environmental influences. The bearings can be mounted on the lifting cylinders as well as between two side brackets. Therefore, axial clearance values of less than 0,5 mm are strived for in order to ensure an accurate running of the rolling elements.

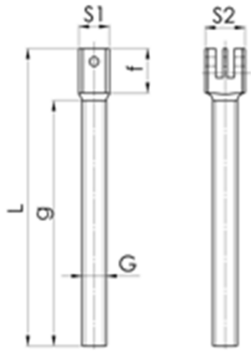
Suitable leaf chains and roller chains are normally available ex-works

Article number	D mm	d mm	H mm	E mm	G mm	A mm	C kN	C_o kN	Weight ~ kg	Chain types		
KLR-8019	80	40	28,0	26	19	90	50	54	0,55	BL 534	AL 544	LL 1044
KLR-8025	80	40	30,0	32	25	90	40	51	0,78	BL 544	AL 644	LL 1066
KLR-8033	80	40	38,0	36	33	98	37	45	1,20	BL 634	AL 666	LL 1288
KLR-10033	100	50	42,0	40	33	115	52	63	1,70	BL 834	AL 844	LL 1644
KLR-11045	110	55	58,0	56	45	135	52	63	2,10	BL 846	AL 866	LL 1666
KLR-13055	130	55	67,0	65	55	158	70	85	5,40	BL 1046	AL 1066	LL 2066
KLR-15772	157	80	88,0	78	72	187	70	85	4,50	BL 1246	AL 1266	LL 2466

! Other chain guide rollers are available on request !

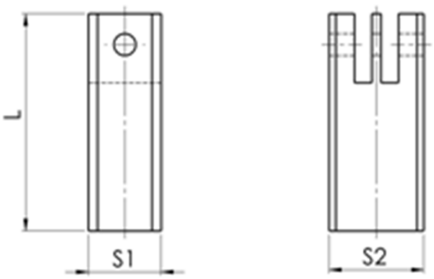
Chain anchor

Article number	L mm	g mm	S1 mm	S2 mm	f mm	G	Chain types
13 KA 0234	190	160	20	25	20	16 x 1,5	13 FK 0234
13 KA 0334	200	160	20	25	30	16 x 1,5	13 FK 0334
13 KA 0434	200	160	30	35	30	16 x 1,5	13 FK 0434
13 KA 0446	220	160	30	45	30	16 x 1,5	13 FK 0446
13 KA 0546	230	160	32	60	60	24 x 1,5	13 FK 0546
13 KA 0646	230	180	38	65	65	24 x 1,5	13 FK 0646



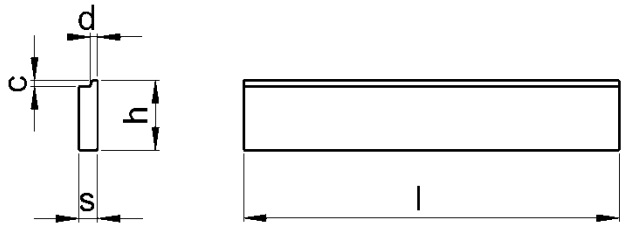
Chain clamping bolt

Article number	L mm	S1 mm	S2 mm	Chain types
13 KB 0234	60	20	25	13 FK 0234
13 KB 0334	60	20	25	13 FK 0334
13 KB 0434	80	30	35	13 FK 0434
13 KB 0446	80	30	45	13 FK 0446
13 KB 0546	100	32	60	13 FK 0546
13 KB 0646	110	38	65	13 FK 0646



! Additional chain anchors and chain blocks as well as chain-end parts are available on request !

Fork carrier profile & frame



Fork carrier profile beading, hot rolled from S355J2G3
We deliver in 3 ISO Classes up to 3000 mm in length.

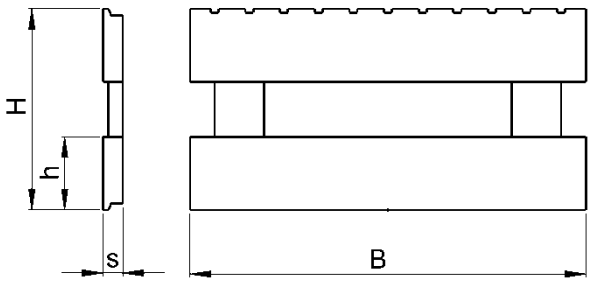
Other dimensions are available on request.

Order example:
Article number + Suffix

U for lower fork carrier profile, not grooved
O for the upper fork carrier profile, grooved

Fork carrier profile

Article number	ISO FEM	h mm	s mm	c mm	d mm	Weight kg/m	Wx min cm^4	Wy min cm^4
305 110 32	II	110	32	13	16,0	25,7	49,7	16,9
305 150 38	II	150	38	13	16,0	42,2	114,4	33,6
305 148 40	III	148	40	16	21,5	43,7	117,3	36,1
305 180 38	III	180	38	16	21,5	51,3	172,2	40,2
305 180 45	III	180	45	16	21,5	60,2	198,5	56,5
305 180 57	IV	180	57	19	25,5	75,2	240,2	89,4



Fork carrier frames will be fitted to rapid, tensioning attachments to facilitate an integrated side slider or for attaching extension devices as required.

Fork carrier frame

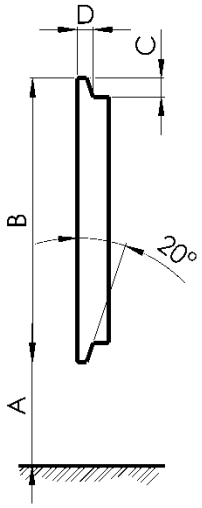
Article number	ISO	Load capacity kg	h mm	H mm	s mm	B mm
241 063	II	2000	110	407	32	1000
241 065	II	2500	150	407	38	1000
241 066	III	3500	148	508	40	1000
241 068	III	4500	180	508	45	1200
241 069	IV	6000	180	635	57	1500

! Other dimensions are available on request !

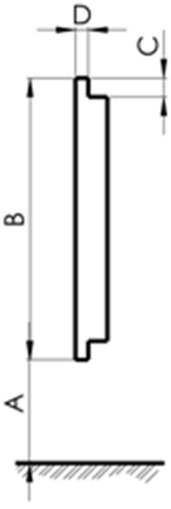
Fork carrier profile

For proper suspension design and size of the fork carrier shall prevail

for ISO/FEM-fork carriage DIN 15178/1986-10				
Class	**A mm**	**B mm**	**C mm**	**D mm**
I < 10 kN	76 oder 114	331	13	16,0
II 10-25 kN	76 oder 152	407	13	16,0
III 25-50 kN	76 oder 203	508	16	21,5
IV 50-63 kN	127 oder 254	635	19	25,5



for DIN fork carriage DIN 15178/1986-10				
Class	**A mm**	**B mm**	**C mm**	**D mm**
I < 10 kN	120	360	20	15
II 10-25 kN	160	400	20	20
III 25-50 kN	200	500	25	25
IV 50-63 kN	250	570	40	40



In addition to the fork rakes listed below, we also offer special forks for many different applications. e.g.

Swan necked, bending position / lifting fork with carrying bolt - cable drum - Coils function / reversed, lifting fork

Flat lifting fork ("cake slice") / noise-insulated lifting fork / coated lifting fork / chip board application

Lifting fork for extension devices and/or attachments / Bolt-on fork / Creased fork / Swivel fork / Knife lift fork / Harbour fork

etc.

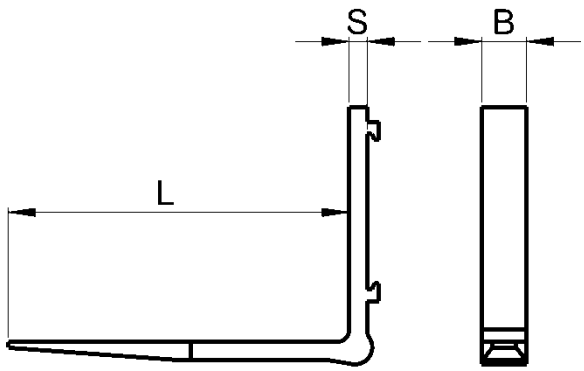
Ask us when calculating your lifting fork requirements.

Incorrectly fitted lifting forks can cause serious damage.

Forks

Forks are manufactured according to **ISO 2328/2330**

cross-section B x S mm	FEM	Lifting capacity Couple/LSP kg/mm
80 x 40	2A/B	2 000 / 500
100 x 35	2A/B	2 000 / 500
100 x 40	2A/B	2 500 / 500
100 x 45	2A/B	3 000 / 500
120 x 40	2A/B	3 000 / 500
125 x 45	2A/B	3 200 / 500
100 x 45	3A/B	3 500 / 500
125 x 45	3A/B	3 500 / 500
100 x 50	3A/B	3 900 / 500
120 x 50	3A/B	3 500 / 500
140 x 50	3A/B	5 800 / 500
150 x 50	3A/B	6 000 / 500
130 x 60	3A/B	6 000 / 500
150 x 60	4A/B	8 000 / 600
150 x 70	4A/B	9 000 / 600
200 x 60	4A/B	10 000 / 600
200 x 70	4A/B	12 000 / 600



! Lengths from 800 mm - 2400 mm !

Order example:

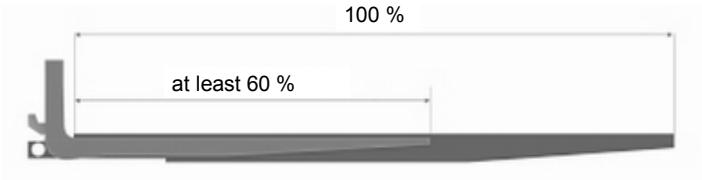
Cross section	/	Fork lengths	/	Suspension (FEM)
100 x 45 mm		1600 mm		3A

Fork extensions

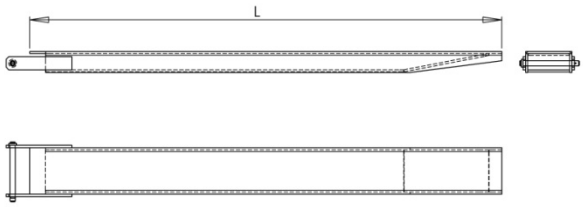
Fork extensions are manufactured according to **ISO 13284:2003-02.** The load carrying capacity of the fork extension is adapted to the particular fork rakes, please also refer to the capacity and the centre of gravity of the fork lift truck.

The length of the fork rake base unit should be at least 60% of the length of the fork extension.

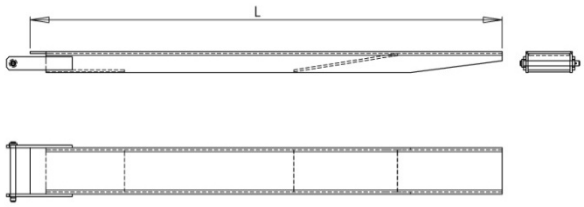
Example:
Extension 1600 m long – fork 1000 mm



Closed fork extension
For heavy goods with a higher nominal load capacity complying with the fork rakes.



Open fork extension
For light goods



Please specify whether closed or open design

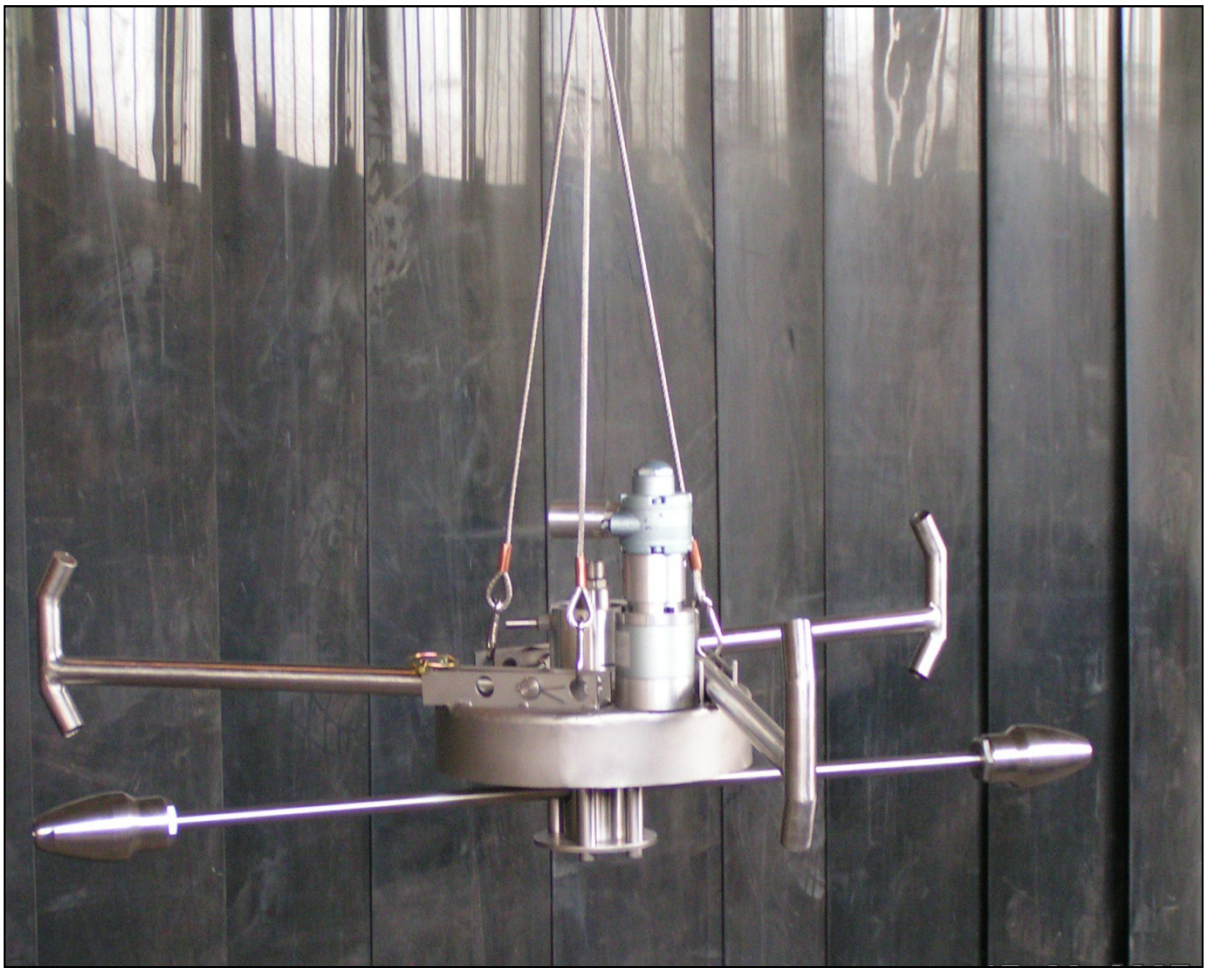
Suffix
G – closed design
O – open design

Order example:

100 x 40 x 1600 G
(for forks 100 x 40 x 1000
Closed version)

Dynajet shaft cleaner
High pressure concrete cleaning for vertical sewer entry shafts

With the Dynajet500th with 500bar pressure and a water flow rate 30l/min. as well as the shaft cleaner, this work can be done safely by the operator to achieve optimum quality and in a short time.



Technical data:

Permissible pressure, Maximum 500 bar
Throughput 30l/min (15l/min per nozzle)
1000 mm diameter (> 600mm folded)
Revolutions, approx. 2-15 RPM
Pneumatic drive unit

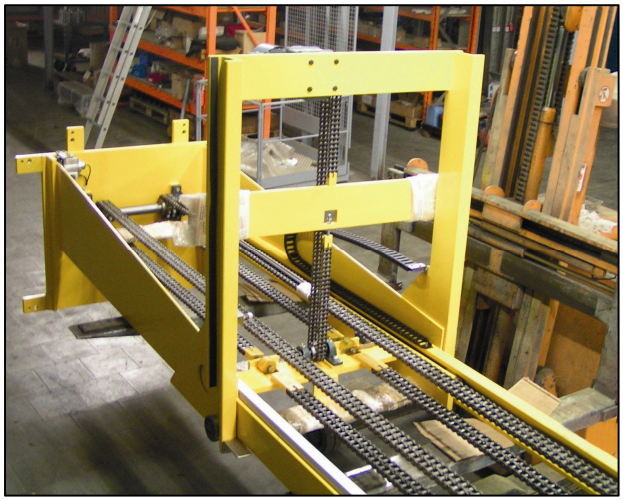
Special constructions
example

electric drive units, complete
for the cleaning of aircraft turbines

Load capacity:	800 kg / 600 mm LSP
Lifting height	1800 mm
Drive unit:	electric
Control:	automatic

Four-part, lifting mast

Load capacity:	2500 kg / 500 mm LSP
Lifting height:	9700 mm
Drive unit:	hydraulic



Horizontal and vertical drive unit

Load capacity:	1500 kg / 700 mm LSP
Lifting height:	3000 mm
Drive unit:	electric
Control:	semi-automatic

Special constructions
example

Lifting platform with floor mounting
and adjustable recess for spiral machining

Load capacity	1000 kg / 1000 mm LSP
Lifting height:	4500 mm
Drive unit:	hydraulic
Control:	manually and automatically

Mobile lifting unit
with flangeable coil attachment

Load capacity:	2600 kg / 950 mm LSP
+	1200 kg / 250 mm LSP
Lifting height:	2600 mm
Drive unit:	hydraulic

Lifting mast
with a lifting fork propensity for side loader

Load capacity:	3000 kg / 600 mm LSP
Lifting height:	4500 mm
Drive unit:	hydraulic

Special constructions
example

Lifting unit
for lifting a welding robot

Load capacity:	9500 kg / 2500 mm LSP
Lifting height:	5000 mm
Drive unit:	hydraulic and electric
Control:	semi-automatic

Bulk goods conveyor with loading ramp

Load capacity:	1000 kg / 750 mm LSP
Lifting height:	3500 m
Drive unit:	hydraulic
Control:	semi-automatic

Vertical and horizontal traversing
with carrying arms and loading basket for annealing furnaces

Load capacity:	3000 kg / 1150 mm LSP
Lifting height	6000 mm
Drive unit:	hydraulic, medium: Water glycol
Control:	semi and full automatic
Travel:	8000 mm

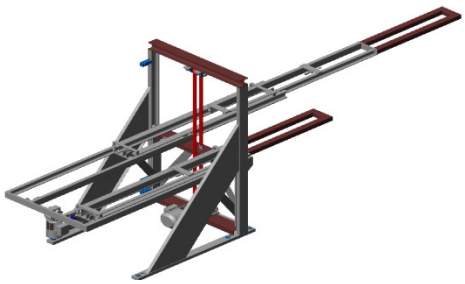
Special constructions
example

Automatic lifting and transport unit for woodworking

2 Lifting units with 2-driver sleds including the control unit

Load capacity: 1500 kg / 400 mm LSP
Lifting height: 6000 mm
Drive unit: Electric transmission motor with drive shaft implemented over 18 m

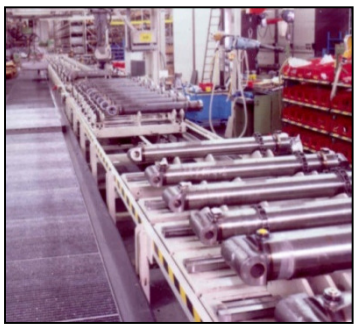
Telescopic unit

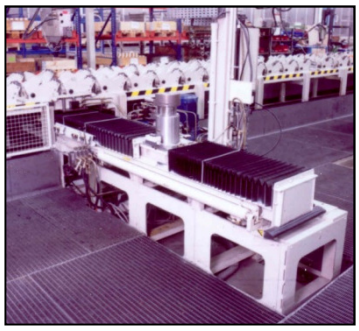


for coating furnaces

Load capacity: 300 kg / 2000mm LSP
Drive unit: electric
Control: semi-automatic

Assembly unit





Semi-automatic coating unit with adjustable height for mounting the cylinders

Drive unit: Electric and pneumatic
Control: Semi-automatic
Track length: 48 m
Cylinder size: 3000-3500 mm

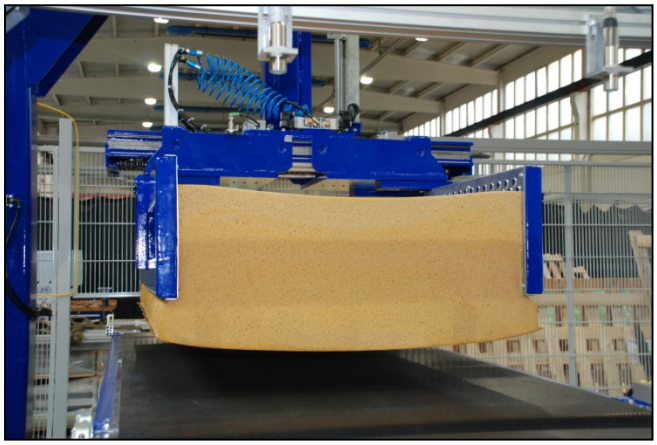
Special constructions
example

Spring tower

Area 47
Highest built spring tower
27 m high

Slab sliding unit

Sliding weight on rollers:	4 400 kg
Thrust:	15 000 N
Extension thrust to the motor:	25 000 N
Motor drive unit:	2 380 N
Face-to-face dimension:	11 000 mm



Bulk good conveyor with gripper

Transport weight:	max	500 kg
Lift, vertical:	max	750 mm
Travel horizontally:	max	9 050 mm
Gripper, opening area: +/-		900-1300 mm
Overall length:		11 450 mm
Overall height above floor		4 200 mm

Our team in administrative services

Disposition:

Your enquiries will be processed here and the orders completed.

Shipping:

Picked and packed deliveries, preparation for collection per carrier or package service

Collection:

Several times a day by carrier, express delivery, parcel service or overnight shipping.

Pre-cut material:

We saw all the rolled bearing profiles for you to your desired fixed length by utilising a CNC-Automatic Saw.

CNC Precision straightening machine:

To achieve an even greater straightness and product improvement, we can align our rails finely with our CNC straightening machine to up to 0.2 mm per metre when needed.

C&T´s
Indemnification Rescission-,
Selling-, Delivery conditions and payment conditions

1. General: The following conditions are the sole deciding factor for our business, even if the customer has other prescribed conditions. They are taken to be valid and accepted when you do not countermand them immediately after receipt of the order confirmation. Amendments, additions and/or alterations submitted on the telephone or verbally require a written confirmation before they are considered to be effective. With the introduction of these terms and conditions, all other valid terms or conditions are thereby invalid.

2. Offers: are subject to change until confirmed in writing by us.

3. Prices: are in EURO ex works and exclude packaging, shipping costs and insurance as well as VAT, local taxes, duties and custom´s charges. Orders placed according to price lists will be delivered and invoiced for the price(s) current in the latest price list for the delivery date. Packaging will charge at the cost price. All used packaging materials, such as cardboard boxes, disposable plywood boxes as well as wooden crates will not be returnable.

4. Surcharge for small quantities: as a lump sum. 10,- Euro per delivery will be charged as an additional, administration fee for small orders up to 50.- Euro net goods value.

5. Delivery time: for our deliveries begin on the date of the order confirmation and are binding. Even with a fixed agreed delivery we shall be entitled to amend our delivery times when there are subsequent changes to the order and in consideration of our operational situation. Cases of force majeure, in particular by subsequent occurrences of material shortage difficulties and/or in procuring materials, equipment failure, strikes, lockouts, other staff shortages, lack of transportation, administrative orders (even if they occur at our pre- and/or subcontractors) or other unforeseen obstacles shall not be considered as default. In these cases, we are entitled to postpone the delivery and/or performance for the time duration of the inconvenience and/or handicap plus an adequate start-up time thereafter or because of the delivery and/or one part hereof which is in default to resign in part or entirely from the contract. Damages and rescission as a result of delayed delivery are excluded in principle by the purchaser. We retain the right to design, form, colour and specification changes to the scope by the manufacturer during the delivery period, provided the purchase is only slightly changed and the changes are reasonable for the customer. In addition, we are entitled to make orders in instalments. For special versions, the order amount may be delivered by up to 10% over or under the order volume although the goods will, in this case, be invoiced for the actual quantity delivered. We are entitled to make subsequent deliveries subject to the complete payment of preceding deliveries, independent of the otherwise, agreed maturity data.

6. Shipping: is always at the risk and expense of the purchaser, unless expressly agreed otherwise in writing.
If no shipping method is requested, then we will select the most inexpensive shipping method available.

Delivery is ex works, excluding packaging.

7. Invoicing: Invoices are payable within 30 days of the invoice date without discounts, cash payments within 10 days will be subjected to a 2% discount on the net value of the goods under the premise that all previous invoices have been remitted at this time. The payment shall only be made when we can dispose of the amount. In cases of overdue payments, we calculate a delayed-payment interest fee of 5 % p. a. over the respective discount rate of the German Federal Bank. We reserve the right in this case to cancel any previously granted quantity discounts, in whole or in part. Exchange will only be accepted by special arrangement, their adoption neither implies fulfilment nor deferral. In this case, accruing discount and other expenses shall be borne by the purchaser. If the buyer defaults on payments, we can terminate the contract without prejudice to the assertion of rights under the agreed retention after a reasonable period or claim damages for non-performance. In the case of receiving unsatisfactory information about the purchaser and/or in cases of other risks and/or hazards to our economical interests, we are entitled to change payment conditions retroactively and to demand that deliveries will be made quid-pro-quo to remittances. In this case, we are also entitled to resign from this contract.

8. Retention of title:

8.1 The goods purchased remain the sole property of FSG until the date of full remittance of the invoice and open invoices from FSG. The right to the property remains in existence irrespective of any claims against FSG from the purchaser with regard to the purchased object, for example on the basis of repair or spare part deliveries as well as other performance.

8.2 During the retention of title period, the purchaser is entitled to retain and utilise the purchased property as long as they have meet their obligations under the following provisions of this section and is not in arrears in accordance with Section 3. Pledges or assignments are not permitted. If the buyer is in default, or fails to comply with their obligations under the retention of title, FSG can reclaim the object of purchase and a after a written notice with a reasonable time to retain the right to sell the purchased item. The repossession of the purchased goods by FSG does not constitute a termination of the contract.

8.3 Rights from the resale or any other legal reason (insurance, tort) in respect of the reserved goods (including all balance claims from current accounts) will be reassigned in full by the purchaser in full to the seller. The seller authorises the purchaser irrevocably to collect the claims assigned to the seller for his account in his own name.

8.4 Any assignments by third parties with regard to the purchased goods, especially seizure and/or liens, must include a notification to the assignee relating to the property rights of FSG and they must be notified that FSG can enforce its proprietary rights at any time. If the third party is not in a position to refund the resulting legal, judicial or out-of-court costs which arise in this context, the purchaser will be liable for reimbursing the seller.

9. Complaints: the dispatch must be executed within five working days, at the latest, after receipt of the goods otherwise the delivery will be taken to be accepted. If defects are noted, then our obligation is restricted to a repeat delivery and/or remedying the defect(s) or issuing a credit note to the value of the invoice amount. Further claims, in particular claims for damages and rescission are excluded. Returns on behalf of the customer without prior consultation with us are prohibited. We cannot be held liable for any details supplied, in particular dimensions, weights and technical drawings in our catalogues and technical descriptions.

10. Guarantees and warranties: are granted within the legal framework. The customer is obliged to return replaced parts, at our request, to us at no extra cost for us.

11. Return of goods: is excluded without special, express agreement.

12. Copyright: Illustrations, technical drawings as well as samples and other documentation which are contained in our catalogues and brochures are subject to our exclusive copyright and may not be used without our permission.

13. Data protection: all of our business partners have hereby declared that their
Personal-related data may be utilised by us with the assistance of EDP for commercially-related purpose within the provisions of the Federal Data Protection Act.

14. Place of fulfilment: for the delivery and payment is the registered office of the company FSG. The place of jurisdiction for both parties is Reutlingen. German law applies exclusively for the execution of the order. If one or more of the above provisions is proved to be invalid and/or void, then the validity of the remaining provisions shall not be affected. The invalid provision shall be replaced in this case by a valid one which complies with the economic purpose as far as possible.

Prices:
are in Euro ex works, excluding packing, shipping, insurance and VAT.

Delivery:
ex works

Payment:
Within 10 days, less 2% discount or within 30 days net

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