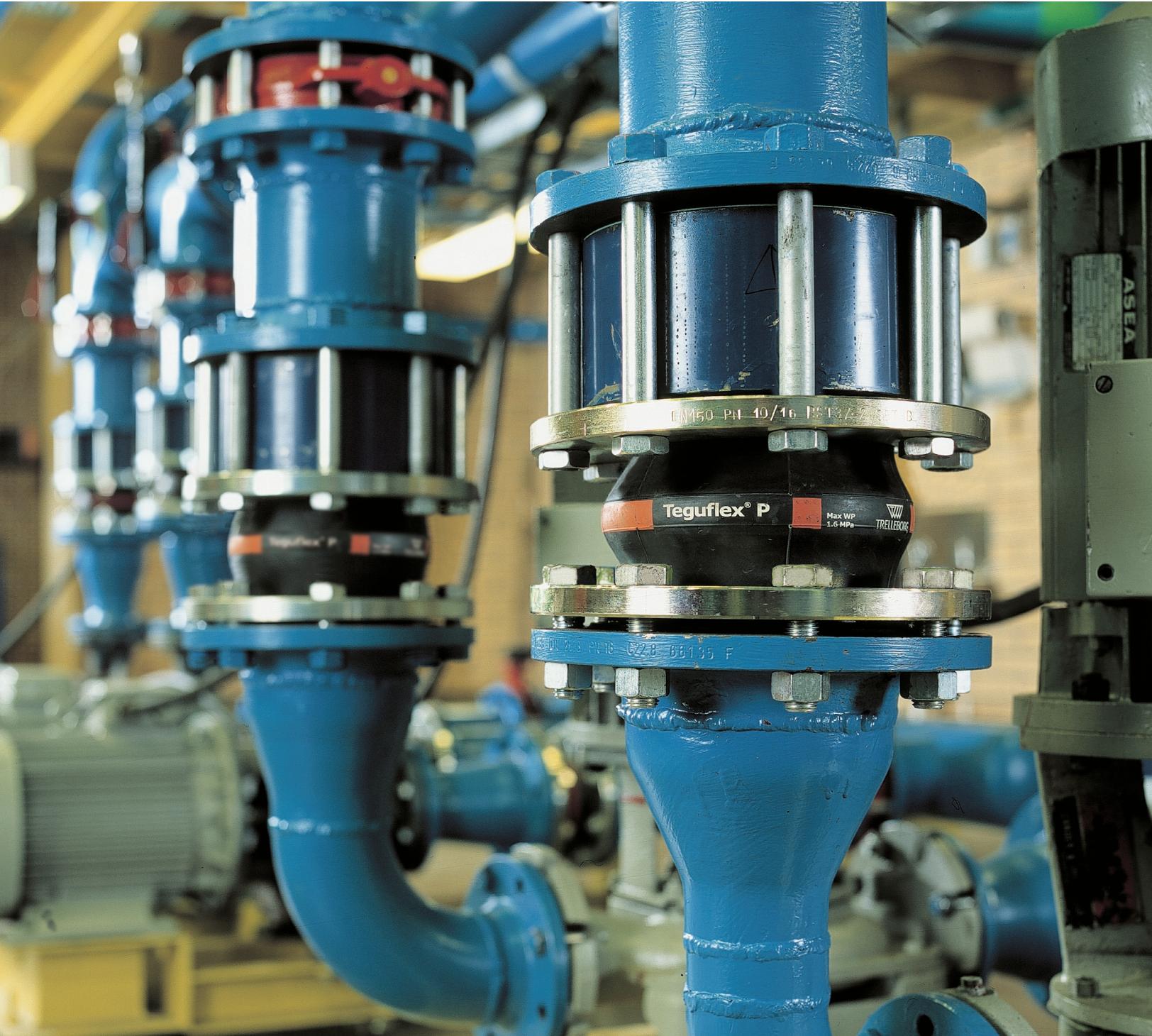


# Trelleborg Expansion Joints



## Consult Trelleborg and feel secure

### Complete range of rubber expansion joints

We offer the market the most comprehensive selection of rubber expansion joints, covering the widest range of applications and dimensions. By adapting the latest rubber and fabric technology, Trelleborg can provide the most effective solutions to suit the required properties for any pipe systems. We can also develop unique rubber expansion joints for special installations.

### Focus on Customer Benefits

Trelleborg knows that realising benefits for the customer is of key importance. Our focus is always to make the work easier and more comfortable for our customers and also their customers. This means we let our work be guided by our philosophy in providing Comfort, Safety and concern for the Environment.

### Quality and Commitment

Trelleborg has more than 100 years of experience of manufacturing rubber products, with a history of stability and commitment to quality and continuous improvement to find better solutions and products. Most of our operations are conducted according to ISO 9001/9002 standards. We believe that environmental management systems like ISO 14001 efficiently contribute to the integration of environmental issues in our daily work.

### Continuous Development

Trelleborg invests heavily in research and development. We identify the customer needs from our experienced technical sales staff and then our chemists and engineers are dedicated to find the most cost-effective appropriate solutions. This is achieved through continuous development of new materials, composites, designs and manufacturing methods.

The Trelleborg group employs more than 14,000 people globally and is established in more than 35 countries.



# Trelleborg Exp

A complete range of r

Range and style	Dimensions	Working pressure	Operating temperature	Typical applications
<b>TRELLEBORG TF</b> Turnable flanges	DN 25 – DN 1000	Up to 16 Bar	Up to 130°C	For all types of industrial applications, residential buildings, industrial plants, industrial premises as well as sanitary applications. Compensate for thermal elongation and contraction. Isolate vibrations, dampen noise and provide a tight connection with engines, pumps, turbines etc.
<b>TRELLEBORG FF</b> Full-faced rubber flanges	DN 500 – DN 3200	Up to 10 Bar	Up to 90°C	Trelleborg FF are suitable in pressurized large diameter systems with requirements for small reaction forces, high reliability and long life. These expansion joints are suitable for large displacements in lateral or angular directions, and they are used in cooling water systems at power plants, in gas and drinking-water supply lines, for pumps and boilers.
<b>TRELLEBORG S</b> Special	DN 25 – DN 3200	According to requirements	According to requirements	For industrial applications, offshore, dredging, etc. Measurements and/or pressure and temperature requirements correspond to Trelleborg TF or FF.
<b>TRELLEBORG TU</b> Threaded unions	DN 20 – DN 65	Up to 10 Bar	Up to 80°C	Small pipe connections where a screwed connection is preferred over a flange. Compensate for thermal elongation and contraction. Isolate vibrations, dampen noise and provide a tight connection with engines, pumps, turbines etc.

Inner lining material	Typical applications
NR	Abrasive material, waste water, sea water
CR	Cold water, alkaline water, sea water, cold air
NBR/ECO	Oil, petroleum, gas, compressed air
NBR/PVC	Unleaded petrol, hydraulic oil
EPDM	Warm water, cooling water, acids, weak chlorinated solutions
EPDM (Spec.)	Hot water 130°C, vapour, cooling water
Hypalon	Strong acids, alkalis and other chemicals
BUTYL	Warm media, hot compressed air, alkalines
SBR	Abrasive material (slurry, sand, waste water, etc)
HNBR	Hot oil 110°C, warm hydraulic oil, hot oil mixed water
Viton	Highly aggressive chemicals and/or high temperature
PTFE-Lining	Extremely aggressive products
Fire retardant *	Fuel, lubrication oil, hydraulic oil in certain applications

Chemical resistance: See table or contact nearest Trelleborg office for details. \*Outer lining material.

## Material assortment

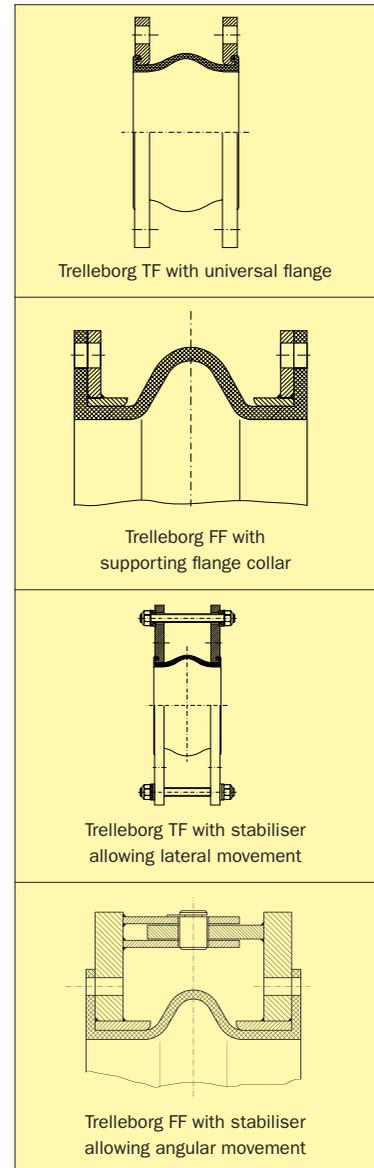
We have through the years built up extensive knowledge of different rubber materials and their constituent polymers, raw materials and reinforcement materials.

A wide range of rubber materials enable us to select the right material for most applications.

# Expansion Joints

## Rubber expansion joints

	Design
<p>idential houses, as heating and</p> <p>misalignment, pressure surges in etc.</p>	<p>A moulded rubber bellow that combines elastic properties of rubber with various types of reinforcement to provide a flexible pipe joint that is easy to install and provides good performance and long service life.</p> <p>Turnable flanges according to the requirements.</p>
<p>arge-sized pipe on forces, providing</p> <p>ge extensions in axial, used particularly in condensers, in pumps, turbines and</p>	<p>A customary manufactured rubber bellow with full-faced rubber flanges and loose or integrated retaining flanges with supporting collar.</p> <p>Bellow with or without convolution, robust, of various rubber qualities and reinforcement.</p>
<p>ing etc., where temperature rates do not</p>	<p>Specially developed and manufactured to suit requirements for pressure, temperature, building length and diameter which standard expansion joints do not meet.</p>
<p>onnection rather correct misalign- sorb pressure surges nes etc.</p>	<p>The Trelleborg TU is a moulded twin sphere expansion joint with screwed connections. Loose male thread.</p> <p>Metal parts, made of malleable cast iron and hot dipped galvanized, are furnished with BSP threads.</p>



## Applications

For all types of industrial applications, residential houses, industrial plants, industrial premises as well as heating and sanitary applications.

Compensate for thermal elongation and misalignment.

Isolate vibrations, dampen noise and pressure surges in connection with engines, pumps, turbines etc.

## Design

A moulded rubber bellows that combines elastic properties of rubber with various types of reinforcement to provide a flexible pipe joint that is easy to install providing good performance and a long service life.

Building length 130 mm.

Turnable flanges.

**Teguflex® P**  
Trelleborg TF BL 130

## Expansion Joints

DN 25-DN 300



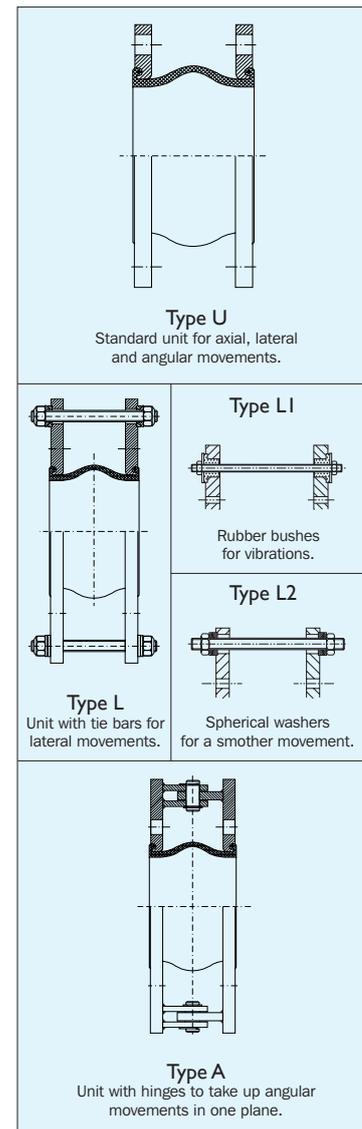
## Materials

Colour Label	Inner tube	Outer cover	Max temp. °C	Applications
Red	EPDM	EPDM	90°	Hot water, cooling water with salt solutions, chlorine solutions, esters and ketones.
Yellow	ECO (Epichloridrine)	ECO	90°	Water, salt solutions, alkalis, mineral oils, vegetable or animal oils, oils aerosols, butane or propane gas, etc.
Yellow TW <sup>1</sup>	ECO	ECO	90°	Tank wagons, tankers and stationary structures for oil-based products and unleaded petrol with less than 50% aromatic hydrocarbon.
White	Nitrile white	ECO	90°	Drinking water, food and beverages. Including fats and oils.
Green	Hypalon	Chloroprene	90°	Strong and/or concentrated acids, etc. Compressed air that bears oil aerosols.
Blue	SBR	Chloroprene	90°	Wearing material such as sludge suspended stone, calcium.

<sup>1</sup> Provided with aluminium flanges acc. to DIN 28460 for tank lorries. Maximum allowable pressure 10 bar. Sizes: from DN65 up to DN125 both included only.

## Pressure rating

Condition	Temperature	Pressure
Max. working pressure	70°C	16 bar
	90°C	10 bar
Test pressure	20°C	25 bar
Burst pressure	20°C	>50 bar



# Teguflex P BL 130 DN 25-DN 300

## Flange qualities

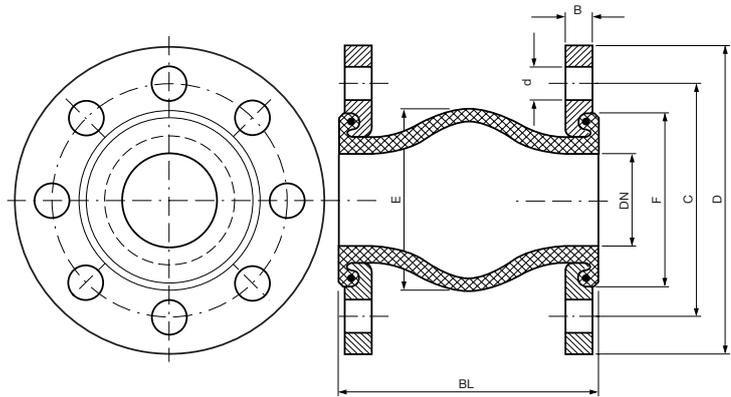
Yellow cromated steel flanges are supplied as standard, however other types are available: stainless steel, hot dipped galvanized, etc.

## Flange measurements

DN 32-DN 300 DIN 2501 PN 6/10/16

(see Flange dimension table for details)

Other flange standards available. Please ask.



## Dimensions and movements

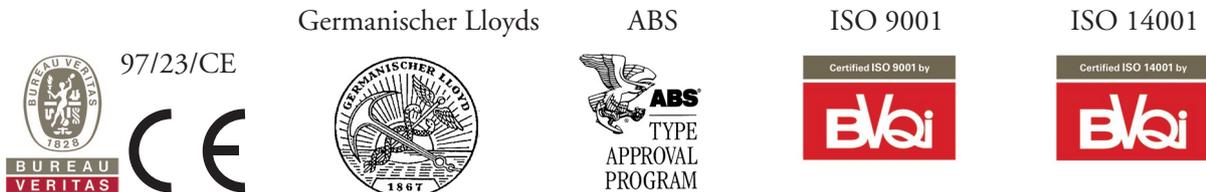
DN mm	BL mm	Eff.cross-sectional area Q(cm <sup>2</sup> )	(E) mm	(F) mm	Permissible movements				Max. vacuum		Weight		P Tied flanges kg	Spring rates		
					Com- pression mm	Elon- gation mm	Lateral mm	An- gular	W/o support ring bar	With support ring bar	Incl. flange kg	Incl. Tie-rod flange kg		Com- pression Stiffness kg/cm	Elon- gation Stiffness kg/cm	Lateral Stiffness kg/cm
25/32	130	35	77	72	30	20	20	35°	0.8	1.0	2.8	4.5	4	50	75	50
40	130	50	85	80	30	20	20	35°	0.8	1.0	3.3	4.8	5	50	75	50
50	130	74	95	90	30	20	20	35°	0.7	1.0	3.7	5.0	5	50	75	50
65	130	87	110	105	30	20	20	30°	0.6	1.0	4.8	6.4	7	50	75	50
80	130	120	125	120	30	20	20	30°	0.5	1.0	5.3	7.5	8	50	75	50
100	130	143	145	140	30	20	20	25°	0.5	1.0	6.2	9.0	10	65	85	65
125	130	210	170	165	30	20	20	25°	0.4	1.0	8.2	11.2	12	65	85	65
150	130	283	195	190	30	20	20	15°	0.3	1.0	11.2	13.4	16	75	100	75
200	130	525	245	240	30	20	20	15°	0.3	1.0	16.8	19.4	23	75	100	75
250	130	636	295	290	30	20	20	10°	0.2	1.0	21.6	25.4	33	100	150	100
300	130	897	345	340	30	20	20	10°	0.2	1.0	30.1	33.1	44	100	150	100

Note: Maximum values do not apply simultaneously. Stiffness values tolerance: +/- 20%.

## Optional equipment

Teflon lining (PTFE), Vacuum rings (stainless steel), Flame guard, etc. are available.

## Approvals



**TRELLEBORG**  
ENGINEERED SYSTEMS

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E-mail: expansion.joints@trelleborg.com Internet: www.trelleborg.com/iesa

Distributor:

## Applications

For all types of industrial applications, residential houses, industrial plants, industrial premises as well as heating and sanitary applications.

Compensate for thermal elongation and misalignment.

Isolate vibrations, dampen noise and pressure surges in connection with engines, pumps, turbines etc.

## Design

A moulded rubber bellows that combines elastic properties of rubber with various types of reinforcement to provide a flexible pipe joint that is easy to install providing good performance and a long service life.

Building length 150/200/275/300 mm.

Turnable flanges.

**Teguflex® W**  
Trelleborg TF BL 150-300

## Expansion Joints

DN 25-DN 1000



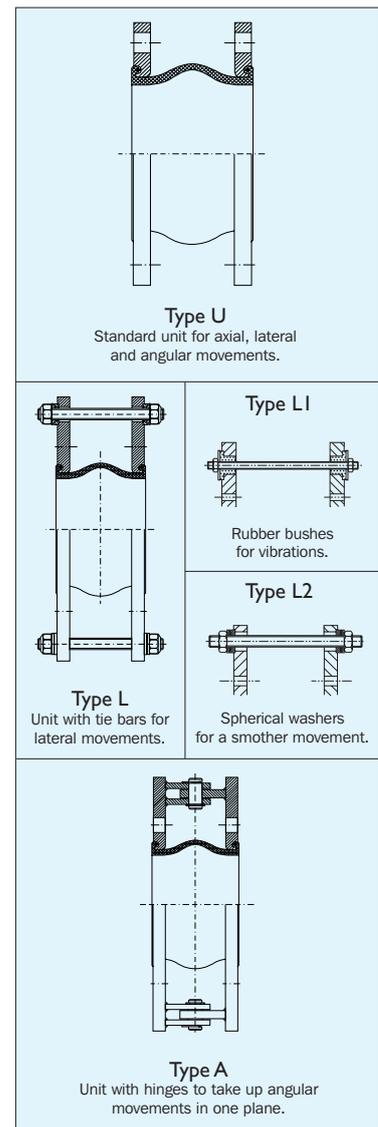
## Materials

Colour Label	Inner tube	Outer cover	Max temp. °C	Applications
Red	EPDM	EPDM	90°	Hot water, cooling water with salt solutions, chlorine solutions, esters and ketones.
Yellow	ECO	ECO	90°	Water, salt solutions, alkalis, mineral oils, vegetable or animal oils, oils aerosols, butane or propane gas, etc.
White	Nitrile white	ECO	90°	Drinking water, food and beverages. Including fats and oils.
Green	Hypalon	Chloroprene	90°	Strong and/or concentrated acids, etc. Compressed air that bears oil aerosols.
Blue	SBR	Chloroprene	90°	Wearing material such as sludge suspended stone, calcium.
Double red HP	Spec. EPDM	Spec. EPDM	130°	Hot water, vapour, hot air, etc. at temperatures up to 130°C.

**Note:** Other materials available. Please ask.

## Pressure rating

Condition	Temperature	Pressure	
		DN 25-300	DN 350-1000
Max. working pressure	70°C	16 bar	10 bar
	90°C	10 bar	8 bar
Test pressure	20°C	25 bar	15 bar
Burst pressure	20°C	>50 bar	>30 bar



# Teguflex W BL 150-300 DN 25-DN 1000

## Flange qualities

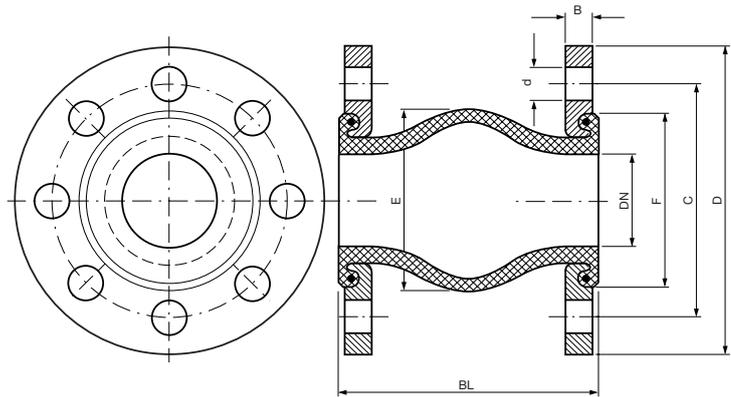
Yellow cromated steel flanges are supplied as standard, however other types are available: stainless steel, hot dipped galvanized, etc.

## Flange measurements

DN 32-DN 1000 DIN 2501 PN 6/10/16

(see Flange dimension table for details)

Other flange standards available. Please ask.



## Dimensions and movements

DN mm	BL mm	Eff. cross-sectional area Q(cm <sup>2</sup> )	(E) mm	(F) mm	Permissible movements				Max. vacuum		Weight		Spring rates		
					Com- pression mm	Elon- gation mm	Lateral mm	An- gular	W/o support ring bar	With support ring bar	Incl. flange kg	Incl. tied flanges kg	Comp- ression Stiffness kg/cm	Elon- gation Stiffness kg/cm	Lateral Stiffness kg/cm
32	150	24	77	72	30	20	20	35°	0.8	1.0	3	4	50	75	50
40	150	45	85	80	30	20	20	35°	0.8	1.0	3	5	50	75	50
50	150	46	95	90	30	20	20	35°	0.8	1.0	4	6	50	75	50
65	150	82	110	105	30	20	20	30°	0.8	1.0	5	7	50	75	50
80	150	110	125	120	30	20	20	30°	0.5	1.0	6	8	50	75	60
100	150	163	145	140	30	20	20	25°	0.5	1.0	7	10	65	85	65
125	150	228	170	165	30	20	20	25°	0.5	1.0	8	12	65	85	65
150	150	321	195	190	30	20	20	15°	0.5	1.0	10	16	75	100	75
175	150	435	225	215	30	20	20	15°	0.5	1.0	13	19	75	100	75
200	200	549	245	240	30	20	20	15°	0.3	1.0	15	24	100	150	100
225	150	657	270	265	30	20	20	15°	0.3	1.0	15	24	100	150	100
250	200	766	295	290	30	20	20	10°	0.3	1.0	20	34	100	150	100
300	200	975	345	340	30	20	20	10°	0.3	1.0	24	45	100	150	100
350	200	1290	430	425	30	20	20	10°	0.3	1.0	32	54	100	150	100
400	200	1628	475	470	30	20	20	10°	0.3	1.0	45	71	100	150	100
450	200	2054	532	510	30	20	20	10°	0.3	1.0	52	81	150	200	150
500	200	2546	590	560	30	20	20	10°	0.3	1.0	63	100	150	200	150
600	200	3466	685	655	30	20	20	6°	0.3	1.0	95	140	175	250	175
700	275	4500	820	778	40	25	30	5°	0.3	1.0	125	347	175	250	175
800	275	5600	920	878	40	25	30	4°	0.2	1.0	160	406	200	300	200
900	300	7000	1060	988	40	25	30	4°	0.2	1.0	175	456	200	300	200
1000	300	8500	1160	1088	40	25	30	3°	0.1	1.0	210	490	225	350	225

Note: Maximum values do not apply simultaneously. Stiffness values tolerance: +/- 20%.

## Optional equipment

Vacuum rings (stainless steel), Flame guard, etc. are available.

## Approvals



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 E-mail: expansion.joints@trelleborg.com Internet: www.trelleborg.com/iesa

Distributor:

## Applications

For all types of industrial applications, such as compressors, pumps etc. as well as heating and sanitary applications.

Compensate for thermal elongation and misalignment.

Reduce vibrations, dampen noise and pressure surges in connection with engines, pumps, compressors, turbines etc.

## Design

Teguflex C is a rubber expansion joint of very flexible construction. Because of its high convolution and the short building length, the expansion joint gets outstanding noise and vibration absorbing properties as well as a high expansion absorption in all directions.

The turnable flanges with threaded holes and the highly flexible bellow, makes the mounting of the expansion joint very simple.

Building length 100 mm.

Turnable flanges.

**Teguflex<sup>®</sup> C**  
 Trelleborg TF BL 100

## Expansion Joints

DN 25-DN 150



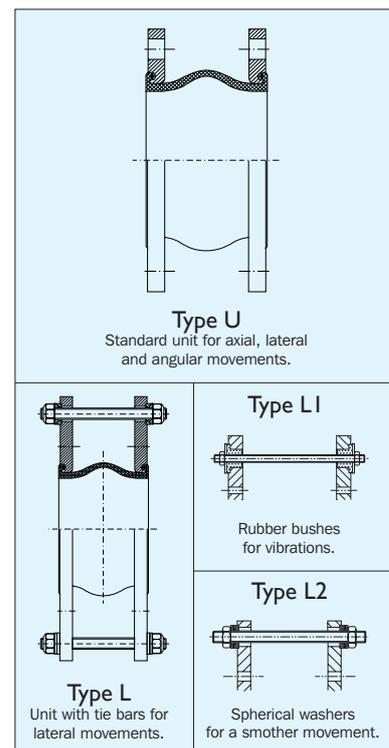
## Materials

Colour Label	Inner tube	Outer cover	Max temp. °C	Applications
Red	EPDM	EPDM	90°	Hot water, cooling water with salt solutions, chlorine solutions, esters and ketones.
Yellow	ECO	ECO	90°	Water, salt solutions, alkalis, mineral oils, vegetable or animal oils, oils aerosols, butane or propane gas, etc.
Double red HP	Spec. EPDM	Spec. EPDM	130°	Hot water, vapour, hot air etc. at temperatures up to 130°C.

Note: Other materials available. Please ask.

## Pressure rating

Pressure	Temperature	Teguflex Pressure	Teguflex HP Pressure
Max. working pressure	70°C	10 bar	10 bar
	90°C	6 bar	10 bar
	130°C	-	6 bar
Test pressure	20°C	15 bar	15 bar
Burst pressure	20°C	>30 bar	>30 bar



# Teguflex C BL 100 DN 25-DN 150

## Flange qualities

Yellow cromated steel flanges are supplied as standard, however other types are available: stainless steel, hot dipped galvanized, etc.

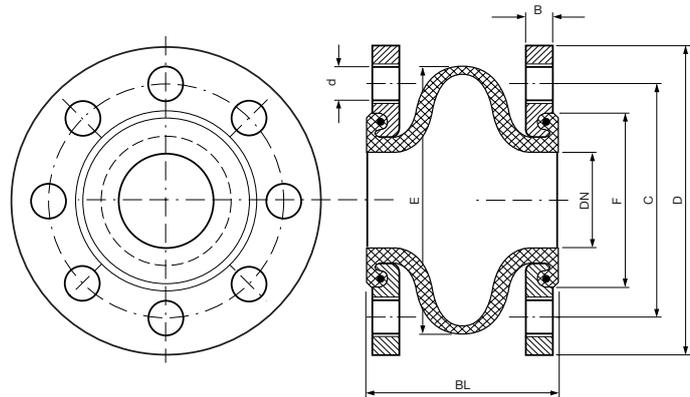
## Flange measurements

DN 25-DN 150 DIN 2501 PN6/10/16

**Note:** Threaded holes! See table below (d).

(see Flange dimension table for details)

Other flange standards available. Please ask.



## Dimensions and movements

DN mm	BL mm	Eff.cross-sectional area Q(cm <sup>2</sup> )	(E) mm	(F) mm	(d)	Permissible movements				Max. vacuum		Weight		Spring Rates		
						Com- pression mm	Elon- gation mm	Lateral mm	Ang- ular	W/o support ring bar	With support ring bar	Incl. flange kg	Incl. Tie-rod flange kg	Com- pression Stiffness kg/cm	Elon- gation Stiffness kg/cm	Lateral Stiffness kg/cm
25/32	100	18/18	110	65	M16	30	20	30	15°	0.8	1.0	2.8	4.5	30	40	30
40	100	18	110	78	M16	30	20	30	15°	0.8	1.0	3.3	4.8	30	40	30
50	100	35	120	90	M16	30	20	30	15°	0.7	1.0	3.7	5.0	30	40	30
65	100	56	135	108	M16	30	20	30	15°	0.6	1.0	4.8	6.4	30	40	30
80	100	87	170	124	M16	30	20	30	15°	0.5	1.0	5.3	7.5	30	40	30
100	100	130	180	152	M16	30	20	30	15°	0.5	1.0	6.2	9.0	40	50	40
125	100	190	195	183	M16	30	20	30	15°	0.4	0.9	8.2	11.2	40	50	40
150	100	263	260	214	M20	30	20	30	15°	0.3	0.9	11.2	13.4	50	60	50

**Note:** Maximum values do not apply simultaneously. Stiffness values tolerance: +/- 20%.  
Other dimensions available. Please ask.

## Optional equipment

Vacuum rings, Flame guard, etc. are available.



**TRELLEBORG**  
ENGINEERED SYSTEMS

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E-mail: expansion.joints@trelleborg.com Internet: www.trelleborg.com/iesa

Distributor:

**Applications**

Teguflex HP is suitable for a variety of applications including heating systems, industrial plants with hot water, vapour and hot air etc.

Compensate for thermal elongation and misalignment.

Isolate vibrations, dampen noise and pressure surges in connection with engines, pumps, turbines etc.

The expansion joint is resistant to acids, alkalis, alcohols, esters and ketones.

**Note:** Do not use in connection anti-corrosive agents or other medium based on oil.

**Design**

The Teguflex HP expansion joint is composed of a special internal EPDM rubber compound, suitable for high temperature applications without harden.

The unique fabric reinforcement is resistant to hydrolysis which will endure high temperatures in combination with moisture and water. This ensure a long service life with remained properties.

Building length 130/200 mm.

Turnable flanges.

**Teguflex® HP**  
Trelleborg TF BL 130/200

**Expansion Joints**  
DN 25-DN 600

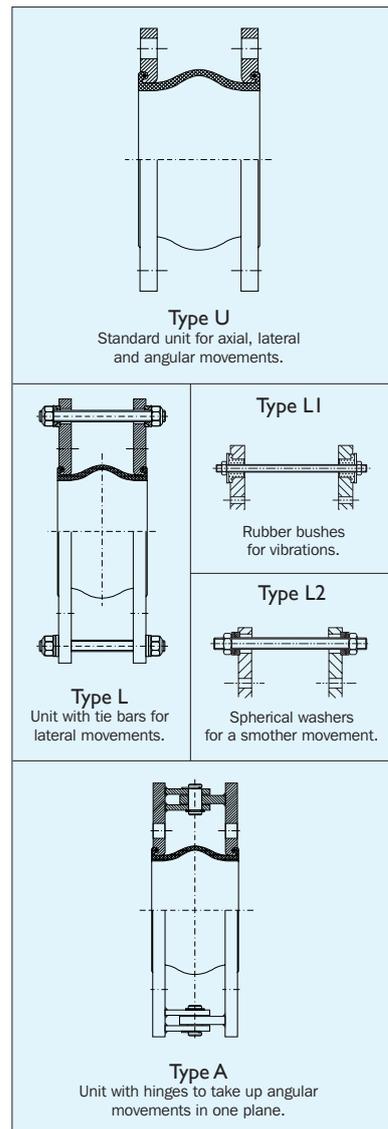


**Materials**

Colour Label	Inner tube	Outer cover	Max temp. °C	Applications
Double red HP	Spec. EPDM	Spec. EPDM	130°	Hot water, vapour, hot air, etc. at temperatures up to 130°C.

**Pressure rating**

Pressure	Temperature	DN 25 - DN 150	DN 200 - DN 300	DN 350 - DN 600
Max. working pressure	100°C 130°C	16 bar 10 bar	10 bar 6 bar	10 bar 6 bar
Test pressure	20°C	25 bar	15 bar	15 bar
Burst pressure	20°C	>60 bar	>60 bar	>30 bar



# Teguflex HP BL 130/200 DN 25-DN 600

## Flange qualities

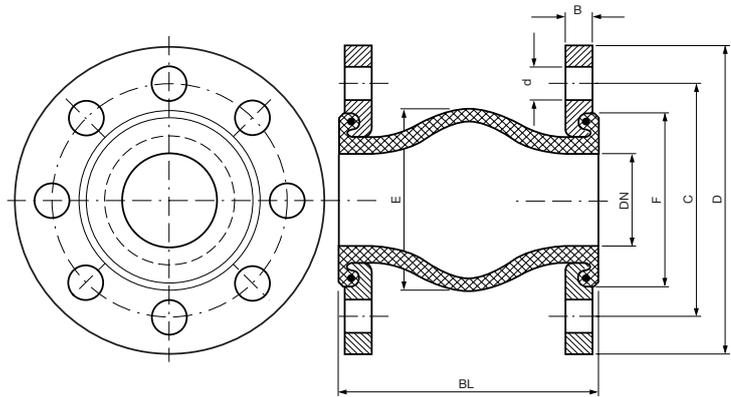
Yellow cromated steel flanges are supplied as standard, however other types are available: stainless steel, hot dipped galvanized, etc.

## Flange measurements

DN 32-DN 600 DIN 2501 PN 6/10/16

(see Flange dimension table for details)

Other flange standards available. Please ask.



## Dimensions and movements

DN mm	BL mm	Eff.cross-sectional area Q(cm <sup>2</sup> )	(E) mm	(F) mm	Permissible movements				Max. vacuum		Weight	
					Com- pression mm	Elon- gation mm	Lateral mm	An- gular	W/o support ring bar	With support ring bar	Incl. flange kg	Incl. tied flanges kg
25/32	130	35	77	72	30	20	20	35°	0.8	1.0	3	4
40	130	45	85	80	30	20	20	35°	0.8	1.0	3	5
50	130	56	95	90	30	20	20	35°	0.7	1.0	4	5
65	130	79	110	105	30	20	20	30°	0.6	1.0	5	7
80	130	104	125	120	30	20	20	30°	0.5	1.0	6	8
100	130	136	145	140	30	20	20	25°	0.5	1.0	7	10
125	130	188	170	165	30	20	20	25°	0.4	1.0	8	12
150	130	254	195	190	30	20	20	15°	0.3	1.0	10	16
200	130	415	245	240	30	20	20	15°	0.3	1.0	15	23
250	130	615	295	290	30	20	20	10°	0.2	1.0	20	33
300	130	855	345	340	30	20	20	10°	0.2	1.0	24	44
350	200	1290	430	425	30	20	20	10°	0.2	1.0	32	54
400	200	1628	475	470	30	20	20	10°	0.2	1.0	45	71
450	200	2054	532	510	30	20	20	10°	0.2	1.0	52	81
500	200	2546	590	560	30	20	20	10°	0.2	1.0	63	100
600	200	3466	685	655	30	20	20	6°	0.2	1.0	95	140

Note: Maximum values do not apply simultaneously.

## Optional equipment

Vacuum rings, Flame guard etc. are available.

## Approvals

Germanischer Lloyds



ABS



97/23/CE



ISO 9001



ISO 14001



**TRELLEBORG**  
ENGINEERED SYSTEMS

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Distributor:

**Applications**

For industrial hot water pipelines where oil-based additives are used against corrosion, for lubricating oil, domestic oil, oil mixed pressurised air etc.

With an allowed working temperature at 110°C, which is approx. 20° higher than many competing materials, you get improved properties when used in cooling systems. For engine manufacturers, for instance, this means that the effectiveness of the coolant system can be increased while maintaining the service life of the expansion joint.

**Design**

The Teguflex HO expansion joint is composed of a special internal Nitrile rubber compound, suitable for high temperatures without harden.

The unique fabric reinforcement is resistant to hydrolysis, which will endure high temperatures in combination with moisture, water or oil mixed water. This ensures a long service life with remained properties.

Building length 130/150/200 mm.

Turnable flanges.

**Teguflex® HO**  
Trelleborg TF BL 130/200

**Expansion Joints**  
DN 25-DN 600

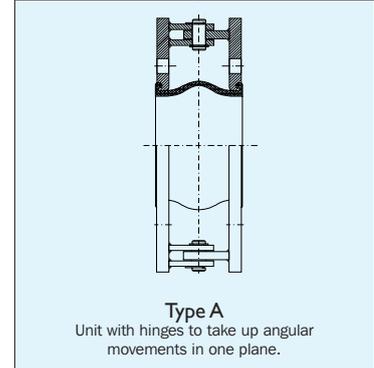
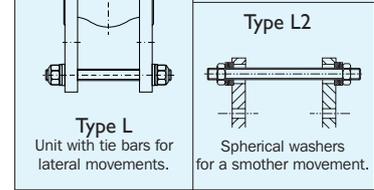
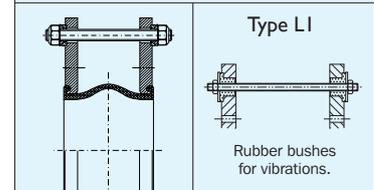
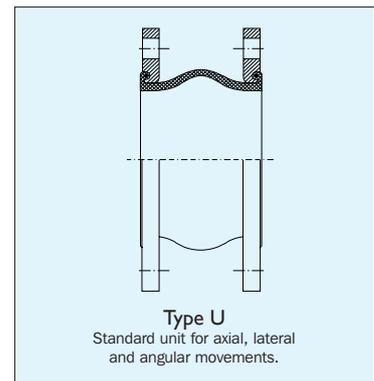


**Materials**

Colour Label	Inner tube	Outer cover	Max temp. °C	Applications
Double Yellow	HNBR	HNBR	110°	Oil, oil-mixed water, oil-mixed pressurised air, etc.

**Pressure rating**

Pressure	Temperature	DN 25 - DN 150	DN 200 - DN 300	DN 350 - DN 600
Max. working pressure	90°C	16 bar	10 bar	10 bar
	110°C	10 bar	6 bar	6 bar
Test pressure	20°C	25 bar	15 bar	15 bar
Burst pressure	20°C	>50 bar	>50 bar	>30 bar



# Teguflex HO BL 130/200 DN 25-DN 600

## Flange qualities

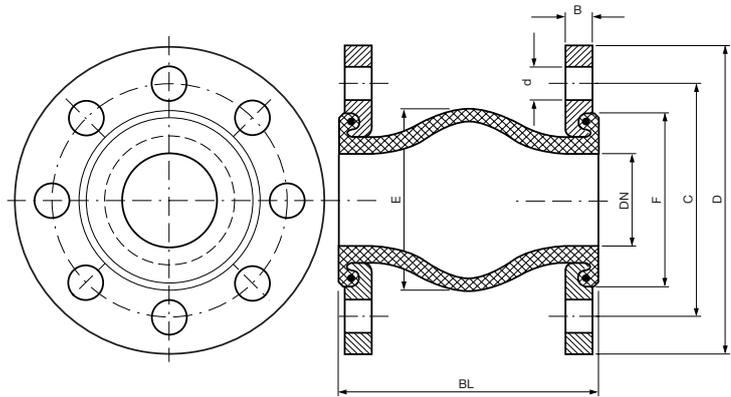
Yellow cromated steel flanges are supplied as standard, however other types are available: stainless steel, hot dipped galvanized, etc.

## Flange measurements

DN 32-DN 600 DIN 2501 PN 6/10/16

(see Flange dimension table for details)

Other flange standards available. Please ask.



## Dimensions and movements

DN mm	BL mm	Eff.cross-sectional area Q(cm <sup>2</sup> )	(E) mm	(F) mm	Permissible movements				Max. vacuum		Weight	
					Com- pression mm	Elon- gation mm	Lateral mm	An- gular	W/o support ring bar	With support ring bar	Incl. flange kg	Incl. tied flanges kg
25/32	130	35	77	72	30	20	20	35°	0.8	1.0	3	4
40	130	45	85	80	30	20	20	35°	0.8	1.0	3	5
50	130	56	95	90	30	20	20	35°	0.7	1.0	4	5
65	130	79	110	105	30	20	20	30°	0.6	1.0	5	7
80	130	104	125	120	30	20	20	30°	0.5	1.0	6	8
100	130	136	145	140	30	20	20	25°	0.5	1.0	7	10
125	130	188	170	165	30	20	20	25°	0.4	1.0	8	12
150	130	254	195	190	30	20	20	15°	0.3	1.0	10	16
200	130	415	245	240	30	20	20	15°	0.3	1.0	15	23
250	130	615	295	290	30	20	20	10°	0.2	1.0	20	33
300	130	855	345	340	30	20	20	10°	0.2	1.0	24	44
350	200	1290	430	425	30	20	20	10°	0.2	1.0	32	54
400	200	1628	475	470	30	20	20	10°	0.2	1.0	45	71
450	200	2054	532	510	30	20	20	10°	0.2	1.0	52	81
500	200	2546	590	560	30	20	20	10°	0.2	1.0	63	100
600	200	3466	685	655	30	20	20	6°	0.2	1.0	95	140

Note: Maximum values do not apply simultaneously.

## Optional equipment

Vacuum rings, Flame guard etc. are available.

## Approvals



**TRELLEBORG**  
ENGINEERED SYSTEMS

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Distributor:

**Applications**

Good resistance to wear is a very important property in many applications, such as sludge suspended stone, calcium, sand blasting houses, sand pipes, etc.

For this kind of demanding use, Trelleborg offers the market a high-performance expansion joints; double blue band, made of natural rubber.

The Teguflex® NR has good resistance to acids, bases, salts and many inorganic chemicals, but not to oxidizing acids. Poor oil resistance and not resistant to aromatic, aliphatic and halogenated hydrocarbons.

Excellent mechanical properties of NR compound, combined with high resilience properties, makes Teguflex® double blue the perfect solution for abrasion problems.



**Expansion Joints**  
DN 25-DN 600

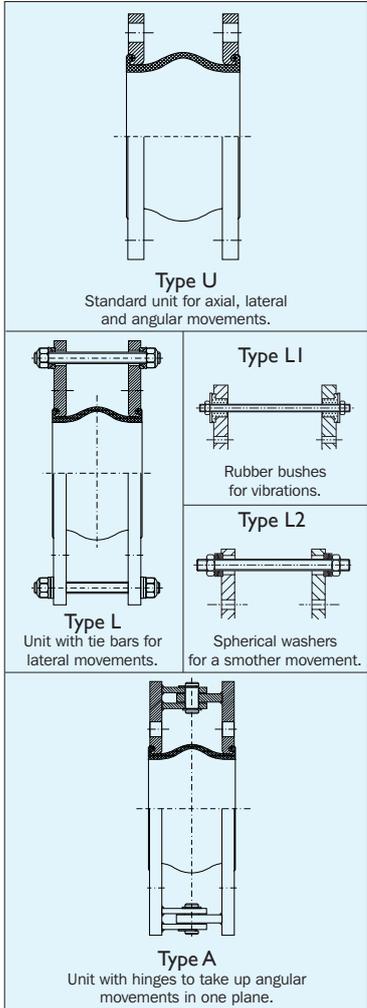


**Materials**

Colour Label	Inner tube	Outer cover	Max temp. °C	Applications
Double Blue	NR	CR	90°	Chemical and abrasion-resistant lining, sand-blasting houses, sand pipe, sludge suspended stone, calcium.

**Pressure rating**

Condition	Temperature	DN 25-DN 150	DN 200-DN 300	DN 350-DN 600
Max. working pressure	70°C	16 bar	10 bar	10 bar
	90°C	10 bar	6 bar	6 bar
Test pressure	20°C	25 bar	25 bar	13 bar
Burst pressure	20°C	>60 bar	>60 bar	>30 bar



# Teguflex NR BL 130/150/200 DN 25-DN 600

## Flange qualities

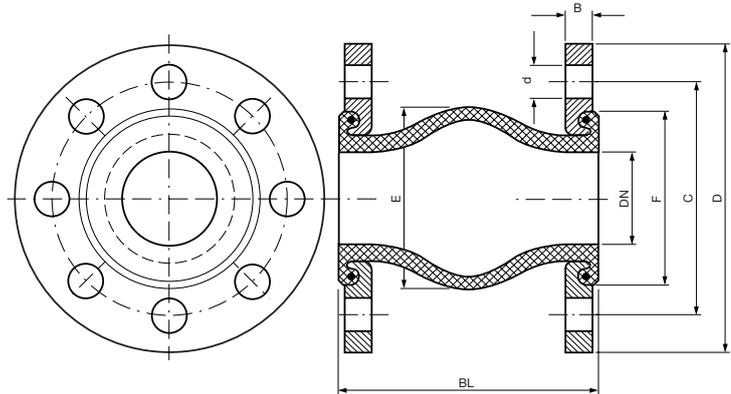
Yellow cromated steel flanges are supplied as standard, however other types are available: stainless steel, hot dipped galvanized, etc.

## Flange measurements

DN 32-DN 600 DIN 2501 PN 6/10/16

(see Flange dimension table for details)

Other flange standards available. Please ask.



## Dimensions and movements

DN mm	BL mm	Eff.cross-sectional area Q(cm <sup>2</sup> )	(E) mm	(F) mm	Permissible movements				Max. vacuum		Weight	
					Com- pression mm	Elon- gation mm	Lateral mm	An- gular	W/o support ring bar	With support ring bar	Incl. flange kg	Incl. Tie-rod flange kg
25/32	130/150	35/24	77	72	30	20	20	35°	0.8	1.0	3	4
40	130/150	50/45	85	80	30	20	20	35°	0.8	1.0	3	5
50	130/150	74/46	95	90	30	20	20	35°	0.7	1.0	4	6
65	130/150	87/92	110	105	30	20	20	30°	0.6	1.0	5	7
80	130/150	120/110	125	120	30	20	20	30°	0.5	1.0	6	8
100	130/150	143/163	145	140	30	20	20	25°	0.5	1.0	7	10
125	130/150	210/228	170	165	30	20	20	25°	0.4	1.0	8	12
150	130/150	283/321	195	190	30	20	20	15°	0.3	1.0	10	16
175	150	435	225	215	30	20	20	15°	0.3	1.0	13	19
200	130/150/200	525/549	245	240	30	20	20	15°	0.3	1.0	15	24
225	150	657	270	265	30	20	20	15°	0.3	1.0	15	24
250	130/200	636/766	295	290	30	20	20	10°	0.2	1.0	20	34
300	130/200	897/975	345	340	30	20	20	10°	0.2	1.0	24	45
350	200	1290	430	425	30	20	20	10°	0.2	1.0	32	54
400	200	1628	475	470	30	20	20	10°	0.2	1.0	45	71
450	200	2054	532	510	30	20	20	10°	0.2	1.0	52	81
500	200	2546	590	560	30	20	20	10°	0.2	1.0	63	100
600	200	3466	685	655	30	20	20	6°	0.2	1.0	95	140

Note: Maximum values do not apply simultaneously.

## Optional equipment

Vacuum rings, Flame guard, etc. are available. Please ask for information.



97/23/CE



ISO 9001



ISO 14001



**TRELLEBORG**  
ENGINEERED SYSTEMS

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Distributor:

## Applications

For use in pressurized large sized pipe systems with requirements for small reaction forces, providing high reliability and long life. These expansion joints are suitable for large extension in axial, lateral or angular directions and they are used particularly in cooling water systems at power plants, in condensers, in gas and drinking water supply lines for pumps, turbines and boilers. They compensate for thermal elongation, correct misalignment, isolate vibrations, dampen noise and absorb pressure surges.

## Design

A customary manufactured rubber bellow with full-face rubber flanges.

Designed for working pressure 6-10 bar and vacuum 0.8-1.0 bar as standard. Carbon steel vacuum rings inserted into the rubber (never in touch with the fluid) are integral to the design. Other working pressure and/or vacuum rates on request. Integrated painted steel flanges as standard.

Building length 350/450 mm. Other lengths on request.

**Teguflex® FFI**  
Trelleborg FF Integrated flanges

## Expansion Joints

DN 1100-DN 3200



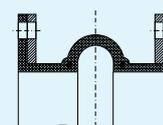
## Materials

Colour Label	Inner tube	Outer cover	Max temp. °C	Applications
Red	EPDM	EPDM	90°	Hot water, cooling water with salt solutions, chlorine solutions, esters and ketones.
Yellow	Nitrile	Chloroprene	90°	Water, salt solutions, alkalis, mineral oils, vegetable or animal oils, aerosols, butane or propane gas, etc.
Green	Hypalon	Chloroprene	90°	Strong and/or concentrated acids, etc. Compressed air that bears oil aerosols.
White	Nitrile white	Chloroprene	90°	Drinking water, food and beverages. Including fats and oils.

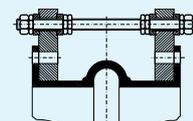
Note: Other materials available. Please ask.

## Pressure rating

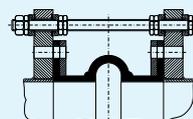
Pressure	Temperature	PN6	PN10
Max. working pressure	70°C 90°C	6 bar 5 bar	10 bar 8 bar
Test pressure	20°C	9 bar	15 bar
Burst pressure	20°C	>20 bar	>25 bar



**Type U**  
Standard unit for axial, lateral and angular movements.



Style A



Style B

**Type L**  
Unit with tie bars for lateral movements.

# Teguflex FFI DN 1100-DN 3200

## Flange qualities

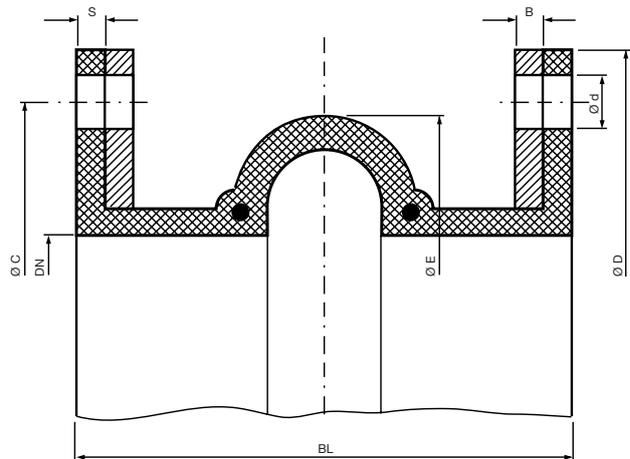
Painted steel flanges as standard. Other surface treatments also available. Please ask!

## Flange measurements

DN 1100-DN 3200 DIN 2501 PN 6/10

(see Flange dimension table for details)

Other flange standards available. Please ask!



## Dimensions and movements

DN mm	BL mm	Eff.cross-sectional area Q(cm <sup>2</sup> )	(E) mm	(S) mm	Permissible movements				Vacuum bar	Weight Incl. flange kg	Spring rate		
					Compression mm	Elongation mm	Lateral mm	Angular			Compression Stiffness kg/cm	Elongation Stiffness kg/cm	Lateral Stiffness kg/cm
1100	350	11700	1260	20	35	30	20	3°	0.9	187	950	1230	1430
1200	350	13700	1360	20	35	30	20	3°	0.9	210	1015	1320	1545
1300	350	15800	1460	20	35	30	20	2.5°	0.9	245	1100	1430	1660
1400	350	18000	1570	25	35	30	20	2.5°	0.9	275	1145	1490	1720
1500	350	20600	1670	25	35	30	20	2°	0.8	302	1270	1655	1895
1600	350	23200	1760	20	35	30	20	2°	0.8	367	1400	1820	2045
1800	350	28400	1860	20	35	30	20	2°	0.8	424	1525	1985	2190
2000	350	35300	2170	20	35	30	20	1.5°	0.8	495	1650	2150	2320
2200	350	42250	2360	20	35	30	20	1.5°	0.8	585	1780	2315	2570
2400	350	49850	2570	25	35	30	20	1.5°	0.8	714	2035	2645	2950
2500	350	53900	2670	25	35	30	20	1°	0.8	800	2080	2700	2960
2600	350	58000	2770	25	35	30	20	1°	0.8	830	2160	2810	3140
2800	350	66900	2970	25	35	30	20	1°	0.8	872	2290	2975	3330
3000	350	76400	3190	35	35	30	20	1°	0.8	960	2540	3305	3710
3200	350	86500	3390	35	35	30	20	1°	0.8	1200	2795	3640	4095

**Note:** Maximum values do not apply simultaneously.  
Other dimensions on request.



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E-mail: expansion.joints@trelleborg.com Internet: www.trelleborg.com/iesa

Distributor:

## Applications

For cooling water systems at power plants, in gas and drinking-water supply lines, at condensers, for pumps, turbines and boilers for the absorption of movements, oscillations, noises and vibrations.

These expansion joints are suitable for large extensions in axial, lateral or angular directions. They are suitable in pressurised large-sized pipe systems with requirements for small reaction forces, providing high reliability and long life.

## Design

Rubber bellow with high convolution and therefore highly flexible. Able to compensate for high movements due to its low inherent resistance.

Steel backing flanges with supporting collar to ensure the smooth movement of the bellow.

**Teguflex® FFL**  
 Trelleborg FF BL 250/300

## Expansion Joints

DN 500-DN 2600



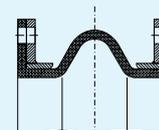
## Materials

Colour Label	Inner tube	Outer cover	Max temp. °C	Applications
Red	EPDM	EPDM	90°	Hot water, cooling water with salt solutions, chlorine solutions, esters and ketones.
Yellow	Nitrile	Chloroprene	90°	Water, salt solutions, alkalis, mineral oils, vegetable or animal oils, oils aerosols, butane or propane gas, etc.
White	Nitrile white	Chloroprene	90°	Drinking water, food and beverages. Including fats and oils.
Green	Hypalon	Chloroprene	90°	Strong and/or concentrated acids, etc. Compressed air that bears oil aerosols.

Note: Other materials available. Please ask.

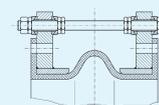
## Pressure rating

Pressure	Temperature	Pressure
Max. working pressure	90°C	10 bar
Test pressure	20°C	15 bar
Burst pressure	20°C	>30 bar

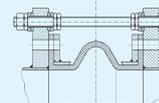


**Type U**

Standard unit for axial, lateral and angular movements.



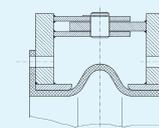
**Style A**



**Style B**

**Type L**

Unit with tie bars for lateral movements.



**Type A**

Unit with hinges to take up angular movements in one plane.

# Teguflex FFL BL 250/300 DN 500-DN 2600

## Flange qualities

Standard design RST 37-2, with rust resisting primer coating.

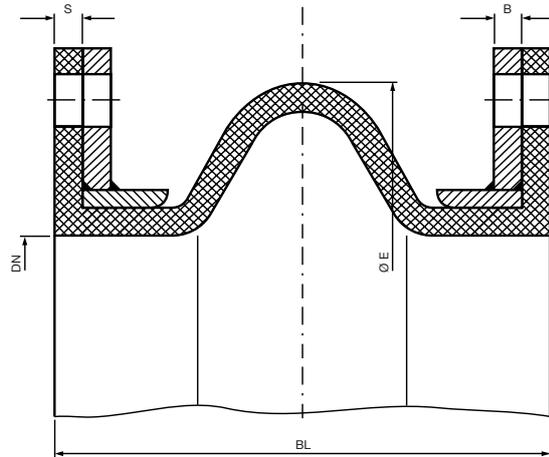
Other materials and surface treatments available by agreement.

## Flange measurements

DN 500-DN 2600 DIN 2501 PN 6/10

(see Flange dimension table for details)

Other flanges standards available. Please ask.



## Dimensions and movements

DN mm	BL mm	Eff. cross-sectional area Q(cm <sup>2</sup> )	(E) mm	(S) mm	(B) mm	Permissible movements				Max. vacuum		Weight
						Com- pression mm	Elon- gation mm	Lateral mm	An- gular	W/o support ring bar	With support ring bar	Incl. flange kg
500	250	1860	620	12	12	40	30	30	6.5°	0.2	1.0	45
600	250	2790	725	15	12	40	30	30	5.4°	0.2	1.0	57
700	250	4300	840	15	15	40	30	30	4.8°	0.2	1.0	84
800	250	4950	950	15	15	40	30	30	4.3°	0.2	1.0	100
900	250	6610	1050	15	15	40	30	30	3.7°	0.2	1.0	113
1000	250	8700	1160	15	15	40	30	30	3.3°	0.2	1.0	133
1100	300	10900	1270	15	15	40	30	30	3.1°	0.2	1.0	150
1200	300	12900	1380	20	20	40	30	30	2.8°	0.2	1.0	180
1400	300	17200	1590	20	20	40	30	30	2.4°	0.2	1.0	230
1500	300	19600	1705	20	20	40	30	30	2.3°	0.2	1.0	250
1600	300	22200	1820	20	20	40	30	30	2.1°	0.2	1.0	285
1800	300	27800	2020	20	20	40	30	30	1.9°	0.2	1.0	315
2000	300	34000	2230	20	20	40	30	30	1.7°	0.2	1.0	360
2200	300	40800	2440	25	25	40	30	30	1.5°	0.2	1.0	445
2400	300	48000	2650	25	25	40	30	30	1.4°	0.2	1.0	520
2600	300	55200	2860	25	25	40	30	30	1.2°	0.2	1.0	550

**Note:** Maximum values do not apply simultaneously.  
Other building lengths and/or dimensions available. Please ask.

## Optional equipment

Vacuum rings are available.



**TRELLEBORG**  
ENGINEERED SYSTEMS

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E-mail: expansion.joints@trelleborg.com Internet: www.trelleborg.com/iesa

Distributor:

## Applications

Compensate for thermal elongation and correct misalignment in all type of pipe installations. Isolate vibrations, dampen noise and absorb pressure surges in connection with engines, pumps, turbines, etc.

For application with media such as: water, warm water, sea water, weak acids, air, etc.

## Construction

A moulded rubber bellow that combines elastic properties of rubber with reinforcement to provide a flexible pipe joint that is easy to install.

Building length **130 mm**.

Turnable flanges.

## Description

- **Inner tube:** EPDM or CR.
- **Reinforcement:** nylon fabric.
- **Cover:** EPDM or CR.
- **Standard flanges:** mild steel (Zinc plated), according to DIN 2501, PN 10/16. Others on request.

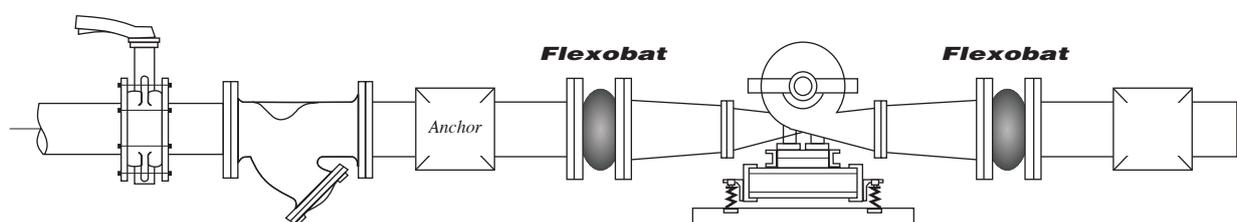
# Flexobat

Trelleborg

## Rubber expansion joints with turnable flanges

Operating pressure: **16 bar**

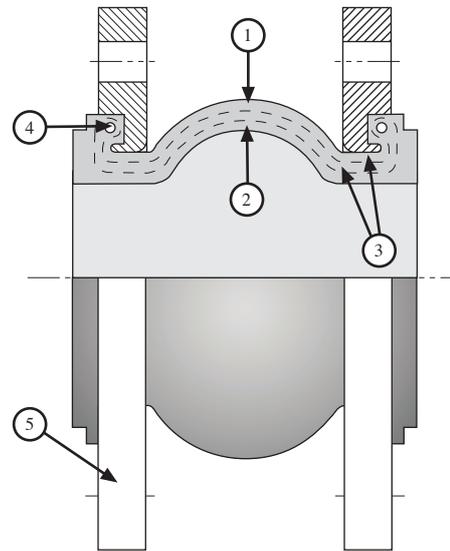
Operating temperature: **-10°C to +80°C**



## Technical Data

Nominal size		L	Axial Compression	Axial Elongation	Lateral Deflection	Lateral Deflection
mm	inches	Neutral length mm				
32	1 <sup>1/4</sup>	130	12	10	12	15
40	1 <sup>1/2</sup>	130	12	10	12	15
50	2	130	12	10	12	15
65	2 <sup>1/2</sup>	130	12	10	12	15
80	3	130	12	10	12	12
100	4	130	12	10	12	9
125	5	130	12	10	12	9
150	6	130	12	10	12	5
200	8	130	12	10	12	5
250	10	130	12	10	12	3
300	12	130	12	10	12	3

DN 350-600 available on request.



## Operating temperature against operating pressure

Operating temperature	Operating pressure (bar)				
	ambient	50°C	60°C	70°C	80°C
Maximum operating pressure (bar)	16	12,4	10	7,5	6,5

No	Part name	Material
1	Body (outer layer)	EPDM or CR
2	Body (inner layer)	EPDM or CR
3	Reinforcing fabric	Nylon fabric
4	Wire	Hard steel wire
5	Flange	Mild steel - zinc plated

## Notes

- Higher temperatures affect movement and pressure. As temperature increases, rated values must be reduced accordingly.
- Pressures shown are recommended “operating”, test pressure is 1.5 times “operating” pressure.
- Expansion joints may operate in pipelines or equipments carrying fluids at stated temperatures and pressures. Normal precautions shall be taken to make sure these parts are installed correctly and inspected regularly. Precautions shall be taken to protect personnel in the event of leakage or splash.
- For other kinds of applicable fluids, except the above, to which the rubber joint becomes applicable, please kindly consult your supplier or manufacturer.



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## Design

Rubber/metal expansion joints specially designed to relieve high-frequency surface vibrations and noise transmission in pipelines.

Synthetic rubber body with steel flanges fully inserted into the rubber.

EPDM quality for working temperatures between -10°C / +90°C PN 10 connection acc to EN 1092 / DIN 2501.

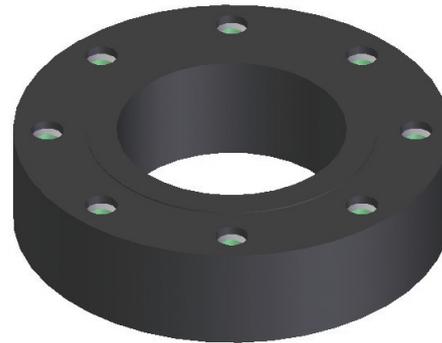
## Applications

For engines, machinery, pump compressors, etc., where there is a need of dampening noise and vibration.

**Teguflex® AV**  
Trelleborg

## Antivibratory Expansion Joints

DN 20-DN 200



Joint		Flange PN10 EN1092/DIN2501					Bolts			Maximum pressure kg/cm <sup>2</sup>	Estimated weight kg
DN mm	BL mm	ØD mm	ØK mm	n nos.	ØL mm	C mm	Quantity nos.	Metrics mm	Length mm		
20	70	105	75	4	M12	14	8	M12	30	10	2,0
25	70	115	85	4	M12	16	8	M12	30	10	2,5
32	70	140	100	4	M16	16	8	M16	30	10	3,5
40	70	150	110	4	M16	16	8	M16	30	10	3,8
50	70	165	125	4	M16	16	8	M16	35	10	5,0
65	70	185	145	4	M16	16	8	M16	35	10	5,5
80	70	200	160	4	M16	18	8	M16	40	10	6,5
100	70	220	180	8	M16	18	16	M16	40	10	7,5
125	70	250	210	8	M16	18	16	M16	40	10	9,0
150	70	285	240	8	M20	18	16	M20	40	10	12,0
200	90	340	295	8	M20	20	16	M20	45	10	18,0

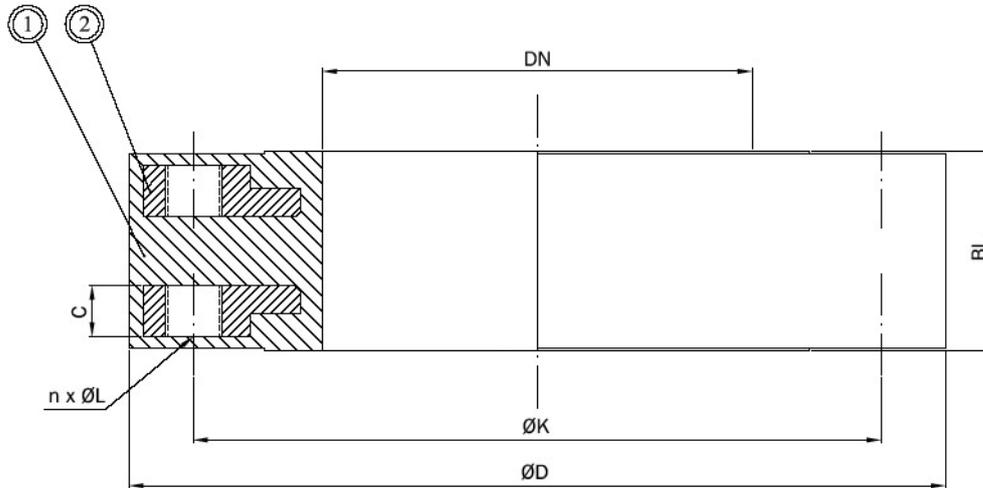
**IMPORTANT NOTICE:** Those joints are not suitable for oscillation, tension, torsion, expansion or bending loads. For axial and radial movements or for high-amplitude vibrations use other Teguflex expansion joints.

## INSTALLATION

The pipeline must be perfectly aligned and anchored by fixed points.

Use flat washers and hexagonal bolts DIN 933 with a maximum C thread in the joint.

## Teguflex AV DN 20-DN 200



Item	Part	Material
1	Body	Rubber grade EPDM
2	Flange	Carbon steel grade S275 JR

Teguflex AV is the right solution for vibrations and noise problems in pipelines. On the contrary, this type is not suitable to absorb tension, expansion or torsion. When these movements occur; please use Teguflex P/W or contact us.

We will be glad to help you to choose the best category for each application.

Ask us for information!



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## Applications

Teguflex TU are recommended in small diameter pipes, pumps and equipments, because most connections in housing and industries services are often required in screwed connection rather than flanges for small diameter installations.

Excellent for applications where large lateral or angular movements arise.

Typical applications could be pumps (suction and discharge line), air-condition systems and irrigations.

## Design

The style TU screwed union expansion joints are designed to absorb pipe movements, stress, isolate vibrations, reducing system noise and protect against start up and surge forces.

The Teguflex TU are designed in twin sphere because its proven absorption and flexibility in all directional movements during operation.

By combination of spherical structure with super stability against internal pressure and strong special reinforcement the Teguflex TU displays an outstanding pressure resistant of 30 bar bursting pressure or above at normal temperature.

The metal parts, made of malleable cast iron and zinc plated, are furnished with BSP threads as standard. Also available in stainless steel and/or NPT threaded unions.

**Teguflex<sup>®</sup> TU**  
Trelleborg TU

## Expansion Joints

DN 20-DN 65



## Materials

Colour Label	Inner tube	Outer cover	Max temp. °C	Applications
Black & TU	EPDM	EPDM	80°	Water, warm water, sea water, air and weak acids.

**Note:** Other material available. Please ask.

## Pressure rating

Pressure	Temperature	Pressure
Max. working pressure	20°C	10 bar
	50°C	10 bar
	80°C	6 bar
Test pressure	20°C	15 bar
Burst pressure	20°C	> 30 bar

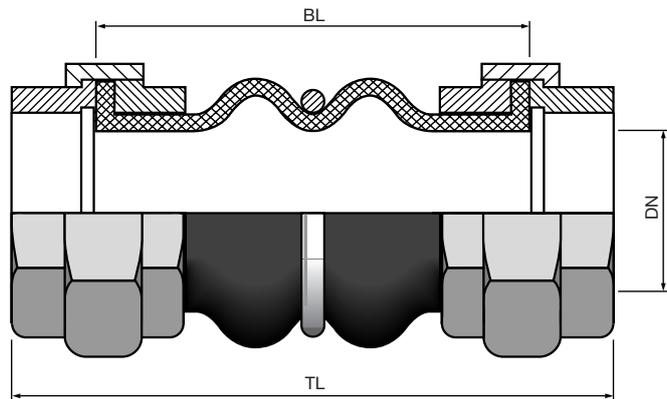
## Teguflex TU DN 20-DN 65

### Union flange qualities

Zinc plated threaded ends. Also available with stainless steel (SS304) under request.

### Union

BSP (standard) or NPT (under request).



### Dimensions and movements

DN mm	INS	TL mm	BL mm	Permissible movements				Permissible pressure		
				Com- pression mm	Elon- gation mm	Lateral mm	An- gular	20°C bar	80°C bar	Vacuum bar
20	3/4"	200	152	22	6	22	30°	10	6	0.5
25	1"	200	140	22	6	22	30°	10	6	0.5
32	1 1/4"	200	140	22	6	22	30°	10	6	0.5
40	1 1/2"	200	130	22	6	22	30°	10	6	0.5
50	2"	200	120	22	6	22	30°	10	6	0.5
65	2 1/2"	240	140	22	6	22	30°	10	6	0.5

**Note:** Maximum values do not apply simultaneously.



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 E-mail: [expansion.joints@trelleborg.com](mailto:expansion.joints@trelleborg.com) Internet: [www.trelleborg.com/iesa](http://www.trelleborg.com/iesa)

Distributor:

**Applications**

Trelleborg Expansion Joints are used to create secure and better pipe systems. They help to compensate for any bending, stretching and compression that may arise. In addition, they reduce vibrations and noise.

They are used in industrial installations, offshore, dredging industry, cooling water systems for power plants, in gas and drinking-water supply lines and in combination with condensors, in pumps, turbines, boilers and more.

**Construction**

By adapting the latest rubber and fabric technology, Trelleborg can provide the most effective solutions to suit the required properties for any pipe systems. The expansion joints may be specially designed for pressures, temperatures, chemicals, lengths, diameters and shapes required by any applications.

The expansion joints may be manufactured in different shapes: round, square, rectangular, conical, with or without arches. In other cases with open or filled arches, with or without flanges.

Although Trelleborg Expansion Joints count as a single product, the potential variations are almost infinite.

**Consult Trelleborg and feel secure**

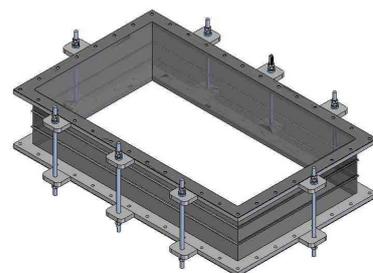
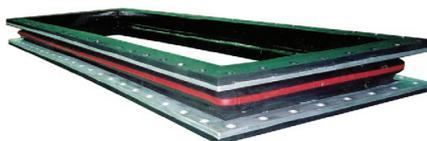
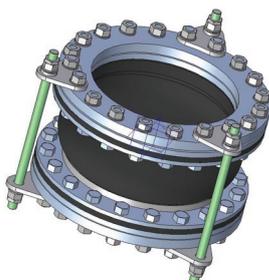
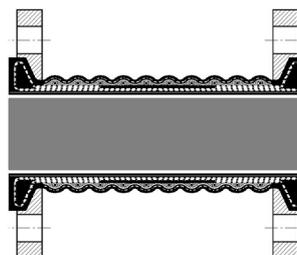
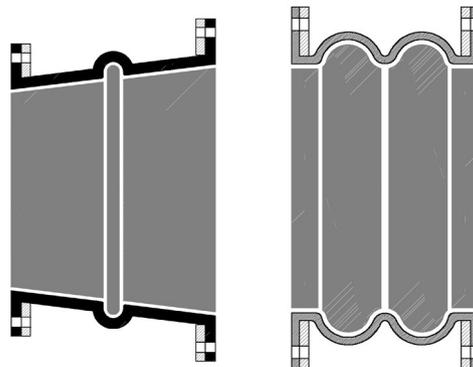
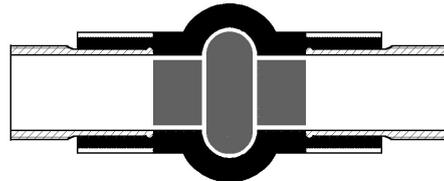
Trelleborg has more than 100 years of experience in manufacturing rubber products, with a history of stability and commitment to quality.

**Continuous Development**

Trelleborg has invested heavily in R&D identifying our customers needs. With our experienced technical sales staff, chemists and engineers we are dedicated to find the most cost effective and appropriate solutions. This is achieved through continuous development of new materials, composites, design and manufacturing methods.

**Trelleborg S**  
Special

**Expansion Joints**  
DN 25-DN 3200





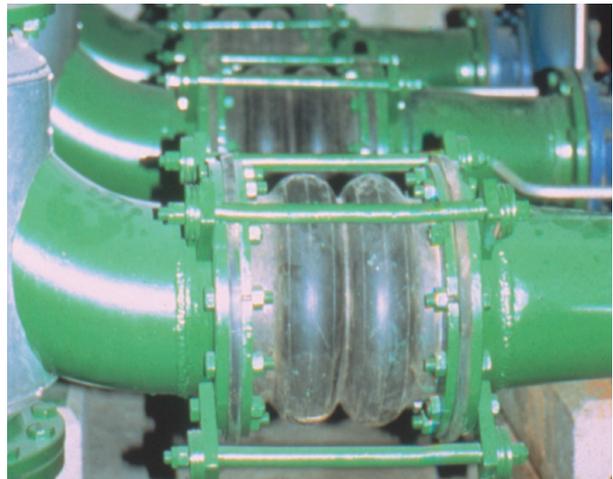
Trelleborg Expansion Joints are used in all types of industrial installations, offshore ...



... dredging industry, ...



... cooling water systems for power plants, food processing industry, in gas and drinking-water supply lines ...



... and in combination with condensers, pumps, turbines, boilers and more.

## Complete range of rubber expansion joints

We offer the market the most comprehensive selection of rubber expansion joints, covering the widest range of applications and dimensions. In certain cases one may be forced to use specially manufactured expansion joints due to higher pressures and temperatures, aggressive chemicals, and of course requirements for other dimensions.

In such cases, contact us. We will certainly be able to develop a special variant for your particular application. We have the long experience and know-how required for that.



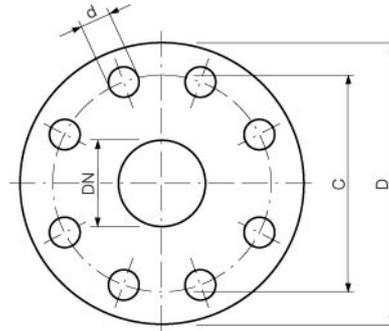
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## Flange dimensions

The table shows flanges according to DIN 2501 and ANSI 150 lb. For other flange standards or pressure classes, please ask.

# Flange dimensions

## Trelleborg Expansion Joints



### DIN 2501 PN 6, PN 10

DN	PN 6 – DIN 2501				PN 10 – DIN 2501			
	Ext. Diameter D mm	Bolt Circle Ø C mm	Number of Bolt Holes	Drilling Bolt Hole Ø d mm	Ext. Diameter D mm	Bolt Circle Ø C mm	Number of Bolt Holes	Drilling Bolt Hole Ø d mm
15	80	55	4	11	95	65	4	14
20	90	65	4	11	105	75	4	14
25	100	75	4	11	115	85	4	14
32	120	90	4	14	140	100	4	18
40	130	100	4	14	150	110	4	18
50	140	110	4	14	165	125	4	18
65	160	130	4	14	185	145	4	18
80	190	150	4	18	200	160	8	18
100	210	170	4	18	220	180	8	18
125	240	200	8	18	250	210	8	18
150	265	225	8	18	285	240	8	22
175	295	255	8	18	315	270	8	22
200	320	280	8	18	340	295	8	22
250	375	335	12	18	395	350	12	22
300	440	395	12	22	445	400	12	22
350	490	445	12	22	505	460	16	22
400	540	495	16	22	565	515	16	26
450	595	550	16	22	615	565	20	26
500	645	600	20	22	670	620	20	26
600	755	705	20	26	780	725	20	30
700	860	810	24	26	895	840	24	30
800	975	920	24	30	1015	950	24	33
900	1075	1020	24	30	1115	1050	28	33
1000	1175	1120	28	30	1230	1160	28	36
1200	1405	1340	32	33	1455	1380	32	39
1400	1630	1560	36	36	1675	1590	36	42
1600	1830	1760	40	36	1915	1820	40	48
1800	2045	1970	44	39	2115	2020	44	48
2000	2265	2180	48	42	2325	2230	48	48
2200	2475	2390	52	42	2550	2440	52	56
2400	2685	2600	56	42	2760	2650	56	56
2600	2905	2810	60	48	2960	2850	60	56
2800	3115	3020	64	48	3180	3070	64	56
3000	3315	3220	68	48	3405	3290	68	62

## Flange dimensions – Trelleborg Expansion Joints

### Note

ANSI-flanges from DN 700 to 1400 are specified according to AWWA C207 Class D.

### DIN 2501 PN 16, ANSI B16.5 150 lb

DN	PN 16 – DIN 2501				ANSI B16.5 – 150 lb.			
	Ext. Diameter D mm	Bolt Circle Ø C mm	Number of Bolt Holes	Drilling Bolt Hole Ø d mm	Ext. Diameter inch D mm	Bolt Circle Ø C mm	Number of Bolt Holes	Drilling Bolt Hole Ø d mm
15	95	65	4	14	1/2" 88,9	60,3	4	15,9
20	105	75	4	14	3/4" 98,4	69,8	4	15,9
25	115	85	4	14	1" 107,9	79,4	4	15,9
32	140	100	4	18	1 1/4" 117,5	88,9	4	15,9
40	150	110	4	18	1 1/2" 127,0	98,4	4	15,9
50	165	125	4	18	2" 152,4	120,6	4	19,0
65	185	145	4	18	2 1/2" 177,8	139,7	4	19,0
80	200	160	8	18	3" 190,5	152,4	4	19,0
100	220	180	8	18	4" 228,6	190,5	8	19,0
125	250	210	8	18	5" 254,0	215,9	8	22,2
150	285	240	8	22	6" 279,4	241,3	8	22,2
175	315	270	8	22	7" 311,2	269,9	8	22,2
200	340	295	12	22	8" 342,9	298,4	8	22,2
250	405	355	12	26	10" 406,4	361,9	12	25,4
300	460	410	12	26	12" 482,6	431,8	12	25,4
350	520	470	16	26	14" 533,4	476,2	12	28,6
400	580	525	16	30	16" 596,9	539,7	16	28,6
450	640	585	20	30	18" 635,0	577,8	16	31,7
500	715	650	20	33	20" 698,5	635,0	20	31,7
600	840	770	20	36	24" 812,8	749,3	20	34,9
700	910	840	24	36	28" 927,1	863,6	28	34,9
800	1025	950	24	39	32" 1060,4	977,9	28	41,3
900	1125	1050	28	39	36" 1168,4	1085,8	32	41,3
1000	1255	1170	28	42	40" 1289,0	1200,1	36	41,3
1200	1485	1390	32	48	48" 1511,3	1422,4	44	41,3
1400	1685	1590	36	48	54" 1682,7	1593,8	44	47,7
1600	1930	1820	40	56	-	-	-	-
1800	2130	2020	44	56	72" 2197,1	2095,6	60	47,7
2000	2345	2230	48	62	78" 2362,2	2260,6	64	53,9
2200	2555	2440	52	62	-	-	-	-
2400	-	-	-	-	96" 2876,5	2755,9	68	60,3



**TRELLEBORG**  
ENGINEERED SYSTEMS

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Distributor:



**Chemical resistance**

The table below indicates the effects of specific chemicals on rubber expansion joints. The table comprises recommendations which do not imply an undertaking or a guarantee on the part of Trelleborg Expansion Joints.

Get in touch with your nearest Trelleborg sales office for further information.

**Chemical resistance**  
Trelleborg Expansion Joints

Chemicals in system	Innerliner of expansion joint										
	ECO	NR	CR	NBR	EPDM	CSM	IIR	SBR	FKM	PTFE	
Acetaldehyde D	-	X	X	X	B	C	B	X	A	A	
Acetic acid 5%	B	B	A	B	A	A	A	B	A	A	
10%	B	B	B	B	A	B	A	B	A	A	
20%	B	B	B	B	A	B	B	B	B	A	
30%	B	B	B	B	A	B	B	B	B	A	
50%	B	B	C	C	A	B	B	C	C	A	
99,5% glacial	X	B	X	C	B	C	B	C	X	A	
Acetic acid. Amhydride	X	C	C	X	A	C	A	C	X	A	
Aceton	X	B	C	X	A	C	A	C	X	A	
Acetylene	-	B	B	A	A	B	A	B	A	A	
Ammonia gas, cold	-	A	A	A	A	A	A	A	X	A	
Ammonia gas, hot	-	X	B	X	B	B	B	X	X	A	
Ammonia, liquid	-	B	A	B	A	B	A	B	X	A	
Ammonium hydroxid	B	B	B	C	A	A	A	B	B	A	
Amyl acetate	X	C	X	X	A	C	A	X	X	A	
Aniline	X	X	X	X	B	X	B	X	B	A	
Aniline dyes	-	B	B	C	B	B	B	B	B	A	
Animal fats	A	X	B	A	B	B	B	X	A	A	
Argon	-	X	X	C	A	X	B	X	A	A	
Arsenic acid	-	B	B	B	A	A	A	B	A	A	
Beer	A	A	A	A	A	A	A	A	A	A	
Benzene (Benzol)	X	X	X	X	X	X	X	X	A	A	
Black liquer	-	X	C	A	X	C	X	X	A	A	
Brandy	-	A	A	A	A	A	A	A	A	A	
Bromine liquid	-	X	X	X	X	X	X	X	A	A	
Butane	A	X	A	A	X	B	X	X	A	A	
Butanol (butyl alcohol)	-	A	A	A	A	A	A	A	A	A	
Butyl acetat	X	X	X	X	B	C	X	X	X	A	
Calcium hypochlorite	B	C	X	C	A	A	B	X	A	A	
Caustic potash	-	B	B	C	B	A	A	B	C	A	
Caustic soda	-	A	B	C	A	B	A	B	B	A	
Chlorine gas,dry, 40°C	B	X	X	X	C	C	X	X	A	A	
Chlorine gas,wet, 40°C	B	X	X	X	C	C	X	X	C	A	
Chlorine solution, 0,1 gr/l	-	-	-	-	A	A	A	-	-	A	A
Chlorine solution, 0,1-1g/l	-	-	-	-	A	A	A	-	-	A	A
Chlorine sol. 1-10g/l, 40°C	-	-	-	-	B	B	B	-	-	-	-
Chlorine sol. >10g/l, 40°C	-	-	-	-	C	C	C	-	-	-	-
Chlorosulphonic acid	-	X	X	X	X	X	X	X	C	A	
Chromic acid	-	X	X	X	C	B	C	X	A	A	

Chemicals in system	Innerliner of expansion joint										
	ECO	NR	CR	NBR	EPDM	CSM	IIR	SBR	FKM	PTFE	
Detergent	A	B	B	A	A	A	A	B	A	A	
Diesel oil	A	X	C	A	X	C	X	X	A	A	
Ethane	-	X	B	A	X	B	X	X	A	A	
Ethanol	B	A	A	A	A	A	A	A	B	A	
Ether, Ethyl ether	B	X	X	C	X	X	C	X	X	A	
Ethyl acetat	-	X	X	X	B	X	B	X	X	A	
Ethyl chloride	B	B	X	B	A	C	A	B	A	A	
Ethyl glycol (Cellosolve)	-	X	X	C	B	C	B	X	C	A	
Ethylene chloride	-	X	X	X	C	X	C	X	B	A	
Ethylene glycol	A	A	A	A	A	A	A	A	A	A	
Ferrous salts, non oxidizing	-	A	A	A	A	A	A	A	A	A	
Formaldehyde,formalin, 40°C	B	B	B	B	A	A	A	B	A	A	
Formic acid, 40°C	B	B	B	X	A	B	A	A	X	A	
Fuel oil	A	X	C	A	X	C	X	X	A	A	
Furan (Furfuran)	-	X	X	X	X	X	X	X	C	A	
Furfural (Furfurol)	X	X	X	X	B	C	B	X	X	A	
Glucose	A	A	A	A	A	A	A	A	A	A	
Glycerine, glycerol	A	A	A	A	A	A	A	A	A	A	
Green liquor, white liquor	A	A	A	A	A	A	A	A	A	A	
Hydraulic oil (petroleum)	A	X	B	A	X	B	X	X	A	A	
Hydrobromic acid, max 40°C	-	-	-	-	C	A	A	B	-	B	A
Hydrochloric acid,37%,	B	-	-	-	X	A	A	-	-	-	A
Hydrochloric acid,37%,70°C	C	X	X	X	X	C	X	X	X	A	A
Hydrochloric acid, diluted	-	-	-	-	C	A	A	B	-	A	A
Hydrofluoric acid, 50%, 40°C	-	C	C	X	B	B	B	C	A	A	
Hydrofluosilicic acid, 40°C	-	A	B	B	A	A	A	B	A	A	
Hydrogen	-	B	A	A	A	A	A	B	A	A	
Hydrogen peroxid, 3%,40°C	-	B	B	B	A	A	A	B	A	A	
30%,20°C	-	C	C	C	B	A	B	C	A	A	
90%,20°C	-	C	C	C	-	-	-	-	B	A	
Hydrogen sulphide, dry, 20°C	-	A	A	A	A	A	A	A	X	A	
,wet,20°C	B	X	A	C	A	A	A	X	X	A	
,wet,40°C	B	X	C	X	B	C	B	X	X	A	
Lactic acid	-	B	A	A	A	A	B	B	A	A	
Linseed oil	A	X	B	A	B	B	A	X	A	A	
Liquid manure	-	-	-	-	A	A	A	-	-	-	A
LP- gas	A	X	B	A	X	X	X	X	A	A	
Lubricating oil	A	X	C	A	X	X	X	X	A	A	
Methanol, methyl alcohol	B	A	A	B	A	A	A	A	X	A	

It applies at ambient temperature unless otherwise stated. For other temperatures, please contact us.

# Chemical resistance – Trelleborg Expansion Joints

Rating code A Excellent B Good C Conditional X Inappropriate - Please ask	Innerliner of expansion joint									
	ECO	NR	CR	NBR	EPDM	CSM	IIR	SBR	FKM	PTFE
Chemicals in system	Epichloridine	Natural	Chloroprene	Nitrile	EPDM	Hypalon	Butyl	SBR	Viton	Teflon
Methyl chloride	-	X	X	X	C	X	C	X	A	A
Methyl ethyl ketone MEK	X	X	X	X	A	X	B	X	X	B
Methyl isobutyl ketone	X	X	X	X	B	X	C	X	X	A
Methyl isopropyl ketone	-	X	X	X	C	X	C	X	X	A
Methylene chloride	-	X	X	X	X	X	X	X	B	A
Milk	-	A	A	A	A	A	A	A	A	A
Natural gas	A	C	A	A	X	A	X	C	A	A
Nitric acid,20%, 40°C	X	X	C	X	A	A	A	X	A	A
20%, 50°C	X	X	X	X	B	A	B	X	A	A
40%, 50°C	X	X	X	X	C	A	C	X	A	A
50%, 50°C	X	X	X	X	X	B	X	X	A	A
60%, 20°C	X	X	X	X	X	C	X	X	A	A
70%, 20°C	X	X	X	X	C	X	X	X	A	A
Nitric acid, fuming	X	X	X	X	X	X	X	X	C	A
Nitrobenzene	X	X	X	X	B	X	B	X	B	A
Nitrogen	A	A	A	A	A	A	A	A	A	A
Nitrous gases	-	X	X	X	C	X	X	X	X	B
Oleic acid	A	X	C	A	X	C	X	X	A	A
Olive oil	A	X	C	A	C	C	C	X	A	A
Oxalic acid	-	C	C	C	A	B	A	B	B	A
Oxygen	B	C	B	C	A	B	A	X	A	A
Ozone	A	X	C	X	B	B	C	X	A	A
Palmitic acid	B	B	B	A	B	C	B	B	A	A
Paraffin, kerosene	-	X	C	A	X	C	X	X	A	A
Perchloroethylene	B	X	X	C	X	X	X	X	A	A
Petrol, 100 octan	C	X	X	C	X	X	X	X	A	A
65 octan	B	X	X	B	X	C	X	X	A	A
Petroleum ether	B	X	B	B	X	X	X	X	A	A
Petroleum oils,high aromatic	B	X	X	B	X	X	X	X	A	A
low aromatic	A	X	C	A	X	B	X	X	A	A
Phenol	-	X	X	X	C	C	B	X	A	A
Phosphoric acid,45%, 40°C	-	C	B	C	A	B	B	C	A	A
85%, 40°C	-	C	C	X	B	B	B	C	A	A
Plating sol. w/o chromium.	-	X	X	X	A	C	C	X	A	A
Propan, LP-gas	A	X	C	A	X	C	X	X	A	A

Rating code A Excellent B Good C Conditional X Inappropriate - Please ask	Innerliner of expansion joint									
	ECO	NR	CR	NBR	EPDM	CSM	IIR	SBR	FKM	PTFE
Chemicals in system	Epichloridine	Natural	Chloroprene	Nitrile	EPDM	Hypalon	Butyl	SBR	Viton	Teflon
Propanol, propyl alcohol	A	A	A	A	A	A	A	A	A	A
Rapeseed oil	A	X	X	X	A	C	A	X	A	A
Rosin oil	-	X	C	A	X	C	X	X	A	A
Salicylic acid	-	A	C	B	A	A	A	B	A	A
Salt solutions, non oxidizing	-	A	A	A	A	A	A	A	A	A
Sewage water	-	B	B	A	B	A	B	B	A	A
Silicofluoric acid, 40°C	-	B	B	B	B	A	B	B	A	A
Sodium hypochlorite, <10g/l	B	C	B	C	A	A	B	C	A	A
>10g/l	B	X	X	X	B	B	C	X	A	A
Styrene, 40°C	-	X	X	X	X	X	X	X	B	A
Sugar solutions	-	A	A	A	A	A	A	A	A	A
Sulphur chloride, 40°C	-	X	X	X	X	C	X	X	A	A
Sulphur, molten	-	X	X	X	B	B	C	X	A	A
Sulphur dioxide, dry gas,40°C	-	C	X	X	A	X	B	C	A	A
Sulphur trioxide, dry gas	-	X	X	X	B	X	C	X	A	A
Sulphuric acid, < 60%	B	C	C	X	B	B	B	X	A	A
60%, 50°C	X	C	X	X	B	B	B	X	A	A
75%, 50°C	X	X	X	X	B	B	B	X	A	A
80%, 50°C	X	X	X	X	C	B	C	X	A	A
96%, 50°C	X	X	X	X	C	C	X	X	A	A
Sulphuric acid,fuming,Oleum	X	X	X	X	X	X	X	X	B	A
Sulphurous acid, 40°C	-	C	C	X	A	A	B	C	A	A
Tar, 40°C	B	X	C	B	X	C	X	X	A	A
Toluene, toluol	X	X	X	C	X	X	X	X	A	A
Transformer oil,ch1.hydrocar.	-	X	X	X	X	X	X	X	A	A
mineral based	-	X	B	A	X	C	X	X	A	A
Trichloroethylene, 40°C	-	X	X	X	X	X	X	X	A	A
Turpentine, terpene	A	X	X	A	X	X	X	X	A	A
Vegetable oils	A	X	C	A	X	B	X	X	A	A
Water, distilled	A	A	C	A	A	A	A	A	A	A
fresh	A	A	B	A	A	A	A	A	A	A
fresh ,distilled 100°C	-	C	C	B	A	B	B	C	A	A
salt	-	A	A	A	A	A	A	A	A	A
Whiskey, Wine	-	A	A	A	A	A	A	A	A	A
Xylene, xylol	X	X	X	X	X	X	X	X	A	A

It applies at ambient temperature unless otherwise stated. For other temperatures, please contact us.



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Distributor:

## INSTALLATION OF TRELLEBORG TF EXPANSION JOINTS – with turnable flanges.

### Key factors for installation

Trelleborg rubber expansion joints are supplied ready for installation. Following advises are however to be taken into consideration in order to obtain a good performance and prolonged service life of the expansion joint.

### Fixed points

An expansion joint acts as a piston by the forces arising from the internal pressure. To prevent the pipes from damage they are to be properly anchored in order to take care of these reaction forces ( $F_r$ ). The reaction force of an expansion joint is calculated by the following formula:

$$F_r = A \times P \times 0,01$$

$F_r$  = reaction force in kN.

$A$  = effective cross sectional area in  $\text{cm}^2$ .

$P$  = actual pressure in bar or  $\text{kp}/\text{cm}^2$ .

### Installation

The turnable metal flanges make installation easier and eliminate twist.

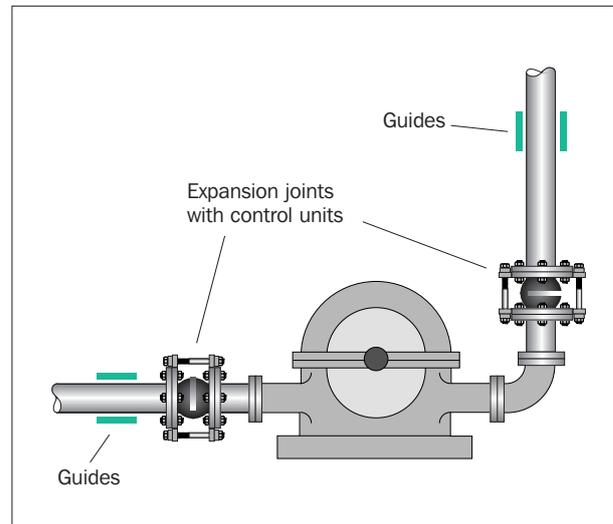
The low inherent rigidity of Trelleborg TF expansion joints make for easier accommodation of installation dimensions.

The expansion joints shall be easily accessible and open to regular supervision. It is recommended to let the expansion joints work in compression rather than stretching. Torsion is not permitted.

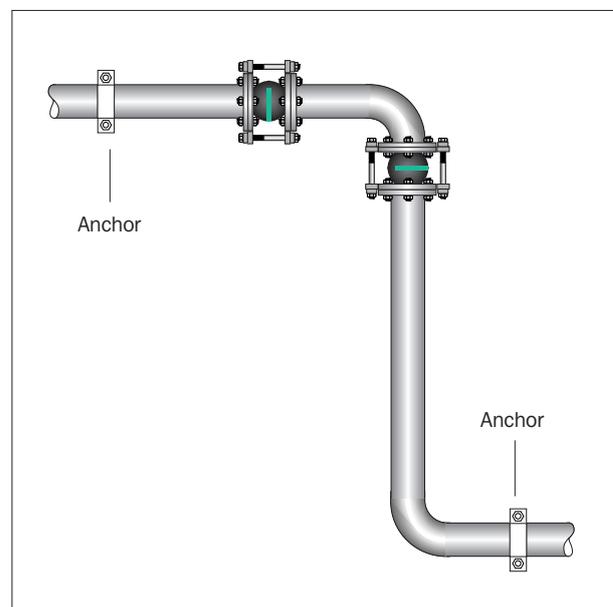
Check the permissible movements, temperature, pressure and proper rubber quality before installation!

# Installation

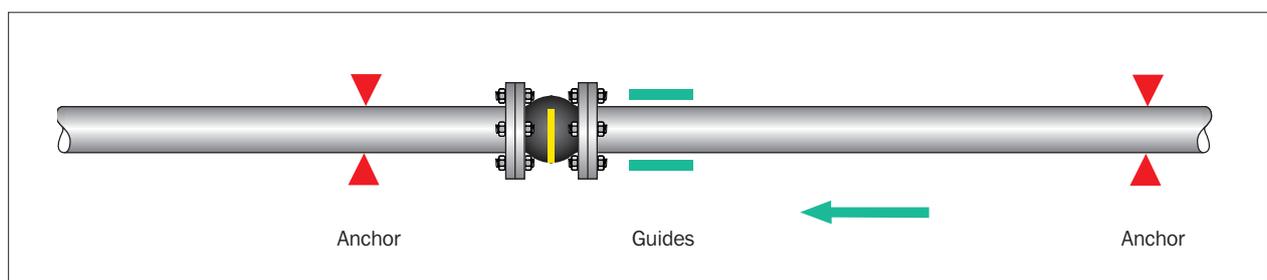
## Trelleborg TF Expansion Joints



Pressure-restrained expansion joint on pump (with tie bar). Absorb vibrations and thus relieve pressure on the machine housing.



Arrangement with lateral expansion joints.



# Installation of Trelleborg TF Expansion Joints

## Mounting

- In order to provide the movement capabilities indicated in the technical specifications, the assembly bolts should be mounted with bolts heads towards expansion joint body. (1)
- If this is for any reason impossible, ensure that the threaded bolts project as little as possible (no more than 2 or 3 mm) to avoid damage to the body.
- Tightening must be progressive and crosswise in diagonal sequence with bolting pressure evenly distributed.
- The design of the expansion joints secures a sealing to the counter flange. That is why no sealing gasket is required.

**Note:** If the bolts and nuts are tightened too strongly, the sealing face might be crushed causing improper function!

## Counter flanges

It is very important for the safe operating and life expectancy of the expansion joint to make a proper installation of the counter flanges (Fig. 2 to 5). The sealing face of the counter flange must be machined smooth and cover most of the rubber sealing face (or at least 60%) to ensure a good sealing (Fig. 2).

## Precaution

Do not paint or lubricate rubber parts of expansion joints!

When welding work is to take place the bellow has to be protected from welding heat and sparks!

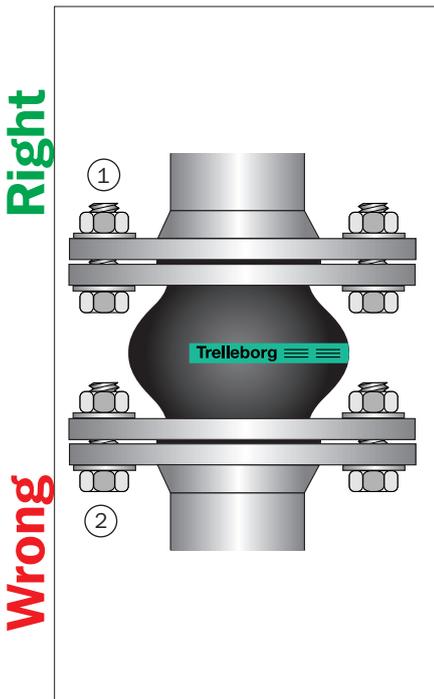


Fig. 1

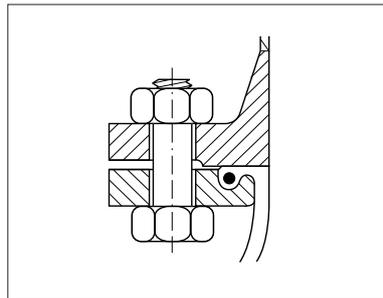


Fig. 2 Flange provided with smooth sealing surface.

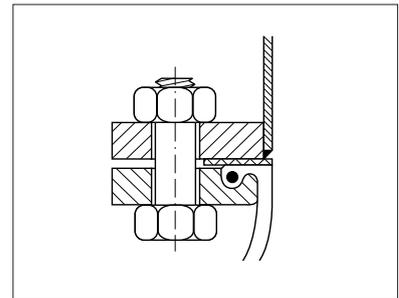


Fig. 4 Flange provided with flat sealing gasket to protect the rubber surface.

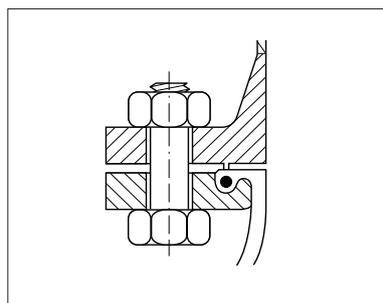


Fig. 3 Do not use flange with tongue or groove which will damage the rubber.

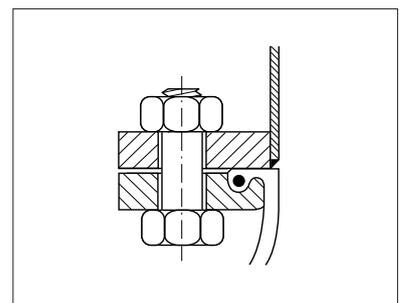


Fig. 5 Sharp edge pipe ends will damage the rubber face.



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## INSTALLATION OF TRELLEBORG FF EXPANSION JOINTS – with full-faced flanges.

### Key factors for installation

Trelleborg rubber expansion joints are supplied ready for installation. Following advices are however to be taken into consideration in order to obtain a good performance and prolonged service life of the expansion joint.

### Fixed points

An expansion joint acts as a piston by the forces arising from the internal pressure. To prevent the pipes from damage they have to be properly anchored in order to take care of these reaction forces (Fr).

The reaction force of an expansion joint is calculated by the following formula:

$$Fr = A \times P \times 0,01$$

Fr = reaction force in kN.

A = effective cross sectional area in cm<sup>2</sup>.

P = actual pressure in bar or kp/cm<sup>2</sup>.

### Checking

For optimum lifetime of expansion joints, make sure that the installed length and operating movements are compatible with their capabilities. (See our Technical Specifications for installation length and technical data).

Check that expansion joints working pressures and grades are compatible with the operating conditions.

### Precautions prior to installation

- To avoid any damage, the expansion joints should be handled with great care, using a counter-flange lifting-ring.
- It is essential that the expansion joints are mounted on flat faced piping flanges that have been degreased and are clean and dry.
- No gasket must be mounted between the rubber expansion joint flanges and the mating pipe flanges.

### Expansion Joint Positioning

- Position the expansion joint, making sure the holes of the expansion joint counter-flanges and flanges are in line with the holes of mating pipe flanges.

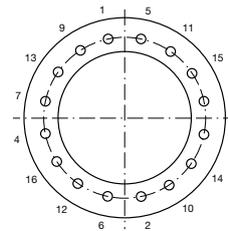
# Installation

## Trelleborg FF Expansion Joints

- When the expansion joint is in place, check the length of the bolts so that the arch will not be damaged during operation.
- Use a conical drive-in pin if necessary.
- Set bolts in place and tighten the nuts slightly on both flanges.
- Cut and remove webbing, taking care not to damage the cover.

### Expansion Joint Installation:

- Tighten bolts on each flange moderately as in the sequence shown below:



- Bolts should be tightened in diametral crosswise order.
- Repeat tightening sequence several times.
- 1st pass: Tighten to approximatively 10% of the maximum permissible torque for the bolting. Based on the class 6.8.
- 2nd pass: Tighten to approximatively 30% of the maximum value.
- 3rd pass: After at least 2 hours, re-tighten to 30% of the maximum value to make up for the reduction in tightening after relaxation of tightening force in the 2nd pass.
- All bolts must be tightened to the same torque value.
- If necessary, re-tighten until there are no signs of leakage, see page or deformation of the top of the rubber flanges upon going on stream or during hydraulic pressure test.

### Precaution

Do not paint or lubricate rubber parts of the expansion joints.

# Installation of Trelleborg FF Expansion Joints

## INSTALLATION OF THE TIE-ROD ASSEMBLY

- Arrangement of the various parts of a tie-rod unit is shown in the contractual drawings.
- The parts must be mounted in the right order.
- Spherical bearings, washers or spherical bearing nuts (if any) must be lubricated taking care not to foul the expansion joint.

### Bolt tightening

- The bolts should be tightening when installing the expansion joint.
- Gradually tighten all bolts, including those of the tie-rod plates, in a diametrical crosswise order, in several passes.

### Tie-rod adjustment

- Tie-rods should be adjusted to conform to the installed length of the expansion joint.
- The only play allowed (if any) after tightening is shown in contractual tie-rod drawings.

### Tightening of locknuts on threaded rods

- Once the tie-rods have been adjusted and slightly tightened by fitting the nuts on either side of the fixing plates, tighten the counter nuts.
- Lock the nut/counter nut assembly by hand to state-of-art procedure.

### Checking

After tightening, make sure the tie-rod play values (if any) are all identical so that reaction will be evenly distributed between each tie-rod.

## MAINTENANCE AFTER INSTALLATION

### Prior to starting up

- Remove any dust or foreign bodies which may have found their way inside the expansion joints.
- Make sure there is no possibility of accidental damage or sabotage. It is advisable to cover the expansion joints with light metal sheeting.
- Check that no lubricant can fall onto the expansion joints.

### When starting up

- Check for leakage.
- If necessary, check efficiency of tie-rods.

### When running

- The expansion joints must be easily accessible and never covered with insulating material or paint.
- They may only be protected with our fire-resistant covers, where these are specified.
- As soon as the expansion joints are working, make sure they are not subjected to movements exceeding their allowable limits.

### Maintenance

It is advisable to inspect the expansion joints every **12 months**.

- Any changes in outer cover will be indicative of serious deterioration.
- Make sure the bolts are properly tightened.
- Check the extent of expansion joint movements, which must remain within their allowable limits.

It is advisable to make an in-depth inspection of expansion joints at least every **5 years**.

- Check each expansion joint carefully. For this, it must either be easily accessible for internal inspection or must be dismantled.



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## STORAGE IN GENERAL

In the majority of products based on vulcanized rubber, storage for a certain period inevitably induces changes in the physical properties of the stored products.

Consequently, these products may not have their ultimate performance characteristics if stored for a length of time before installation (for example, an excess hardness, softening of the rubber or cracks and other surface deteriorations). These changes may result from one particular factor or from a combination of factors, namely the effect of oxygen, ozone, light, heat and humidity.

The adverse effects of these factors may be minimised by a careful choice of the storage conditions.

## PROTECTIVE MEASURES

### Storage area requirements

**Cool:** The storage temperature should be below 25°C and products should be stored away from direct sources of heat such as boilers, radiators and direct sunlight.

If the storage temperature is below 15°C, care should be exercised during the handling of stored products as they may have stiffened and become susceptible to distortion if not handled carefully. The temperature of products taken from such low-temperature storage should be raised to approximately 30°C throughout their mass, before the products are put into service.

It must not drop below 0° C nor exceed +30° C. However, should the temperature fall below 0° C, simply take the precaution of rewarning the joint slowly before handling them in order to avoid any risk of damage.

**Relatively dry:** Maintain a relative humidity between 45 and 70% since excessive dryness is harmful for the expansion joint. Temporary deviations are however allowed.

The relative humidity should be such that, given the variations of temperature in storage, condensation does not occur. In any event, the relative humidity of the atmosphere in storage should be less than 70% or, if polyurethanes are being stored, less than 65%.

#### Note:

- Air with 75% RH at 15°C will have a dew point of approximately 11°C.
- Air with 75% RH at 20°C will have a dew point of approximately 16°C.
- Air with 65% RH at 15°C will have a dew point of approximately 9°C.
- Air with 65% RH at 20°C will have a dew point of approximately 13°C.
- Air with 50% RH at 10°C will have a dew point of approximately 0°C.

# Storage

## Trelleborg Expansion Joints

For the counter-flanges (or metal parts) excessive dryness or humidity are harmful and the pieces must be protected.

**Light ventilation:** Ventilation should be as light as possible, avoiding any draughts.

### Heating

Stoves, radiators and steam pipes should be insulated. If this is not possible, the expansion joint must be stored at a good distance from these heat sources.

### Lightning

During storage, the expansion joints must not be exposed to sunlight or any other light source rich in ultraviolet radiation.

### Cleanliness

It is advisable to clean the room thoroughly previous to storing expansion joints.

Oil, greases and chemicals must not be stored in the same room or should at least be kept separate from the expansion joints.

### Ozone

As ozone is particularly deleterious to rubber, storage rooms should not contain any equipment that is capable of generating ozone, such as mercury vapour lamps or high-voltage electrical equipment giving rise to electric sparks or silent electrical discharges. Combustion gases and organic vapours should be excluded from storage rooms, as they may give rise to ozone via photochemical processes.

**Note 1:** When equipment such as a fork-lift truck is used to handle large rubber products, care needs to be taken to ensure this equipment is not a source of pollution that may affect the rubber.

**Note 2:** Combustion gases should be considered separately. While they are responsible for generating ground-level ozone, they may also contain unburned fuel which, by condensing on rubber products, can cause additional deterioration.

*Please turn!*

## Storage – Trelleborg Expansion Joints

### Deformation

Rubber should be stored free from superimposed tensions and compressive stresses or other causes of deformation. Where products are packaged in a strain-free condition, they should be stored in their original packaging. In case of doubt, the manufacturer's advice should be asked for.

**Note:** It is advisable that rings of large internal diameter are formed into three equal superimposed loops so as to avoid creasing or twisting. It is not possible to achieve this condition by forming just two loops.

### OUR EXPANSION JOINTS

#### Storage precautions

- It is advisable to store them in such a way that they have no contact with the ground.
- Our expansion joints must be laid flat, on a plain surface to prevent any deformation.
- Avoid contact with any sharp object.

Under the above optimum conditions, the expansion joints may be stored for a maximum period of two years from end of manufacture. Expansion joint supplied in a packing case may be stored flat in their original packing in a warehouse for the same period of two years.

Where longer storage is scheduled, it is essential to protect the rubber portions of the expansion joints by giving them two coats in alternate directions of special CSM (hypalon based) paint, at works.

This is for spares which have been given this treatment may be stored for a **maximum total period of 5 years** under the above conditions. (The first two years, they may be stored in their packing case as for non-treated expansion joints).

**Note:** Metal parts such as tie rods and bolts are to be stored in their original packing.

As applicable, give them treatment for normal conditions of storage of metal parts, suitable for the storage area.

### For interim storage during construction work when no proper user facilities are yet available

This storage, which will last no more than a few months, must comply with the following requirement:

- Lay the expansion joint flat on a plain surface covered with wood and a fabric or plastic protective covering.
- Store in a dry place (protected against rain, surface water and splashing).
- Cover the expansion joints to protect them from bad weather and sunlight, (light coloured fabric or plastic if storage area is exposed to sunlight).
- Provide natural ventilation (but avoid draughts and air movements).
- Take necessary precautions to avoid contact, even accidentally, with chemicals, oil, grease, etc.
- Store away from sources of heat or ozone.
- Shield against malicious mischief.
- There are no reservations as to ambient storage temperatures, providing they exceed 0°C.
- Wherever possible, store in the shade of a building.
- Position, so that the identification marking is visible without any items having to be moved.



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