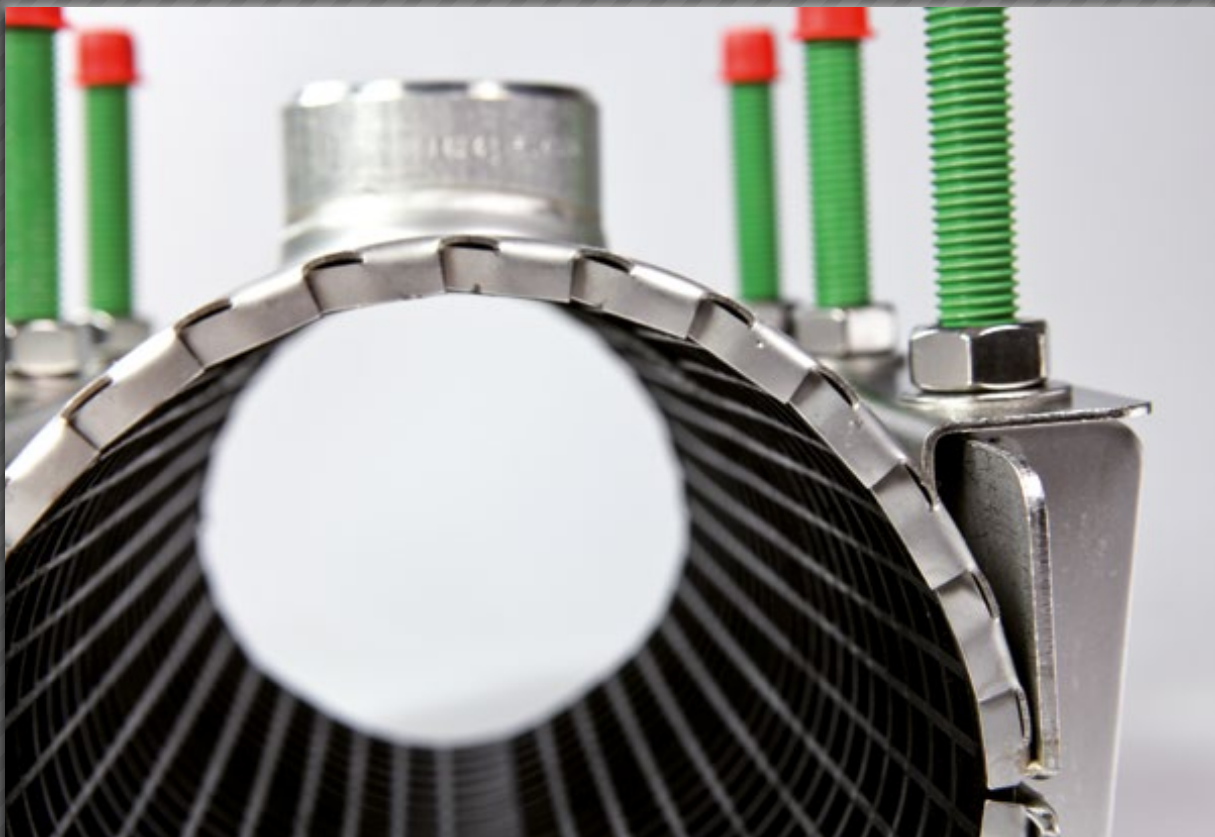


COMPETENT CONSULTING SINCE 1919

LESCH HORN

TECHNICAL INDUSTRY PRODUCTS



PIPE CONNECTION TECHNOLOGY

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Commitment to quality, as standard Guaranteed quality for over 90 years

In 1919 Wilhelm Leschhorn founded the cornerstone of his wholesale business of technical products with the launch of its "cooperation for measuring equipment mbH". In the beginnings, the family business specialised in an assortment of device parts, standardised parts and measuring equipment. In the following years the product line has regularly been updated and adapted to current market developments.

Since its creation Leschhorn focused on meeting client's needs for products within production chains and continues its corporate philosophy of "Everything out of one hand" until the present day.



Leschhorn Logo – the original
Leschhorn catalogue of standardised parts from 1959

Specialist with multiple skills

For over 90 years Leschhorn has been your partner for industrial business-to-business trade of technical products. To deliver our promise of being a "guarantor for quality and performance", we continuously work with our engineers and experts to design innovative and purpose built products.

Our in-house production enables us to offer custom made products even for small quantity orders.

Permanent monitoring of suppliers and product markets allow us to adapt our product line accordingly and to provide a regular up to date and customer-orientated product range.

We are currently an established supplier to wellknown companies of different market sectors such as chemicals, pharmaceuticals, automobile and packaging technologies as well as utility companies and the mechanical engineering industries.

Our clients now number around 7000 national and international companies that are currently in long term business relations with Leschhorn. Over the years these relationships evolved to being trustful partnerships, which shows that we are on the right track. It is the guarantee of long term partnerships based on trust, competence and responsibility that draws clients back to Leschhorn as this represents our key focus.



Outline product program – Leschhorn's catalogue of measuring equipment from 1964 – the original

Your advantages

- » We carry out your purchase for technical products
- » We guarantee planning reliability through an extensive stock on hand
- » An outstanding product range for a one stop fulfilment
- » One contact to assist all your orders
- » Reduced number of orders
- » Reduced administration fees
- » You can order with your familiar item number of the manufacturer – We transcode for you
- » Combined packaging and shipping for cost reduction on small quantities

Service and flexibility

Carry out your entire purchase of products with us. As a system supplier of C parts, we are happy to integrate with your preferred suppliers and tailor for your specific product enquiry. With our help you can reduce your stock to maximise your possibilities.

Contact us for your individual consultation today.

High quality brands

Leschhorn – technical components for industry and the manual trade – partners with many strong brands. Our listed manufacturers see Leschhorn as a reliable and competent partner in distributing a variety of products.

Find a complete selection of our cooperations at www.leschhorn.de.





Our product line— Your versatile selection

To facilitate your selection we have compiled our extensive assortment of approx. 60.000 products into nine main groups.

Find our full range of products in clear sortation online at www.leschhorn.de.

On the website you can comfortably research parts you are looking for through our overall search facility.

Should you have difficulties finding your desired product within our online range, we offer a variety of items on request. Feel free to contact us directly for enquiries!



01

01 Standardised Parts and Operational Technology

- » Handles and knobs
- » Handwheels
- » Clamping and tension levers
- » Hand cranks
- » Scale rings



02

02 Telescopic Rails

- » Telescopic rails
- » Linear guides
- » Custom rails



03

03 Mashinery and Device Part

- » Drive technology
- » Bearing and mounting technique
- » Engagement and blocking devices
- » Drill bushes
- » Fluid technology



04

04 Clamping and Automation Technology

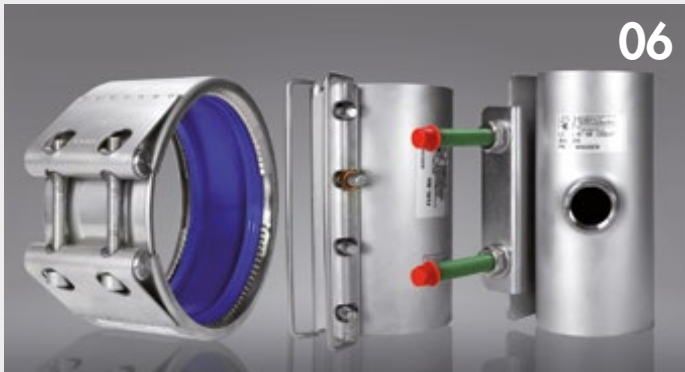
- » Manual-, pneumatic-, hydraulic clamping technology
- » Magnetic-, mechanic-, pneumatic clamping elements



05

05 Vibration and Spring Technology

- » Rubber-metal technology
- » Machine bearing devices
- » Industrial shock absorbers
- » Springs



06

06 Pipe Connection Technology

- » Repair clamps
- » Pipe connections
- » Hose clamps



07

07 Positioning Systems

- » Cardanic positioning system – Karpos
- » Ball bearings
- » Position indicators
- » Pipe and Clamp connectors
- » Adjustable slides



08

08 Measuring Technique

- » Measurement technology
- » Dial gauges
- » Measuring tapes
- » Measuring systems



09

09 Industrial Technique

- » Pneumatic tools
- » Tools and instruments
- » Sensor technology
- » Pneumatic

With us you will always find the right route and person to contact!
Our friendly team of consultants and experts is happy to help and guide you in the right direction

Online Shop / Prices

From March 2013, we will update our website and online shop allowing you to find all our products and prices online and to easily place your orders directly from our website.

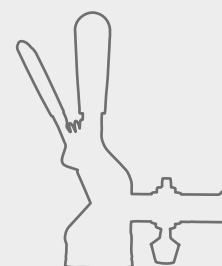
All the prices are to be understood as guidance prices without statutory value added tax (VAT). Items are often stated with scale prices to enable you to understand values for higher quantities.

Please mind that our online shop is still in developing stages and will therefore be continuously supplemented with new products. Should you be unable to find a particular product online, please contact us directly.



Catalogue

The present catalogue 02 heavy duty rails comprises only one of nine product groups of Leschhorn's product spectrum. Our full range of products is to be found in printed form in our main catalogue and its supplement of innovative items. A further subrange is to be found in our catalogue 06 Pipe connection technology. All catalogues are available to download from our website or to be sent by mail on request.



Express-Service

Are you in a hurry? – Is your order especially urgent? Please let us know and we are eager to process your order as quickly as possible. Provided your enquiry consists of an item in stock and your order reaches us by 2pm, we can ensure next day delivery.

Field representation

You have a special enquiry or prefer personal contact? We are happy to visit you and deal with your individual requirements. Our friendly and competent external staff are available to you throughout Germany and in German speaking areas abroad.



Contact

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Address	Schlitzerstraße 6 60386 Frankfurt

vCard – QR Code



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All-purpose use

- » System-independent pipe couplings
- » Compatible with all conventional pipe connections
- » Connects pipes made of the same or different materials
- » For pressure, suction and vacuum lines
- » Absolute sealability for liquid and gaseous media as well as solids
- » Repair of pipe damage without any operational interruptions quickly and reliably
- » Uniform assembly and sealing principle for all materials and diameters

Economical

- » Easy and quick assembly thanks to the delivered, ready-to-install element
- » Connection of smooth-ended pipes without the need for any time-consuming processing of pipe ends

Easy assembly

- » Cut the pipes to length, centre the pipe couplings and tighten the screws
- » For thick- and thin-walled pipes

Reliability

- » Stress-free, flexible pipe connection
- » Pressure-resistant and tight, even with an inexact pipe joint
- » Dampens pressure shocks, vibrations and structure-borne noise
- » Transfers longitudinal dilatations and unwindings
- » For an operating temperature range of -50 °C to +200 °C
Designed for short-term operation at max. +230 °C (depending on the seal's material)

Easy to use

- » Detachable and reusable
- » Maintenance-free with trouble-free operation
- » No expensive assembly tools and set-up times
- » Assembly without the risk of fire and explosion

Durable

- » Progressive sealing effect
- » Tensile-resistant and friction-locked
- » Resistant to corrosion and temperature
- » High chemical resistance

Space-saving

- » Compact design for space-saving pipe laying
- » Trim insulation, small openings, little space required
- » Low weight compared to cast iron pipes

Market segment	Type of lines	Area of application	Coupling properties
Structural and civil engineering above and below ground	Sanitary lines, fuel lines, fire protection lines, ventilation lines (aeration and deaeration)	Military constructions Civil defence systems Bridges	Vibration-resistant Shock-resistant Ready-to-install
Water and gas supply	Water lines, gas lines, shaft pipes, hydrant lines, tank lines	Gasworks Waterworks Water supply	Can be aligned Stress-free Tensile-resistant
Power plants	Turbine lines, transformer lines, cooling lines, transport lines	CERN nuclear power plant Hydroelectric power plant Research centres	Impact-resistant under pressure Shock-resistant
Machine construction and plant construction	cooling lines, conveyor lines, lubrication lines, fuel lines	Motors Vehicles Locomotives	Vibration-resistant Sound-absorbing Reusable
Shipbuilding Offshore	Ballast lines, fuel lines, fire protection lines, ventilation lines, cooling water lines	Container Tanker Freighter Platforms	Space-saving Weight-saving Flame-retardant Can be aligned
Mining	drainage lines, extraction lines, compressed air lines	Underground mining Tunnel	Stress-free Can be aligned Impact-resistant under pressure
Disposal	Sludge pipes, drainage lines, chemical lines, ventilation lines	Sewage treatment plants Sewage water system Maintenance	Space-saving Can be aligned Reusable

Table of pipe dimensions

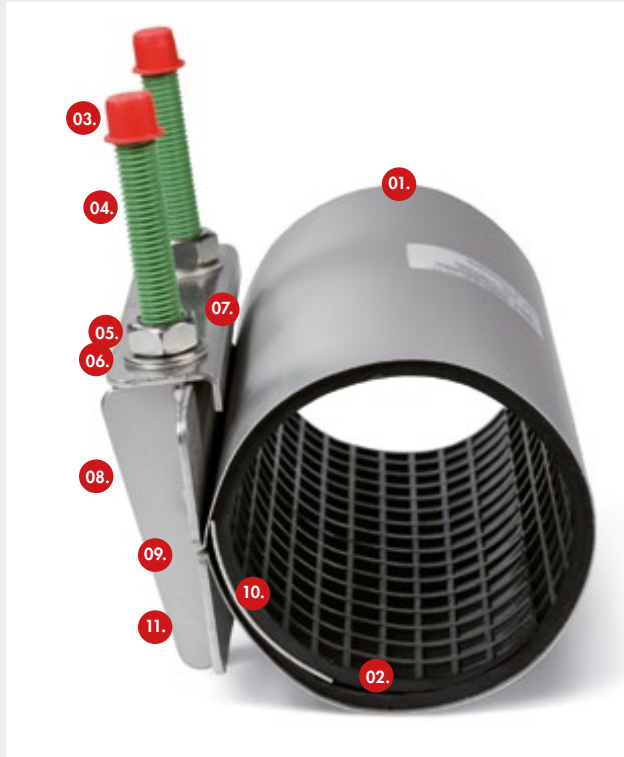
Size in inches	Nominal width	Material types																			
		Copper pipes	Steel pipes	Steel pipes with PE coating	Hard PE pipes 1st district heating lines	GA pipes	SML + MI pipes	GGG ductile pressure pipes	Fibre cement pipes	Vitrified clay pipes (normal)	Vitrified clay pipes (reinforced)	PE pipes HDPE PN 2.5/3.2	PE pipes HDPE PN 6	PE pipes LDPE PN	PE pipes LDPE PN 10	HT/KG/KA pipes	PVC pressure pipes PN 10/16	PP + ABS			
DN	DIN	17671	2439 - 41 2448			19500	19522	28610	19831	1230	8074	8074	8074	8074	19534	19532	80778				
3/8	10	12	17.2													16	12				
3/8	12	15														16	20	16	16		
1/2	15	18	21.3													20	25	20	20		
3/4	20	22	26.9	31	90											25	32	25	25		
1	25	28	33.7	38	90											32	40	32	32		
1 ¼	32	35	42.4	46.5	110											40	50	40	40		
1 ½	40	42	42.0 48.3	52.5	110											50	50	50	63	50	50
2	50	54 57	53.0 60.3	65	125	60	58		64	78 +3		63	63	63	75	50 63	63	63	63		
2 ½	65	76.1	76.1	80	140											75	75		63	75	75
2 ½	(70)					80	78		84			75		90		75				75	90
2 ½	(75)									105 +4										90	
3	80	80.0 88.9	88.9	93	160 168 180			98				90	90								
4	100	104.0 108.0 114.3	102.0 108.0 114.3	112 119	180 200	112	110	118	116	132 +5		110/ 125	110						110	110	110

Size in inches	Nominal width	Copper pipes	Steel pipes	Steel pipes with PE coating	Hard PE pipes 1st district heating lines	GA pipes	SML + MI pipes	GGG ductile pressure pipes	Fibre cement pipes	Vitrified clay pipes (normal)	Vitrified clay pipes (reinforced)	PE pipes HDPE PN 2.5/3.2	PE pipes HDPE PN 6	PE pipes LDPE PN	PE pipes LDPE PN 10	HT/KG/KA pipes	PVC pressure pipes PN 10/16	PP + ABS
5	125	130 133	133.0 139.7	137 144	225	137	135	144	141	160 +4		125/ 140	140			125	140	125 140
6	150	154 159	159.0 168.3	163 173	250 266 280	162	160	170	168	187 +4		160	180			160	160 180	160 180
8	200	208 219	219.1	224	315 234	212	210	222	220	242 +5	262 +5	160/ 180	225			200	225	200 225 250
8	(225)				335							200/ 225	250					225 250 280
10	250	267	273	278	400	274	274	274	270	296 +6	318 +6	250/ 280	280			250	280	250 280 315
12	300	324	323.9		450		326	326	322	350 +7	374 +7	315/ 355	355			315	355	315 400
14	350		355.6		500			378	378	404 +7	430 +7		400					355 400
16	400		406.4		560		429	429	432	460 +8	490 +8					400	450	
18	450		457.2		630				486	524 +8	548 +8		450					
20	500		508	670			532	532	573	581 +9	607 +9		560				500 560	
24	600		609.6					635	646	687 +12	721 +12		630			630		
28	700		711.2					738	750	790 +15	831 +15		710					
32	800		812.8					842	856	895 +17	941 +17		800					

Repair clamps

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Characteristics and brief description

1. Clamp/housing
2. Sealing
3. Cap
4. Bolt
5. Nut
6. Washer
7. Retaining clip
8. Screw yoke
9. Side clip
10. Bridge plate
11. Handle



One product for all applications

The repair sealing clamp product line developed by Leschhorn meets the highest material requirements with "Made in Germany" quality. It is suitable for a wide range of applications, such as sealing holes, cracks and porous areas. The non-tensile resistant sealing clamps are delivered ready for installation. This installation can take place even in difficult-to-reach areas without heavy equipment due to their compact design. This often eliminates long lead times in practice, which can save hard cash.

The clamps are available in a broad spectrum of clamping ranges and lengths. The standard clamps are available in a clamping range from 21 mm to 1000 mm. The lengths can be selected from 100 mm to 1000 mm.

We also manufacture special clamps with individual clamping ranges and lengths of up to 2000 mm at the customer's request.

Rust-free material

Nirosta is the best material for manufacturing pipe sealing clamps in terms of rust resistance. All metal parts are therefore made of stainless steel, Nirosta® (stainless steel) material no. 1.4301 (AISI 304, V2A). The clamps are also available in Nirosta® (stainless steel), material no. 1.4401 (AISI 316, V4A) on request.

Lightweight and simple

Compared to cast-iron repair clamps, stainless steel versions have the advantage that fewer bolts and nuts are used. The assembled parts are thus more stable and weigh less, which makes handling during assembly considerably easier.

Welded into one piece

The screws are firmly welded to the clamp to form a unit, so there are no loose parts that could be lost during assembly. The retaining clip and nuts are the only moving parts belonging to the clamp.

The screws are coated with special Teflon to prevent them from becoming stuck to the screw thread. The thread is ½ UNC or ⅝ UNC rolled.

Two welding procedures are used for the Leschhorn repair clamp. The clamp is TIG-welded to the side clips. The screw yokes and bolts are MIG-welded to the side clips.

For optimum corrosion protection, the clamp is completely pickled and passivated after the welding work is complete, i.e., coated with a non-metallic protective layer.

Install in a sufficient manner = Improve profits!

UNC – Unified Coarse Thread product line

American unified coarse thread. The old NC identifier is comparable to the metric thread. The new UNC identifier is comparable to the ISO metric thread. NC and UNC threads are interchangeable, analogous to the metric and ISO metric threads.



All-round sealed rubber

The standard Leschhorn repair clamp seals are made of EPDM, a special synthetic rubber. This meets the requirements of the DVGW Standard W 270 and the KTW recommendation.

The rubber seal is equipped with a grid which is flattened at the ends to ensure proper sealing. The rubber seal is applied uniformly with a special adhesive between the pipe to be sealed and the bridge plate (stainless steel bridge).

The rubber is chemically treated to increase antioxidant activity, which significantly extends its life span and improves its durability. This design allows a radial, uniform clamping force connection and provides a correct fit of the clamp around the pipe to be sealed.

If need be, the repair clamps are also available with an alternative rubber seal, such as an SBR, NBR or VITON® seal.

All rubber materials used comply with the major drinking water regulations from Germany DVGW (KTW, W 270 and W 534), Great Britain (WRAS) and France (ACS). For more information, see page 14.



Identification

All Leschhorn repair clamps are provided with a label containing the most important features of the clamp, such as the type, clamping range, length, material, information on pressure resistance and the kind of pipe contents (water, gas, solids, etc.)

On request, we are also happy to create customised labelling for the clamp which is specially suited to your needs.



The LS 1-H clamp with two handles is also provided with the production date KW/year and an imprint over the direction of rotation.

The plan is to use a QR code with stored assembly instructions. Assistance with the installation is also to be provided at the assembly site using a smartphone.



LS 1-H, the clamps for a particularly assembly-friendly installation

With the LS 1-H repair clamp, Leschhorn, together with Hamburger waterworks, has developed a particularly easy-to-assemble sealing clamp that is user-friendly thanks to its details.

Two 6-mm thick double clips allow the clamp to be mounted with only one hand even when under tension, thus enabling the seal to be applied uniformly over the entire length. The middle bolt on the bolt carrier is extended by approx. 30 mm to allow the clamp to be fixed under tension even more easily. This makes the fastening of a first nut easier, so that the remaining nuts can be conveniently tightened afterwards.

Like the other Leschhorn repair clamps, the LS 1-H has no loose parts that could be lost during assembly. All edges are specially rounded to avoid the risk of injury.

All Leschhorn clamps are provided with a label containing the most important features (length, clamping range, etc.). In addition to the conventional labelling, the LS1-H also contains information on the nominal width, the date of manufacture and the direction of rotation to avoid assembly errors.



Extended bolt and retaining clip for easier assembly under tension

Quality in all parts – The materials used

We only use tested products of the highest quality for the Leschhorn repair sealing clamps. The clamps are manufactured in such a way that they can withstand high loads and thus offer maximum safety for the repair of defective or leaking pipes of all kinds.

Here, you will find the most important explanations regarding the materials used by our company.

Housing, bolts and nuts

Stainless steel material no. 1.4301
(X5CrNi18-10), AISI 304 (V2A)

Description:

Stainless steel with material number 1.4301 is an austenitic, acid-resistant 18-10Cr-Ni steel, and is the first commercial corrosion-resistant steel. As a result of its low carbon content, it is resistant to intercrystalline corrosion after welding at sheet thicknesses of up to 5 mm even without subsequent heat treatment. The weldability is good according to all electrical procedures; gas fusion welding should not be used. AISI 304 is approved for temperatures of up to 600 °C.

Application:

The steel is resistant to water, steam, humidity, food acids and weak organic and inorganic acids and is therefore suitable for a wide range of versatile applications, e.g., in the food industry, during beverage production, in the pharmaceutical and cosmetics industry, for chemical apparatus construction, in architecture, in vehicle construction, for household objects and domestic appliances, for surgical instruments, for cabinet and kitchen construction and in sanitary installations.

This Cr-Ni steel is unsuitable for applications in swimming pools (keyword: stress corrosion).

Stainless steel material no. 1.4401
(X5CrNiMo17-12-2), AISI 316 (V4A)

Application:

According to the DVGW worksheet W541 (the basis for the requirements for pipes made of stainless steels for domestic drinking water installations), steel material 1.4401 is used most frequently alongside 1.4571. This is a chromium-nickel steel with a molybdenum addition. Key selection criteria are the good processing properties and the long-term aspects with regard to corrosion resistance.

AISI

American Iron and Steel Institute –
American material identification for stainless steel.



Sealing sleeve

EPDM – ethylene propylene diene rubber

is a terpolymeric elastomer and is characterised by high resistance to extreme weather conditions, sunlight and moisture. It also has excellent ozone resistance. EPDM is often used for seals, O-rings, etc., due to its high elasticity and resistance to heat, chemicals, hot water and steam. EPDM does not have good resistance to oils and petrol.

HT-EPDM compounds

The upper-temperature limit for the use of EPDM has been extended to 150 °C (long-term) and 170 °C (short-term) with this material. Vulcanisate made from these materials has a high resistance to ageing, a marginal increase in hardness due to ageing and only little permanent deformation, even at temperatures above 130 °C. In practice, the HT compounds are already used for seals and rubberised rollers, but are also breaking new ground for new applications with EPDM in other areas. Special settings of these mixtures are suitable for contact with food.

NBR – nitrile-butadiene rubber

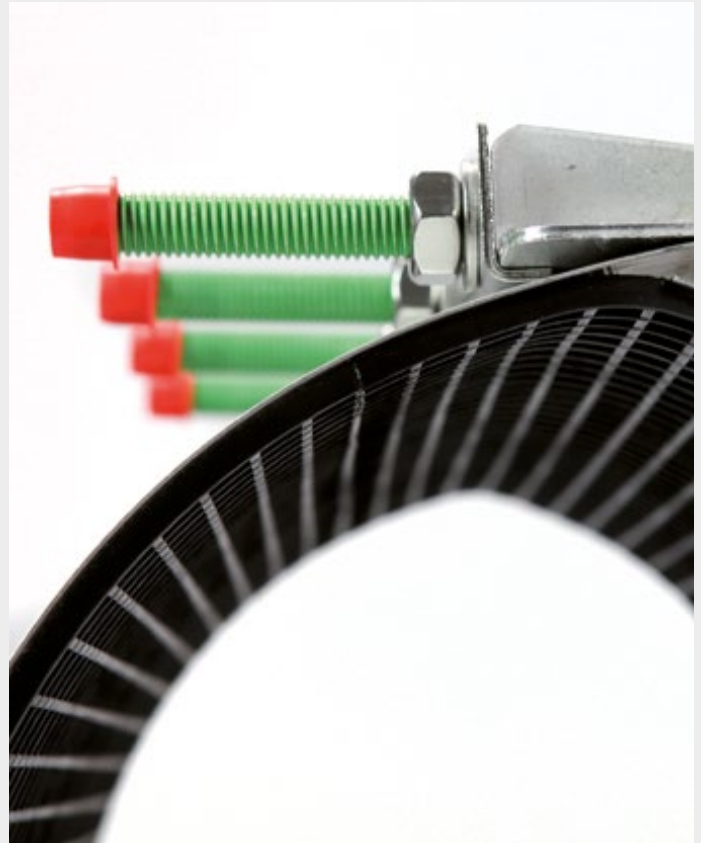
Nitrile rubber is often also known under the brand name Perbunan®. NBR is characterised by good abrasion resistance and good temperature resistance, as well as very good resistance to fuels, mineral oils, lubricating greases, vegetable and animal fats, oils, water, gas and other hydrocarbons.

SBR – styrene-butadiene rubber

It is characterised by good mechanical properties such as high elongation at break and very high strength, impact resilience, abrasion hardness and resistance to ageing. SBR is not very resistant to mineral oils and fats.

FPM

The fluororubber is manufactured from fluorine and rubber and is also known by the name of Viton®. This is a registered trademark of DuPont Performance Elastomers. It is characterised by high thermal and chemical resistance and is used, for example, as an O-ring seal for detachable flange connections.



Standards and guidelines

With the selection of the rubber material, Leschhorn meets the requirements of the market and offers products of the highest quality whose performance and durability comply with international certifications of the major drinking water regulations.

Germany

DVGW – Deutscher Verein des Gas- und Wasserfaches e.V. (German Association for Gas and Water)

Among other things, the association has defined standards such as the DVGW worksheet W 270 and the DVGW worksheet W 534. W 270 includes technical information on the “Propagation of microorganisms on materials for drinking water and their testing and evaluation”. W 534 includes technical information on “Pipe connectors and pipe connections in drinking water installations”.

For more information on the worksheets, visit: www.dvgw-cert.com.

Great Britain:

WRAS – water regulations advisory scheme

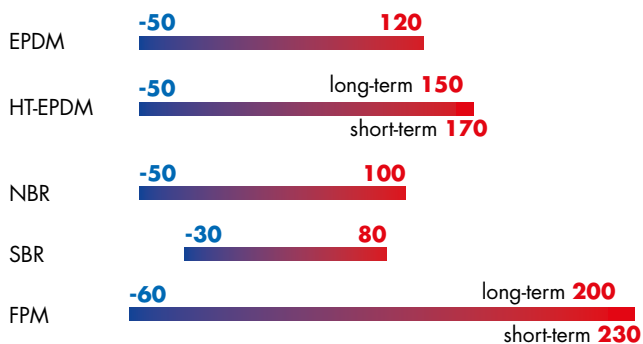
Among other things, the programme develops criteria for testing materials used in water and waste-water technology.

For more information, visit: www.wras.co.uk.

France

ACS = Attestation de conformité sanitaire (Declaration of sanitary conformity) French law from the Ministry of Health, which governs the approval criteria for the use of materials (elastomers) in contact with drinking water.

The seal's temperature resistance



Connection of pipe ends

The Leschhorn repair clamps LS 1, LS 1-H, LS 1 special, LS 2, LS 3, LS 1-A, LS 2-A, and SST are suitable for connecting the following potential applications.



Connection of pipes with different outer diameters



Connection of pipes with an offset



Connection of pipes with a gap between the pipe ends



Connection of pipes with alignment

Overview of the repair clamps

Type	Description	Lengths mm	Clamping ranges mm	Tolerance range mm	Pressure [PN]		Material		Page
					Water	Gas	Housing/ screws	Seal	
 <p>LS 1</p>	One-piece clamp made of one piece without loose parts	100 – 600	21 – 25 to 350 – 360	4 mm (Up to 60 Ø pipe) 7 mm (60 Ø – 05 Ø pipe) 10 mm (Above 105 Ø)	20	6	W 1.4301 (AISI 304) V2A**	EPDM***	22
 <p>LS 1-H</p>	One-piece clamp made of one piece without loose parts, with two handles and an extended bolt for easier assembly	250 – 600	95 – 102 up to 350 – 360	10 (for pipes up to 100 mm)	20	6	W 1.4301 (AISI 304) V2A**	EPDM***	23
 <p>LS 1 special</p>	Clamp made of two single parts with a separate retaining clip and welded bolts; facilitates repair when pipes are close together. Specially developed for district heating.	100 – 600	95 – 102 up to 350 – 360	4 mm (Up to 60 Ø pipe) 7 mm (60 Ø – 105 Ø pipe) 10 mm (Above 105 Ø)	20	6	W 1.4301 (AISI 304) V2A**	EPDM 130 °C	24
 <p>LS 2</p>	Two-piece clamp made of one piece without loose parts	200 – 600	88 – 110 up to 625 – 645	20	16*	4	W 1.4301 (AISI 304) V2A**	EPDM***	25
 <p>LS 3</p>	Three-piece clamp made of one piece without loose parts	300 – 1000	270 – 300 up to 970 – 1000	30	10	3	W 1.4301 (AISI 304) V2A**	EPDM***	26
 <p>LS 1-A</p>	One-piece tapping clamp without loose parts, same design features as LS 1, available with an internal thread (female) and an external thread (male), available in a thread size of 1/2" to 4" inch	100 – 600	46 – 50 to 350 – 360	4 mm (Up to 60 Ø pipe) 7 mm (60 Ø – 105 Ø pipe) 10 mm (Above 105 Ø)	20	6	W 1.4301 (AISI 304) V2A**	EPDM***	27
 <p>LS 2-A</p>	Two-piece tapping clamp, same design features as LS 2, available with an internal thread (female) and an external thread (male), available in a thread size of 1/2" to 4" inch	200 – 800	88 – 110 up to 625 – 645	20 – 40	16*	4	W 1.4301 (AISI 304) V2A**	EPDM***	28
 <p>SST</p>	Consists of two, three or four parts with flange outlet according to the design. A value between DN 40-300 can be selected.	300 – 1000	88 – 110 up to 970 – 1000	20 – 40	16*	4	W 1.4301 (AISI 304) V2A**	EPDM***	30

*Optionally up to 25 bar ** Material no. 1.4401 (AISI 316) V4A is also available on request ***Also available with NBR, SBR or FPM seals

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LS 1



Description

The repair clamp consists of one piece without loose parts.

Length

The LS 1 is available in lengths from 100 mm to 600 mm. For further details, see table.
Other lengths on request.

Tolerance range

The clamps have different tolerance ranges depending on the diameter of the pipes.

Up to 60 mm pipe $\varnothing = 4$ mm tolerance
60 mm to 105 mm pipe $\varnothing = 7$ mm tolerance
Above 105 mm pipe $\varnothing = 10$ mm tolerance

Material

Housing, bolts and nuts:
Standard: Stainless steel, 1.4301, AISI 304
Request: Stainless steel, 1.4401, AISI 316

Rubber:

Standard: EPDM
Request: SBR, NBR, Viton

Pressure

Water pressure up to 20 bar
Gas pressure up to 6 bar
The clamp has a complete all-round seal.

Identification

Label with information on the type, clamping range, length, material, pressure resistance, type of pipe contents (e.g. water, gas)

Clamping range mm	Length mm							DN	Inch	Pressure		
	100	150	200	250	300	400	500			Water	Gas	
21 – 25	100	150	200					20	¾	20	6	
25 – 29	100	150	200					25	1	20	6	
31 – 35	100	150	200					25	1	20	6	
37 – 41	100	150	200					25	1	20	6	
40 – 44	100	150	200					25	1	20	6	
44 – 48	100	150	200					32	1 ¼	20	6	
46 – 50	100	150	200					32	1 ¼	20	6	
48 – 52	100	150	200					40	1 ½	20	6	
54 – 58	100	150	200					40	1 ½	20	6	
57 – 61	100	150	200					50	2	20	6	
58 – 65	100	150	200	250	300	400		50	2	20	6	
60 – 67	100	150	200	250	300	400		50	2	20	6	
63 – 70	100	150	200	250	300	400		50	2	20	6	
67 – 74	100	150	200	250	300	400		50	2	20	6	
70 – 77	100	150	200	250	300	400		65	2 ½	20	6	
73 – 80	100	150	200	250	300	400		65	2 ½	20	6	
76 – 83	100	150	200	250	300	400		65	2 ½	20	6	
80 – 87	100	150	200	250	300	400		65	2 ½	20	6	
82 – 89	100	150	200	250	300	400		65	2 ½	20	6	
87 – 94	100	150	200	250	300	400		80	3	20	5	
91 – 98	100	150	200	250	300	400		80	3	20	5	
95 – 102	100	150	200	250	300	400		80	3	20	5	
102 – 112	100	150	200	250	300	400		80	3	20	5	
106 – 116	100	150	200	250	300	400	500	80	3	16	4	
108 – 118	100	150	200	250	300	400	500	100	4	16	4	
113 – 123	100	150	200	250	300	400	500	100	4	16	4	
116 – 125	100	150	200	250	300	400	500	100	4	16	4	
118 – 128	100	150	200	250	300	400	500	100	4	16	4	
120 – 131	100	150	200	250	300	400	500	100	4	16	4	
125 – 135	100	150	200	250	300	400	500	100	4	16	4	
130 – 140	100	150	200	250	300	400	500	100	4	16	4	
132 – 142	100	150	200	250	300	400	500	125	5	16	4	
135 – 145	100	150	200	250	300	400	500	125	5	16	4	
140 – 150	100	150	200	250	300	400	500	125	5	16	4	
145 – 155		150	200	250	300	400	500	125	5	16	4	
151 – 161		150	200	250	300	400	500	600	125	5	16	4
155 – 165		150	200	250	300	400	500	600	125	5	16	4
159 – 170			200	250	300	400	500	600	150	6	16	4

Clamping range mm	Length mm							DN	Inch	Pressure	
	200	250	300	400	500	600	150			16	4
165 – 175	200	250	300	400	500	600	150	6	16	4	
167 – 177	200	250	300	400	500	600	150	6	16	4	
170 – 180	200	250	300	400	500	600	150	6	16	4	
174 – 184	200	250	300	400	500	600	150	6	16	4	
176 – 186	200	250	300	400	500	600	150	6	16	4	
180 – 191	200	250	300	400	500	600	175	7	16	4	
186 – 196	200	250	300	400	500	600	175	7	16	4	
190 – 200	200	250	300	400	500	600	175	7	16	4	
193 – 203	200	250	300	400	500	600	175	7	16	4	
200 – 210	200	250	300	400	500	600	175	7	16	4	
209 – 220	200	250	300	400	500	600	200	8	16	4	
215 – 225	200	250	300	400	500	600	200	8	16	4	
219 – 229	200	250	300	400	500	600	200	8	16	4	
222 – 233	200	250	300	400	500	600	200	8	16	4	
230 – 240	200	250	300	400	500	600	200	8	16	4	
237 – 247	200	250	300	400	500	600	200	8	10	3	
239 – 249	200	250	300	400	500	600	200	8	10	3	
243 – 254	200	250	300	400	500	600	225	8	10	3	
250 – 260	200	250	300	400	500	600	225	9	10	3	
252 – 263	200	250	300	400	500	600	225	9	10	3	
261 – 271	200	250	300	400	500	600	250	10	10	3	
266 – 276	200	250	300	400	500	600	250	10	10	3	
270 – 280	200	250	300	400	500	600	250	10	10	3	
273 – 283	200	250	300	400	500	600	250	10	10	3	
280 – 291	200	250	300	400	500	600	250	10	10	3	
290 – 300			300	400	500	600	250	10	10	3	
300 – 310			300	400	500	600	250	10	10	3	
305 – 315			300	400	500	600	300	10	10	3	
310 – 320			300	400	500	600	300	10	10	3	
315 – 325			300	400	500	600	300	10	10	3	
320 – 330			300	400	500	600	300	10	10	3	
325 – 335			300	400	500	600	300	10	10	3	
334 – 344			300	400	500	600	300	10	10	3	
340 – 350			300	400	500	600	300	10	10	3	
350 – 360			300	400	500	600	300	10	10	3	

Material

Housing, bolts and nuts:
Standard: Stainless steel, 1.4301, AISI 304
Request: Stainless steel, 1.4401, AISI 316

Rubber:
Standard: EPDM
Request: SBR, NBR, Viton

Pressure

Water pressure up to 20 bar
Gas pressure up to 6 bar
The clamp has a complete all-round seal.

Identification

According to our specifications, the LS 1 H contains the identification: Date of manufacture, direction of rotation, clamping range, area of application, nominal width, PN, standards: DVGW – W 270 and KTW-recommendation.

LS 1-H

Description

The LS 1-H consists of one piece without loose parts. The repair clamps from the LS 1-H product line are equipped with user-friendly details such as two 6 mm thick double clips and a 5 mm retaining clip for optimum handling. All edges are rounded to avoid personal injury.

The middle bolt on the bolt carrier is extended by approx. 30 mm for better assembly. To prevent cold welding, the M12 bolts are in the range DN 80-125 and M16 in the range DN 150. These are fitted with CuNiSi nuts.

Length

The LS 1 is available in lengths from 250 mm to 600 mm. For further details, see table. Other lengths on request.

Tolerance range

For pipes above 100 mm, it has a tolerance range of 10 mm.



Clamping range mm	Length mm					DN	Inch	Pressure	
	250	300	400	500	600			Water	Gas
95 – 102	250	300	400	500	600	80	3	20	5
102 – 112	250	300	400	500	600	80	3	20	5
106 – 116	250	300	400	500	600	80	3	16	4
108 – 118	250	300	400	500	600	100	4	16	4
113 – 123	250	300	400	500	600	100	4	16	4
116 – 125	250	300	400	500	600	100	4	16	4
118 – 128	250	300	400	500	600	100	4	16	4
120 – 131	250	300	400	500	600	100	4	16	4
125 – 135	250	300	400	500	600	100	4	16	4
130 – 140	250	300	400	500	600	100	4	16	4
132 – 142	250	300	400	500	600	125	5	16	4
135 – 145	250	300	400	500	600	125	5	16	4
140 – 150	250	300	400	500	600	125	5	16	4
145 – 155	250	300	400	500	600	125	5	16	4
151 – 161	250	300	400	500	600	125	5	16	4
155 – 165	250	300	400	500	600	125	5	16	4
159 – 170	250	300	400	500	600	150	6	16	4
165 – 175	250	300	400	500	600	150	6	16	4
167 – 177	250	300	400	500	600	150	6	16	4
170 – 180	250	300	400	500	600	150	6	16	4
174 – 184	250	300	400	500	600	150	6	16	4
176 – 186	250	300	400	500	600	150	6	16	4
180 – 191	250	300	400	500	600	175	7	16	4
186 – 196	250	300	400	500	600	175	7	16	4
190 – 200	250	300	400	500	600	175	7	16	4
193 – 203	250	300	400	500	600	175	7	16	4

Clamping range mm	Length mm					DN	Inch	Pressure	
	250	300	400	500	600			Water	Gas
200 – 210	250	300	400	500	600	175	7	16	4
209 – 220	250	300	400	500	600	200	8	16	4
215 – 225	250	300	400	500	600	200	8	16	4
219 – 229	250	300	400	500	600	200	8	16	4
222 – 233	250	300	400	500	600	200	8	16	4
230 – 240	250	300	400	500	600	200	8	16	4
237 – 247	250	300	400	500	600	200	8	10	3
239 – 249	250	300	400	500	600	200	8	10	3
243 – 254	250	300	400	500	600	225	8	10	3
250 – 260		300	400	500	600	225	9	10	3
252 – 263		300	400	500	600	225	9	10	3
261 – 271		300	400	500	600	250	10	10	3
266 – 276		300	400	500	600	250	10	10	3
270 – 280		300	400	500	600	250	10	10	3
273 – 283		300	400	500	600	250	10	10	3
280 – 291		300	400	500	600	250	10	10	3
290 – 300		300	400	500	600	250	10	10	3
300 – 310		300	400	500	600	250	10	10	3
305 – 315		300	400	500	600	300	10	10	3
310 – 320		300	400	500	600	300	10	10	3
315 – 325		300	400	500	600	300	10	10	3
325 – 335		300	400	500	600	300	10	10	3
334 – 344		300	400	500	600	300	10	10	3
340 – 350		300	400	500	600	300	10	10	3
350 – 360		300	400	500	600	300	10	10	3



LS 1 special

Description

The repair clamps consist of two single parts.

Clamp with separate retaining clip and welded bolts.

The construction facilitates repair when pipes are close together. It has been specially developed for district heating (EPDM seal 130 °C).

Length

The LS-1 special is available in lengths from 100 mm to 600 mm.

For further details, see table.

Other lengths on request.

Tolerance range

The clamps have different tolerance ranges depending on the diameter of the pipes.

Up to 60 Ø pipe = tolerance range 4 mm

60 Ø to 105 Ø pipe = tolerance range 7 mm

Above 105 Ø = tolerance range 10 mm

Pressure

Water pressure up to 20 bar

Gas pressure up to 6 bar

The clamp has a complete all-round seal.

Clamping range mm	Length mm							DN	Inch	Pressure		
										Water	Gas	
21 – 25	100	150	200					20	¾	20	6	
25 – 29	100	150	200					25	1	20	6	
31 – 35	100	150	200					25	1	20	6	
37 – 41	100	150	200					25	1	20	6	
40 – 44	100	150	200					25	1	20	6	
44 – 48	100	150	200					32	1 ¼	20	6	
46 – 50	100	150	200					32	1 ¼	20	6	
48 – 52	100	150	200					40	1 ½	20	6	
54 – 58	100	150	200					40	1 ½	20	6	
57 – 61	100	150	200					50	2	20	6	
58 – 65	100	150	200	250	300	400		50	2	20	6	
60 – 67	100	150	200	250	300	400		50	2	20	6	
63 – 70	100	150	200	250	300	400		50	2	20	6	
67 – 74	100	150	200	250	300	400		50	2	20	6	
70 – 77	100	150	200	250	300	400		65	2 ½	20	6	
73 – 80	100	150	200	250	300	400		65	2 ½	20	6	
76 – 83	100	150	200	250	300	400		65	2 ½	20	6	
80 – 87	100	150	200	250	300	400		65	2 ½	20	6	
82 – 89	100	150	200	250	300	400		65	2 ½	20	6	
87 – 94	100	150	200	250	300	400		80	3	20	5	
91 – 98	100	150	200	250	300	400		80	3	20	5	
95 – 102	100	150	200	250	300	400		80	3	20	5	
102 – 112	100	150	200	250	300	400		80	3	20	5	
106 – 116	100	150	200	250	300	400	500	80	3	16	4	
108 – 118	100	150	200	250	300	400	500	100	4	16	4	
113 – 123	100	150	200	250	300	400	500	100	4	16	4	
116 – 125	100	150	200	250	300	400	500	100	4	16	4	
118 – 128	100	150	200	250	300	400	500	100	4	16	4	
120 – 131	100	150	200	250	300	400	500	100	4	16	4	
125 – 135	100	150	200	250	300	400	500	100	4	16	4	
130 – 140	100	150	200	250	300	400	500	100	4	16	4	
132 – 142	100	150	200	250	300	400	500	125	5	16	4	
135 – 145	100	150	200	250	300	400	500	125	5	16	4	
140 – 150	100	150	200	250	300	400	500	125	5	16	4	
145 – 155		150	200	250	300	400	500	125	5	16	4	
151 – 161		150	200	250	300	400	500	600	125	5	16	4

Clamping range mm	Length mm							DN	Inch	Pressure	
										Water	Gas
155 – 165	150	200	250	300	400	500	600	125	5	16	4
159 – 170		200	250	300	400	500	600	150	6	16	4
165 – 175		200	250	300	400	500	600	150	6	16	4
167 – 177		200	250	300	400	500	600	150	6	16	4
170 – 180		200	250	300	400	500	600	150	6	16	4
174 – 184		200	250	300	400	500	600	150	6	16	4
176 – 186		200	250	300	400	500	600	150	6	16	4
180 – 191		200	250	300	400	500	600	175	7	16	4
186 – 196		200	250	300	400	500	600	175	7	16	4
190 – 200		200	250	300	400	500	600	175	7	16	4
193 – 203		200	250	300	400	500	600	175	7	16	4
200 – 210		200	250	300	400	500	600	175	7	16	4
209 – 220		200	250	300	400	500	600	200	8	16	4
215 – 225		200	250	300	400	500	600	200	8	16	4
219 – 229		200	250	300	400	500	600	200	8	16	4
222 – 233		200	250	300	400	500	600	200	8	16	4
230 – 240		200	250	300	400	500	600	200	8	16	4
237 – 247		200	250	300	400	500	600	200	8	10	3
239 – 249		200	250	300	400	500	600	200	8	10	3
243 – 254		200	250	300	400	500	600	225	8	10	3
250 – 260		200	250	300	400	500	600	225	9	10	3
252 – 263		200	250	300	400	500	600	225	9	10	3
261 – 271		200	250	300	400	500	600	250	10	10	3
266 – 276		200	250	300	400	500	600	250	10	10	3
270 – 280		200	250	300	400	500	600	250	10	10	3
273 – 283		200	250	300	400	500	600	250	10	10	3
280 – 291		200	250	300	400	500	600	250	10	10	3
290 – 300				300	400	500	600	250	10	10	3
300 – 310				300	400	500	600	250	10	10	3
305 – 315				300	400	500	600	300	10	10	3
310 – 320				300	400	500	600	300	10	10	3
315 – 325				300	400	500	600	300	10	10	3
320 – 330				300	400	500	600	300	10	10	3
325 – 335				300	400	500	600	300	10	10	3
334 – 344				300	400	500	600	300	10	10	3
340 – 350				300	400	500	600	300	10	10	3
350 – 360				300	400	500	600	300	10	10	3

Length

The LS 2 is available in lengths 200 mm to 700 mm.

For further details, see table. Other lengths on request.

Tolerance range

It has a tolerance range of approx. 20 mm.

Pressure

Water pressure up to 16 bar
(On request: water pressure up to 25 bar)
Gas pressure up to 4 bar
The clamp has a complete all-round seal.

LS 2

Description

The repair clamps consist of two parts.



Clamping range mm	Length mm								DN	Inch	Pressure	
	200	250	300	400	500	600	700	Water			Gas	
88 – 110	200	250	300	400	500	600	700	80	3	16	4	
100 – 120	200	250	300	400	500	600	700	80	3	16	4	
108 – 128	200	250	300	400	500	600	700	100	4	16	4	
114 – 134	200	250	300	400	500	600	700	100	4	16	4	
120 – 140	200	250	300	400	500	600	700	100	4	16	4	
130 – 150	200	250	300	400	500	600	700	100	4	16	4	
133 – 153	200	250	300	400	500	600	700	125	5	16	4	
135 – 155	200	250	300	400	500	600	700	125	5	16	4	
140 – 160	200	250	300	400	500	600	700	125	5	16	4	
159 – 180	200	250	300	400	500	600	700	150	6	16	4	
165 – 185	200	250	300	400	500	600	700	150	6	16	4	
168 – 189	200	250	300	400	500	600	700	150	6	16	4	
170 – 190	200	250	300	400	500	600	700	150	6	16	4	
176 – 196	200	250	300	400	500	600	700	150	6	16	4	
180 – 200	200	250	300	400	500	600	700	150	6	16	4	
190 – 210	200	250	300	400	500	600	700	175	7	16	4	
195 – 215	200	250	300	400	500	600	700	175	7	16	4	
205 – 225	200	250	300	400	500	600	700	175	7	16	4	
210 – 230	200	250	300	400	500	600	700	200	8	16	4	
216 – 238	200	250	300	400	500	600	700	200	8	16	4	
225 – 246	200	250	300	400	500	600	700	200	8	16	4	
230 – 250	200	250	300	400	500	600	700	200	8	16	4	
240 – 260	200	250	300	400	500	600	700	225	9	16	4	
250 – 270	200	250	300	400	500	600	700	225	9	16	4	
260 – 280	200	250	300	400	500	600	700	225	9	16	4	
269 – 289	200	250	300	400	500	600	700	225	9	16	4	

Clamping range mm	Length mm								DN	Inch	Pressure	
	200	250	300	400	500	600	700	Water			Gas	
273 – 293	200	250	300	400	500	600	700	250	10	16	4	
282 – 302	200	250	300	400	500	600	700	250	10	16	4	
295 – 315	200	250	300	400	500	600	700	250	10	16	4	
315 – 335	200	250	300	400	500	600	700	300	12	10	3	
322 – 344	200	250	300	400	500	600	700	300	12	10	3	
337 – 358	200	250	300	400	500	600	700	300	12	10	3	
347 – 367	200	250	300	400	500	600	700	350	14	10	3	
365 – 385			300	400	500	600	700	350	14	10	3	
382 – 402			300	400	500	600	700	350	14	10	3	
395 – 415			300	400	500	600	700	350	14	10	3	
400 – 420			300	400	500	600	700	350	14	10	3	
404 – 424			300	400	500	600	700	400	16	10	3	
410 – 430			300	400	500	600	700	400	16	10	3	
420 – 440			300	400	500	600	700	400	16	10	3	
435 – 455				400	500	600	700	400	16	10	3	
450 – 470				400	500	600	700	400	16	10	3	
457 – 477				400	500	600	700	450	18	10	3	
468 – 488				400	500	600	700	450	18	10	3	
500 – 520				400	500	600	700	500	20	10	3	
510 – 530				400	500	600	700	500	20	10	3	
520 – 540				400	500	600	700	500	20	10	3	
545 – 565				400	500	600	700	550	22	6	1	
570 – 590				400	500	600	700	550	22	6	1	
590 – 610				400	500	600	700	550	22	6	1	
600 – 620				400	500	600	700	600	24	6	1	
625 – 645				400	500	600	700	600	24	6	1	

LS 3

Description

The repair clamps consist of three parts.



Length

The LS 3 is available in lengths from 300 mm to 1000 mm.

For further details, see table.

Other lengths on request.

Tolerance range

It has a tolerance range of approx. 30 mm.

Pressure

Water pressure up to 10 bar

Gas pressure at 3 bar

The clamp has a complete all-round seal.

Clamping range mm	Length mm							DN	Inch	Pressure	
	300	400	500	600	700	800	Water			Gas	
270 – 300	300	400	500	600	700	800		250	10	10	3
300 – 330	300	400	500	600	700	800		250	10	10	3
310 – 340	300	400	500	600	700	800		300	12	10	3
335 – 365	300	400	500	600	700	800		300	12	10	3
340 – 370	300	400	500	600	700	800		350	14	10	3
360 – 390	300	400	500	600	700	800		350	14	10	3
385 – 415	300	400	500	600	700	800		350	14	10	3
395 – 425	300	400	500	600	700	800		350	14	10	3
400 – 430	300	400	500	600	700	800		400	16	10	3
410 – 440	300	400	500	600	700	800		400	16	10	3
420 – 450	300	400	500	600	700	800		400	16	10	3
435 – 465	300	400	500	600	700	800		400	16	10	3
440 – 470	300	400	500	600	700	800		450	18	10	3
460 – 490	300	400	500	600	700	800		450	18	10	3
475 – 505	300	400	500	600	700	800		450	18	6	2
485 – 515	300	400	500	600	700	800		500	20	6	2
510 – 540	300	400	500	600	700	800		500	20	6	2
530 – 560	300	400	500	600	700	800		500	20	6	2
535 – 565	300	400	500	600	700	800		500	20	6	2
560 – 590	300	400	500	600	700	800		500	20	6	2
570 – 600	300	400	500	600	700	800		500	20	6	2
585 – 615		400	500	600	700	800		600	24	6	2
600 – 630		400	500	600	700	800		600	24	6	2
610 – 640		400	500	600	700	800		600	24	6	2

Clamping range mm	Length mm							DN	Inch	Pressure	
	400	500	600	700	800	900	1000			Water	Gas
620 – 650	400	500	600	700	800			600	24	6	2
630 – 660	400	500	600	700	800			600	24	6	2
650 – 680	400	500	600	700	800			600	24	4	–
685 – 715	400	500	600	700	800			600	24	4	–
700 – 730		500	600	700	800	900	1000	700	28	4	–
705 – 735		500	600	700	800	900	1000	700	28	4	–
710 – 740		500	600	700	800	900	1000	700	28	4	–
730 – 760		500	600	700	800	900	1000	700	28	4	–
747 – 777		500	600	700	800	900	1000	750	30	4	–
750 – 780		500	600	700	800	900	1000	750	30	4	–
780 – 810		500	600	700	800	900	1000	750	30	4	–
805 – 835			600	700	800	900	1000	800	32	3	–
810 – 840			600	700	800	900	1000	800	32	3	–
835 – 865			600	700	800	900	1000	800	32	3	–
850 – 880			600	700	800	900	1000	800	32	2	–
865 – 895			600	700	800	900	1000	800	32	2	–
900 – 930				700	800	900	1000	900	36	2	–
925 – 955				700	800	900	1000	900	36	2	–
945 – 975				700	800	900	1000	900	36	2	–
970 – 1000				700	800	900	1000	900	36	2	–
995 – 1025				700	800	900	1000	1000	40	2	–
1020 – 1050				700	800	900	1000	1000	40	2	–

Length

The LS 1-A is available in lengths from 100 mm to 600 mm.
Other lengths on request.

Tolerance range

The clamps have different tolerance ranges depending on the diameter of the pipes.

Ø pipe:	Tolerance range:
Up to 61 Ø	4 mm
Up to 105 Ø	7 mm
Above 105 Ø	10 mm

Pressure

Water pressure up to 20 bar
Gas pressure up to 6 bar

LS 1-A

Description

The tapping clamp consists of one piece without loose parts and has the same design features as the standard type LS 1.

Outlets

Thread outlets with an internal or external thread.

Available from 1/2" inch to 4" inches.

The internal or external thread of the collar conforms to DIN 2999.

Material made of stainless steel allows tapping under pressure.



LS 1-A with a 1-inch internal thread (IG)



LS 1-A with a 1-inch external thread (AG)

Internal or external thread
Outlets in inches

1/2	1 1/4	2 1/2
3/4	1 1/2	3
1	2	4

Clamping range mm	Length mm						DN	Inch	Pressure			
									Water	Gas		
46 – 50	100	150					32	1 1/4	20	6		
48 – 52	100	150	200				40	1 1/2	20	6		
54 – 58	100	150	200				40	1 1/2	20	6		
57 – 61	100	150	200				50	2	20	6		
58 – 65	100	150	200	250	300	400	50	2	20	6		
60 – 67	100	150	200	250	300	400	50	2	20	6		
63 – 70	100	150	200	250	300	400	50	2	20	6		
67 – 74	100	150	200	250	300	400	50	2	20	6		
70 – 77	100	150	200	250	300	400	65	2 1/2	20	6		
73 – 80	100	150	200	250	300	400	65	2 1/2	20	6		
76 – 83	100	150	200	250	300	400	65	2 1/2	20	6		
80 – 87	100	150	200	250	300	400	65	2 1/2	20	6		
82 – 89	100	150	200	250	300	400	65	2 1/2	20	6		
87 – 94	100	150	200	250	300	400	80	3	20	5		
91 – 98	100	150	200	250	300	400	80	3	20	5		
95 – 102	100	150	200	250	300	400	80	3	20	5		
102 – 112	100	150	200	250	300	400	80	3	20	5		
106 – 116	100	150	200	250	300	400	80	3	16	4		
108 – 118	100	150	200	250	300	400	100	4	16	4		
113 – 123	100	150	200	250	300	400	100	4	16	4		
116 – 125	100	150	200	250	300	400	100	4	16	4		
118 – 128	100	150	200	250	300	400	100	4	16	4		
120 – 131	100	150	200	250	300	400	100	4	16	4		
125 – 135	100	150	200	250	300	400	100	4	16	4		
130 – 140	100	150	200	250	300	400	100	4	16	4		
132 – 142	100	150	200	250	300	400	125	5	16	4		
135 – 145	100	150	200	250	300	400	125	5	16	4		
140 – 150	100	150	200	250	300	400	125	5	16	4		
145 – 155		150	200	250	300	400	125	5	16	4		
151 – 161		150	200	250	300	400	600	125	5	16	4	
155 – 165		150	200	250	300	400	500	125	5	16	4	
159 – 170			200	250	300	400	500	600	150	6	16	4
165 – 175			200	250	300	400	500	600	150	6	16	4
167 – 177			200	250	300	400	500	600	150	6	16	4

Clamping range mm	Length mm						DN	Inch	Pressure			
									Water	Gas		
170 – 180			200	250	300	400	500	600	150	6	16	4
174 – 184			200	250	300	400	500	600	150	6	16	4
176 – 186			200	250	300	400	500	600	150	6	16	4
180 – 191			200	250	300	400	500	600	175	7	16	4
186 – 196			200	250	300	400	500	600	175	7	16	4
190 – 200			200	250	300	400	500	600	175	7	16	4
193 – 203			200	250	300	400	500	600	175	7	16	4
200 – 210			200	250	300	400	500	600	175	7	16	4
209 – 220			200	250	300	400	500	600	200	8	16	4
215 – 225			200	250	300	400	500	600	200	8	16	4
219 – 229			200	250	300	400	500	600	200	8	16	4
222 – 233			200	250	300	400	500	600	200	8	16	4
230 – 240			200	250	300	400	500	600	200	8	16	4
237 – 247			200	250	300	400	500	600	200	8	10	3
239 – 249			200	250	300	400	500	600	200	8	10	3
243 – 254			200	250	300	400	500	600	225	8	10	3
250 – 260			200	250	300	400	500	600	225	9	10	3
252 – 263			200	250	300	400	500	600	225	9	10	3
261 – 271			200	250	300	400	500	600	250	10	10	3
266 – 276			200	250	300	400	500	600	250	10	10	3
270 – 280			200	250	300	400	500	600	250	10	10	3
273 – 283			200	250	300	400	500	600	250	10	10	3
280 – 291			200	250	300	400	500	600	250	10	10	3
290 – 300				300	400	500	600	250	10	10	3	
300 – 310				300	400	500	600	250	10	10	3	
305 – 315				300	400	500	600	300	10	10	3	
310 – 320				300	400	500	600	300	10	10	3	
315 – 325				300	400	500	600	300	10	10	3	
320 – 330				300	400	500	600	300	10	10	3	
325 – 335				300	400	500	600	300	10	10	3	
334 – 344				300	400	500	600	300	10	10	3	
340 – 350				300	400	500	600	300	10	10	3	
350 – 360				300	400	500	600	300	10	10	3	



LS 2-A

Description

The tapping clamp consists of two pieces without loose parts and has the same design features as the standard type LS 2.

Outlets

Thread outlets with an internal or external thread. For a figure of the thread outlets, see LS 1-A, page 21.

Available from 1/2" inch to 4" inches.

The internal thread or external thread of the collar conforms to DIN 2999.

Material made of stainless steel allows tapping under pressure.



High-pressure clamp up to 25 bar. Edge folding prevents the rubber seal from shifting under high pressure

Length

The LS 2-A is available in lengths from 200 mm to 800 mm.

For further details, see table. Other lengths on request.

Tolerance range

According to the design, the two-piece tapping clamp has a tolerance range of approx. 20 mm and can therefore be used on various AZ, steel or cast iron pipes.

Pressure

Water pressure up to 16 bar
(On request: water pressure up to 25 bar)
Gas pressure up to 4 bar

Internal or external thread outlets in inches		
1/2	1 1/4	2 1/2
3/4	1 1/2	3
1	2	4

Clamping range mm	Length mm								DN	Inch	Pressure	
	200	250	300	400	500	600	700	800			Water	Gas
88 – 110	200	250	300	400	500	600	700	80	3	16	4	
100 – 120	200	250	300	400	500	600	700	80	3	16	4	
108 – 128	200	250	300	400	500	600	700	100	4	16	4	
114 – 134	200	250	300	400	500	600	700	100	4	16	4	
120 – 140	200	250	300	400	500	600	700	100	4	16	4	
130 – 150	200	250	300	400	500	600	700	100	4	16	4	
133 – 153	200	250	300	400	500	600	700	125	5	16	4	
135 – 155	200	250	300	400	500	600	700	125	5	16	4	
140 – 160	200	250	300	400	500	600	700	125	5	16	4	
159 – 180	200	250	300	400	500	600	700	150	6	16	4	
165 – 185	200	250	300	400	500	600	700	150	6	16	4	
168 – 189	200	250	300	400	500	600	700	150	6	16	4	
170 – 190	200	250	300	400	500	600	700	150	6	16	4	
176 – 196	200	250	300	400	500	600	700	150	6	16	4	
180 – 200	200	250	300	400	500	600	700	150	6	16	4	
190 – 210	200	250	300	400	500	600	700	175	7	16	4	
195 – 215	200	250	300	400	500	600	700	175	7	16	4	
205 – 225	200	250	300	400	500	600	700	175	7	16	4	
210 – 230	200	250	300	400	500	600	700	200	8	16	4	
216 – 238	200	250	300	400	500	600	700	200	8	16	4	
225 – 246	200	250	300	400	500	600	700	200	8	16	4	
230 – 250	200	250	300	400	500	600	700	200	8	16	4	
240 – 260	200	250	300	400	500	600	700	225	9	16	4	
250 – 270	200	250	300	400	500	600	700	225	9	16	4	
260 – 280	200	250	300	400	500	600	700	225	9	16	4	
269 – 289	200	250	300	400	500	600	700	225	9	16	4	

Clamping range mm	Length mm								DN	Inch	Pressure	
	200	250	300	400	500	600	700	800			Water	Gas
273 – 293	200	250	300	400	500	600	700	250	10	16	4	
282 – 302	200	250	300	400	500	600	700	250	10	16	4	
295 – 315	200	250	300	400	500	600	700	250	10	16	4	
315 – 335	200	250	300	400	500	600	700	300	12	10	3	
322 – 344	200	250	300	400	500	600	700	300	12	10	3	
337 – 358	200	250	300	400	500	600	700	300	12	10	3	
347 – 367	200	250	300	400	500	600	700	350	14	10	3	
365 – 385			300	400	500	600	700	350	14	10	3	
382 – 402			300	400	500	600	700	350	14	10	3	
395 – 415			300	400	500	600	700	350	14	10	3	
400 – 420			300	400	500	600	700	350	14	10	3	
404 – 424			300	400	500	600	700	400	16	10	3	
410 – 430			300	400	500	600	700	400	16	10	3	
420 – 440			300	400	500	600	700	400	16	10	3	
435 – 455				400	500	600	700	400	16	10	3	
450 – 470				400	500	600	700	400	16	10	3	
457 – 477				400	500	600	700	450	18	10	3	
468 – 488				400	500	600	700	450	18	10	3	
500 – 520				400	500	600	700	500	20	10	3	
510 – 530				400	500	600	700	500	20	10	3	
520 – 540				400	500	600	700	500	20	10	3	
545 – 565				400	500	600	700	550	22	6	1	
570 – 590				400	500	600	700	550	22	6	1	
590 – 610				400	500	600	700	550	22	6	1	
600 – 620				400	500	600	700	600	24	6	1	
625 – 645				400	500	600	700	600	24	6	1	

A large grid of small dots for taking notes, covering the majority of the page.



SST

Description

Depending on the design, the repair clamp consists of two, three or four parts and has a flanged outlet to couple pipes. The complete all-round seal ensures a tapping of the pipe under pressure without the risk of bursting a pipe.

Length and flange outlets

The SST is available in lengths from 300 mm to 1000 mm.

The flange outlets can be selected between a nominal width of DN 40-300. For further details, see table. Other lengths on request.

Tolerance range

According to the design, the two-piece, three-piece or four-piece tapping clamp has a tolerance range of approx. 20-40 mm and can therefore be used on various AZ, steel or cast iron pipes.

Clamping range mm	Length mm						Flange outlet DN								DN	Inch	Pressure			
																	Water	Gas		
88 – 110	300	400	500	600			40	50	65	80				80	3	16	4			
100 – 120	300	400	500	600			40	50	65	80				80	3	16	4			
108 – 128	300	400	500	600			40	50	65	80				100	4	16	4			
114 – 134	300	400	500	600			40	50	65	80				100	4	16	4			
120 – 140	300	400	500	600			40	50	65	80				100	4	16	4			
130 – 150	300	400	500	600			40	50	65	80				100	4	16	4			
133 – 153	300	400	500	600			40	50	65	80	100			125	5	16	4			
135 – 155	300	400	500	600			40	50	65	80	100			125	5	16	4			
140 – 160	300	400	500	600			40	50	65	80	100			125	5	16	4			
159 – 180	300	400	500	600			40	50	65	80	100	125	150	150	6	16	4			
165 – 185	300	400	500	600			40	50	65	80	100	125	150	150	6	16	4			
168 – 190	300	400	500	600			40	50	65	80	100	125	150	150	6	16	4			
170 – 190	300	400	500	600			40	50	65	80	100	125	150	150	6	16	4			
176 – 196	300	400	500	600			40	50	65	80	100	125	150	150	6	16	4			
180 – 200	300	400	500	600			40	50	65	80	100	125	150	150	6	16	4			
190 – 210	300	400	500	600			40	50	65	80	100	125	150	175	7	16	4			
195 – 215	300	400	500	600			40	50	65	80	100	125	150	175	7	16	4			
205 – 225	300	400	500	600			40	50	65	80	100	125	150	175	7	16	4			
210 – 230	300	400	500	600			40	50	65	80	100	125	150	200	8	16	4			
216 – 238	300	400	500	600			40	50	65	80	100	125	150	200	8	16	4			
225 – 246	300	400	500	600			40	50	65	80	100	125	150	200	8	16	4			
230 – 250	300	400	500	600			40	50	65	80	100	125	150	200	8	16	4			
240 – 260	300	400	500	600			40	50	65	80	100	125	150	200	225	9	16	4		
250 – 270	300	400	500	600			40	50	65	80	100	125	150	200	250	225	9	16	4	
260 – 280	300	400	500	600			40	50	65	80	100	125	150	200	250	225	9	16	4	
269 – 289	300	400	500	600			40	50	65	80	100	125	150	200	250	225	9	16	4	
273 – 293	300	400	500	600			40	50	65	80	100	125	150	200	250	250	10	16	4	
282 – 302	300	400	500	600			40	50	65	80	100	125	150	200	250	250	10	16	4	
295 – 315	300	400	500	600			40	50	65	80	100	125	150	200	250	250	10	16	4	
315 – 335	300	400	500	600						80	100	125	150	200	250	300	12	10	3	
322 – 344	300	400	500	600						80	100	125	150	200	250	300	12	10	3	
337 – 358		400	500	600	700	800				80	100	125	150	200	250	300	300	12	10	3
347 – 367		400	500	600	700	800				80	100	125	150	200	250	300	350	14	10	3
350 – 370		400	500	600	700	800				80	100	125	150	200	250	300	350	14	10	3
360 – 380		400	500	600	700	800				80	100	125	150	200	250	300	350	14	10	3
365 – 385		400	500	600	700	800				80	100	125	150	200	250	300	350	14	10	3

Pressure

Water pressure up to 16 bar
(On request: water pressure up to 25 bar)
Gas pressure up to 4 bar

Clamping range mm	Length mm					Flange outlet DN								DN	Inch	Pressure				
																Water	Gas			
382 – 402	400	500	600	700	800					80	100	125	150	200	250	300	350	14	10	3
396 – 420	400	500	600	700	800					80	100	125	150	200	250	300	350	14	10	3
404 – 424	400	500	600	700	800					80	100	125	150	200	250	300	400	16	10	3
410 – 430		500	600	700	800					80	100	125	150	200	250	300	400	16	10	3
420 – 440		500	600	700	800					80	100	125	150	200	250	300	400	16	10	3
435 – 455		500	600	700	800					80	100	125	150	200	250	300	400	16	10	3
450 – 470		500	600	700	800					80	100	125	150	200	250	300	400	16	10	3
468 – 488		500	600	700	800					80	100	125	150	200	250	300	450	18	10	3
485 – 505		500	600	700	800					80	100	125	150	200	250	300	450	18	10	3
500 – 520		500	600	700	800					80	100	125	150	200	250	300	500	20	10	3
516 – 536		500	600	700	800					80	100	125	150	200	250	300	500	20	10	3
532 – 552		500	600	700	800					80	100	125	150	200	250	300	500	20	10	3
545 – 575		500	600	700	800					80	100	125	150	200	250	300	500	20	6	2
570 – 600		500	600	700	800	1000				80	100	125	150	200	250	300	500	20	6	2
585 – 615		500	600	700	800	1000				80	100	125	150	200	250	300	600	24	6	2
610 – 640			600	700	800	1000				80	100	125	150	200	250	300	600	24	6	2
630 – 660			600	700	800	1000				80	100	125	150	200	250	300	600	24	6	2
650 – 680			600	700	800	1000				80	100	125	150	200	250	300	600	24	6	2
668 – 698			600	700	800	1000				80	100	125	150	200	250	300	600	24	6	2
685 – 715			600	700	800	1000				80	100	125	150	200	250	300	600	24	4	–
708 – 738			600	700	800	1000				80	100	125	150	200	250	300	700	28	4	–
728 – 758			600	700	800	1000				80	100	125	150	200	250	300	700	28	4	–
747 – 777			600	700	800	1000				80	100	125	150	200	250	300	750	30	4	–
768 – 798			600	700	800	1000				80	100	125	150	200	250	300	750	30	4	–
780 – 810			600	700	800	1000				80	100	125	150	200	250	300	750	30	4	–
805 – 835			600	700	800	1000				80	100	125	150	200	250	300	800	32	3	–
810 – 840			600	700	800	1000				80	100	125	150	200	250	300	800	32	3	–
835 – 865			600	700	800	1000				80	100	125	150	200	250	300	800	32	3	–
850 – 880			600	700	800	1000				80	100	125	150	200	250	300	800	32	2	–
865 – 895			600	700	800	1000				80	100	125	150	200	250	300	800	32	2	–
880 – 910			600	700	800	1000				80	100	125	150	200	250	300	800	32	2	–
900 – 930			600	700	800	1000				80	100	125	150	200	250	300	900	36	2	–
925 – 955			600	700	800	1000				80	100	125	150	200	250	300	900	36	2	–
945 – 975			600	700	800	1000				80	100	125	150	200	250	300	900	36	2	–
970 – 1000			600	700	800	1000				80	100	125	150	200	250	300	900	36	2	–



Open-ended spanner set

DIN 3113 type A – ISO 3318

Short version
Ring side with energy profile 15° angled

Chrome-plated
Chrome-vanadium steel

Heads, ground



Identification

No.: 280/8 KT
Contents: 8, 9, 10, 11, 13,
14, 17, 19, 21 mm
Weight: 750 g/set



Ratschfix spanner set

Open-ended combination spanner

Ring side with energy profile 15° angled
Length pursuant to DIN 3113 A

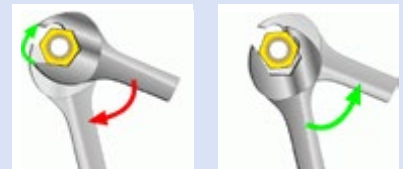
Chrome-plated
Chrome-vanadium steel

Heads, ground



Identification

No.: 280/R 8KT
Contents: 9, 10, 11, 13,
14, 17, 19, 21 mm
Weight: 860 g/set



280/R 8KT sales box 8-piece



Double ring spanner set

DIN 838 – ISO 3318

Offset

Chrome-plated
Chrome-vanadium steel

Rings, ground
mm sizes with energy profile



Identification

No.: 380/8 KT
Contents: 6x7, 8x9, 10x11,
12x13, 14x15,
16x17, 18x19, 20x22 mm
Weight: 1450 g/set

380/8 KT sales box 8-piece, offset

Manufacturer information



The name Carl Walter stands for quality and reliability. With almost 100 years of company history, the company can look back on a long tradition and an abundance of experience in tool manufacturing.

The research and development department is constantly working on designing new and innovative products. In doing so, great importance is attached to quality assurance.

The quality management already introduced in 1995 is officially confirmed with the successful certification pursuant to DIN EN ISO 9001:2008.

You can purchase the entire Walter product range from Leschhorn as an authorised sales partner.

Find this and more information on our website at www.leschhorn.de.

If you have any questions, feel free to call us – we will be happy to advise you!
+49 69 420 976-0

Identification

No.	2391/130
Type	1300TQW
Range (Nm)	301–30
Outlet square drive	12.5 (1/2")
L	470
Weight (g)	1100

Torquik W torque spanner

For the workshop

Triggering torque spanner
Right-hand and left-hand rotation

Accuracy better than $\pm 4\%$
Double scale (Nm/ft.lb.)

With change-over ratchet



Identification

No.	2393/220
Type	2200TQR
Range (Nm)	40–220
Scaling	10
Outlet square drive	12.5 (1/2")
L	530
Weight (g)	1250

Torquik R torque spanner

For industry and assembly

Triggering torque spanner
Ergonomic handle
Right-hand and left-hand rotation

Accuracy better than $\pm 4\%$
Double scale (Nm/ft.lb.)

With change-over ratchet



Identification

No.	2389/220
Type	2200TQV
Range (Nm)	40–220
Inlet square drive	14x18
L	500
Weight (g)	1150

Torquik V torque spanner

For every application

Triggering torque spanner
For plug-in tools

Ergonomic handle
Right-hand and left-hand rotation

Accuracy better than $\pm 4\%$
Double scale (Nm/ft.lb.)





Model range Circometer CJU

Circumferential tape measure for measuring the outer circumference and diameter, Scale line distance 1 mm, with vernier scale, 0.1 mm reading.
Test certificate available on request.

Info
Type A: Steel
Type B: rust-free



Measurement range Circumference mm	Measurement range Diameter mm	No.
60 – 950	20 – 300	CJU 950
940 – 2200	300 – 700	CJU 2200
2190 – 3460	700 – 1100	CJU 3460
3450 – 4720	1100 – 1500	CJU 4720
4710 – 5980	1500 – 1900	CJU 5980
5970 – 7230	1900 – 2300	CJU 7230
7220 – 8500	2300 – 2700	CJU 8500
8490 – 9760	2700 – 3100	CJU 9760
9730 – 11010	3100 – 3500	CJU 11010
– 23550	– 7500	CJU 23550

Measurement range Circumference [inch]	Measurement range Diameter [inch]	No.
2 – 38	0.7 – 12.0	CJU 38
37 – 87	11.8 – 27.7	CJU 87



Model range C

Circumferential tape measure for measuring the outer diameter, scale line distance 1 mm, with vernier scale, reading 0.05 mm.
Test certificate available on request.

Info
Type A: Steel
Type B: rust-free



Measurement range mm	No.
15 – 115	C 115
100 – 230	C 230
200 – 330	C 330

Manufacturer information



OSKAR SCHWENK is one of the oldest manufacturers of precision measuring instruments and can look back on 90 years of manufacturing experience.

As early as 1921, the company founder OSKAR SCHWENK developed and manufactured the first SUBITO®. In the meantime, this product has become a worldwide byword and benchmark for a two-point internal comparison measuring instrument with the highest precision.

Today, Schwenk stands for the highest quality in the sector of measuring instruments.

You can purchase the complete Schwenk product range from Leschhorn as an authorised sales partner.

Find this and more information on our website at www.leschhorn.de.

If you have any questions, feel free to call us – we will be happy to advise you!
+49 69 420 976-0

A large grid of small dots for taking notes, covering the majority of the page area.

Assembly instructions for non tensile-resistant repair clamps.

Applies to all clamps from the LS product line.

Instructions for pipes made of steel, GA and AZ. Stoneware, cast iron, fibre cement and PVC. Not suitable for the tensile-resistant connection of two pipes or a broken pipe.

Note:

If you have to repair plastic pipes, please get in touch with us first. In this case, it may be necessary to use an inner support ring.

01. Clamp/housing
02. Sealing
03. Cap
04. Bolt
05. Nut
06. Washer
07. Retaining clip
08. Screw yoke
09. Side clip
10. Bridge plate
11. Handle



Step 1:

Measure the pipe diameter and check the correct size of the repair clamp. Before fitting the clamp, clean the pipe thoroughly to remove all dirt and rust so that the surface is smooth and free of loose dirt particles. It is best to use soapy water for this purpose.

This process improves the adhesion of the clamp to the pipe and thus increases the clamp's sealability. Never use grease on the sealing material, bolts or nuts.

Videos on correct assembly

If you prefer to watch a video on how to mount the clamp correctly, simply scan the corresponding QR code with a smartphone.

Still no QR code reader? You can find numerous readers, for example, in the AppStore or on AndroidPit.

Step 2:

Loosen the nuts until the end of the threaded bolt, but not completely. This prevents the loss of loose parts.

Tip:

It is best to mark the pipe at the point where the ends of the burst pipe clamp are supposed to be placed. This makes it possible to see whether the clamp has actually been fastened in the correct position after assembly.

LS 1:

Unfold the clamp and place it around the leak in the pipe. Press the retaining clip onto the screw yoke's section to close the clamp.

LS 2:

Open the clamp and place part 1 on the pipe around the leak. Then pass part 2 under the pipe. Hook the retaining clip into a side clip on one side. Press the retaining clip onto the second screw yoke's section to close the clamp.



Step 2:

LS 3:

Open the clamp and place part 1 on the pipe around the leak. Hook the bolt and retaining clip of part 2 into a screw yoke of part 1. Now, add part 3. First, hook in the bolt and retaining clip into part 2 for this purpose. Finally, clamp part 3 around the pipe and hook it into the screw yoke of part 1.



LS 1 special:

Open the clamp and place part 1 on the pipe around the leak. Hook part 2 into the clip (a) of part 1. Press the retaining clip onto the screw yoke's section of part 1 to close the clamp.



Step 3:

When closing the clamp, make sure that the bridge plate between the pipe and clamp is inserted wrinkle-free without creasing the flattened ends of the rubber seal. If the clamp fits properly, loosely tighten the nuts one after the other.



Step 4:

Then tighten the nuts gradually and uniformly. For this, use a torque spanner with a length of at least 300 mm. The gradual tightening of the nuts stabilises the retaining clip on the side clip. Use the following torques for fastening:

- M12 – 65 Nm, spanner no. 19
- M14 – 85 Nm, spanner no. 22
- M16 – 110 Nm, spanner no. 24



Step 5:

Before filling the hole in the ground, check the pressure tightness of the tightened clamp and perform a pressure test. If the pipe is still leaking, repeat the previous steps.

Step 6:

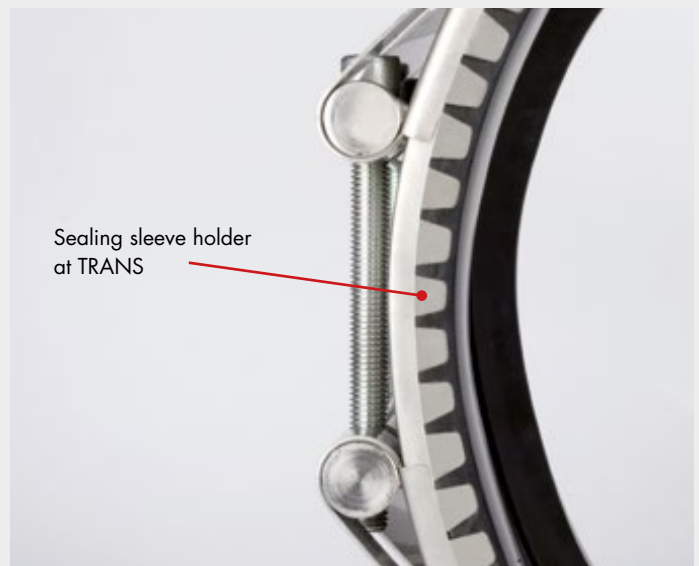
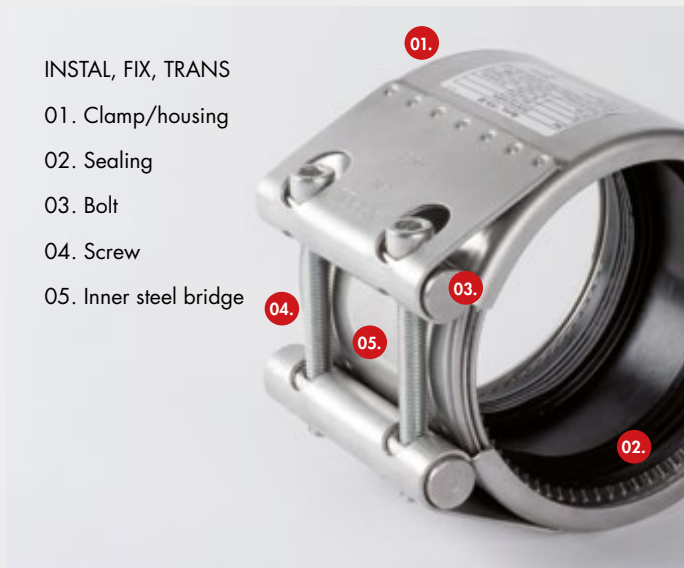
To ensure reliable sealing of the clamp, wait 30 minutes at the end of assembly and retighten the nuts to the prescribed torque. Then fill the hole in the ground and press the soil firmly around the repair clamp.

Pipe connections

» Characteristics and brief description	40
» Areas of application	41
» Materials	42
» Tolerances	43
» Sealing and anchorage	44
» Overview of the pipe couplings	45
» INSTAL product line	46
» FIX product line	52
» TRANS product line	57
» Applications	58



Characteristics and brief description



Advantages of flexible Pipe couplings

- » Simple installation
- » Quick assembly
- » Savings during installation
- » Light weight
- » Space-saving

The Arpol brand is part of our carefully selected product range from manufacturers with its high demands on the processing of the products.

As an authorised sales partner in Germany, you can purchase the entire Arpol product range from us. We are always available for special requests in an advisory capacity.

Feel free to contact us. We will be happy to help you!

Manufacturer information



Founded in Barcelona/Spain in 1976, the family business is one of the pioneers in the development and manufacture of pipe couplings for all types of pipes.

The product range includes a wide spectrum of flexible pipe couplings that offer a variety of problem-solving options. The research and development team is constantly working on improvements and regularly launches innovative products on the market.

Alignment and radial deformation

The clamps are also suitable for mounting on pipes with slight changes in direction, inaccuracies and thus facilitate installation. They withstand land subsidence, bending stresses and superficial loads. The pipe couplings allow a radial deformation of up to 5 %.

Axial movement and application on rough surfaces

When the screws are tightened to the prescribed tightening torque, the anchoring teeth claw into the pipe surface and thus ensure a secure hold even on rough surfaces and smooth-ended pipes.

Absorption of vibrations

The couplings have a vibration-damping property that helps to protect fragile fittings and expensive units.

Can be used on different pipe materials

Pipe material	INSTAL	FIX-L	FIX-M	FIX-U	MULTI-FIX	TRANS
Steel	✓	✓	✓	✓		✓
Cast iron	✓	✓	✓	✓		✓
Fibre cement	✓					✓
Concrete	✓					✓
GFP (glass fibre reinforced plastics)	✓*					✓
PE (polyethene)	✓*			✓	✓	✓*
PVC (polyvinyl chloride)	✓*			✓	✓	✓*

*Only suitable if there is no axial movement of the line.

Flame-retardant

The couplings also remain resistant when exposed to extreme heat influences and provide a high level of safety and reliability.

Deformation-resistant and impact-resistant under pressure

Withstands unusual and hard stresses and absorbs pressure shocks without impairing the sealing or anchoring properties.

Areas of application

Arpol pipe couplings are used in different areas. Here are some examples: Water and gas supply, drinking and waste water plants, chemical plants, power stations, house installations, structural and civil engineering, mines, beverage industry, filling plants, shipbuilding, etc.

Brand quality in the product range

Leschhorn – technical components for industry and trade – is a partner of many strong brands. You can find a complete selection on our web site at www.leschhorn.de. All brand manufacturers see Leschhorn, a technical wholesaler, as a reliable and competent partner for the distribution of their products.

We offer quality in a wide variety of brands!

Info

A detailed list of the areas of application can also be found on page 9. Images of practical applications can be found on page 58/59.

Housing & screws

QUALITY W1

Housing made of carbon steel with a plastic coating for corrosion protection. Screws and bolts made of carbon steel with a Dacromet coating.

QUALITY W2

Housing made of stainless steel AISI 304 L (A2; DIN 1.4307)
Screws and bolts made of carbon steel with a Dacromet coating.

QUALITY W4

Housing made of stainless steel AISI 304 L (A2; DIN 1.4307)
Screws and bolts made of stainless steel AISI 304.

QUALITY W5

Housing made of stainless steel AISI 316 L (A4; DIN 1.4404)
Screws and bolts made of stainless steel AISI 316.



Coated housing

Seal



Red silicone seal
Suitable for hot air and steam.
Temperature range from -55°C to $+240^{\circ}\text{C}$



Blue silicone seal
Suitable for drinking water and industrial water.
Temperature range from -55°C to $+200^{\circ}\text{C}$

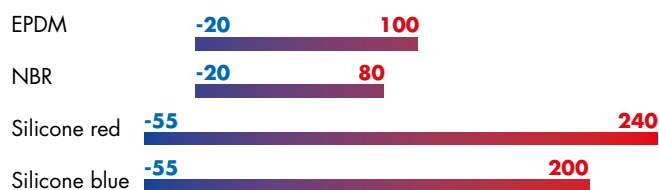
EPDM

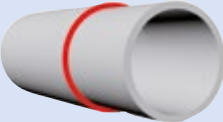

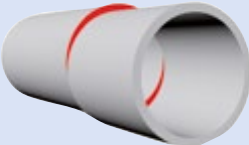

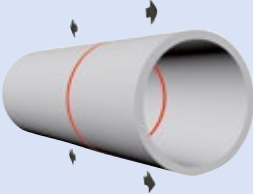
Suitable for water, waste water, particulate matter, compressed air and chemical products.
Temperature range from -20°C to $+100^{\circ}\text{C}$

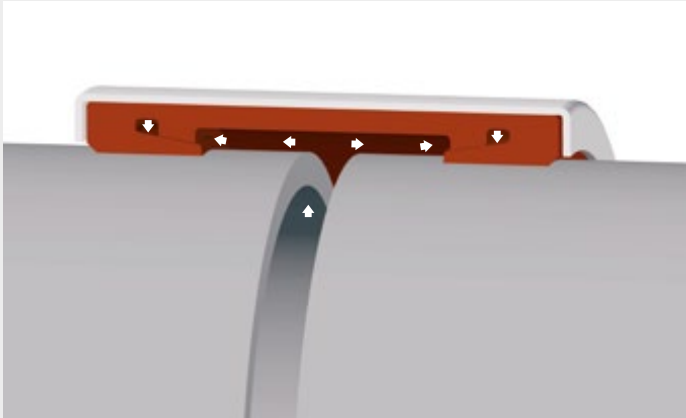
NBR

Suitable for water, oils, fuels and combustible materials, gases and other hydrocarbons.
Temperature range from -20°C to $+80^{\circ}\text{C}$

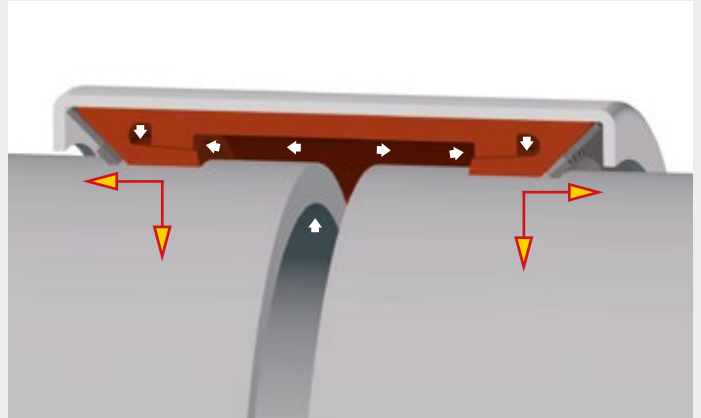
The seal's temperature resistance



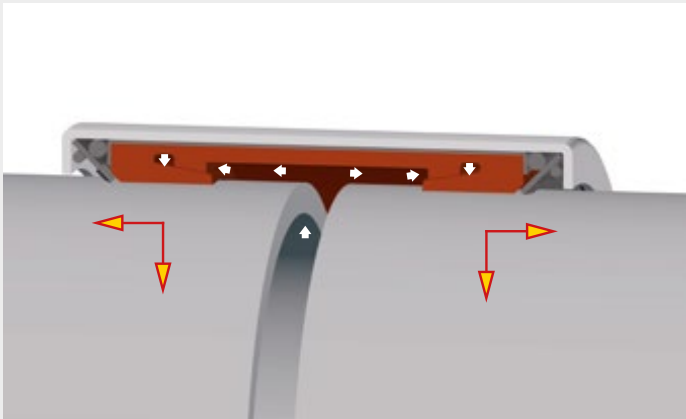
	Connection of pipelines	INSTAL	FIX-L	FIX-M	FIX-U	MULTI-FIX	TRANS
	Connection of pipes with different outer diameters	✓	✓	✓	✓		✓
	Connection of pipes with a gap between the pipe ends	✓	✓	✓	✓	✓	✓
	Connection of pipes with an offset	✓	✓	✓	✓		✓
	Connection of pipes with alignment	✓	✓	✓	✓		✓
	Connection of pipes with axial movement	✓					✓



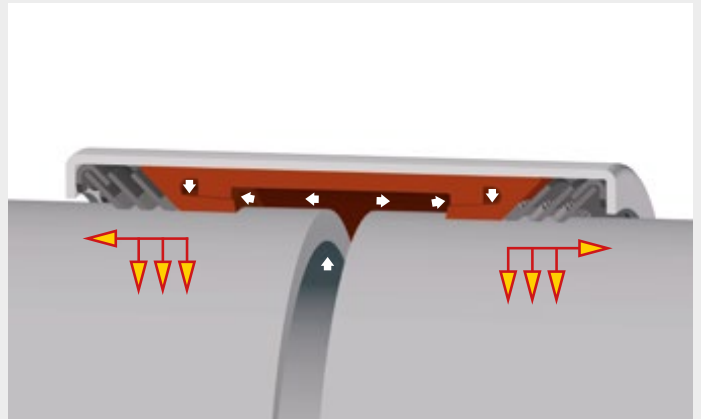
INSTAL



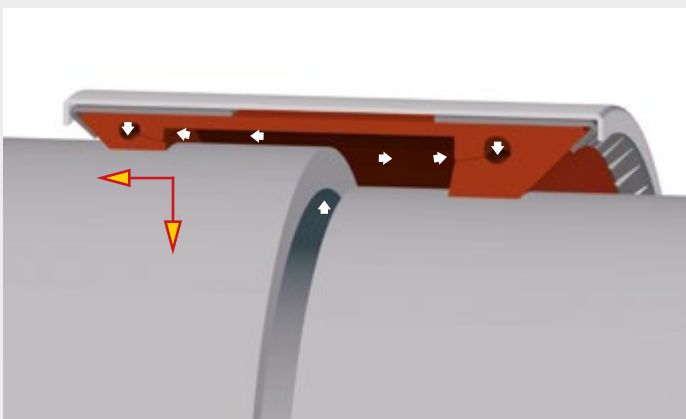
FIX-L – light product line
Tensile-resistant system with an anchoring ring



FIX-M – reinforced product line
tensile-resistant system with an anchoring ring

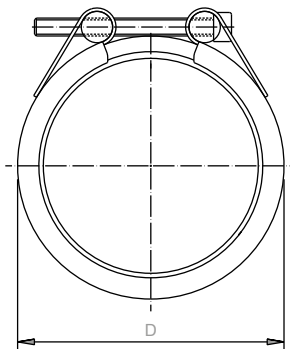
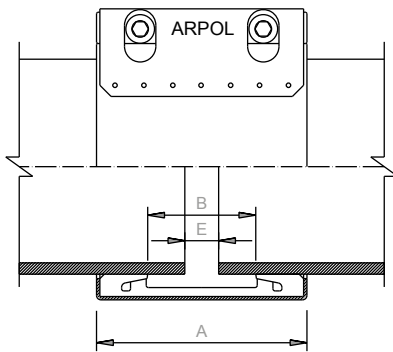


FIX-U – tensile-resistant system with three anchoring rings



TRANS
Tensile-resistant system with an anchoring ring

Type	Description	Width mm	Clamping ranges	Material		Page
				Housing/screws/bolts	Seal	
INSTAL 	Flexible pipe couplings for the connection of pipelines	78 – 300	47 – 171	W1, W2, W4, W5	EPDM, NBR, Silicone	46
REP 	Flexible pipe couplings for the connection of pipelines	95 – 300	47 – 171	W2, W4, W5	EPDM, NBR, Silicone	52
FIX-L 	Flexible pipe couplings with axial anchorage for the connection of pipelines	78 – 141	47 – 613	W4, W5	EPDM, NBR, Silicone blue	56
FIX-M 	Flexible pipe couplings with axial anchorage for the connection of pipelines	93 – 142	47 – 410	W4, W5	EPDM, NBR, Silicone	57
FIX-U 	Flexible pipe couplings with axial anchorage for the connection of pipelines	99 – 201	62 – 402	W4, W5	PDM, NBR, Silicone blue	58
MULTI-FIX 	Flexible pipe couplings with axial anchorage for the connection of pipelines	140 – 200	312 – 1000	W4, W5	On request	59
TRANS 	Flexible pipe coupling for the connection of pipelines with different outer diameters	On request	46 – 500	W2, W4, W5	EPDM	61



Flexible pipe coupling for
the connection of pipelines

INSTAL Width up to 95 IBX product line

Sealing sleeve: EPDM/NBR/silicone
Test pressure: 1.5 x PS/PN

To ensure that the pipe coupling works
properly, follow the assembly instructions.

Material
W2, W4, W5 (see page 42)

**Max. difference between the
outer diameters**

48.3 mm = 0.5 mm
54 – 63 mm = 1.0 mm
76.1 – 104 mm = 1.5 mm
108 – 168.3 mm = 2.5 mm

Maximum alignment
48.3 – 168.3 mm = 4.0 degrees

Maximum offset
48.3 – 154 mm = 1.0 mm
59 – 168.3 mm = 4.0 mm

Tolerances
Permissible tolerances, see page 43.

DA mm	Range mm	Pressure		Dimensions					Pipe seal	
		PN bar	PS bar	A mm	B mm	D mm	E ¹ mm	E ² mm	M	AM Nm
48.3	47 – 49	16	45	78	31	67.3	5	15	8	7
54.0	53 – 55	16	45	78	31	73.0	5	15	8	7
57.0	56 – 58	16	40	78	31	76.0	5	15	8	7
60.3	59 – 61	16	40	78	31	79.3	5	15	8	7
63.0	62 – 65	16	40	78	31	82.0	5	15	8	7
76.1	74 – 77	16	30	94	45	98.1	5	15	8	7
84.0	82 – 85	16	30	94	45	106.0	5	15	8	7
88.9	87 – 91	16	30	94	45	110.9	5	15	8	7
104.0	102 – 106	16	30	94	45	126.0	5	15	8	10
108.0	107 – 111	14	30	94	45	130.0	5	15	8	10
114.3	112 – 117	13	30	95	45	136.3	5	15	8	10
125.0	124 – 127	12	20	95	45	147.0	5	15	8	10
129.0	127 – 131	12	20	95	45	151.0	5	15	8	10
133.0	131 – 136	11	20	95	45	155.0	5	15	8	10
139.7	137 – 142	11	20	95	45	161.7	5	15	8	10
154.0	152 – 156	10	20	95	45	176.0	5	15	8	10
159.0	156 – 161	10	20	95	45	181.0	5	15	8	10
168.3	166 – 171	10	20	95	45	190.3	5	15	8	10

E¹ Permissible gap between the pipe ends without band insert E² Permissible gap between the pipe ends with band insert AM Tightening torque
PN Nominal pressure for shipbuilding with a safety factor of ≥ 4 PS continuous operating pressure DA Outer diameter

Material

W2, W4, W5 (see page 42)

Max. difference between the outer diameters

150 – 500 mm = 2.5 mm
500 – 1200 mm = 3.0 mm

Maximum alignment

150 – 1200 mm = 2 degrees

Maximum offset

150 – 250 mm = 2.0 mm
250 – 1200 mm = 3.0 mm

Tolerances

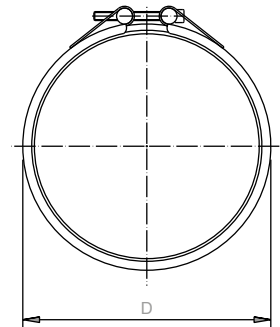
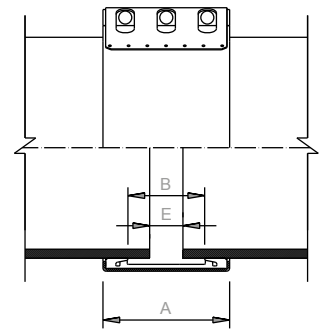
Permissible tolerances, see page 43.

Flexible pipe coupling for the connection of pipelines

INSTAL Width 140 IBY to IFY product line

Nominal diameter is used to orientate the pressure scale. Manufacture of all diameters within the DN range.

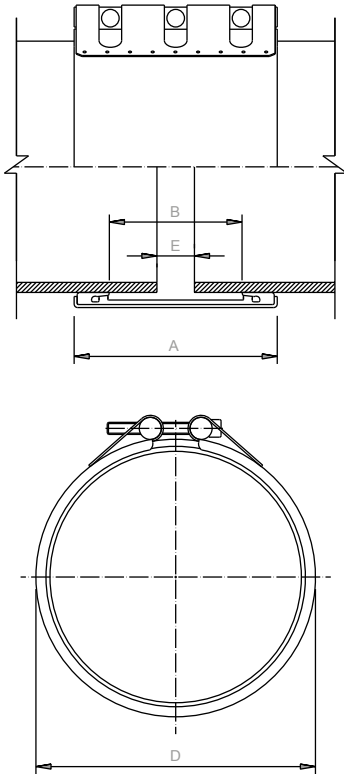
Sealing sleeve: EPDM/NBR/silicone
Test pressure: 1.5 x PS



	IBY mm	ICY mm	IDY mm	IEY mm	IFY mm
A	139	140	141	142	144
B	86	86	86	86	86
D	DA + 23	DA + 24	DA + 25	DA + 26	DA + 28
E ¹	10	10	10	10	10
E ²	35	35	35	35	35

DN mm	IBY			ICY			IDY			IEY			IFY		
	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm
150	23	10	20	30	10	20									
200	18	10	20	24	10	20	30	10	20						
250	15	10	20	19	10	20	24	10	20						
300	12	10	25	16	10	20	20	10	20						
350	11	10	30	14	10	20	18	10	20	21	10	20	28	12	25
400	9	10	30	13	10	20	16	10	20	19	10	20	25	12	25
450	8	10	25	11	10	25	14	10	25	17	12	30	22	12	30
500	8	10	30	10	10	25	13	10	25	15	12	30	20	12	35
550	7	10	30	9	10	30				14	12	35	19	12	35
600	6	10	30	9	10	30				13	12	35	17	12	35
650	6	10	35	8	10	35				12	12	45	16	12	45
700	6	10	35	7	10	35				11	12	45	15	12	45
750	5	10	40	7	10	40				10	12	45	14	16	60
800	5	10	40	6	12	50				10	12	50	13	16	70
850				6	12	60				9	12	60	12	16	70
900				6	12	60				9	12	60	12	16	80
950				5	12	60				8	12	60	11	16	80
1000				5	12	70				8	12	70	10	16	90
1100				5	12	70				7	16	90	9	16	90
1200				4	12	80				7	16	100	9	16	100

E¹ Permissible gap between the pipe ends without band insert E² Permissible gap between the pipe ends with band insert AM Tightening torque
PS Continuous operating pressure DN Nominal diameter DA Outer diameter



Flexible pipe coupling for the connection of pipelines

INSTAL Width 200 IBZ to IHGZ product line

Nominal diameter is used to orientate the pressure scale. Manufacture of all diameters within the DN range.

Sealing sleeve: EPDM/NBR/silicone
Test pressure: 1.5xPS

Material
W2, W4, W5 (see page 42)

Max. difference between the outer diameters

IBZ-IGZ: 150 – 500 mm = 2.5 mm
500 – 1500 mm = 3.0 mm
IHZ-IHGZ: 500 – 1500 mm = 2.0 mm

Maximum alignment

IBZ-IGZ: 150 – 1500 mm = 2.0 degrees
HFZ-IHGZ: 500 – 1500 mm = 1.0 degree

Maximum offset

IBZ-IGZ: 150 – 250 mm = 2.0 mm
250 – 1500 mm = 3.0 mm

Tolerances

Permissible tolerances, see page 43.

	IBZ mm	ICZ mm	IDZ mm	IEZ mm	IFZ mm	IGZ mm	IHFZ mm	IHGZ mm
A	199	200	201	202	204	206	204	206
B	142	142	142	142	142	142	142	142
D	DA + 23	DA + 24	DA + 25	DA + 26	DA + 28	DA + 30	DA + 52	DA + 56
E ¹	15	15	15	15	15	15	15	15
E ²	60	60	60	60	60	60	60	60

DN mm	IBZ			ICZ			IDZ			IEZ			IFZ			IGZ			IHFZ			IHGZ		
	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm
150	23	12	20	30	12	20																		
200	18	12	20	24	12	25	30	12	20															
250	15	12	25	19	12	25	24	12	20															
300	12	12	30	16	12	30	20	12	20															
350	11	12	35	14	12	30	18	12	25	21	12	25	28	16	30									
400	9	12	35	13	12	25	16	12	30	19	12	25	25	16	60									
450	8	12	45	11	12	30	14	12	30	17	12	30	22	16	40									
500	8	12	45	10	12	35	13	12	35	15	12	30	20	16	40									
550	7	12	35	9	12	35				14	16	45	19	16	45									
600	6	12	35	9	12	35				13	16	50	17	16	50	21	20	60	27	20	70	32	20	80
650	6	12	40	8	12	45				12	16	60	16	16	60	20	20	70	25	20	80	32	20	90
700	6	12	45	7	12	45				11	16	60	15	16	60	18	20	70	24	20	80	28	20	90
750	5	12	45	7	12	45				10	16	60	14	16	60	17	20	80	22	20	80	27	20	100
800	5	12	50	6	12	50				10	16	70	13	16	70	16	20	90	20	20	90	25	20	110
850				6	12	60				9	16	70	12	16	70	15	20	90	19	20	90	24	20	110
900				6	12	60				9	16	80	12	16	80	14	20	100	19	20	100	22	20	130
950				5	12	60				8	16	80	11	16	80	14	20	100	17	20	100	22	20	130
1000				5	12	70				8	16	90	10	16	90	13	20	120	16	20	110	20	20	150
1100				5	16	90				7	16	90	9	16	90	12	20	120				19	20	150
1200				4	16	100				7	16	100	9	16	100	11	20	120				17	20	150
1300										6	16	120	8	16	120	10	20	140				16	20	170
1400										6	16	120	7	16	120	9	20	160				14	20	200
1500										5	16	140	7	16	140	9	20	160				14	20	200

E¹ Permissible gap between the pipe ends without band insert E² Permissible gap between the pipe ends with band insert AM Tightening torque
PS Continuous operating pressure DN Nominal diameter DA Outer diameter

Material

W1 (see page 42)

Max. difference between the outer diameters

AFZ-AGZ: 500 – 1500 mm = 3.0 mm

AHFZ-AHGZ: 500 – 1500 mm = 2.0 mm

Maximum alignment

ABZ-AGZ: 500 – 1500 mm = 2.0 degrees

AHFZ-AHGZ: 500 – 1500 mm = 1.0 degree

Maximum offset

ABZ-AGZ: 500 – 1500 mm = 3.0 mm

AHFZ-AHGZ: 500 – 1500 mm = 2.0 mm

Tolerances

Permissible tolerances, see page 43.

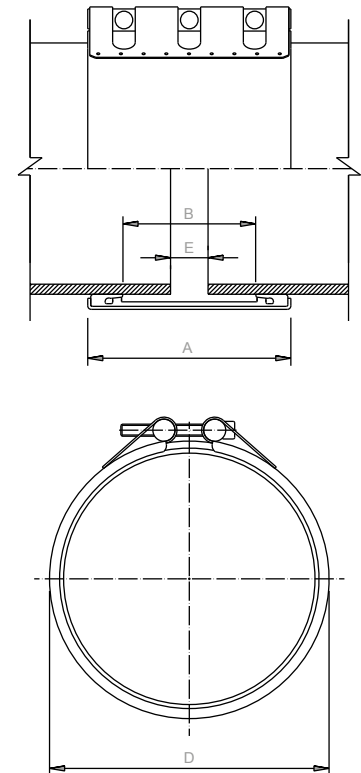
Flexible pipe coupling for the connection of pipelines

INSTAL C-steel, coated Width 200 AFZ to AHGZ product line

Nominal diameter is used to orientate the pressure scale. Manufacture of all diameters within the DN range.

Sealing sleeve: EPDM/NBR/silicone

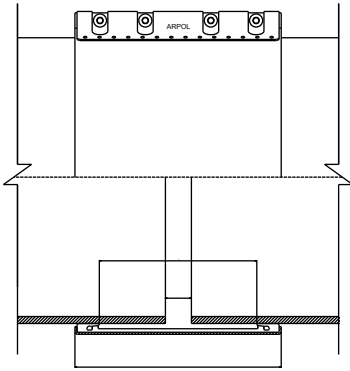
Test pressure: 1.5xPS



	AFZ mm	AGZ mm	AHFZ mm	AHGZ mm
A	204	206	204	206
B	142	142	142	142
D	DA + 28	DA + 30	DA + 52	DA + 56
E ¹	15	15	15	15
E ²	60	60	60	60

DN mm	AFZ			AGZ			AHFZ			AHGZ		
	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm
500	27	M 20	60									
550	25	M 20	60									
600	23	M 20	60	29	M 20	60	32	M 20	70	40	M 20	80
650	21	M 20	70	27	M 20	70	29	M 20	80	37	M 20	90
700	20	M 20	80	25	M 20	80	28	M 20	80	35	M 20	90
750	19	M 20	80	23	M 20	80	26	M 20	80	32	M 20	100
800	17	M 20	90	22	M 20	90	23	M 20	90	30	M 20	110
850	16	M 20	90	21	M 20	90	22	M 20	90	29	M 20	110
900	16	M 20	100	19	M 20	100	22	M 20	100	26	M 20	130
950	15	M 20	100	18	M 20	100	21	M 20	100	25	M 20	130
1000	14	M 20	120	18	M 20	120	19	M 20	110	25	M 20	150
1100	13	M 20	120	16	M 20	120	18	M 20	110	22	M 20	150
1200	12	M 20	120	15	M 20	140	16	M 20	130	21	M 20	150
1300	11	M 20	140	14	M 20	140				19	M 20	170
1400	10	M 20	160	13	M 20	160				18	M 20	200
1500	9	M 20	160	12	M 20	160				16	M 20	200

E¹ Permissible gap between the pipe ends without band insert E² Permissible gap between the pipe ends with band insert AM Tightening torque
PS Continuous operating pressure DN Nominal diameter DA Outer diameter

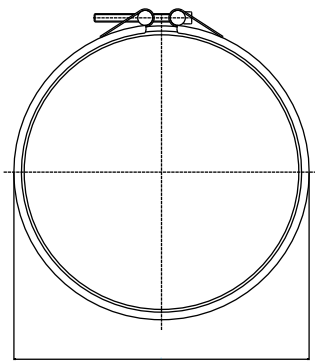


Flexible pipe coupling for the connection of pipelines

INSTAL Width 300 IBW product line to IHGW

Nominal diameter is used to orientate the pressure scale. Manufacture of all diameters within the DN range.

Sealing sleeve: EPDM
Test pressure: 1.5xPS



Material
W2, W4, W5 (see page 42)

Maximum difference between the Outer diameter

IBW-IGW: 300 – 500 mm = 2.5 mm
500 – 1500 mm = 3.0 mm
IHFW-IHGW: 500 – 1500 mm = 2.0 mm

Maximum alignment

IBW-IGW: 300 – 1500 mm = 2.0 degrees
IHFW-IHGW: 500 – 1500 mm = 1.0 degree

Maximum offset

IBZ-IGZ: 300 – 500 mm = 3.0 mm
500 – 1500 mm = 2.0 mm

Tolerances

Permissible tolerances, see page 43.

	IBW mm	ICW mm	IDW mm	IEW mm	IFW mm	IGW mm	IHFW mm	IHGW mm
A	294	295	296	297	299	301	299	301
B	240	240	240	240	240	240	240	240
D	DA + 23	DA + 24	DA + 25	DA + 26	DA + 28	DA + 30	DA + 52	DA + 56
E ¹	15	15	15	15	15	15	15	15
E ²	80	80	80	80	80	80	80	80

DN mm	IBW			ICW			IDW			IEW			IFW			IGW			IHFW			IHGW		
	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm
300	12	12	15	16	12	15	20	12	15															
350	11	12	20	14	12	20	18	12	20	21	16	25	28	16	25									
400	9	12	20	13	12	20	16	12	20	19	16	30	25	16	30									
450	8	12	25	11	12	25	14	12	25	17	16	30	22	16	30									
500	8	12	25	10	12	25	13	12	25	15	16	35	20	16	35									
550	7	12	30	9	12	30				14	16	35	19	16	35									
600	6	12	30	9	12	30				13	16	40	17	16	40	21	20	40	27	20	50	32	20	50
650	6	12	30	8	12	30				12	16	45	16	16	45	20	20	60	25	20	60	32	20	80
700	6	12	35	7	12	35				11	16	45	15	16	45	18	20	60	24	20	60	28	20	80
750	5	12	35	7	12	35				10	16	50	14	16	50	17	20	60	22	20	70	27	20	80
800	5	12	40							10	16	50	13	16	50	16	20	70	20	20	70	25	20	90
850										9	16	60	12	16	60	15	20	70	19	20	80	24	20	90
900										9	16	60	12	16	60	14	20	70	19	20	80	22	20	90
950										8	16	60	11	16	60	14	20	80	17	20	80	22	20	100
1000										8	16	70	10	16	70	13	20	80	16	20	90	20	20	100
1100										7	16	70	9	16	70	12	20	90				19	20	110
1200										7	16	80	9	20	100	11	20	100				17	20	130
1300										6	16	80	8	20	100	10	20	100				16	20	130
1400										6	16	90	7	20	120	9	20	120				14	20	150
1500										5	16	100	7	20	120	9	20	120				14	20	150

E¹ Permissible gap between the pipe ends without band insert E² Permissible gap between the pipe ends with band insert AM Tightening torque
PS Continuous operating pressure DN Nominal diameter DA Outer diameter

Material

W1 (see page 42)

Maximum difference between the Outer diameter

AFW-AGW: 500 – 1500 mm = 3.0 mm
AHFW-AHGW: 500 – 1500 mm = 2.0 mm

Maximum alignment

AFW-AGW: 500 – 1500 mm = 2.0 degrees
AHFW-AHGW: 500 – 1500 mm = 1 degree

Maximum offset

AFW-AGW: 500 – 1500 = 3.0 mm
AHFW-AHGW: 500 – 1500 = 2.0 mm

Tolerances

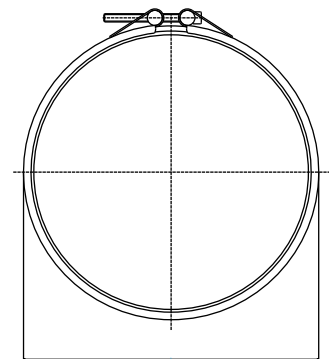
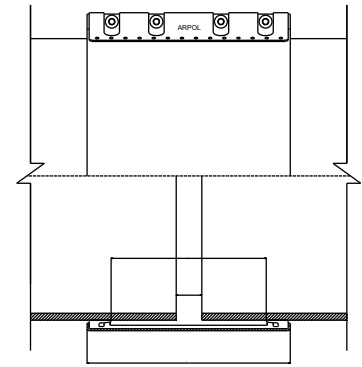
Permissible tolerances, see page 43.

Flexible pipe coupling
for the connection of pipelines

INSTAL C-steel, coated, width 300 AFW to AHGW product line

Nominal diameter is used to orientate the pressure scale. Manufacture of all diameters within the DN range.

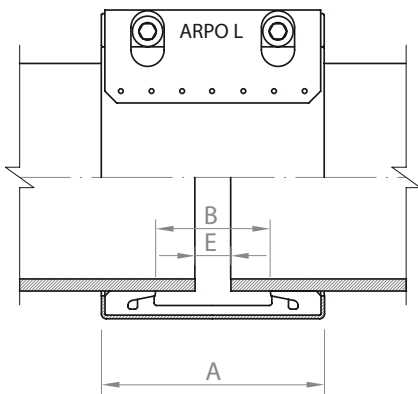
Sealing sleeve: EPDM
Test pressure: 1.5 x PS



	AFW mm	AGW mm	AHFW mm	AHGW mm
A	299	301	299	301
B	240	240	240	240
D	DA + 28	DA + 30	DA + 52	DA + 56
E ¹	15	15	15	15
E ²	80	80	80	80

DN mm	AFW			AGW			AHFW			AHGW		
	PT bar	M	AM Nm	PT bar	M	AM Nm	PT bar	M	AM Nm	PT bar	M	AM Nm
500	27	20	40									
550	25	20	45									
600	23	20	50	29	20	50	32	20	70	40	20	70
650	21	20	60	27	20	60	29	20	80	37	20	80
700	20	20	60	25	20	60	28	20	80	35	20	80
750	19	20	60	23	20	60	26	20	80	32	20	80
800	17	20	70	22	20	70	23	20	90	30	20	90
850	16	20	70	21	20	70	22	20	90	29	20	90
900	16	20	70	19	20	70	22	20	90	26	20	90
950	15	20	80	18	20	80	21	20	100	25	20	100
1000	14	20	80	18	20	80	19	20	100	25	20	100
1100	13	20	90	16	20	90	18	20	110	22	20	110
1200	12	20	100	15	20	100	16	20	130	21	20	130
1300	11	20	100	14	20	100				19	20	130
1400	10	20	120	13	20	120				18	20	150
1500	9	20	120	12	20	120				16	20	150

E¹ Permissible gap between the pipe ends without band insert E² Permissible gap between the pipe ends with band insert AM Tightening torque
PS Continuous operating pressure DN Nominal diameter DA Outer diameter

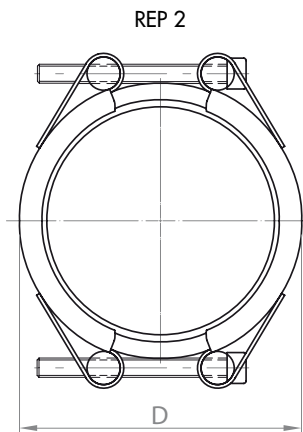
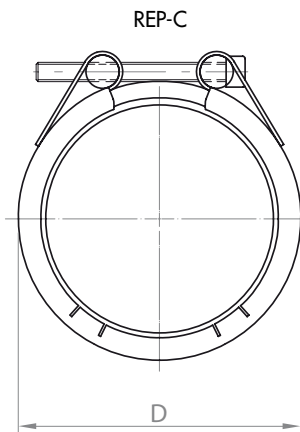


Flexible pipe coupling for the connection of pipelines

REP width 95 IBXC to IBXR product line

To ensure that the pipe coupling works properly, follow the assembly instructions:

Sealing sleeve: EPDM/NBR/silicone
Test pressure: 1.5xPS



Material
W2, W4, W5 (see page 42)

Max. difference between the outer diameters IBXC/IBXR
48.3 mm = 0.5 mm/none
54 – 63 mm = 1.0 mm/2.0 mm
76.1 – 104 mm = 1.5 mm/3.0 mm
108 – 154 mm = 2.5 mm/3.0 mm
154 – 168.3 mm = 2.5 mm/3.0 mm

Maximum alignment IBXC/IBXR
48.3 mm = 4 degrees/none
54 – 168.3 mm = 4 degrees/4 degrees

Maximum offset IBXC/IBXR
48.3 mm = 1.0 mm/none
54 – 154 mm = 1.0 mm/1.0 mm
154 – 168.3 mm = 2.0 mm/2.0 mm

Maximum width of the damaged area
48.3 – 63 mm = 20 mm
76.1 – 168.3 mm = 35 mm

Tolerances
Permissible tolerances (see page 43)

DA mm	Range		Pres- sure PS bar	Dimension					Pipe seal	
	IBXC mm	IBXR mm		A mm	B mm	D mm	E ¹ mm	E ² mm	M	AM Nm
48.3	47 – 94		45	78	31	68	5	15	8	7
54.0	53 – 55		45	78	31	74	5	15	8	7
57.0	56 – 58		40	78	31	77	5	15	8	7
60.3	59 – 61		40	78	31	80	5	15	8	7
63.0	62 – 65	60 – 64	40	94	31	84	5	15	8	7
66.0		64 – 68	40	94	45	88	5	15	8	7
69.0		67 – 72	30	94	45	92	5	15	8	7
76.1	74 – 77	74 – 78	30	94	45	99	5	15	8	7
84.0	82 – 85	80 – 86	30	94	45	107	5	15	8	7
88.9	87 – 91	87 – 93	30	94	45	113	5	15	8	7
94.0		90 – 96	30	94	45	116	5	15	8	7
104.0	102 – 106	98 – 106	30	94	45	128	5	15	8	10
108.0	107 – 111	107 – 111	30	95	45	133	5	15	8	10
114.3	112 – 117	110 – 116	30	95	45	139	5	15	8	10
125.0	124 – 127	118 – 125	20	95	45	149	5	15	8	10
129.0	127 – 131	125 – 131	20	95	45	153	5	15	8	10
133.0	131 – 136	131 – 136	20	95	45	158	5	15	8	10
139.7	137 – 142	137 – 144	20	95	45	164	5	15	8	10
154.0	152 – 156	147 – 156	20	95	45	178	5	15	8	10
159.0	156 – 161	156 – 162	20	95	45	183	5	15	8	10
168.3	166 – 171	166 – 171	20	95	45	193	5	15	8	10

E¹ Permissible gap between the pipe ends without band insert E² Permissible gap between the pipe ends with band insert AM Tightening torque
PS Continuous operating pressure DN Nominal diameter DA Outer diameter M Diameter

Material

W2, W4, W5 (see page 42)

Max. difference between the outer diameters

2 connections/3 connections

150 – 500 mm = 4.0 mm/6.0 mm

500 – 1200 mm = 5.0 mm/7.0 mm

Maximum alignment

2 degrees

Maximum offset

150 – 250 mm = 2.0 mm

250 – 1200 mm = 3.0 mm

Maximum width of the damaged area

50 mm

Tolerances

Permissible tolerances (see page 43)

Flexible pipe coupling for the connection of pipelines

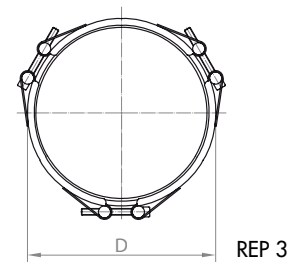
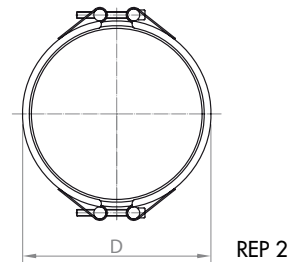
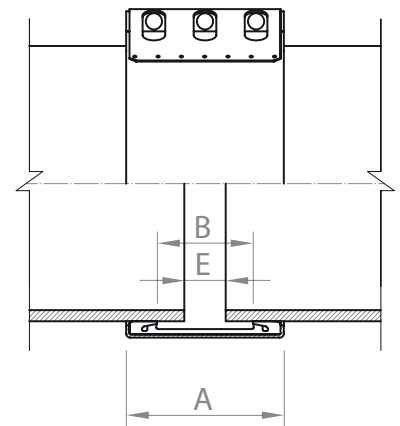
REP width 140 IBYR to FYR IBY3 to IFY3 product lines

To ensure that the pipe coupling works properly, follow the assembly instructions:

Nominal diameter is used to orientate the pressure scale. Manufacture of all diameters within the DN range.

Sealing sleeve: EPDM/NBR/silicone

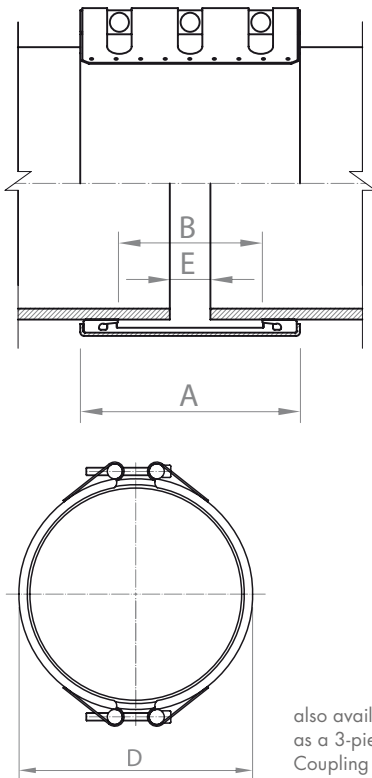
Test pressure: 1.5xPS



	IBYR IBY3 mm	ICYR ICY3 mm	IDYR IDY3 mm	IEYR IEY3 mm	IFYR IFY3 mm
A	139	140	141	142	144
B	86	86	86	86	86
D	DA + 23	DA + 24	DA + 25	DA + 26	DA + 28
E ¹	10	10	10	10	10
E ²	35	35	35	35	35

DN mm	IBYR – IBY3			ICYR – ICY3			IDYR – IDY3			IEYR – IEY3			IFYR – IFY3		
	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm
150	23	10	20	30	10	20									
200	18	10	20	24	10	20	30	10	20						
250	15	10	20	19	10	20	24	10	20						
300	12	10	25	16	10	20	20	10	20						
350	11	10	30	14	10	20	18	10	20	21	10	20	28	12	25
400	9	10	30	13	10	20	16	10	20	19	10	20	25	12	25
450	8	10	25	11	10	25	14	10	25	17	12	30	22	12	30
500	8	10	30	10	10	25	13	10	25	15	12	30	20	12	35
550	7	10	30	9	10	30	12	10	30	14	16	35	19	12	35
600	6	10	30	9	10	30	11	10	30	13	16	35	17	12	35
650	6	10	35	8	10	35	10	12	40	12	16	45	16	12	45
700	6	10	40	7	10	35	9	12	45	11	16	45	15	12	45
750	5	10	40	7	10	40				10	16	45	14	16	60
800	5	10	40	6	12	50				10	16	50	13	16	70
850	5	10	45	6	12	60				9	16	60	12	16	70
900		10		6	12	60				9	16	60	12	16	80
950		10		5	12	60				8	16	60	11	16	80
1000		10		5	12	70				8	16	70	10	16	90
1100		10		5	16	70				7	16	90	9	16	90
1200		10		4	16	80				7	16	100	9	16	100

E¹ Permissible gap between the pipe ends without band insert E² Permissible gap between the pipe ends with band insert AM Tightening torque
PS Continuous operating pressure DN Nominal diameter DA Outer diameter M Diameter



also available
as a 3-piece
Coupling
(figure page 55)

Flexible pipe coupling for the
connection of pipelines

REP width 200 IBZR to IGZR IBZ3 to IGZ3 product lines

Larger diameters on request.
Follow the assembly instructions to ensure that
the pipe coupling works properly.
Nominal diameter is used to orientate the
pressure scale. Manufacture of all diameters
within the DN range.

Sealing sleeve: EPDM/NBR/silicone
Test pressure: 1.5xPS

Material
W2, W4, W5 (see page 42)

**Max. difference between the outer
diameters 2 connections/3 connections**
150 – 250 mm = 0.5 mm/7.0 mm
250 – 500 mm = 1.0 mm/7.0 mm
500 – 1500 mm = 1.5 mm/8.0 mm
1500 – 2000 mm = 2.5 mm/8.0 mm

Maximum alignment
2.0 degrees

Maximum offset
150 – 250 mm = 2.0 mm
250 – 2000 mm = 3.0 mm

Maximum width of the damaged area
100 mm

Tolerances
Permissible tolerances (see page 43)

	IBZR/IBZ3 mm	ICZR/ICZ3 mm	IDZR/IDZ3 mm	IEZR/IEZ3 mm	IFZR/IFZ3 mm	IGZR/IGZ3 mm
A	199	200	201	202	204	206
B	142	142	142	142	142	142
D	DA + 23	DA + 24	DA + 25	DA + 26	DA + 28	DA + 30
E ¹	15	15	15	15	15	15
E ²	60	60	60	60	60	60

DN mm	IBZR – IBZ3 *			ICZR – ICZ3 **			IDZR – IDZ3 *			IEZR – IEZ3 *			IFZR – IFZ3 *			IGZR – IGZ3 *		
	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm	PS bar	M Nm	AM Nm
150	23	12	20	30	12	20			12									
200	18	12	20	24	12	25	30	12	20									
250	15	12	25	19	12	25	24	12	20									
300	12	12	30	16	12	30	20	12	20									
350	11	12	35	14	12	30	18	12	25	21	12	25	28	16	30			
400	9	12	35	13	12	25	16	12	30	19	12	25	25	16	60			
450	8	12	45	11	12	30	14	12	30	17	12	30	22	16	40			
500	8	12	45	10	12	35	13	12	35	15	12	30	20	16	40			
550	7	12	35	9	12	35	12	12	35	13	16	45	19	16	45			
600	6	12	35	9	12	35	11	12	40	14	16	50	17	16	50	21	20	60
650	6	12	40	8	12	45	10	12	45	12	16	60	16	16	60	20	20	70
700	6	12	45	7	12	45	9	12	45	11	16	60	15	16	60	18	20	70
750	5	12	45	7	12	45				10	16	60	14	16	60	17	20	80
800	5	12	50	6	12	50				10	16	70	13	16	70	16	20	90
850	5	12	60	6	12	60				9	16	70	12	16	70	15	20	90
900				6	12	60				9	16	80	12	16	80	14	20	100
950				5	12	60				8	16	80	11	16	80	14	20	100
1000				5	12	70				8	16	90	10	16	90	13	20	120
1100				5	16	90				7	16	90	9	16	100	12	20	120
1200				4	16	100				7	16	100	9	16	120	11	20	120
1300										6	16	120	8	16	120	10	20	140
1400										6	16	120	7	16	140	9	20	160
1500										5	16	140	7	16	160	9	20	160
1600										5	16	140	7	20	160	8	20	180
1700										5	16	140	6	20	180	8	20	180
1800										4	16	160	6	20	200	7	20	200
1900										4	16	160	6	20	200	7	20	200
2000										4	16	180	5	20	220	7	20	220

E¹ Permissible gap between the pipe ends without band insert E² Permissible gap between the pipe ends with band insert AM Tightening torque
PS Continuous operating pressure DN Nominal diameter DA Outer diameter M Diameter * On request ** Available online

Material

W2, W4, W5 (see page 42)

Max. difference between the outer diameters 2 connections/3 connections

300 – 500 mm = 5.0 mm/7.0 mm
500 – 2000 mm = 6.0 mm/8.0 mm

Maximum alignment

300 – 1500 mm = 2.0 degrees
1500 – 2000 mm = 1.0 degree

Maximum offset

3.0 mm

Maximum width of the damaged area

190 mm

Tolerances

Permissible tolerances (see page 43)

Flexible pipe coupling for the connection of pipelines

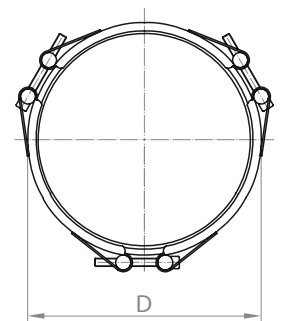
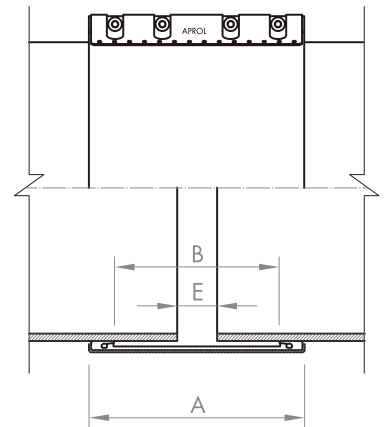
REP width 300 IBWR to IGWR IBW3 to IGW3 product lines

Larger diameters on request.

To ensure that the pipe coupling works properly, follow the assembly instructions: Nominal diameter is used to orientate the pressure scale. Manufacture of all diameters within the DN range.

Sealing sleeve: EPDM/NBR

Test pressure: 1.5 x PS

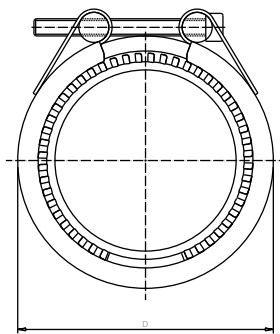
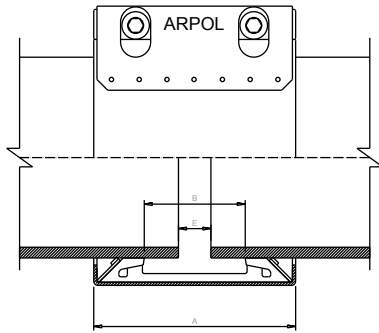


REP 3
also available as
2-piece coupling
(Fig. page 54)

	IBWR IBW3 mm	ICWR ICW3 mm	IDWR IDW3 mm	IEWR IEW3 mm	IFWR IFW3 mm	IGWR IGW3 mm
A	294	295	296	297	299	301
B	240	240	240	240	240	240
D	DA + 23	DA + 24	DA + 25	DA + 26	DA + 28	DA + 30
E ¹	15	15	15	15	15	15
E ²	80	80	80	80	80	80

DN mm	IBWR – IBW3 *			ICWR – ICW3 *			IDWR – IDW3 *			IEWR – IEW3 **			IFWR – IFW3 *			7IGWR – IGW3 *		
	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm	PS bar	M	AM Nm
300	12	12	15	16	12	15	20	12	15									
350	11	12	20	14	12	20	18	12	20	21	16	25	28	16	25			
400	9	12	20	13	12	20	16	12	20	19	16	30	25	16	30			
450	8	12	25	11	12	25	14	12	25	17	16	30	22	16	30			
500	8	12	25	10	12	25	13	12	25	15	16	35	20	16	35			
550	7	12	30	9	12	30	12	12	25	14	16	35	19	16	35			
600	6	12	30	9	12	30	11	12	30	13	16	40	17	16	40	21	20	40
650	6	12	30	8	12	30	10	12	30	12	16	45	16	16	45	20	20	60
700	6	12	35	7	12	35	9	12	35	11	16	45	15	16	45	18	20	60
750	5	12	35	7	12	35				10	16	50	14	16	50	17	20	60
800										10	16	50	13	16	50	16	20	70
850										9	16	60	12	16	60	15	20	70
900										9	16	60	12	16	60	14	20	70
950										8	16	60	11	16	60	14	20	80
1000										8	16	70	10	16	70	13	20	80
1100										7	16	70	9	20	70	12	20	90
1200										7	16	80	9	20	100	11	20	100
1300										6	16	80	8	20	100	10	20	100
1400										6	16	90	7	20	120	9	20	120
1500										5	16	100	7	20	120	9	20	120
1600										5	16	100	7	20	140	8	20	140
1700										5	20	140	6	20	140	8	20	140
1800										4	20	140	6	20	140	7	20	140
1900										4	20	160	6	20	160	7	20	160
2000										4	20	160	5	20	160	7	20	160

E¹ Permissible gap between the pipe ends without band insert E² Permissible gap between the pipe ends with band insert AM Tightening torque
PS Continuous operating pressure DN Nominal diameter DA Outer diameter M Diameter * On request ** Available online



Flexible pipe couplings with axial anchorage for the tensile-resistant connection of pipelines

FIX-L For pipes made of steel

Sealing sleeve: EPDM/NBR/silicone
Test pressure: 1.5xPS/PN

Material
W4, W5 (see page 42)

Maximum difference between the Outer diameter

48 mm = 0.5 mm
50 – 60 mm = 1.0 mm
76 – 104 mm = 1.5 mm
106 – 609 mm = 2.5 mm

Maximum alignment

48 – 154 mm = 4.0 degrees
159 – 609 mm = 2.0 degrees

Maximum offset

48 – 154 mm = 1.0 mm
159 – 219 mm = 2.0 mm
244 – 609 mm = 3.0 mm

Tolerances

Permissible tolerances, see page 43

DA mm	Clamping range mm	Pressure		Dimensions					Pipe seal	
		PN bar	PS bar	A mm	B mm	D mm	E ¹ mm	E ² mm	M	AM Nm
48.3	47.8 – 48.9	16	35	78	31	68	5	15	8	15
54.0	53.5 – 54.5	16	30	78	31	74	5	15	8	15
57.0	56.4 – 57.6	16	30	78	31	77	5	15	8	15
60.3	59.7 – 60.9	16	30	78	31	80	5	15	8	15
76.1	75.3 – 76.9	16	20	94	45	96	5	15	8	15
88.9	88.0 – 89.8	16	20	94	45	112	5	15	8	15
108.0	106.9 – 109.1	16	19	94	45	131	5	15	8	20
114.3	113.2 – 115.4	16	23	95	45	137	5	15	8	20
133.0	131.7 – 134.3	16	18	95	45	156	5	15	10	20
139.7	138.3 – 141.1	16	16	95	45	163	5	15	10	25
154.0	152.4 – 155.6	14	15	95	45	178	5	15	10	25
159.0	157.4 – 160.6	14	15	95	45	183	5	15	10	30
168.3	166.6 – 170.0	13	14	95	45	191	5	15	10	30
219.1	216.9 – 221.3		10	141	86	251	15	35	12	50
244.5	424.0 – 247.0		5.5	141	86	276	15	35	12	50
267.0	264.5 – 269.5		5	141	86	299	15	35	12	50
273.0	270.5 – 275.5		4.5	141	86	305	15	35	12	50
323.9	320.5 – 327.0		3	141	86	356	15	35	12	50
355.6	352.0 – 359.0		2.5	141	86	387	15	35	12	50
406.4	402.5 – 410.5		2	141	86	438	15	35	12	60
457.0	452.5 – 460.5		2	141	86	489	15	35	12	60
508.0	503.5 – 511.5		1.5	141	86	540	15	35	12	60
558.0	554.5 – 562.5		1.5	141	86	590	15	35	12	60
609.0	605.0 – 613.0		1	141	86	641	15	35	12	60

E1 Permissible gap between the pipe ends without band insert E2 Permissible gap between the pipe ends with band insert AM Tightening torque
PN Nominal pressure for shipbuilding with a safety factor of ≥ 4 PS continuous operating pressure DA Outer diameter

Material

W4, W5 (see page 42)

Maximum difference between the Outer diameter

48 mm = 0.5 mm
50 – 60 mm = 1.0 mm
76 – 104 mm = 1.5 mm
106 – 409 mm = 2.5 mm

Maximum alignment

48 – 154 mm = 4.0 degrees
159 – 406 mm = 2.0 degrees

Maximum offset

48 – 154 mm = 1.0 mm
159 – 219 mm = 2.0 mm
244 – 609 mm = 3.0 mm

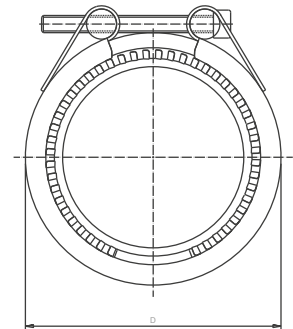
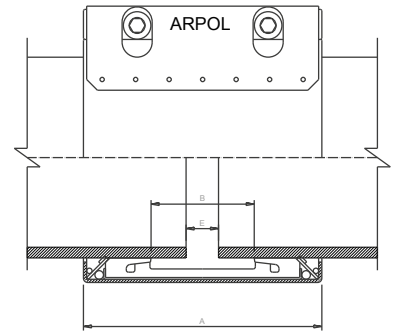
Tolerances

Permissible tolerances, see page 43

Flexible pipe couplings with axial anchorage for the tensile-resistant connection of pipelines

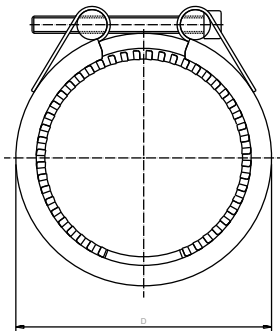
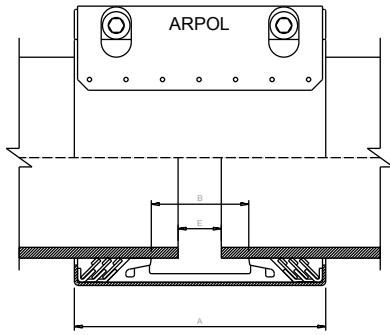
FIX-M For pipes made of steel

Sealing sleeve: EPDM/NBR/silicone
Test pressure: 1.5 x PS/PN



DA mm	Clamping range mm	Pressure		Dimensions						Pipe seal	
		PN bar	PS bar	A mm	B mm	D mm	E ¹ mm	E ² mm	M	AM Nm	
48.3	47.8 – 48.9	16	40	93	31	72	5	15	8	20	
54.0	53.5 – 54.5	16	35	93	31	82	5	15	8	25	
57.0	56.4 – 57.6	16	35	93	31	85	5	15	8	25	
60.3	59.7 – 60.9	16	35	93	31	88	5	15	8	25	
76.1	75.3 – 76.9	16	22	111	45	104	5	15	8	35	
88.9	88.0 – 89.8	16	22	111	45	119	5	15	10	35	
108.0	106.9 – 109.1	16	21	111	45	141	5	15	10	35	
114.3	113.2 – 115.4	16	25	112	45	174	5	15	10	35	
133.0	131.7 – 134.3	16	19	112	45	167	5	15	10	35	
139.7	138.3 – 141.1	16	18	112	45	184	5	15	10	35	
154.0	152.4 – 155.6	16	18	113	45	188	5	15	10	35	
159.0	157.4 – 160.6	16	18	113	45	193	5	15	10	35	
168.3	166.6 – 170.0	16	18	142	45	202	5	15	10	35	
219.1	216.9 – 221.3		16	142	86	255	15	35	12	65	
244.5	242.0 – 247.0		9	142	86	280	15	35	12	65	
267.0	264.5 – 269.5		8	142	86	303	15	35	12	65	
273.0	270.5 – 275.5		8	142	86	309	15	35	12	65	
323.9	320.5 – 327.0		6	142	86	360	15	35	12	65	
355.6	352.0 – 359.0		6	142	86	391	15	35	12	65	
406.4	402.5 – 410.5		5	142	86	441	15	35	12	65	

E¹ Permissible gap between the pipe ends without band insert E² Permissible gap between the pipe ends with band insert AM Tightening torque
PN Nominal pressure for shipbuilding with a safety factor of ≥ 4 PS continuous operating pressure DA Outer diameter



Flexible pipe couplings with axial anchorage for the tensile-resistant connection of pipelines

FIX-U For pipes made of polyethene and PVC

In PE or PVC pipes, inner support rings must be used to avoid deformation and a reduction in the pipe diameter due to temperature fluctuations.

Sealing sleeve: EPDM/NBR/silicone
Test pressure = 1.25 x PS

Material
W4, W5 (see page 42)

Maximum difference between the Outer diameter
48 mm = 1 mm
75 – 90 mm = 1.5 mm
110 – 400 mm = 2.5 mm

Maximum alignment
48 – 140 mm = 4.0 degrees
160 – 400 mm = 2.0 degrees

Maximum offset
48 – 140 mm = 1.0 mm
160 – 225 mm = 2.0 mm
250 – 400 mm = 3.0 mm

Tolerances
Permissible tolerances, see page 43.

DA mm	Clamping range mm	Pressure PS bar		ΔT max. °C			Max. tensile strength kN			Dimensions				Pipe seal		
				PS 6	PS 10	PS 16	PS 6	PS 10	PS 16	A mm	B mm	D mm	E mm	M	AM Nm	
63	62 – 64	10	16			30	7.5	9.5	99	31	85	5	8	10		
75	74 – 76	10	16			30	10.6	13.5	117	31	97	5	8	10		
90	89 – 91	10	16			30	15.2	19.4	117	31	112	5	8	15		
110	108 – 111	10	16			30	22.7	29.0	117	45	132	5	10	15		
125	123 – 126	10	16			30	29.4	37.5	118	45	149	5	10	15		
140	138 – 142	10	16			30	36.9	47.0	118	45	164	5	10	15		
160	158 – 162	10	16	40	30	30	48.1	61.4	118	45	184	5	10	15		
180	178 – 182	6	10	16	40	20	15	40.6	43.3	51.5	201	95	217	10	12	30
200	198 – 203	6	10	16	40	20	15	50.2	53.4	63.6	201	95	237	10	12	30
225	222 – 227	6	10	16	40	20	15	63.5	67.6	80.4	201	95	262	10	12	30
250	247 – 253	6	10	16	40	20	15	78.4	83.4	99.3	201	95	287	10	12	40
280	277 – 283	6	10	16	40	20	15	98.4	104.7	124.6	201	95	317	10	12	40
315	311 – 317	6	10		40	20		124.5	132.5		201	95	352	10	12	40
355	351 – 357	6	10		40	20		158.1	168.3		201	95	392	10	16	50
400	396 – 402	6	10		40	15		200.8	192.0		201	95	437	10	16	50

E Permissible gap between pipe ends AM Tightening torque

DA Outer diameter PS Continuous operating pressure ΔT Difference between the minimum and maximum temperature in the pipeline

Material

W4, W5 (see page 42)

Note

Follow the assembly instructions to ensure that the pipe coupling works properly.

This tensile-resistant pipe connection system requires a special installation process. The MULTI-FIX is only the anchor set. The central pipe clamp can either be an Arpol INSTAL or Leschhorn LS.

Test pressure = 1.25 x PS

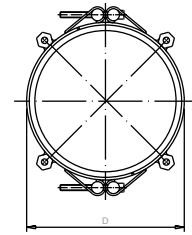
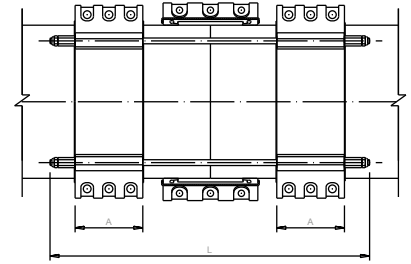
Tolerances

Permissible tolerances, see page 43.

Flexible pipe couplings with axial anchorage for the Connection of pipelines

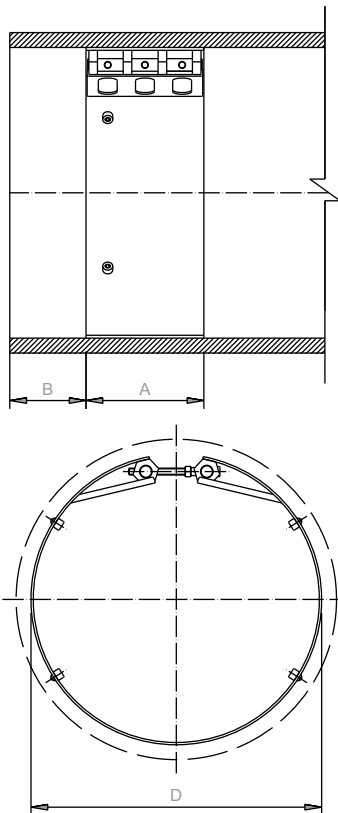
MULTI-FIX For pipes made of Polyethene

In PE pipes, inner support rings must be used to avoid deformation and a reduction in the pipe diameter due to temperature fluctuations.



DA mm	Pressure PS bar				ΔT max. ° C			Max. tensile strength kN			Dimensions						Connecting rod						
											A mm			L mm			D mm	M			Quantity		
											PS 6	PS 10	PS 16	PS 6	PS 10	PS 16		PS 6	PS 10	PS 16	PS 6	PS 10	PS 16
315	6	10	16	40	40	40	125	186	278	140	140	200	645	677	829	326	12	16	16	4	4	4	
355	6	10	16	40	40	40	158	237	353	140	140	200	645	677	829	366	12	16	16	4	4	4	
400	6	10	16	40	40	40	201	301	500	140	200	200	677	809	829	411	16	16	20	4	4	4	
450	6	10	16	40	40	40	254	382	567	140	200	200	677	829	829	461	16	20	20	4	4	6	
500	6	10		40	40		314	470		140	200		677	829		511	16	20		6	6		
560	6	10		40	40		393	589		140	200		677	829		571	16	20		6	6		
630	6	10		40	40		498	746		200	200		829	829		641	20	20		6	6		
710	6	10		40	30		633	810		200	200		829	829		722	20	20		6	6		
800	6	10		40	25		803	941		200	200		829	829		816	20	20		8	8		
900	6	10		40	20		1016	1081		200	200		829	829		916	20	20		9	9		
1000	6	10		40	15		1255	1200		200	200		829	829		1016	24	24		9	9		

DA Outer diameter PS Continuous operating pressure ΔT Difference between the minimum and maximum temperature in the pipeline



Flexible pipe couplings with axial anchorage for the Connection of pipelines

MULTI-FIX Support ring

In PE pipes, inner support rings must be used to avoid deformation and a reduction in the pipe diameter due to temperature fluctuations.

Material

W4, W5 (see page 42)

Note

Follow the assembly instructions to ensure that the pipe coupling works properly.

This tensile-resistant pipe connection system requires a special installation process. Please follow the assembly instructions before choosing this product.

Tolerances

Permissible tolerances, see page 43.

DA mm	A mm	B mm	Dimensions		
			SDR26	D mm SDR17	SDR11
315	200	140	291	278	258
355	200	140	328	313	290
400	200	140	369	353	327
450	200	140	415	397	368
500	200	140	462	441	409
560	200	140	517	494	458
630	200	140	582	556	515
710	200	140	655	626	581
800	200	140	738	706	655
900	200	140	831	794	736
1000	200	140	923	882	818

DA Outer diameter SDR Standard Dimension Ratio, Diameter to wall thickness ratio

Material

W2, W4, W5 (see page 42)

Maximum alignment

47 – 159 mm = 4.0 degrees
160 – 500 mm = 2.0 degrees

Maximum offset

47 – 159 mm = 0.5 mm
160 – 500 mm = 2.0 mm

Note

Follow the assembly instructions to ensure that the pipe coupling works properly.

Tolerances

Permissible tolerances, see page 43.

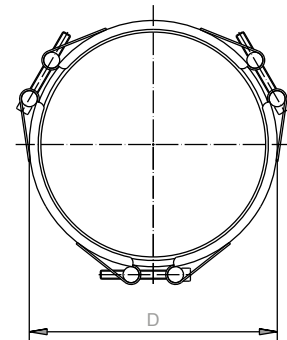
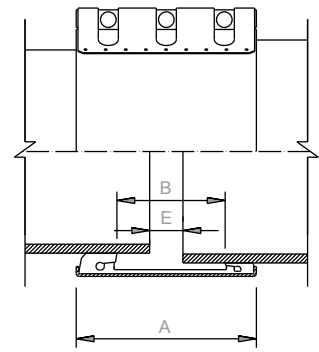
Flexible pipe couplings
for the connection of pipelines
with different Pipe outer diameters

TRANS

The nominal diameter is used to orientate the pressure scale. Manufacture of all diameters within a DN range.

Test pressure = 1.5 x PS

Operating pressure up to 10 bar



DA mm	TRANS 5				TRANS 10				TRANS 20				TRANS 30			
	2 Pipe seals		3 Pipe seals		2 Pipe seals		3 Pipe seals		2 Pipe seals		3 Pipe seals		2 Pipe seals		3 Pipe seals	
	$\Delta \varnothing$ min	$\Delta \varnothing$ max	$\Delta \varnothing$ min	$\Delta \varnothing$ max	$\Delta \varnothing$ min	$\Delta \varnothing$ max	$\Delta \varnothing$ min	$\Delta \varnothing$ max	$\Delta \varnothing$ min	$\Delta \varnothing$ max	$\Delta \varnothing$ min	$\Delta \varnothing$ max	$\Delta \varnothing$ min	$\Delta \varnothing$ max	$\Delta \varnothing$ min	$\Delta \varnothing$ max
47 – 159																
160 – 230	2	10														
230 – 250	2	10	2	11												
251 – 299	2	10	2	11	5	15	4	16	15	25	14	26				
300 – 349	2	10	2	11	5	15	4	16	15	25	14	26	25	35	24	36
350 – 499	2	10	2	12	5	15	3	17	15	25	13	27	25	35	23	37
>500	2	11	2	13	4	16	2	18	14	26	12	28	24	36	22	38

DN Nominal diameter DA Outer diameter

$\Delta \varnothing$ min minimum difference between the outer diameters $\Delta \varnothing$ max maximum difference between the outer diameters

INSTAL



Installation of a steel pipeline in a sewage treatment plant.



Installation within a distribution chamber.



Connection of two distribution chambers with one GRP pipe section.



Connection of a GRP pipe with a shut-off valve.



Installation of a galvanized steel pipe for air supply.



Installation of a GRP pipeline for water supply.

FIX



Tensile-resistant installation for an inspection chamber made of polyethene.



Tensile-resistant installation of a PE pipeline for the waste water of a mine.



Tensile-resistant repair of a pipe section made of polyethene.

TRANS



Repair of a GFP pipe with a pipe section made of cast iron with different outer diameters.



Connection of GFP and steel pipe with different outer diameters at the inlets and outlets of a distribution chamber.

Hose clamps

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» HD®/AERO BG®	66
» AERO HKF®/AERO HKFK®	67
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» GBS®	69
» STABIL TX®	70





Characteristics and brief description

- 01. Improved asymmetric housing construction = uniform force distribution and safe assembly
- 02. Screw support bearing = User-friendly assembly due to safe band guidance
- 03. Material and clamping range embossing = Prevention of mix-ups
- 04. Asymmetrical radial arm = the tilting of the clamp head is prevented during tightening
- 05. Shorter housing nut = uniform compacting pressure for better sealing behaviour
- 06. Band inner side smooth or embossed = optimum hose protection

Advantages of hose clamps

NORMACLAMP® connections have become an integral part of our lives, be it in automotive engineering, in and around the home, in tunnels, on ships and in the water supply.

High band tensile strength and high torque

The new NORMACLAMP® TORRO is still characterised by high band tensile strengths, but compared to competitor products and the predecessor model, the breaking torques are significantly higher. This guarantees a high level of assembly safety.

Uniform distribution of clamping force

The uniform distribution of the clamping force has been further improved by design changes. The clamp fits perfectly to the hose and guarantees optimum sealing behaviour.

Manufacturer information



The NORMA Group has stood for highly developed connection technologies for over 60 years. Prudent investments in innovative solutions enable the company to continuously develop new products and technologies. Over the years, the NORMA Group has developed into an international company with branches worldwide.

In Germany, you can purchase the entire NORMACLAMP® product range from Leschhorn as an authorised sales partner. We are also there for you when it comes to repair services or the replacement of parts.

Material

Basic material	Material	Corrosion resistance in the salt spray test	Availability
W1	Completely made of galvanised steel	144 h	On request
W2	Band and housing: stainless steel 1.4016 Screw: Galvanised steel	72 h	Standard
W2B	NORMACLAMP® GBS band: stainless steel 1.4510/1.4511, clamping head parts: Galvanised steel	72 h	Standard
W3	Completely rust-free steel 1.4016	220 h	On request
W4	Completely rust-free steel 1.4301	240 h	Standard
W5	Completely rust-free steel 1.4571/1.4401	400 h	On request

Type	Description	Width mm		Clamping ranges [Ø mm]		Material standard	Page
		W2	W4	W2	W4		
TORRO® 	Worm thread clamps	5/7.5 9/12	9/12	8 – 16 to 280 – 300	16 – 27 to 280 – 300	W2, W4	64
HD® 	Worm thread clamps for heavy-duty applications		16		25 – 45 to 210 – 232	W4	66
Breeze AERO BG® 	Worm thread clamps	14.3		12 – 22 to 140 – 160		W2	66
Breeze AERO HKF® 	High-performance worm thread clamps	15.8		45 – 67 to 146 – 168		W2	67
Breeze AERO HKFK® 	High-performance worm thread clamps	14.3	14.3	12 – 22 to 70 – 90	12 – 22 to 70 – 90	W2, W4	67
TBGF® 	4-piece, spring-loaded clamp; application for high pressure and temperature fluctuations	20		32 – 36 to 216 – 224		W2B	68
GBS® 	Hinge bolt clamps	18/20/ 25/30	18/20/ 25/30	17 – 19 to 239 – 252	17 – 19 to 239 – 252	W2, W4	69
STABIL® TX 	Worm thread clamps pursuant to DIN 3017	12		12 – 22 to 220 – 240		W2	70



TORRO® Worm thread clamp

Clamping ranges
In W2: 7 – 1 mm to 280 – 300 mm

In W4: 8 – 16 mm to 280 – 300 mm

Width/screw

Available widths in W2:
5/7.5/9/12 mm

Available widths in W4:
9/12 mm.

Width across flats C7,
C6 with a length of 7.5 mm

Width mm	Clamping range Ø mm	Spanner no. C mm	VPE	Material*
5	7 – 11	C6	100	W2
5	11 – 19	C6	100	W2
7.5	8 – 12	C6	100	W2
7.5	10 – 16	C6	100	W2
7.5	12 – 18	C6	100	W2
7.5	12 – 22	C6	100	W2
7.5	16 – 27	C6	100	W2
9	8 – 16	C7	100	W2, W4
9	12 – 22	C7	100	W2, W4
9	16 – 27	C7	100	W2, W4
9	20 – 32	C7	100	W2, W4
9	25 – 40	C7	100	W2, W4
9	30 – 45	C7	100	W2, W4
9	32 – 50	C7	50	W2, W4
9	40 – 60	C7	50	W2, W4
9	50 – 70	C7	50	W2, W4
9	60 – 80	C7	25	W2, W4
9	70 – 90	C7	25	W2, W4
9	80 – 100	C7	25	W2, W4
9	90 – 110	C7	25	W2, W4
9	100 – 120	C7	25	W2, W4
9	110 – 130	C7	25	W2, W4
9	120 – 140	C7	25	W2, W4
9	130 – 150	C7	25	W2, W4
9	140 – 160	C7	25	W2, W4
9	150 – 170	C7	25	W2, W4
9	160 – 180	C7	25	W2, W4
9	170 – 190	C7	25	W2, W4
9	180 – 200	C7	25	W2, W4
9	190 – 210	C7	25	W2, W4

Width mm	Clamping range Ø mm	Spanner no. C mm	VPE	Material*
12	12 – 22	C7	50	W2, W4
12	16 – 27	C7	50	W2, W4
12	20 – 32	C7	50	W2, W4
12	25 – 40	C7	50	W2, W4
12	30 – 45	C7	50	W2, W4
12	35 – 50	C7	50	W2, W4
12	40 – 60	C7	25	W2, W4
12	50 – 70	C7	25	W2, W4
12	60 – 80	C7	25	W2, W4
12	70 – 90	C7	25	W2, W4
12	80 – 100	C7	25	W2, W4
12	90 – 110	C7	20	W2, W4
12	100 – 120	C7	20	W2, W4
12	110 – 130	C7	20	W2, W4
12	120 – 140	C7	20	W2, W4
12	130 – 150	C7	20	W2, W4
12	140 – 160	C7	20	W2, W4
12	150 – 170	C7	20	W2, W4
12	160 – 180	C7	20	W2, W4
12	170 – 190	C7	10	W2, W4
12	180 – 200	C7	10	W2, W4
12	190 – 210	C7	10	W2, W4
12	200 – 220	C7	10	W2, W4
12	210 – 230	C7	10	W2, W4
12	220 – 240	C7	10	W2, W4
12	230 – 250	C7	10	W2, W4
12	240 – 260	C7	10	W2, W4
12	250 – 270	C7	10	W2, W4
12	260 – 280	C7	10	W2, W4
12	270 – 290	C7	10	W2, W4
12	280 – 300	C7	10	W2, W4

* W1, W3, W5 on request

Description

The torque cap is sheared off when the permissible torque is reached, thus saving a torque spanner.

The screw slot is accessible again after the predetermined break-off point, so that the clamp can be disassembled and/or retightened if necessary.

Advantage

Defined tightening torque without any special tools and visual assembly checks

Torque cap

For a width across flats of 7 mm, all material types

Width 9 mm:

for clamping ranges \varnothing 8 – 16 to 12 – 18 mm

for all clamping ranges \varnothing from 12 – 22

Width 12 mm: for all clamping ranges \varnothing

VPE each 1000 pieces

Mounting device required



Description

The NORMACLAMP® TORRO® wing screw can easily be tightened by hand.

Advantage

The clamp can be tightened and opened manually

Wing screw

For a width across flats of 7 mm

Up to maximum \varnothing 140 mm

Width:

9 and 12 mm

VPE

each 1000 pieces



Description

The anti-slip protection is a plastic ring that can be easily applied to the clamp's screw head.

It makes assembly much easier, as the screwdriver can no longer slip off.

Advantage

The spanner does not slip during assembly

Anti-slip protection

For a width across flats of 7 mm

Width:

9 and 12 mm

VPE

each 1000 pieces



Description

The safety cap is used to prevent injuries during assembly. The small plastic cap covers the end of the band and helps to avoid accidents.

Advantage

The NORMACLAMP® TORRO® safety cap is available for a band width of 7.5 mm, 9 mm and 12 mm

Safety cap

Width:

7.5/9 and 12 mm

VPE

each 1000 pieces





HD® worm thread clamp

for heavy-duty applications

Clamping ranges
In W4:
25 – 45 mm to 210 – 232 mm

Width
In W4: 16 mm

Screw
Width across flats C8

Description

NORMACLAMP® HD® is suitable for special areas of application in which high tightening torques and compacting pressures are required, e.g. the fastening of hoses with steel inserts. It is the most powerful hose clamp in the hose clamp product range.



BREEZE AERO BG® Worm thread clamp

Clamping ranges
In W2: 12 – 22 mm to 140 – 160 mm

Width
Available width in W2: 14.3 mm.

Screw
Width across flats C8

Description

With covered band thread for soft hoses (e.g. silicone) in line with the clamping force requirements of DIN 3017.

Areas of application

Use in general applications and in highly-polluted areas in air, water and hydraulic zones.

Very high clamping force and a uniform circumferential force distribution at the proposed operating torque of 5 Nm
Fracture torque > 8.5 Nm.

Above-average corrosion protection.

Width mm	Clamping range Ø mm	VPE	Material
14.3	12 – 22	100	W2
14.3	16 – 27	80	W2
14.3	20 – 32	60	W2
14.3	25 – 40	50	W2
14.3	30 – 45	100	W2
14.3	35 – 50	80	W2
14.3	40 – 60	70	W2
14.3	50 – 70	60	W2

Width mm	Clamping range Ø mm	VPE	Material
14.3	60 – 80	50	W2
14.3	70 – 90	40	W2
14.3	80 – 100	30	W2
14.3	90 – 110	30	W2
14.3	100 – 120	25	W2
14.3	110 – 130	20	W2
14.3	120 – 140	25	W2
14.3	130 – 150	25	W2
14.3	140 – 160	150	W2

Description

Spring-loaded clamp with covered band thread in line with the clamping force requirements of DIN 3017.
Flexible thin-walled band.

Areas of application

Use in highly polluted areas in air, water and hydraulic connections, in combination with high pressure or temperature changes.
Very high clamping force and a uniform circumferential force distribution at the proposed operating torque of 5 Nm; fracture torque > 10 Nm

BREEZE AERO HKF® Worm thread clamp

Clamping ranges
In W2: 45 – 67 mm to 146 – 168 mm

Width
In W2: 15.8 mm.

Screw
Width across flats C10



Width mm	Clamping range Ø mm	VPE	Material
15.8	45 – 67	50	W2
15.8	57 – 79	50	W2
15.8	70 – 92	25	W2
15.8	83 – 105	50	W2

Width mm	Clamping range Ø mm	VPE	Material
15.8	95 – 118	50	W2
15.8	108 – 130	50	W2
15.8	121 – 143	10	W2
15.8	133 – 156	10	W2
15.8	146 – 168	10	W2

Description

Spring-loaded clamp with covered band thread in line with the clamping force requirements of DIN 3017.
Flexible thin-walled band.

Areas of application

Use in highly polluted areas in air, water and hydraulic connections, in combination with high pressure or temperature changes.
Very high clamping force and a uniform circumferential force distribution at the proposed operating torque of 5 Nm; fracture torque > 10 Nm

BREEZE AERO HKFK® Worm thread clamp

Clamping ranges
In W2: 12 – 22 mm to 70 – 90 mm
In W4: 12 – 22 mm to 70 – 90 mm

Width
Available width in W2 and W4:
14.3 mm.

Screw
Width across flats C10



Width mm	Clamping range Ø mm	VPE	Material
14.3	12 – 22	500	W2, W4
14.3	16 – 27	400	W2, W4
14.3	20 – 32	350	W2, W4
14.3	25 – 40	250	W2, W4
14.3	30 – 45	250	W2, W4
14.3	35 – 50	200	W2, W4

Width mm	Clamping range Ø mm	VPE	Material
14.3	40 – 60	300	W2, W4
14.3	50 – 70	250	W2, W4
14.3	60 – 80	200	W2, W4
14.3	70 – 90	200	W2, W4



TBGF® 4-part spring-loaded hose clamp

for very high requirements.

Clamping ranges
In W2B:
43 – 46 mm to 156 – 162 mm

Width
In W2B: 20 mm.
Spring block force: 1800 N
Proposed torque: 7.5 Nm.

Description

T-bolt clamp with insert tape in the lock area.

For diameters less than 76 mm with offset T-bolts.

Areas of application

Use in automotive engineering, industry and plant construction, superimposed with high pressure and temperature fluctuations or vibrations.

Width mm	Clamping range Ø mm*	VPE	Material
20	43 – 46	50	W2B
20	52 – 58	50	W2B
20	54 – 60	50	W2B
20	55 – 56	50	W2B
20	56 – 62	50	W2B
20	68 – 74	50	W2B
20	74 – 84	50	W2B
20	79 – 85	50	W2B
20	83 – 93	50	W2B
20	85 – 91	50	W2B
20	88 – 94	50	W2B
20	91 – 97	50	W2B
20	92 – 102	25	W2B
20	97 – 103	25	W2B
20	102 – 108	25	W2B
20	108 – 114	25	W2B
20	130 – 140	25	W2B
20	156 – 162	25	W2B

* Other clamping ranges on request.

- 01.** W1/W2/W4
New special hexagon head screw with integrated bolt spacer = improved efficiency, captive, W5 cheese-head screw with hexagon socket
- 02.** Reinforced coil loops = makes it possible to absorb significantly higher torques
- 03.** Mechanical suspension = no weld points and no contact corrosion
- 04.** Bridge = hose protection
- 05.** Robust band with rounded edges = prevents injuries and hose damage

GBS® Hinge bolt clamps pursuant to DIN 3017

Particularly suitable for fastening suction and compressed air hoses with a high degree of hardness or with plastic or steel inserts. They are characterised by their extremely high band tensile strengths.

Installation can be carried out with standard manual, pneumatic or electrical tools.

Screw
With a hexagonal head screw



Width mm	Clamping range Ø mm	VPE	Material*
18	17 – 19	50	W2B, W4
18	19 – 21	50	W2B, W4
18	21 – 23	50	W2B, W4
18	23 – 25	50	W2B, W4
18	25 – 27	50	W2B, W4
18	27 – 29	50	W2B, W4
18	29 – 31	50	W2B, W4
18	31 – 34	50	W2B, W4
18	34 – 37	50	W2B, W4
18	37 – 40	50	W2B, W4
18	40 – 43	50	W2B, W4
20	43 – 47	50	W2B, W4
20	47 – 51	50	W2B, W4
20	51 – 55	50	W2B, W4
20	55 – 59	50	W2B, W4
20	59 – 63	50	W2B, W4
20	63 – 68	50	W2B, W4
25	68 – 73	25	W2B, W4

Width mm	Clamping range Ø mm	VPE	Material*
25	73 – 79	25	W2B, W4
25	79 – 85	25	W2B, W4
25	85 – 91	25	W2B, W4
25	91 – 97	25	W2B, W4
25	97 – 104	25	W2B, W4
25	104 – 112	25	W2B, W4
25	112 – 121	25	W2B, W4
25	121 – 130	25	W2B, W4
30	130 – 140	10	W2B, W4
30	140 – 150	10	W2B, W4
30	150 – 162	10	W2B, W4
30	162 – 174	10	W2B, W4
30	174 – 187	10	W2B, W4
30	187 – 200	10	W2B, W4
30	200 – 213	10	W2B, W4
30	213 – 226	10	W2B, W4
30	226 – 239	10	W2B, W4
30	239 – 252	10	W2B, W4

* W1, W5 on request



TX clamps are also available with a wave spring to balance the hose set behaviour.

STABIL® TX Worm thread clamp

pursuant to DIN 3017 and the MAN factory standard M 3259

They are designed to meet the highest technical requirements for hose connections and are used in areas where extremely high band tensile strengths and breaking torques are required.

TX has an embossed band perforation with a homogeneous inner side to protect the hose.

The band thickness is 0.8 mm, from TX 80–100 = 1.0 mm.

Material

All parts made of W2 – stainless steel 1.4016 for corrosion resistance
Width across flats C8

Band

Extremely rounded and raised band edges = hose protection
Embossed perforation = no hose section
Homogeneous perforation inner side = hose protection
Band width 12 mm = higher surface pressure

Housing

Form-fit housing connection = process reliability
Housing size = transmission of higher forces

Screw C8

Optimal thread pitch = higher degree of efficiency
Threaded bearing and screw head = good perforation contact
Surface coating = no tilting of the head, reduction of the idling torque

Width mm	Clamping range* Ø mm	Spanner no. C mm	VPE	Material
16	25 – 45	8	50	W 2
16	32 – 54	8	50	W 2
16	45 – 67	8	50	W 2
16	57 – 79	8	50	W 2
16	70 – 92	8	25	W 2
16	83 – 105	8	10	W 2
16	95 – 118	8	10	W 2
16	108 – 130	8	10	W 2

Width mm	Clamping range* Ø mm	Spanner no. C mm	VPE	Material
16	121 – 143	8	10	W 2
16	133 – 156	8	10	W 2
16	146 – 168	8	10	W 2
16	159 – 181	8	10	W 2
16	172 – 194	8	10	W 2
16	184 – 206	8	10	W 2
16	197 – 219	8	10	W 2
16	210 – 232	8	10	W 2

* Other clamping ranges on request.

Manufacturer information



Founded in 1984, the company from Kirchheim/Teck develops and manufactures products in the areas of electrical engineering, metal and plastics, mainly for the vehicle manufacturers and their subcontractors.

The STABIL connecting parts include hose clamps designed for the highest technical requirements.

The research and development department is continuously working on new and innovative products.

The company manufactures products of the highest quality and is subject to quality requirements according to ISO/TS 16949.

The STABIL GROUP companies operate nationally and internationally.

In Germany, you can purchase the entire Stabil connecting parts product range from Leschhorn, as an authorised sales partner of both the Stabil and TX product line.

If you have any questions, feel free to call us – we will be happy to advise you!
+49 69 420 976-0

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A large grid of small dots for taking notes, covering the majority of the page.

Terms and conditions of sale, delivery and payment

§1 General

The following conditions are solely authoritative for our business dealings, even if the ordering party has stipulated other conditions. They are deemed as accepted if they are not objected to immediately after receipt of the order confirmation. Amendments or additions made by telephone or in person require our written confirmation to be valid. All previously valid conditions become invalid with the introduction of these terms and conditions of sale.

§ 2 Offers

Offers are non-binding until we have confirmed the order in writing.

§ 3 Prices

Prices are in EURO ex works, excluding packaging, shipping costs and insurance as well as value added tax, customs duties and customs clearance costs. For orders using the price list, the prices valid on the day of delivery are calculated according to the latest price list. The packaging is calculated at cost price. All packaging materials used such as cardboard boxes, disposable plywood boxes and normal wooden boxes are non-returnable.

§ 4 Minimum order surcharge

A minimum order surcharge to the amount of € 18 euros per delivery is additionally charged for small orders up to a value of goods of € 80 euros for administrative costs.

§ 5 Delivery times

Delivery times for our deliveries begin with the date of the order confirmation and are non-binding. Even in the case of agreed delivery dates, subsequent changes to the order entitle us to redefine the dates, taking into account our corporate circumstances. In the event of force majeure – in particular, in the event of subsequent material procurement difficulties, operational disruptions, strikes, lockouts, other staff shortages, lack of transport means, official orders, etc., (even if they occur with our second source or subcontractors) – or in the event of other unforeseeable obstacles, there shall be no delay. In this case, we are entitled to postpone the delivery or performance for the duration of the impediment in addition to a reasonable time or to cancel the contract in whole or in part in respect of the non-performance of a part of this contract or on account of the delivery. Compensation for damages and rescission owing to a delay in delivery are generally excluded on the part of the ordering party. The manufacturer reserves the right to make design or shape changes, deviations in colour shades and changes to the scope of delivery during the delivery time, provided that the object of purchase is not significantly modified and the changes are reasonable for the customer. In all other cases, we are entitled to execute orders in part-deliveries. For custom-made products, a prepayment of 50 % of the agreed value of goods must be made. The order quantity may be over- or under-delivered by up to 10 % for custom-made products; in this case, the actual delivery quantity will be invoiced. We are entitled to make the dispatch of follow-up orders dependent on the complete payment of previous deliveries, irrespective of the agreed due dates in this respect.

§ 6 Shipping

Is always at the risk and expense of the ordering party, unless otherwise expressly agreed in writing. We will only replace goods lost or damaged during transport on the basis of a new order against payment of the prices valid at the respective time. We will take out insurance against transport damage at the express request of the ordering party for the ordering party's account. In principle, transport takes place in the most favourable way for us, at our own discretion, without any liability for cheaper shipping or shorter distances. Express goods and express shipping costs are to be borne by the buyer, even if the order's value is exempt from postage. A portion of the packaging costs will always be invoiced.

§ 7 Invoices

Invoices are payable within 14 days after the invoice date without deduction; for payment within 8 days with a 2 % cash discount of the net value of goods, provided that all due invoices have been paid until this time. Payment will be deemed

to have been made once we have the amount at our disposal. In the event of a delay in payment, we charge default interest to the amount of 5 % p.a. using the respective discount rate of the Deutsche Bundesbank. In this case, we reserve the right to cancel the quantity discount granted in whole or in part. Bills of exchange are only accepted by special arrangement; their acceptance does not equate to either performance or deferment. Any discount and other expenses incurred will be borne by the ordering party in this case. If the ordering party is in arrears with payments, we may rescind the contract or claim compensation for damages for non-performance after setting a reasonable deadline, irrespective of the assertion of rights from the agreed retention of title. In the event that we receive unsatisfactory information about the ordering party or in cases involving other risks to the economic interests of our company, we are entitled to subsequently change the agreed terms of payment and to demand delivery against the provision of security or concurrent payment. In this case, we reserve the right to rescind the contract.

§ 8 Retention of title

We will retain the title to the purchased goods until all payments arising from the business relationship with the ordering party have been received. In the case of a breach of contract by the ordering party, especially in the case of a default in payment, we are entitled to take back the purchased goods. The taking back of the purchased goods by our company does not constitute a rescission of the contract, unless we have expressly declared so in writing. The court-ordered seizure of the purchased goods by our company will always constitute a revision of the contract. We are entitled to dispose of the purchased goods after their return; the proceeds of the sale will be deducted from the ordering party's liabilities – less reasonable disposal costs. In the event of a court-ordered seizure of goods or other interventions by third parties, the ordering party must notify us in writing without undue delay, so that we are able to take legal action according to § 771ZPO (German code of civil procedure). Insofar as the third party is unable to reimburse us for the judicial and extrajudicial costs of such legal action, the ordering party is liable for the losses incurred. The ordering party is entitled to resell the purchased goods in the ordinary course of business; he hereby assigns to us all claims to the amount of the final invoice (including VAT) accruing to him against his customers or third parties from the resale irrespective of whether the purchased goods have been resold without or after processing. The ordering party is authorised to include this claim even after the assignment. Our authority to enforce the claim ourselves remains unaffected. However, we undertake not to enforce the claim as long as the ordering party meets his payment obligations from the collected proceeds, is not in default of payment and, in particular, no application for the opening of bankruptcy or insolvency proceedings or the cessation of payments has been made. If this is the case, we may demand that the ordering party informs us of the assigned claims and their debtors, gives us all the information required to assert our rights and hands over the relevant documents. The processing or alteration of the purchased goods will always be carried out on our behalf. If the purchased goods are processed with other objects not belonging to us, we will acquire co-ownership of the new object in proportion to the value of the purchased goods to the other processed objects at the time of processing. In all other cases, the same provisions concerning the goods delivered under reservation will apply to the new object arising from such processing. At the request of the ordering party, we undertake to release the securities to which we are entitled to the extent that the value of our securities exceeds the claims to be secured by more than 20 %; we retain the right to select the securities to be released.

§ 9 Complaints

Delivery complaints about obvious defects must be reported within five working days after receipt of the goods at the latest. We assume no liability for information on dimensions, weights and drawings, in our catalogues and technical descriptions in particular.

§ 10 Warranty/compensation for damages

In the event of defects, the right of the ordering party is initially limited to subsequent performance. If subsequent performance

is not successful, or if we are not prepared or not in a position to provide subsequent performance, or if this is delayed beyond a reasonable deadline for reasons for which we are responsible, the ordering party has the right to rescind the contract or require a reduction in payment at his discretion. Claims for damages are excluded, insofar as damage resulting from injury to life, body or health is concerned or other damages that can be attributed to a willful or grossly negligent violation of contractual obligations by one of our employees or one of our legal representatives. The limitation of liability will also not apply if the ordering party asserts claims for damages due to the absence of a guaranteed characteristic.

§ 11 Product liability

Insofar as the ordering party processes our products further and thus becomes manufacturer according to § 4 Product Liability Act (Produkthaftungsgesetz, ProdHaftG), the purchaser indemnifies Leschhorn against liability in accordance with § 1 ProdHaftG. This does not apply if a product defect can be attributed to a willful or grossly negligent violation of contractual obligations at Leschhorn.

§ 12 Return of goods

Return of goods only for the value of goods over € 50. For returns owing to incorrect orders, we will issue a credit note for the value of the goods with a processing and re-storage discount of 25 % and a freight-free return delivery.

§ 13 Copyright

We have exclusive copyright to the figures and drawings as well as to samples and other documents contained in our catalogues and prospectuses. They may not be resold without our authorisation.

§14 Data protection

Each of our business partners agrees to our processing of personal data for business purposes with the help of electronic data processing (EDP) in accordance with the provisions of the Federal Data Protection Act.

§ 15 Place of performance

The place of performance for delivery and payment is Frankfurt; the court of jurisdiction will be Frankfurt for both parties. If the purchaser is a registered trader, a legal entity under public law or a special fund under public law, the exclusive court of jurisdiction is Frankfurt. This exclusive court of jurisdiction also applies if the purchaser has no general court of jurisdiction, moves his domicile or usual abode outside Germany after the conclusion of the contract or his habitual residence or usual abode is not known at the time legal action is taken. German law applies exclusively to the processing of the order. The UN Convention on the International Sale of Goods is excluded, i.e., inapplicable. Should one or more of the above provisions be or become invalid or void, the validity of the remaining provisions will not be affected. In this case, the invalid provision must be replaced with a valid one that achieves the intended economic purpose of the contract to the greatest extent possible.

§ 16 Severability clause

The nullity or invalidity of any provision of this contract will not result in the nullity or invalidity of the remaining provisions of this contract.

§17 Written form

For the validity of the written form, the written form can only be waived by written agreement.

Date: 12.10.2015

All information in this catalogue corresponds to the latest state of affairs at the time of publication.

We reserve the right to make changes as a result of further developments, new product launches or on account of errors. We apologise for any inaccuracies or typing errors.

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Your opinion matters to us.

Please do not hesitate to contact us and let us know!

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For the sake of the environment, this catalogue is CO₂ neutral.

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