MEGA FLEXON

EXPANSION JOINT & FLEXIBLE PRODUCTS

ISO 9001
ISO 14001
ISO 45001

RUBBER
EXPANSION JOINTS

TECHNICAL DESIGN CATALOG V.2

INDEX

Megaflexon

EXPANSION JOINTS & FLEXIBLE PRODUCTS

Milestones

1986

Founded Manufacturing Metallic and Rubber Expansion Joints

2002

Obtained CE and PED mark issued by Bureau Veritas

2006

Obtained Patents,

- Expansion Joints with Automatic Pressure Control Device
- 2Ply Bellows Expansion Joint & Process

2009

- Obtained ASME "U" "S" "PP" Stamp
- Won the Presidential Citation at the 39th Industrial Technology Contest of Korea

1997

Obtained ISO 9001 issued by TUV

ISO 9001

2003

Developed expansion joint design for GRP/FRP pipelines

2007

Achieved US Ten Million Dollars Export Records

2010

Obtained ISO 14001 issued by ICR

ISO 14001

2012

Contracted to supply GIS bellows to Hyundai Heavy Industry (1,700~2000 sets per year)

2013

Obtained Patents, Design and Process of Dismantling Joints

2015

Made a contract for Petronas RAPID P1 RFCC project which reaches about US Ten Million Dollars

Renewal CE and PED mark issued by HPi Verification Services (Ireland) Ltd.

2020

Obtained ISO 45001 issued by ABS

ISO 45001

2021

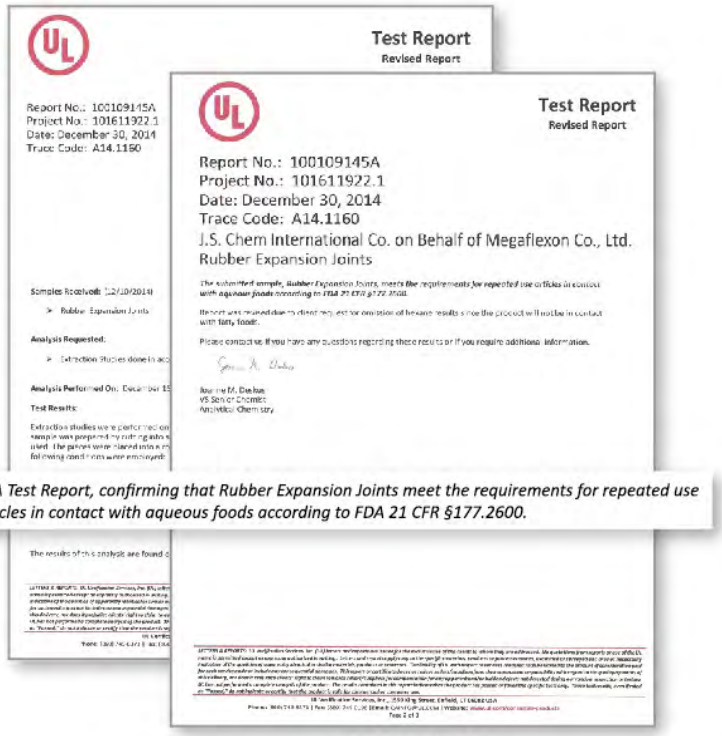
Project		Licensor
DBNR RFCC		UOP
HPC Hyundai Chemical	PE/PP	HDPE-Univation
		PP-Grace
PDH Polska Oleflex CCR (EGAT) - PE/PP		UOP
Orlen Lietuva RFCC		UOP
PDH Polska Oleflex CCR (UOP) - PE/PP		UOP

For High Temperature & High Pressure

Certification

Quality Assurance

MEGAFLEXON declares that Quality and Service are our most TOP priority. We always put quality and service on our most top priority and will make sure to deliver zero-defect products and service on time to our customers. In order to ensure our quality commitment, our degreed quality specialists do strictly carry out all required activities for quality assurance.



Test Report
Revised Report

Report No.: 100109145A
Project No.: 101611922.1
Date: December 30, 2014
Trace Code: A14.1160
J.S. Chem International Co. on Behalf of Megaflexon Co., Ltd.
Rubber Expansion Joints

The submitted sample, Rubber Expansion Joints, meets the requirements for repeated use articles in contact with aqueous foods according to FDA 21 CFR §177.2600.

FDA Test Report, confirming that Rubber Expansion Joints meet the requirements for repeated use articles in contact with aqueous foods according to FDA 21 CFR §177.2600.

ABS Quality Evaluations
Certificate Of Conformance

MEGAFLEXON Co., Ltd.
78-12, Seunggo-ro 79beon-gil, Gimpo-si
Gyeonggi-do
Korea

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

ISO 9001:2015

DESIGN, DEVELOPMENT, PRODUCTION AND SERVICING OF METAL, RUBBER, & FABRIC EXPANSION JOINTS AND FLEXIBLE HOSE & QUICK COUPLER

· ISO 9001 Certificate

Certificate of Registration

This is to certify that:
MEGAFLEXON Co., Ltd.

has been assessed by International Certification Register Ltd., at request of their Environmental Management System and found to comply with

KS I ISO 14001:2015 / ISO 14001:2015

Certification Scope:
Design, Development, Production and After Servicing of Metal, Rubber & Fabric Expansion Joints and Steel Flexible Hose & Quick Couple

· ISO 14001 Certificate

Certificate of Quality System Approval

This is to certify that the product listed below conforms to the requirements of the
Pressure Equipment Directive 2014/68/EU

· CE PED Certificate

Engineering Applications

Expansion joints have a wide range of applications, and each expansion joint is designed based on its unique environmental and installation conditions-pressure, temperature, movements, space, and/or corrosion, etc. The applications of our expansion joints include the following.

- Fossil fuel power plants
- Nuclear power plants
- Desalination plants
- Chemical and Pharmaceutical industry
- District heating
- Iron and steelmills
- Automotive industry
- Wastewater treatment plants
- Pulp and paper plants
- LNG plants
- Food and beverage industry
- Gas and water supply and water treatment plant
- Environmental technology, combustion plant
- Shipbuilding
- Sanitary piping systems
- Piping systems for chilled or hot water

The design of rubber expansion joints are based on and complies with the following.

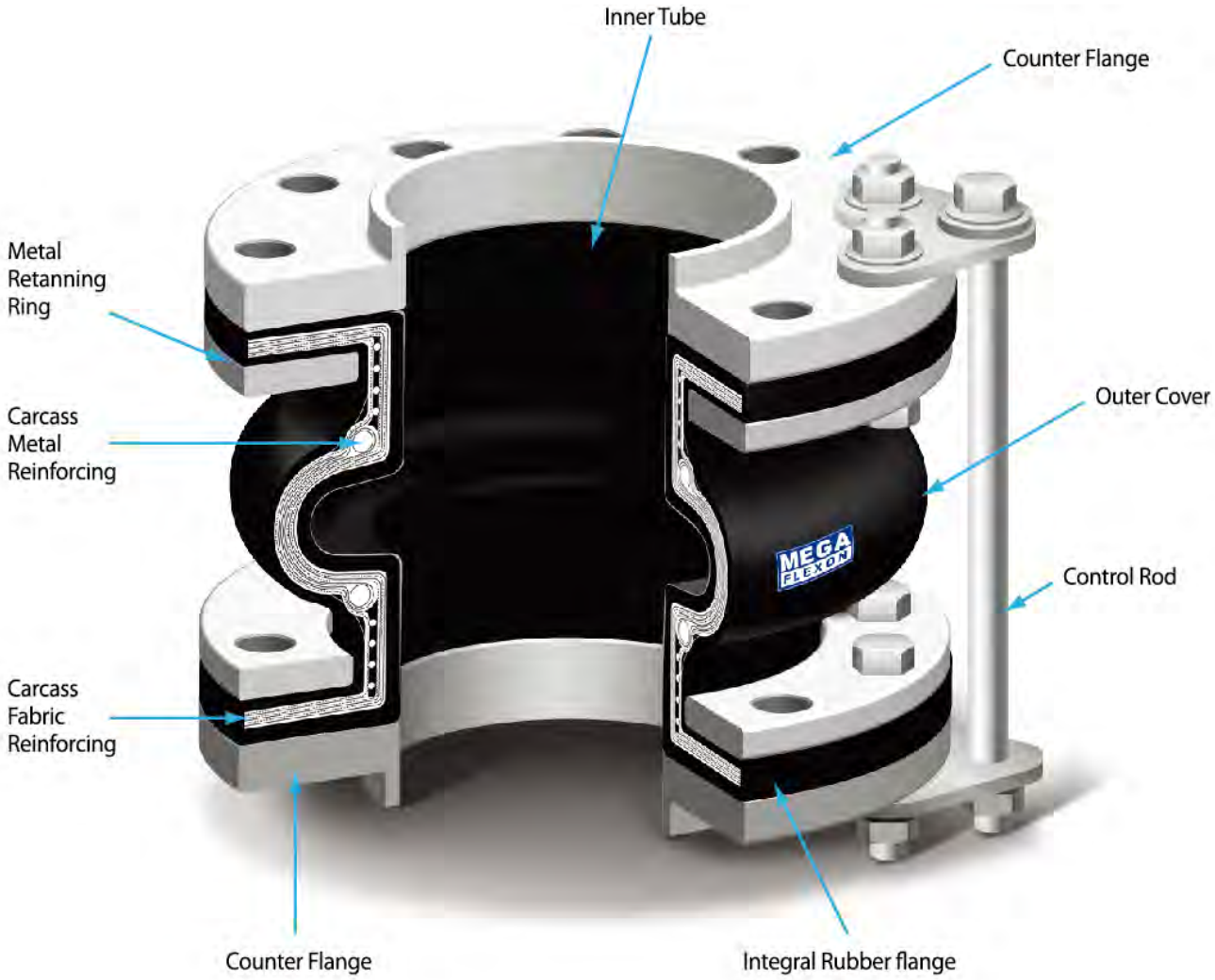
- FSA
- ASME
- DIN
- KS
- JIS
- BS / EN
- OTHERS

Major Customers

Introduction

MEGAFLEXON Rubber expansion joints have been specified and used for many years by consulting engineers, mechanical contractors, pressure vessel designers, plant engineers and turn-key construction firms. They are installed to accommodate movement in piping runs, protect piping from expansion and contraction and insure efficient and economical on-stream operations. Rubber expansion joints are a specifically engineered and designed section of pipe that is flanged and is able to be inserted within a rigid piping system with the goal to be the achievement of one or more of the following.
Rubber expansion joints, designed by engineers and fabricated by skilled craftsmen, are used in all systems conveying fluids under pressure and / or vacuum at various temperatures:

- **To absorb movement**
- **To relieve system strain due to thermal change, load stress, pumping surges, wear or settling**
- **To reduce mechanical noise & vibration**
- **To compensate for misalignment**
- **To eliminate electrolysis between dissimilar metals**



▲ *Cross Sectional View of Standard Spool Arch Type Expansion Joint*

Product Description

A. DEFINITION

A non-metallic expansion joint is a flexible connector fabricated of natural or synthetic elastomers, fluoroplastics and fabrics and, if necessary, metallic reinforcements to provide stress relief in piping systems due to thermal and mechanical vibration and/or movements.
Noteworthy performance features include flexibility and concurrent movements in either single or multiple arch type construction, isolation of vibration and noise, resistance to abrasion and chemical erosion.

B. FUNCTIONS

Engineers can solve anticipated problems of vibration, noise, shock, corrosion, abrasion, stresses and space by incorporating rubber expansion joints into designed piping systems.

B.1. Reduce Vibration

Rubber expansion joints isolate or reduce vibration caused by equipment. Some equipment requires more vibration control than others. Reciprocating pumps and compressors, for example, generate greater unbalanced forces than centrifugal equipment. However, rubber pipe and expansion joints dampen undesirable disturbances including harmonic overtones and vibrations caused by centrifugal pump and fan blade frequency.
This is based on actual tests conducted by a nationally recognized independent testing laboratory. Rubber expansion joints reduce transmission of vibration and protect equipment from the adverse effects of vibration.

B.2. Dampen Sound Transmission

Subsequent to going on stream, normal wear, corrosion, abrasion and erosion eventually bring about imbalance in motive equipment, generating undesirable noises transmitted to occupied areas. Rubber expansion joints tend to dampen transmission of sound because of the steel-rubber interface of joints and mating flanges. Thick-wall rubber expansion joints, compared with their metallic counterparts, reduce considerably the transmission of sound.

B.3. Compensate Lateral, Torsional and Angular Movements

Pumps, compressors, fans, piping and related equipment move out of alignment due to wear, load stresses, relaxation and settling of supporting foundations. Rubber expansion joints compensate for lateral, torsional and angular movements, preventing damage and undue downtime of plant operations.

B.4. Compensate Axial Movements

Expansion and contraction movements due to thermal changes or hydraulic surge effects are compensated for with strategically located rubber expansion joints. They act as helix springs, compensating for axial movements.

C. ADVANTAGES

The industry has allied itself with designers, architects, contractors and erectors in designing and fabricating rubber expansion joints under rigid standards to meet present-day operating conditions. The industry has kept abreast of the technological advances in rubber compounding and synthetic fabrics to provide rubber expansion joints having advantages not available in other materials.

C.1. Minimal Face-to-Face Dimensions

Minimal face-to-face dimensions in rubber expansion joints offer untold economies compared with costly expansion bends or loops. The relative cost of the pipe itself may be less or no more than a rubber expansion joints; however, total costs are higher when considering plant space, installation labor, supports and pressure drops.

C.2. Lightweight

Rubber expansion joints are relatively light in weight, requiring no special handling equipment to position, contributing to lower installation labor costs.

C.3. Low Movement Forces Required

The inherent flexibility of rubber expansion joints permits almost unlimited flexing to recover from imposed movements, requiring relatively less force to move, thus preventing damage to motive equipment.

C.4. Reduced Fatigue Factor

The inherent characteristics of natural and synthetic elastomers are not subject to fatigue breakdown or embrittlement and prevent any electrolytic action because of the steel-rubber interface of joints and mating flanges.

C.5. Reduced Heat Loss

Rubber expansion joints reduce heat loss, giving long maintenance-free service. The added piping required for loops contribute to higher operating costs after going on stream due to increase in heat losses.

C.6. Corrosion, Erosion Resistant

A wide variety of natural, synthetic and special purpose elastomers and fabrics are available to the industry. Materials are treated and combined to meet a wide range of practical ressure-temperature operating conditions, corrosive attack, abrasion and erosion.

▶ ***Temperature class of materials used In expansion joints***

Type of Elastomer	Class	Type of Fabric	Class
Gum Rubber	Std. 1	Cotton	Std. 1
Natural Rubber	Std. 1	Rayon	Std. 1
SBR/GRS/Buna-S	Std. 1	Nylon	Std. 2
Neoprene	Std. 2	Polyester	Std. 3
Buna-N/Nitrile	Std. 2	Fiberglass	Std. 3
Hypalon	Std. 2	Kevlar	Std. 3
Butyl	Std. 2	Nomex	Std. 3
Chlorobutyl	Std. 3		
EPDM	Std. 3		
Viton/Fluorel	Std. 3		
Silicone	Std. 3		
Teflon/TFE/FEP	Std. 3		

Standard Class 1- Recommended up to 180 °F (82 °C)
Standard Class 2- Recommended up to 230 °F (110 °C)
Standard Class 3- Recommended for over up to 250 °F (121 °C)
NOTE: Material combinations are available for temperatures to 400°F (204 °C)

Product Description

Standard and special sizes of rubber expansion joints are available with PTFE/TFE/FEP liners, fabricated to the configurations of the joint body, as added insurance against corrosive attack. Fluoroplastics possess unusual and unique characteristics of thermal stability, non-sticking surface, extremely low co-efficient of friction and resistance to practically all corrosive fluids and forms of chemical attack.

C.7. No Gaskets
Elastomeric expansion joints are supplied with flanges of vulcanized rubber and fabric integrated with the tube, making the use of gaskets unnecessary. The sealing surfaces of the expansion joint equalize uneven surfaces of the pipe flange to provide a fluid and gas-tight seal. A ring gasket may be required for raised face flanges. Consult manufacturer about specific applications.

C.8. Acoustical Impedance
Elastomeric expansion joints significantly reduce noise transmission in piping systems because the elastomeric composition of the joint acts as a dampener that absorbs the greatest percentage of noise and vibration.

C.9. Greater Shock Resistance
The elastomeric type expansion joints provide good resistance against shock stress from excessive hydraulic surge, water hammer or pump cavitation.

D. CONSTRUCTION DETAILS

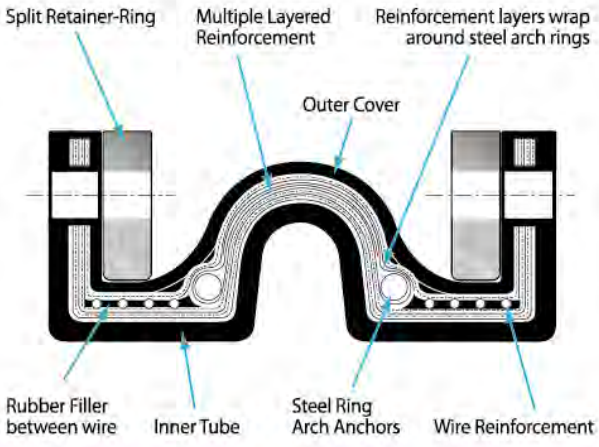
D.1. Inner Tube
A protective, leakproof lining made of synthetic or natural rubber as the service dictates. This is a seamless tube that extends through the bore to the outside edges of the flanges. Its purpose is to eliminate the possibility of the materials being handled penetrating the carcass and weakening the fabric. These tubes can be designed to cover service conditions for chemical petroleum, sewage, gaseous and abrasive materials.

D.2. Outer Cover
The exterior surface of the joint is formed from natural or synthetic rubber, depending on service requirements. The prime function of the cover is to protect the carcass from outside damage or abuse. Special polymers can be supplied to resist chemicals, oils, sunlight, acid fumes and ozone. Also, a protective coating may be applied to the exterior of the joint for additional protection.

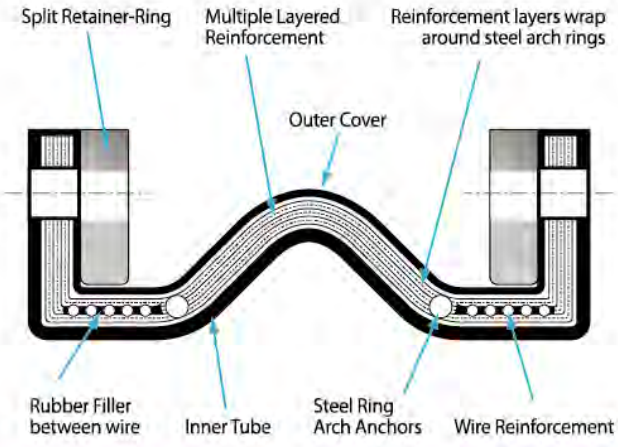
D.3. Carcass
The carcass or body of the expansion joint consists of fabric and, when necessary, metal reinforcement.

D.3.A. Fabric Reinforcement
The carcass fabric reinforcement is the flexible and supporting member between the tube and cover. Standard constructions normally utilize high quality synthetic fabric. Natural fabrics can also be used at some pressures and temperatures. All fabric plies are impregnated with rubber or synthetic compounds to permit flexibility between the fabric plies.

D.3.B. Metal Reinforcement
Wire or solid steel rings embedded in the carcass are frequently used as strengthening members of the joint. The use of metal sometimes raises the rated working pressure and can supply rigidity to the joint for vacuum service.



NARROW ARCH

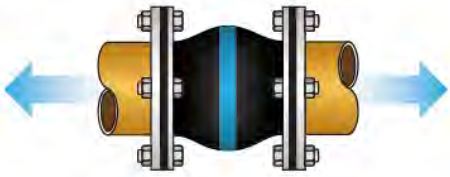


WIDE ARCH

Movements

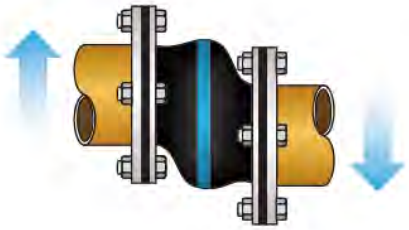
Axial Compression

- Longitudinal movement shortens face-to-face dimension along axis of expansion joint/flexible coupling
- Pipe flanges remain perpendicular to axis



Axial Extension

- Longitudinal movement lengthens face-to-face dimension along axis of expansion joint /flexible coupling
- Pipe flanges remain perpendicular to axis

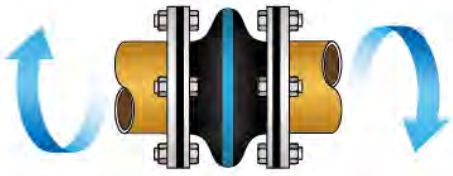


Lateral / Transverse movement

- Offset movement of one/both pipe flanges
- Both flanges remain parallel to each other while forming angle to axis of joint

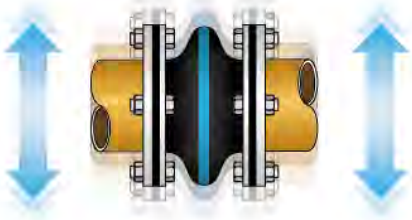
Angular Movement

- Deflection / rotation of one or both flanges
- Angle with axis of expansion joint/flexible couping is formed



Torsional Movement

- Rotation of one flange with stationary counterpart
- Simultaneous rotation of both flanges in opposing motion



Vibration

- By definition oscillating movement around axis of expansion joint / flexible coupling
- Pipe flanges remain parallel with each other
- Flanges remain perpendicuiar to axis
- Mechanical vibration in steel piping system reduced with installation of pipe connectors / expansion joints

MEGAFLEXON with confidence

Spool Type Rubber Expansion Joints

Features

- Hand-built construction
- Single to multiple arches as required
- Internal sleeve or protective covers available
- Design according to pressure, vacuum ratings and temperature conditions
- ASME, DIN, KS, JIS and BS flange drilling code available
- Reinforcement/Spiral steel wire or steel bar
- Available from 2 inch to 176 inch

※ For other sizes, consult with Megaflexon.

SERIES SSE

Spool Type

Single Open Arch

▲ *Filled Arch*

Rubber expansion joint with single open arch

DESIGN	Spool type single-arch rubber bellows with full faced rubber flanges. Vacuum support ring optional.
NOMINAL DIAMETERS	DN 50 to DN 4300
INSTALLATION LENGTH	Depending on customer's design conditions
PRESSURE	Depending on the nominal diameter up to 40 bar. Vacuum-proof up to 0.8 bar absolute, with vacuum support ring up to 0.05 bar absolute. Available to design based on Pressure Equipment Directive PED 97/23/EC.
MOVEMENT	For axial, lateral and angular movements

- Hand-built standard or custom design
- Standard or custom face to face dimensions
- All directional movement capability
- Excellent chemical and abrasion resistance
- Full vacuum rating available
- Hot dip galvanized retaining rings
- Integral backing ring design available
- 120℃ continuous service standard
- Absorbs noise, vibration and shock
- Compensates for minor misalignment and offset
- Low stiffness and deflection forces
- Simple and easy installation
- No gaskets required
- Provides easy access to piping and equipment
- Filled arch design available
- Wide range of rubbers available, Incl. EPDM, Neoprene, Butyl, Nitrile, Hypalon, Viton, Teflon, Food grade ,etc.

TYPICAL NARROW 1 ARCH RUBBER EXPANSION JOINT

DN		OAL	MOVEMENT					Effective Area	Max. Design Pressure
			Comp.	Ext.	Lateral	Angular	Torsional		
Inch	mm	mm	mm	mm	mm	deg	deg	Cm²	barG
2	50	150	11	6	13	14.5	3	90	24
2 1/2	65	150	11	6	13	11.5	3	112	20
3	80	150	11	6	13	10	3	137	16
4	100	150	11	6	13	7.5	3	195	16
5	125	150	11	6	13	6.0	3	281	16
6	150	150	11	6	13	5.0	3	361	16
8	200	150	18	10	13	5.5	3	569	16
10	250	200	18	10	13	4.5	3	929	16
12	300	200	18	10	13	3.75	3	1224	16
14	350	200	18	10	13	3.25	2	1559	15
16	400	200	18	10	13	2.75	2	2078	12
18	450	200	18	10	13	2.5	1	2509	12
20	500	200	21	11	13	2.5	1	2980	10
22	550	250	21	11	13	2.25	1	3492	10
24	600	250	21	11	13	2.0	1	4044	10
26	650	250	24	13	13	2.3	1	4759	10
28	700	250	24	13	13	2.0	1	5400	10
30	750	250	24	13	13	2.0	1	6082	10
32	800	250	24	13	13	1.8	1	6805	10
34	850	250	24	13	13	1.75	1	7568	10
36	900	250	24	13	13	1.5	1	8371	10
40	1000	250	24	13	13	1.5	1	10100	10
42	1050	300	27	14	13	1.5	1	10751	10
44	1100	300	27	14	13	1.5	1	12186	10
46	1150	300	27	14	13	1.3	1	12668	10
48	1200	300	27	14	13	1.25	1	14255	10
50	1250	300	27	14	13	1.25	1	15350	8
52	1300	300	27	14	13	1.25	1	16486	8
54	1350	300	27	14	13	1.25	1	17662	8
56	1400	300	27	14	13	1.25	1	17962	8
58	1450	300	27	14	13	1.0	1	19359	8
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76	1900	300	27	14	13	0.9	0.5	33277	6
78	1950	300	27	14	13	0.9	0.5	34940	6
80	2000	300	27	14	13	0.9	0.5	35362	6
82	2050	300	27	14	13	0.9	0.5	36984	6
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142	3550	300	27	14	13	0.51	0.5	106362	6
144	3600	300	21	14	13	0.47	0.5	109272	6

TYPICAL WIDE 1 ARCH RUBBER EXPANSION JOINT

DN		OAL	MOVEMENT					Effective Area	Max. Design Pressure
			Comp.	Ext.	Lateral	Angular	Torsional		
Inch	mm	mm	mm	mm	mm	deg	deg	Cm²	barG
2	50	150	19	11	16	18.1	3	90	24
2 1/2	65	150	19	11	16	14.4	3	112	20
3	80	150	19	11	16	12.5	3	137	16
4	100	150	19	11	16	9.4	3	195	16
5	125	150	19	11	16	7.5	3	281	16
6	150	150	19	11	16	6.2	3	361	16
8	200	150	30	17	16	6.9	3	569	16
10	250	200	30	17	19	5.6	3	929	16
12	300	200	30	17	19	4.7	3	1224	16
14	350	200	30	17	19	4.1	2	1559	15
16	400	200	30	17	19	3.4	2	2078	12
18	450	200	30	17	19	3.1	1	2509	12
20	500	200	37	19	19	3.1	1	2980	10
22	550	200	37	19	19	2.8	1	3492	10
24	600	250	37	19	19	2.5	1	4044	10
26	650	250	41	25	19	2.9	1	4759	10
28	700	250	41	25	19	2.5	1	5400	10
30	750	250	41	25	19	2.5	1	6082	10
32	800	250	41	25	19	2.2	1	6805	10
34	850	250	41	25	19	2.20	1	7568	10
36	900	250	41	25	19	1.9	1	8371	10
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46	1150	300	48	25	19	1.6	1	12668	10
48	1200	300	48	25	19	1.6	1	14255	10
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56	1400	300	48	25	19	1.6	1	17962	8
58	1450	300	48	25	19	1.2	1	19359	8
60	1500	300	48	25	19	1.2	1	21434	8
62	1550	300	48	25	19	1.2	1	21904	8
64	1600	300	48	25	19	1.2	1	23114	8
66	1650	300	48	25	19	1.2	1	25571	6
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80	2000	300	48	25	19	1.1	0.5	35362	6
82	2050	300	48	25	19	1.1	0.5	36984	6
84	2100	300	48	25	19	1.0	0.5	40172	6
86	2150	300	48	25	19	1.0	0.5	40471	6
88	2200	300	48	25	19	1.0	0.5	42459	6
90	2250	300	48	25	19	1.0	0.5	45768	6
92	2300	300	48	25	19	1.0	0.5	47715	6
94	2350	300	48	25	19	1.0	0.5	47916	6
96	2400	300	48	25	19	0.87	0.5	51730	6
98	2450	300	48	25	19	0.87	0.5	51875	6
100	2500	300	48	25	19	0.87	0.5	55780	6

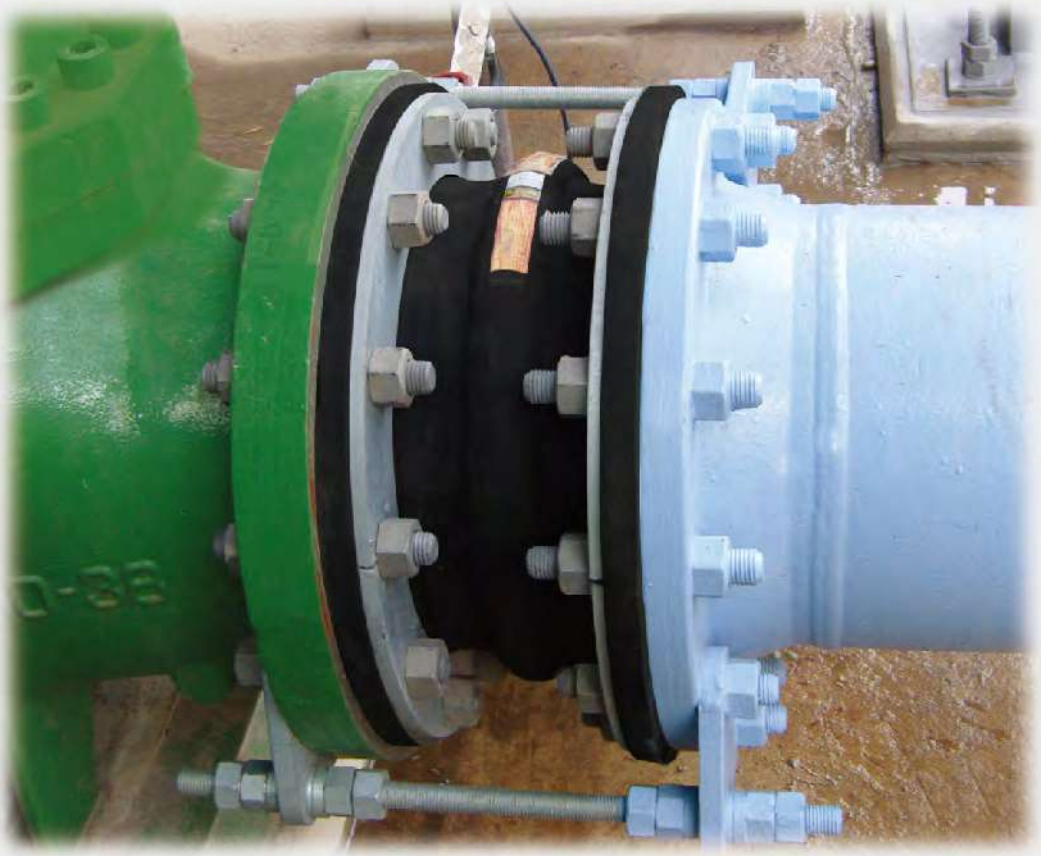
Note

1) For other sizes, consult with Megaflexon.
2) All sizes can be supplied with a filled arch reducing their movements by 50% and increasing the spring rates fourfold.
3) Movements are non-concurrent. For concurrent movements, contact us.
4) Drilling depending on customer specification and requirements

** WARNING : Tie rods set must be used when piping is not properly anchored. Number of rods qre dependent upon design pressures. Expansion joints may operate in pipelines carrying fluids at elevated temperatures and pressures, so predcaution should be taken to ensure proper installation and regular inspection. Care is required to protect personnel in the event of leakage or splash. Adequate floor drains qre always recommended.

SERIES SSE


ALSTOM
NEW GRAIN COMBINED CYCLE GAS TURBINE (COST)
3X KA26 - 1 POWER PLANT
FOR: EON UK PLC
WESTWOOD BUSINESS PARK,
WESTWOOD WAY COVENTRY CV48LG
CONTRACT NO: JPGC 00017
UNIT NO. :S9
STORAGE CLASS : D
PACKAGE NO. :4500416889-001
GROSS WEIGHT :3355 KG
NET WEIGHT :3255 KG
DIMENSIONS :475-4X 180-2X 185-7 CM



SERIES SDE

Spool Type

Double Open Arch

Rubber expansion joint with double open arch

DESIGN	Spool type double-arch rubber bellows with full faced rubber flanges. Vacuum support ring optional.
NOMINAL DIAMETERS	DN 50 to DN 4300
INSTALLATION LENGTH	Depending on customer's design conditions
PRESSURE	Depending on the nominal diameter up to 40 bar. Vacuum-proof up to 0.8 bar absolute, with vacuum support ring up to 0.05 bar absolute. Available to design based on Pressure Equipment Directive PED 97/23/EC.
MOVEMENT	For large axial, lateral and angular movements

- Double the movement with 1/2 the spring rate
- Hand-built standard or custom design
- Standard or custom face to face dimensions
- All directional movement capability
- Excellent chemical and abrasion resistance
- Full vacuum rating available
- Hot dip galvanized retaining rings
- Integral backing ring design available
- 120℃ continuous service standard
- Absorbs noise, vibration and shock
- Compensates for minor misalignment and offset
- Low stiffness and deflection forces
- Simple and easy installation
- No gaskets required
- Provides easy access to piping and equipment
- Filled arch design available
- Wide range of rubbers available, Incl. EPDM, Neoprene, Butyl, Nitrile, Hypalon, Viton, Teflon, Food grade ,etc.

TYPICAL NARROW 2 ARCH RUBBER EXPANSION JOINT

DN		OAL	MOVEMENT					Effective Area	Max. Design Pressure
			Comp.	Ext.	Lateral	Angular	Torsional		
Inch	mm	mm	mm	mm	mm	deg	deg	Cm²	barG
2	50	250	22	12	26	29	6	90	24
2 1/2	65	250	22	12	26	23	6	112	20
3	80	250	22	12	26	20	6	137	16
4	100	250	22	12	26	15	6	195	16
5	125	250	22	12	26	12.0	6	281	16
6	150	250	22	12	26	10.0	6	361	16
8	200	250	36	20	26	11	6	569	16
10	250	300	36	20	26	9	6	929	16
12	300	300	36	20	26	7.50	6	1224	16
14	350	300	36	20	26	6.5	4	1559	15
16	400	300	36	20	26	5.5	4	2078	12
18	450	300	36	20	26	5	2	2509	12
20	500	300	42	22	26	5	2	2980	10
22	550	350	42	22	26	4.5	2	3492	10
24	600	350	42	22	26	4.0	2	4044	10
26	650	350	48	26	26	4.6	2	4759	10
28	700	350	48	26	26	4.0	2	5400	10
30	750	350	48	26	26	4.0	2	6082	10
32	800	350	48	26	26	3.6	2	6805	10
34	850	350	48	26	26	3.50	2	7568	10
36	900	350	48	26	26	3.0	2	8371	10
40	1000	350	48	26	26	3.0	2	10100	10
42	1050	400	54	28	26	3.0	2	10751	10
44	1100	400	54	28	26	3.0	2	12186	10
46	1150	400	54	28	26	2.6	2	12668	10
48	1200	400	54	28	26	2.50	2	14255	10
50	1250	400	54	28	26	2.50	2	15350	8
52	1300	400	54	28	26	2.50	2	16486	8
54	1350	400	54	28	26	2.50	2	17662	8
56	1400	400	54	28	26	2.50	2	17962	8
58	1450	400	54	28	26	2.0	2	19359	8
60	1500	400	54	28	26	2.0	1	21434	8
62	1550	400	54	28	26	2.0	1	21904	8
64	1600	400	54	28	26	2.0	1	23114	8
66	1650	400	54	28	26	2.0	1	25571	6
68	1700	400	54	28	26	2.0	1	27032	6
70	1750	400	54	28	26	2.0	1	27465	6
72	1800	400	54	28	26	1.8	1	30073	6
74	1850	400	54	28	26	1.8	1	31573	6
76	1900	400	54	28	26	1.8	1	33277	6
78	1950	400	54	28	26	1.8	1	34940	6
80	2000	400	54	28	26	1.8	1	35362	6
82	2050	400	54	28	26	1.8	1	36984	6
84	2100	400	54	28	26	1.6	1	40172	6
86	2150	400	54	28	26	1.6	1	40471	6
88	2200	400	54	28	26	1.6	1	42459	6
90	2250	400	54	28	26	1.6	1	45768	6
92	2300	400	54	28	26	1.6	1	47715	6
94	2350	400	54	28	26	1.6	1	47916	6
96	2400	400	54	28	26	1.4	1	51730	6
98	2450	400	54	28	26	1.4	1	51875	6
100	2500	400	54	28	26	1.4	1	55780	6
102	2550	400	54	28	26	1.32	1	58056	6
104	2600	400	54	28	26	1.32	1	60245	6
106	2650	400	54	28	26	1.32	1	60699	6
108	2700	400	54	28	26	1.24	1	62902	6
110	2750	400	54	28	26	1.24	1	65144	6
112	2800	400	54	28	26	1.24	1	67426	6
114	2850	400	54	28	26	1.24	1	69745	6
116	2900	400	54	28	26	1.24	1	72107	6
118	2950	400	54	28	26	1.24	1	74506	6
120	3000	400	54	28	26	1.12	1	76945	6
122	3050	400	54	28	26	1.12	1	79423	6
124	3100	400	54	28	26	1.12	1	81940	6
126	3150	400	54	28	26	1.12	1	84495	6
128	3200	400	54	28	26	1.12	1	87092	6
130	3250	400	54	28	26	1.12	1	89727	6
132	3300	400	54	28	26	1.02	1	92401	6
134	3350	400	54	28	26	1.02	1	95115	6
136	3400	400	54	28	26	1.02	1	97868	6
138	3450	400	54	28	26	1.02	1	100660	6
140	3500	400	54	28	26	1.02	1	103491	6
142	3550	400	54	28	26	1.02	1	106362	6
144	3600	400	54	28	26	0.94	1	109272	6

TYPICAL WIDE 2 ARCH RUBBER EXPANSION JOINT

DN		OAL	MOVEMENT					Effective Area	Max. Design Pressure
			Comp.	Ext.	Lateral	Angular	Torsional		
Inch	mm	mm	mm	mm	mm	deg	deg	Cm²	barG
2	50	250	38	22	32	36.2	6	96	24
2 1/2	65	250	38	22	32	28.8	6	112	20
3	80	250	38	22	32	25	6	137	16
4	100	250	38	22	32	18.8	6	195	16
5	125	250	38	22	32	15.0	6	281	16
6	150	250	38	22	32	12.4	6	361	16
8	200	250	60	34	32	13.8	6	569	16
10	250	300	60	34	38	11.2	6	929	16
12	300	350	60	34	38	9.40	6	1224	16
14	350	350	60	34	38	8.2	4	1559	15
16	400	350	60	34	38	6.8	4	2078	12
18	450	350	60	34	38	6.2	2	2509	12
20	500	375	74	38	38	6.2	2	2980	10
24	600	375	74	38	38	5.0	2	4044	10
30	750	375	82	50	38	5.0	2	6082	10
36	900	375	82	50	38	3.8	2	8371	10
42	1050	400	96	50	38	3.8	2	10751	10
48	1200	400	96	50	38	3.20	2	14255	10
54	1350	400	96	50	38	3.20	2	17662	8
60	1500	400	96	50	38	2.4	2	21434	8
66	1650	400	96	50	38	2.4	2	25571	6
72	1800	400	96	50	38	2.2	1	30073	6
78	1950	400	96	50	38	2.2	1	34940	6
84	2100	400	96	50	38	2.0	1	40172	6
90	2250	400	96	50	38	2.0	1	45768	6
96	2400	400	96	50	38	1.7	1	51730	6
102	2550	400	96	50	38	1.74	1	58056	6
108	2700	400	96	50	38	1.74	1	64747	6

Note

1) For other sizes, consult with Megaflexon.
2) All sizes can be supplied with a filled arch reducing their movements by 50% and increasing the spring rates fourfold.
3) Movements are non-concurrent. For concurrent movements, contact us.
4) Drilling depending on customer specification and requirements

** WARNING : Tie rods set must be used when piping is not properly anchored. Number of rods qre dependent upon design pressures. Expansion joints may operate in pipelines carrying fluids at elevated temperatures and pressures, so predcaution should be taken to ensure proper installation and regular inspection. Care is required to protect personnel in the event of leakage or splash. Adequate floor drains qre always recommended.

SERIES SDE

SIEMENS / SERAYA POWER PLANT, SINGAPORE
78 INCH (DN 1950) X 500mmL
DOUBLE OPEN ARCH TYPE

SIEMENS / SERAYA POWER PLANT, SINGAPORE
100 INCH (DN 2500) X 750mmL
DOUBLE OPEN ARCH TYPE

SERIES STE

Spool Type

Triple Open Arch

Rubber expansion joint with triple open arch

DESIGN	Spool type triple-arch rubber bellows with full faced rubber flanges. Vacuum support ring optional.
NOMINAL DIAMETERS	DN 50 to DN 4300
INSTALLATION LENGTH	Depending on customer's design conditions
PRESSURE	Depending on the nominal diameter up to 40 bar. Vacuum-proof up to 0.8 bar absolute, with vacuum support ring up to 0.05 bar absolute. Available to design based on Pressure Equipment Directive PED 97/23/EC.
MOVEMENT	For extremely large axial, lateral and angular movements

- Triple the movement with 1/3 the spring rate
- Hand-built standard or custom design
- Standard or custom face to face dimensions
- All directional movement capability
- Excellent chemical and abrasion resistance
- Full vacuum rating available
- Hot dip galvanized retaining rings
- Integral backing ring design available
- 120℃ continuous service standard
- Absorbs noise, vibration and shock
- Compensates for minor misalignment and offset
- Low stiffness and deflection forces
- Simple and easy installation
- No gaskets required
- Provides easy access to piping and equipment
- Filled arch design available
- Wide range of rubbers available, Incl. EPDM, Neoprene, Butyl, Nitrile, Hypalon, Viton, Teflon, Food grade ,etc.

TYPICAL NARROW 3 ARCH RUBBER EXPANSION JOINT

DN		OAL	MOVEMENT					Effective Area	Max. Design Pressure
			Comp.	Ext.	Lateral	Angular	Torsional		
Inch	mm	mm	mm	mm	mm	deg	deg	Cm²	barG
2	50	350	33	18	39	43.5	9	90	24
2 1/2	65	350	33	18	39	34.5	9	112	20
3	80	350	33	18	39	30	9	137	16
4	100	350	33	18	39	22.5	9	195	16
5	125	350	33	18	39	18.0	9	281	16
6	150	350	33	18	39	15.0	9	361	16
8	200	350	54	30	39	16.5	9	569	16
10	250	400	54	30	39	13.5	9	929	16
12	300	400	54	30	39	11.25	9	1224	16
14	350	400	54	30	39	9.75	6	1559	15
16	400	400	54	30	39	8.25	6	2078	12
18	450	400	54	30	39	7.5	3	2509	12
20	500	400	63	33	39	7.5	3	2980	10
22	550	450	63	33	39	6.75	3	3492	10
24	600	450	63	33	39	6.0	3	4044	10
26	650	450	72	39	39	6.9	3	4759	10
28	700	450	72	39	39	6.0	3	5400	10
30	750	450	72	39	39	6.0	3	6082	10
32	800	450	72	39	39	5.4	3	6805	10
34	850	450	72	39	39	5.25	3	7568	10
36	900	450	72	39	39	4.5	3	8371	10
40	1000	450	72	39	39	4.5	3	10100	10
42	1050	500	81	42	39	4.5	3	10751	10
44	1100	500	81	42	39	4.5	3	12186	10
46	1150	500	81	42	39	3.9	3	12668	10
48	1200	500	81	42	39	3.75	3	14255	10
50	1250	500	81	42	39	3.75	3	15350	8
52	1300	500	81	42	39	3.75	3	16486	8
54	1350	500	81	42	39	3.75	3	17662	8
56	1400	500	81	42	39	3.75	3	17962	8
58	1450	500	81	42	39	3.0	3	19359	8
60	1500	500	81	42	39	3.0	1.5	21434	8
62	1550	500	81	42	39	3.0	1.5	21904	8
64	1600	500	81	42	39	3.0	1.5	23114	8
66	1650	500	81	42	39	3.0	1.5	25571	6
68	1700	500	81	42	39	3.0	1.5	27032	6
70	1750	500	81	42	39	3.0	1.5	27465	6
72	1800	500	81	42	39	2.7	1.5	30073	6
74	1850	500	81	42	39	2.7	1.5	31573	6
76	1900	500	81	42	39	2.7	1.5	33277	6
78	1950	500	81	42	39	2.7	1.5	34940	6
80	2000	500	81	42	39	2.7	1.5	35362	6
82	2050	500	81	42	39	2.7	1.5	36984	6
84	2100	500	81	42	39	2.4	1.5	40172	6
86	2150	500	81	42	39	2.4	1.5	40471	6
88	2200	500	81	42	39	2.4	1.5	42459	6
90	2250	500	81	42	39	2.4	1.5	45768	6
92	2300	500	81	42	39	2.4	1.5	47715	6
94	2350	500	81	42	39	2.4	1.5	47916	6
96	2400	500	81	42	39	2.1	1.5	51730	6
98	2450	500	81	42	39	2.1	1.5	51875	6
100	2500	500	81	42	39	2.1	1.5	55780	6
102	2550	500	81	42	39	1.98	1.5	58056	6
104	2600	500	81	42	39	1.98	1.5	60245	6
106	2650	500	81	42	39	1.98	1.5	60699	6
108	2700	500	81	42	39	1.86	1.5	62902	6
110	2750	500	81	42	39	1.86	1.5	65144	6
112	2800	500	81	42	39	1.86	1.5	67426	6
114	2850	500	81	42	39	1.86	1.5	69746	6
116	2900	500	81	42	39	1.86	1.5	72107	6
118	2950	500	81	42	39	1.86	1.5	74506	6
120	3000	500	81	42	39	1.68	1.5	76945	6
122	3050	500	81	42	39	1.68	1.5	79423	6
124	3100	500	81	42	39	1.68	1.5	81940	6
126	3150	500	81	42	39	1.68	1.5	84496	6
128	3200	500	81	42	39	1.68	1.5	87092	6
130	3250	500	81	42	39	1.68	1.5	89727	6
132	3300	500	81	42	39	1.53	1.5	92401	6
134	3350	500	81	42	39	1.53	1.5	95115	6
136	3400	500	81	42	39	1.53	1.5	97868	6
138	3450	500	81	42	39	1.53	1.5	100660	6
140	3500	500	81	42	39	1.53	1.5	103491	6
142	3550	500	81	42	39	1.53	1.5	106362	6
144	3600	500	81	42	39	1.41	1.5	109272	6

TYPICAL WIDE 3 ARCH RUBBER EXPANSION JOINT

DN		OAL	MOVEMENT					Effective Area	Max. Design Pressure
			Comp.	Ext.	Lateral	Angular	Torsional		
Inch	mm	mm	mm	mm	mm	deg	deg	Cm²	barG
2	50	350	57	33	48	54.3	9	90	24
2 1/2	65	350	57	33	48	43.2	9	112	20
3	80	350	57	33	48	37.5	9	137	16
4	100	350	57	33	48	28.2	9	195	16
5	125	350	57	33	48	22.5	9	281	16
6	150	350	57	33	48	18.6	9	361	16
8	200	350	90	51	48	20.7	9	569	16
10	250	400	90	51	57	16.8	9	929	16
12	300	400	90	51	57	14.10	9	1224	16
14	350	400	90	51	57	12.3	6	1559	15
16	400	400	90	51	57	10.2	6	2078	12
18	450	400	90	51	57	9.3	3	2509	12
20	500	400	111	57	57	9.3	3	2980	10
24	600	500	111	57	57	7.5	3	4044	10
30	750	500	123	75	57	7.5	3	6082	10
36	900	500	123	75	57	5.7	3	8371	10
42	1050	550	144	75	57	5.7	3	10751	10
48	1200	550	144	75	57	4.80	3	14255	10
54	1350	550	144	75	57	4.80	3	17662	8
60	1500	550	144	75	57	3.6	3	21434	8
66	1650	550	144	75	57	3.6	3	25572	6
72	1800	550	144	75	57	3.3	1.5	30073	6
78	1950	550	144	75	57	3.3	1.5	34940	6
84	2100	550	144	75	57	3.0	1.5	40172	6
90	2250	550	144	75	57	3.0	1.5	45768	6
96	2400	550	144	75	57	2.6	1.5	51730	6
102	2550	550	144	75	57	2.61	1.5	58056	6
108	2700	550	144	75	57	2.61	1.5	64747	6

Note

1) For other sizes, consult with Megaflexon.
2) All sizes can be supplied with a filled arch reducing their movements by 50% and increasing the spring rates fourfold.
3) Movements are non-concurrent. For concurrent movements, contact us.
4) Drilling depending on customer specification and requirements

** WARNING : Tie rods set must be used when piping is not properly anchored. Number of rods qre dependent upon design pressures. Expansion joints may operate in pipelines carrying fluids at elevated temperatures and pressures, so predcaution should be taken to ensure proper installation and regular inspection. Care is required to protect personnel in the event of leakage or splash. Adequate floor drains qre always recommended.

SERIES SME

Spool Type

Four or More Open Arch

Rubber expansion joint with multiple open arch

DESIGN	Spool type four or more-arch rubber bellows with full faced rubber flanges. Vacuum support ring optional.
NOMINAL DIAMETERS	DN 50 to DN 4300
INSTALLATION LENGTH	Depending on customer's design conditions
PRESSURE	Depending on the nominal diameter up to 40 bar. Vacuum-proof up to 0.8 bar absolute, with vacuum support ring up to 0.05 bar absolute. Available to design based on Pressure Equipment Directive PED 97/23/EC.
MOVEMENT	For extremely large axial, lateral and angular movements

- Quadruple the movement with 1/4 the spring rate
- Hand-built standard or custom design
- Standard or custom face to face dimensions
- All directional movement capability
- Excellent chemical and abrasion resistance
- Full vacuum rating available
- Hot dip galvanized retaining rings
- Integral backing ring design available
- 120℃ continuous service standard
- Absorbs noise, vibration and shock
- Compensates for minor misalignment and offset
- Low stiffness and deflection forces
- Simple and easy installation
- No gaskets required
- Provides easy access to piping and equipment
- Filled arch design available
- Wide range of rubbers available, Incl. EPDM, Neoprene, Butyl, Nitrile, Hypalon, Viton, Teflon, Food grade ,etc.

TYPICAL NARROW 4 ARCH RUBBER EXPANSION JOINT

DN		OAL	MOVEMENT					Effective Area	Max. Design Pressure
			Comp.	Ext.	Lateral	Angular	Torsional		
Inch	mm	mm	mm	mm	mm	deg	deg	Cm²	barG
2	50	450	44	24	52	58	12	90	24
2 1/2	65	450	44	24	52	46	12	112	20
3	80	450	44	24	52	40	12	137	16
4	100	450	44	24	52	30	12	195	16
5	125	450	44	24	52	24.0	12	281	16
6	150	450	44	24	52	20.2	12	361	16
8	200	450	72	40	52	22	12	569	16
10	250	500	72	40	52	18	12	929	16
12	300	500	72	40	52	15.00	12	1224	16
14	350	500	72	40	52	13	8	1559	15
16	400	500	72	40	52	11	8	2078	12
18	450	500	72	40	52	10	4	2509	12
20	500	500	84	44	52	10	4	2980	10
22	550	550	84	44	52	9	4	3492	10
24	600	550	84	44	52	8.0	4	4044	10
26	650	550	96	52	52	9.2	4	4759	10
28	700	550	96	52	52	8.0	4	5400	10
30	750	550	96	52	52	8.0	4	6082	10
32	800	550	96	52	52	7.2	4	6805	10
34	850	550	96	52	52	7.00	4	7568	10
36	900	550	96	52	52	6.0	4	8371	10
40	1000	550	96	52	52	6.0	4	10100	10
42	1050	600	108	56	52	6.0	4	10751	10
44	1100	600	108	56	52	6.0	4	12186	10
46	1150	600	108	56	52	5.2	4	12668	10
48	1200	600	108	56	52	5.00	4	14255	10
50	1250	600	108	56	52	5.00	4	15350	8
52	1300	600	108	56	52	5.00	4	16486	8
54	1350	600	108	56	52	5.00	4	17662	8
56	1400	600	108	56	52	5.00	4	17962	8
58	1450	600	108	56	52	4.0	4	19359	8
60	1500	600	108	56	52	4.0	2	21434	8
62	1550	600	108	56	52	4.0	2	21904	8
64	1600	600	108	56	52	4.0	2	23114	8
66	1650	600	108	56	52	4.0	2	25571	6
68	1700	600	108	56	52	4.0	2	27032	6
70	1750	600	108	56	52	4.0	2	27465	6
72	1800	600	108	56	52	3.6	2	30073	6
74	1850	600	108	56	52	3.6	2	31573	6
76	1900	600	108	56	52	3.6	2	33277	6
78	1950	600	108	56	52	3.6	2	34940	6
80	2000	600	108	56	52	3.6	2	35362	6
82	2050	600	108	56	52	3.6	2	36984	6
84	2100	600	108	56	52	3.2	2	40172	6
86	2150	600	108	56	52	3.2	2	40471	6
88	2200	600	108	56	52	3.2	2	42459	6
90	2250	600	108	56	52	3.2	2	45768	6
92	2300	600	108	56	52	3.2	2	47715	6
94	2350	600	108	56	52	3.2	2	47916	6
96	2400	600	108	56	52	2.8	2	51730	6
98	2450	600	108	56	52	2.8	2	51875	6
100	2500	600	108	56	52	2.8	2	55780	6
102	2550	600	108	56	52	2.64	2	58056	6
104	2600	600	108	56	52	2.64	2	60245	6
106	2650	600	108	56	52	2.64	2	60699	6
108	2700	600	108	56	52	2.48	2	62902	6
110	2750	600	108	56	52	2.48	2	65144	6
112	2800	600	108	56	52	2.48	2	67426	6
114	2850	600	108	56	52	2.48	2	69746	6
116	2900	600	108	56	52	2.48	2	72107	6
118	2950	600	108	56	52	2.48	2	74506	6
120	3000	600	108	56	52	2.24	2	76945	6
122	3050	600	108	56	52	2.24	2	79423	6
124	3100	600	108	56	52	2.24	2	81940	6
126	3150	600	108	56	52	2.24	2	84496	6
128	3200	600	108	56	52	2.24	2	87092	6
130	3250	600	108	56	52	2.24	2	89727	6
132	3300	600	108	56	52	2.04	2	92401	6
134	3350	600	108	56	52	2.04	2	95115	6
136	3400	600	108	56	52	2.04	2	97868	6
138	3450	600	108	56	52	2.04	2	100660	6
140	3500	600	108	56	52	2.04	2	103491	6
142	3550	600	108	56	52	2.04	2	106362	6
144	3600	600	108	56	52	1.88	2	109272	6

TYPICAL WIDE 4 ARCH RUBBER EXPANSION JOINT

DN		OAL	MOVEMENT					Effective Area	Max. Design Pressure
			Comp.	Ext.	Lateral	Angular	Torsional		
Inch	mm	mm	mm	mm	mm	deg	deg	Cm²	barG
2	50	450	76	44	64	72.4	12	90	24
2 1/2	65	450	76	44	64	57.6	12	112	20
3	80	450	76	44	64	50	12	137	16
4	100	450	76	44	64	37.6	12	195	16
5	125	450	76	44	64	30.0	12	281	16
6	150	450	76	44	64	24.8	12	361	16
8	200	450	120	68	64	27.6	12	569	16
10	250	500	120	68	76	22.4	12	929	16
12	300	500	120	68	76	18.80	12	1224	16
14	350	500	120	68	76	16.4	8	1559	15
16	400	500	120	68	76	13.6	8	2078	12
18	450	500	120	68	76	12.4	4	2509	12
20	500	500	148	76	76	12.4	4	2980	10
24	600	600	148	76	76	10.0	4	4044	10
30	750	600	164	100	76	10.0	4	6082	10
36	900	600	164	100	76	7.6	4	8371	10
42	1050	650	192	100	76	7.6	4	10751	10
48	1200	650	192	100	76	6.40	4	14255	10
54	1350	650	192	100	76	6.40	4	17662	8
60	1500	650	192	100	76	4.8	4	21434	8
66	1650	650	192	100	76	4.8	4	25571	6
72	1800	650	192	100	76	4.4	2	30073	6
78	1950	650	192	100	76	4.4	2	34940	6
84	2100	650	192	100	76	4.0	2	40172	6
90	2250	650	192	100	76	4.0	2	45768	6
96	2400	650	192	100	76	3.5	2	51730	6
102	2550	650	192	100	76	3.48	2	58056	6
108	2700	650	192	100	76	3.48	2	64747	6

Note

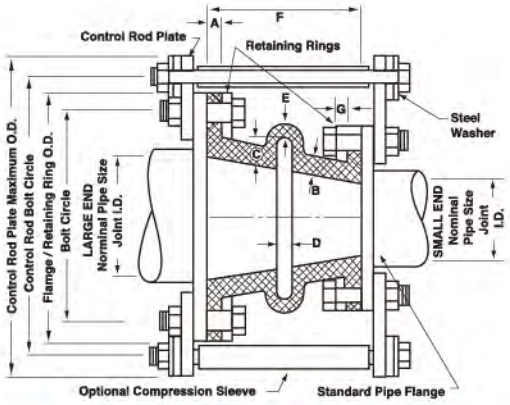
1) For other sizes, consult with Megaflexon.
2) All sizes can be supplied with a filled arch reducing their movements by 50% and increasing the spring rates fourfold.
3) Movements are non-concurrent. For concurrent movements, contact us.
4) Drilling depending on customer specification and requirements

** WARNING : Tie rods set must be used when piping is not properly anchored. Number of rods qre dependent upon design pressures. Expansion joints may operate in pipelines carrying fluids at elevated temperatures and pressures, so predcaution should be taken to ensure proper installation and regular inspection. Care is required to protect personnel in the event of leakage or splash. Adequate floor drains qre always recommended.

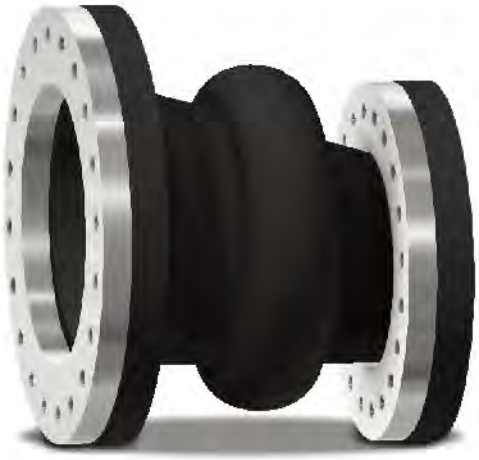
SERIES SME

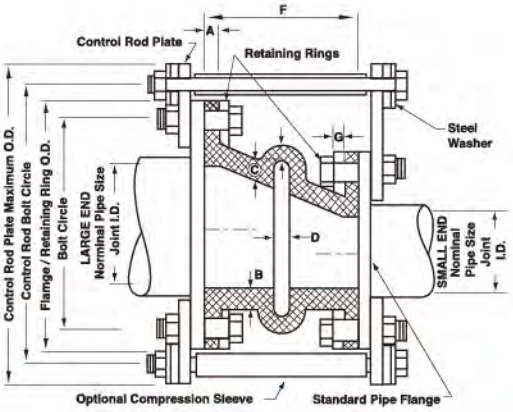
SERIES SRE

SRE C-Type
Concentric Reducer
To connect pipe of unequal diameters



SRE E-Type
Eccentric Reducer
For equipment with different size flanges





CONCENTRIC

LARGE SIDE DN		SMALL SIDE DN		OAL	MOVEMENT Com.	Ext.	Lat.	Ang.	Tor.
inch	mm	inch	mm	mm	mm	mm	mm	deg	deg
2	50	1	25	150	12	6	12	16	3.1
2 1/2	65	1	25	150	12	6	12	14	3
3	80	1	25	150	12	6	12	12.5	2.9
4	100	2	50	150	12	6	12	9.5	2.7
5	125	2	50	150	12	6	12	6.3	2.6
6	150	3	75	150	12	6	12	6.1	2.4
8	200	4	100	150	20	10	12	6	2.2
10	250	6	150	200	20	10	12	5.8	2.1
12	300	6	150	200	20	10	12	5.2	2
14	350	8	200	200	20	10	12	3.9	1.8
16	400	10	250	200	20	10	12	3.3	1.4
18	450	12	300	200	20	10	12	2.6	1

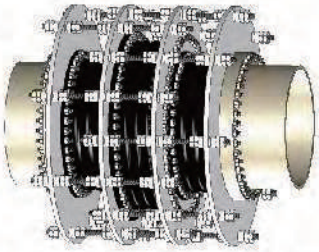
ECCENTRIC

LARGE SIDE DN		SMALL SIDE DN		OAL	MOVEMENT Com.	Ext.	Lat.	Ang.	Tor.
inch	mm	inch	mm	mm	mm	mm	mm	deg	deg
2	50	1	25	150	12	6	12	16	3.1
2 1/2	65	1	25	150	12	6	12	14	3
3	80	1	25	150	12	6	12	12.5	2.9
4	100	2	50	150	12	6	12	9.5	2.7
5	125	2	50	200	12	6	12	6.3	2.6
6	150	3	75	200	12	6	12	6.1	2.4
8	200	4	100	200	20	10	12	6	2.2
10	250	6	150	200	20	10	12	5.8	2.1
12	300	6	150	250	20	10	12	5.2	2
14	350	8	200	250	20	10	12	3.9	1.8
16	400	10	250	250	20	10	12	3.3	1.4
18	450	12	300	250	20	10	12	2.6	1

* Size up to 108" is available.

SERIES SPE

Pressure Balanced Rubber Expansion Joint (S-Type)



Knowing and minimizing the expansion joint stiffness is even more critical in advanced designs such as the pressure balance arrangement. In this arrangement, the primary function is to balance or cancel out the internal working pressure in order to minimize the net end loads acting on adjacent piping or equipment. Minimizing pressure forces makes the remaining force largely that of the expansion joint stiffness. Because there are two expansion joints in a pressure balance arrangement, the stiffness values are roughly double.

The two expansion joints perform together to accommodate external movements, e.g., thermal, vibration, settlement, etc.
For example, if the pipe moves laterally, the two expansion joints will deflect laterally.
Alternatively, if the pipe moves axially or in line with the two expansion joints, one expansion joint will act in compression while the other acts in extension. In all cases, the additional stiffness of the two joints is considerably less than the pressure thrust force, demonstrating the benefit of the arrangement.

▲ *Straight pipe balanced (S-Type)*

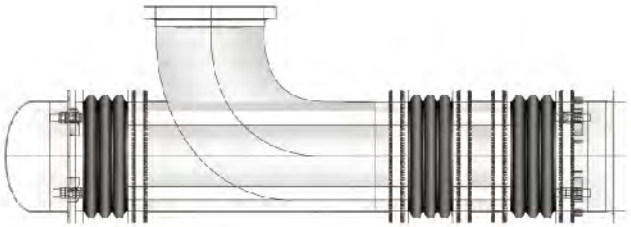
SERIES SPE

Pressure Balanced Rubber Expansion Joint (L-Type)

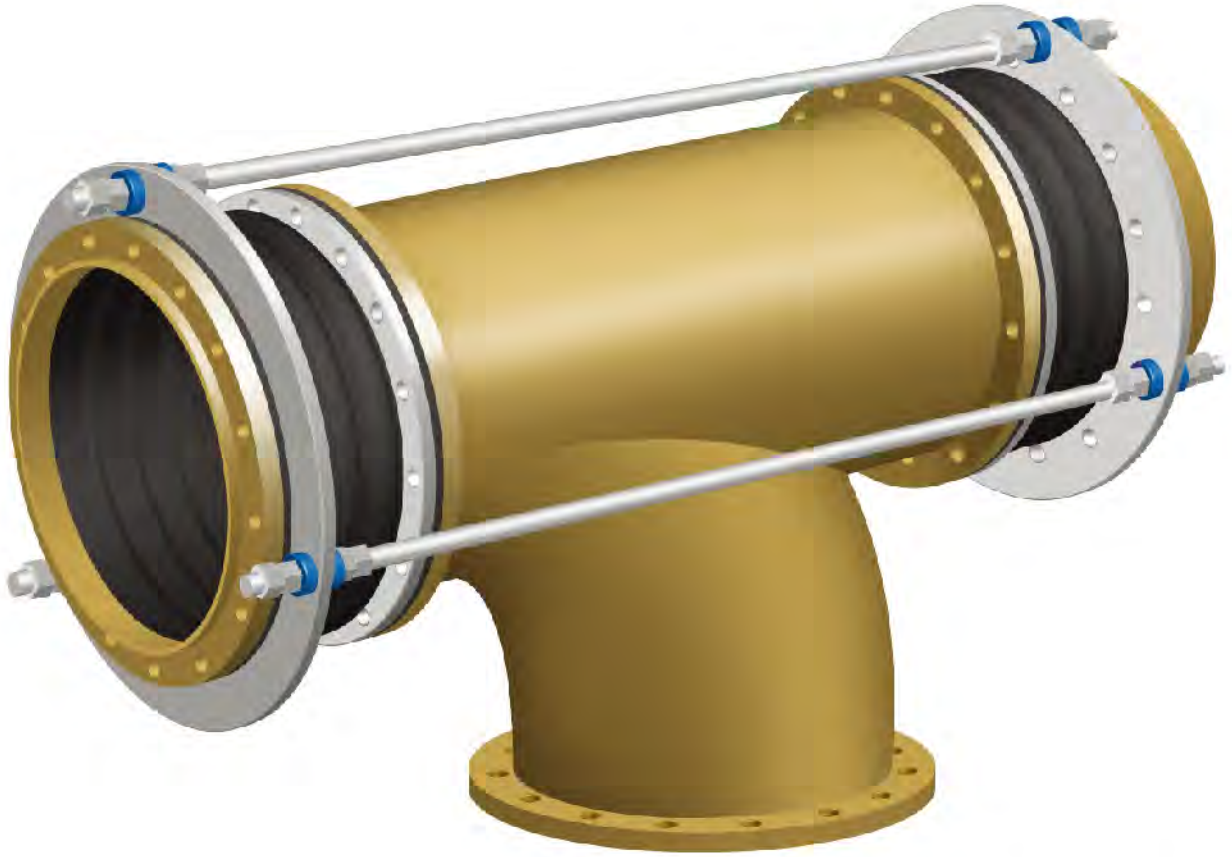
Pressure balanced expansion joint is used most frequently in applications similar to those shown for the single expansion joint, but where pressure loading upon piping or equipment is considered excessive or objectionable. The major advantage of the pressure balanced design is its ability to absorb externally imposed axial movement without imposing pressure loading on the system.

Where large amounts of lateral deflection are involved, a pressure balanced universal expansion joint must be used. Two bellows are used in the flow end of the expansion joint and a single bellows in the balancing end. Normally, the balancing bellows will be subjected only to axial movement if the tie rods are properly designed to rotate or pivot at their attachment points.

In order for a pressure balanced expansion joint to function properly, the pressure thrust restrained by the tie rods must exceed the axial movement forces of the expansion joint.



▲ *Bent pipe balanced (L-Type)*



▲ *Pressure Balanced Rubber Expansion Joint*

SERIES INT-SSE

Integral Backing Ring Type

Megaflexon has specially designed the Integral steel flange type rubber expansion joints, not to transmit thrust force loads to counter flange at all.
The integral steel flange type rubber expansion joint completely absorbs thrust force to be occurred from expansion joints during operation, so no thrust force is transmitted to counter flange.
By using the integral steel flange type design, counter flange is completely protected from such thrust force, and it absolutely guarantees safety, reliability and long lifecycle.

The following parameters should be considered:

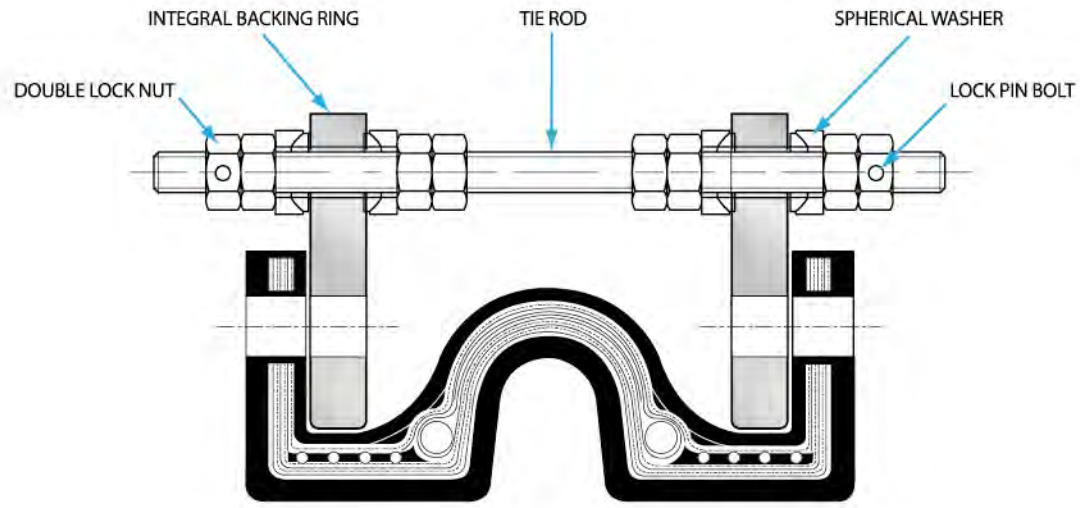
- Operating Pressure
- Product Dimensions
- Design Movements
- Flange Characteristics

Rubber expansion joint with integral backing ring type

DESIGN	Spool type single/multiple-arch rubber bellows with full faced rubber flanges and integral backing rings. Vacuum support ring optional.
NOMINAL DIAMETERS	DN 50 to DN 4300
INSTALLATION LENGTH	Depending on customer's design conditions
PRESSURE	Depending on the nominal diameter up to 40 bar. Vacuum-proof up to 0.8 bar absolute, with vacuum support ring up to 0.05 bar absolute. Available to design based on Pressure Equipment Directive PED 97/23/EC.
MOVEMENT	For axial, lateral and angular movements

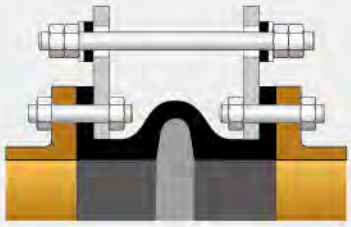
- Hand-built standard or custom design
- Standard or custom face to face dimensions
- All directional movement capability
- Excellent chemical and abrasion resistance
- Full vacuum rating available
- Hot dip galvanized Integral Backing Ring
- Integral backing ring design available
- 120℃ continuous service standard
- Absorbs noise, vibration and shock
- Compensates for minor misalignment and offset
- Low stiffness and deflection forces
- Simple and easy installation
- No gaskets required
- Provides easy access to piping and equipment
- Filled arch design available
- Wide range of rubbers available, Incl. EPDM, Neoprene, Butyl, Nitrile, Hypalon, Viton, Teflon, Food grade ,etc.

SERIES INT-SSE

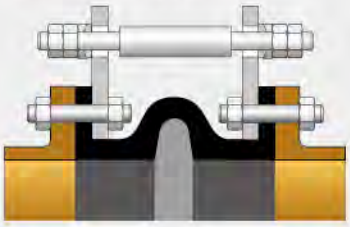


TIE-RODS WITH INTEGRAL BACKING RING

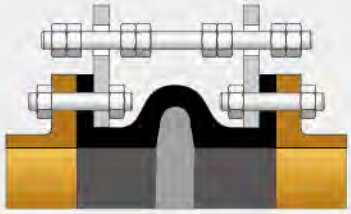
TR-1SF
Tie rods with nuts and metallic /rubber washers



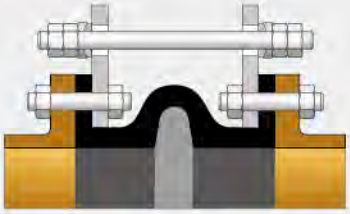
TR-2SF
Tie rods with nuts and spherical washers c / w compression pipe limiter



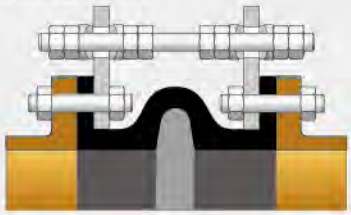
TR-3SF
Tie rods with compression / elongation limiter nuts



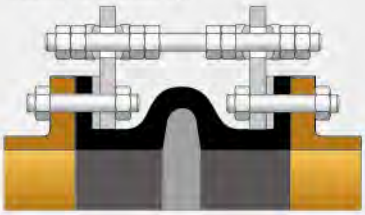
TR-4SF
Tie rods with external nuts and spherical washers



TR-5SF
Tie rods with external / internal nuts and spherical washers



TR-6SF
Retainer Ring with Gusset Plate Internal Side Build Up



DESIGN OF INTEGRAL BACKING RING

with Two Tie-rods

with Three Tie-rods

with Four Tie-rods

with Multiple Tie-rods

SERIES INT-SSE

ALSTOM / FUJAIRAH F2 CCPP, UAE
DN 4000 x 400mmL

SERIES SHE

Hinged Type

FOR ANGULAR RUBBER EXPANSION JOINTS

A hinged Expansion Joint contains one bellows and is designed to permit angular rotation in one plane only by the use of a pair of pins through hinge plates attached to the Expansion Joint ends. The hinges and hinge pins must be designed to retrain the thrust of the Expansion Joint due to internal pressure and extraneous forces, where applicable. Hinged Expansion Joints should be used in sets of two or three to function properly.

Rubber expansion joint with Hinge Type

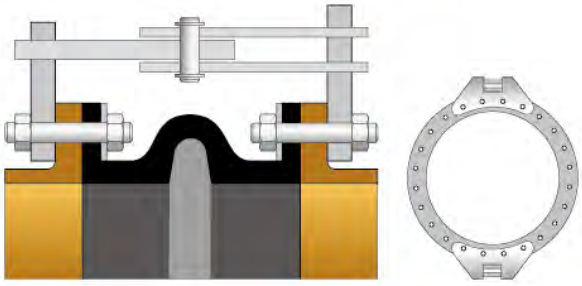
DESIGN	Spool type single/multiple-arch rubber bellows with over backing flanges and hinge system. Vacuum support ring optional. Gusset plate type or integral backing ring type available.
NOMINAL DIAMETERS	DN 50 to DN 4300 (For other sizes, consult with Megaflexon.)
INSTALLATION LENGTH	Depending on customer's design conditions
PRESSURE	Depending on the nominal diameter up to 40 bar. Vacuum-proof up to 0.8 bar absolute, with vacuum support ring up to 0.05 bar absolute.
MOVEMENT	For angular movements

PIPE SIZE (inch)	ALLOWABLE ANGULAR θ DISPLACEMENT	TAN θ	LENGTH (mm)
1 1/2	30°	.58	200
2	30°	.58	200
2 1/2	30°	.58	200
3	30°	.58	200
4	29°	.55	200
5	24°	.45	200
6	20°	.36	200
8	15°	.27	254
10	13°	.23	254
12	11°	.19	305
14	10°	.18	305

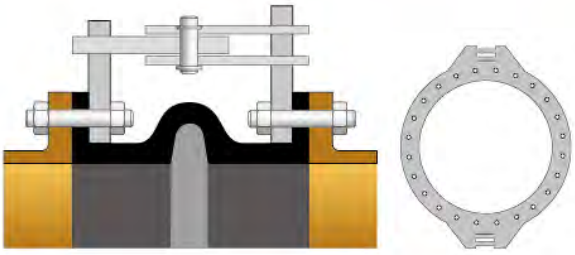
* For other sizes, consult with Megaflexon.

96 INCH (DN 2400) x 400mmL
HINGED TYPE

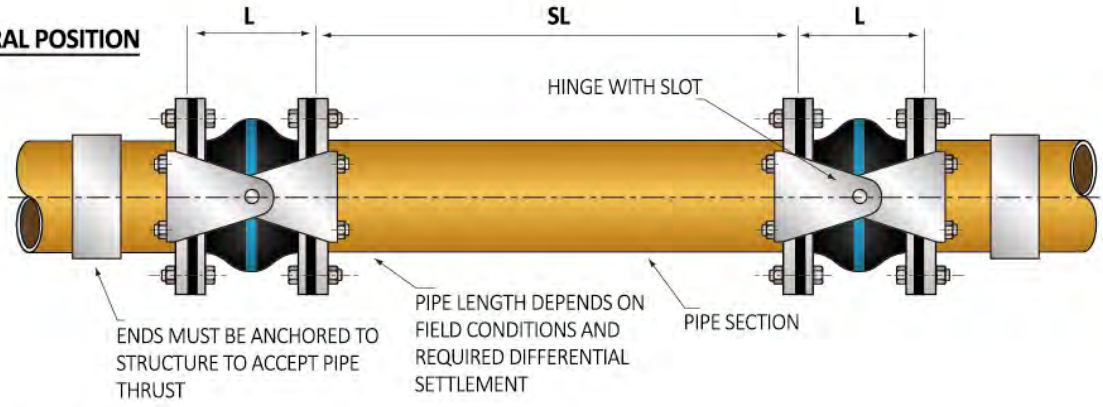
HINGE WITH GUSSET PLATE



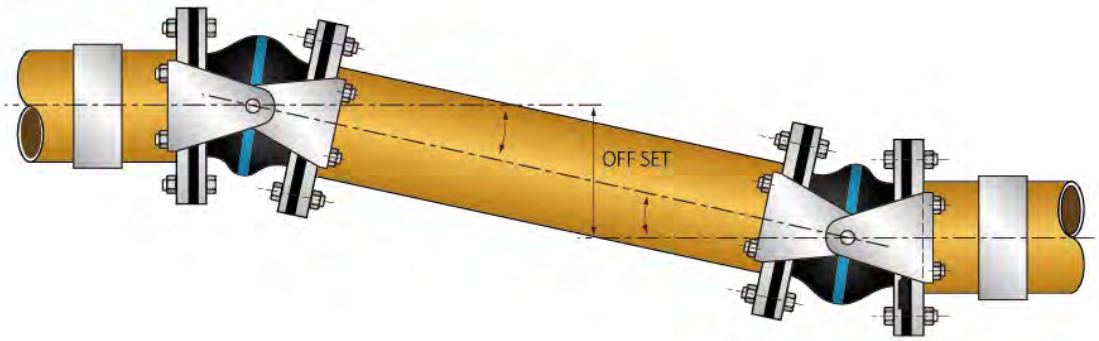
HINGE WITH INTEGRAL BACKING RING



NEUTRAL POSITION



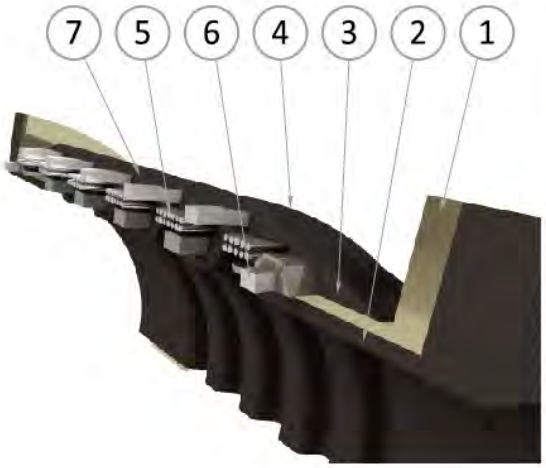
SETTLEMENT POSITION



SERIES SBE

Buried Type

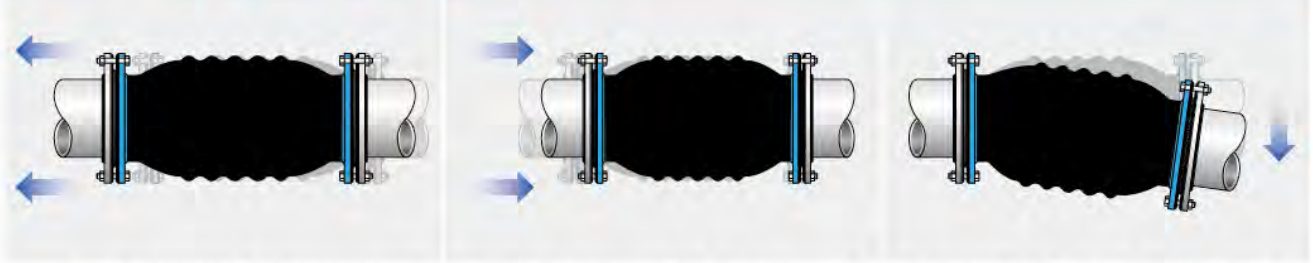
The buried type rubber expansion joints are designed for underground installation and absorb the movement of piping lines. It is used for raw water supply pipe lines, water treatment plant and drainage system line, etc. It absorbs movements in angular and lateral direction and provides a solution for broken piping lines, leakage or bending caused by earthquake, temperature difference, geology tenderness and exterior impact, etc.



NO	DESCRIPTION	MATERIAL
1	RETAINER RING	ASTM A36
2	INNER RUBBER	NATURAL RUBBER
3	SPECIAL REINFORCEMENT	POLYESTER CORD
4	OUTER RUBBER	NATURAL RUBBER
5	REINFORCEMENT WIRE	STEEL WIRE
6	REINFOCING CORDS	HIGH TENSILE SYNTHETIC NYLON
7	PRINCIPAL REINFORCEMENT	POLYESTER CORD

* Reinforcement is designed according to size and pressure.

UNDERGROUND TYPE MOVEMENT



Axial Extension Movement | Axial Compression Movement | Lateral Deflection Movement

BURIED TYPE RUBBER EXPANSION JOINT

NOMINAL DIAMETER	DIMENSION									SPECIFICATION					
	OVERALL LENGTH	FLANGE DIMENSION						BELLOWS		TEST PRESS	WORKING PRESS	MOVEMENT LATERAL	ELONGATION	COMPRESSION	TORSION
	L	LO	PCD Ø	O.D Ø	N-Ø h	FIX. BOLT	WEIGHT	CORRUGATION	W	barG	barG	(y) m/m	(+X) m/m	(-X) m/m	Deg
50	800	52	120	152	4-19	M16	20	5	60	18	10	200	60	60	30
80	800	78	152.4	191	4-19	M16	25	5	60	18	10	200	60	60	30
100	800	102	190.5	229	8-19	M16	35	5	60	18	10	200	80	80	30
125	800	128	215.9	254	8-23	M20	40	5	60	18	10	200	80	80	30
150	750	154	241.3	279	8-23	M20	60	6	40	18	10	200	80	40	30
200	750	202	298.5	343	12-23	M20	70	6	40	18	10	200	80	40	24
250	750	254	362	406	12-25	M22	80	6	40	18	10	200	80	40	20
300	750	304	431.8	482.6	12-25	M22	120	6	40	18	10	200	80	40	16
350	750	336	476.2	533.4	12-28	M24	135	6	40	18	10	200	80	50	14
400	850	387	539.7	596.9	16-28	M24	185	6	50	18	10	200	100	50	14
450	850	438	577.8	635	16-32	M30	220	6	50	18	10	200	100	50	12
500	850	489	635	698.5	20-32	M30	240	6	50	18	10	200	100	60	12
600	1000	590	749.3	812.8	20-35	M33	330	5	85	16	10	200	120	60	10
700	1000	692	863.6	927.1	28-34	M30	410	5	85	16	10	200	120	60	8
800	1000	794	977.9	1060.4	28-42	M39	500	5	85	16	10	200	120	60	8
900	1000	895	1085.8	1168.4	32-42	M39	630	5	85	16	10	200	120	70	8
1000	1200	997	1200.2	1289.1	36-42	M39	900	5	100	16	10	200	140	70	5
1100	1200	1099	1314.5	1403.4	40-42	M39	1000	5	100	16	10	200	140	70	5
1200	1200	1200	1422.4	1511.3	44-42	M39	1150	5	100	16	10	200	140	70	5
1350	1200	1353	1593.8	1682.7	44-48	M45	1320	5	100	16	10	200	140	70	5
1500	1200	1505	1758.9	1854.2	52-48	M45	1700	5	100	16	10	200	140	70	5
1650	1400	1657	1930.4	2032	52-48	M45	2000	5	100	16	10	200	140	70	4
1800	1400	1809	2095.5	2197.1	60-48	M45	2280	5	100	16	10	200	140	70	4
1950	1400	1900	2260.6	2362.2	64-54	M52	2670	5	100	16	10	200	140	70	3
2100	1600	2114	2425.7	2533.7	64-54	M52	3420	5	110	16	10	200	160	80	3
2250	1600	2267	2590.8	2705.1	68-62	M60	4210	5	110	16	10	200	160	80	3
2400	1500	2419	2755.9	2876.6	68-62	M60	4980	4		16	10	200	150	75	3

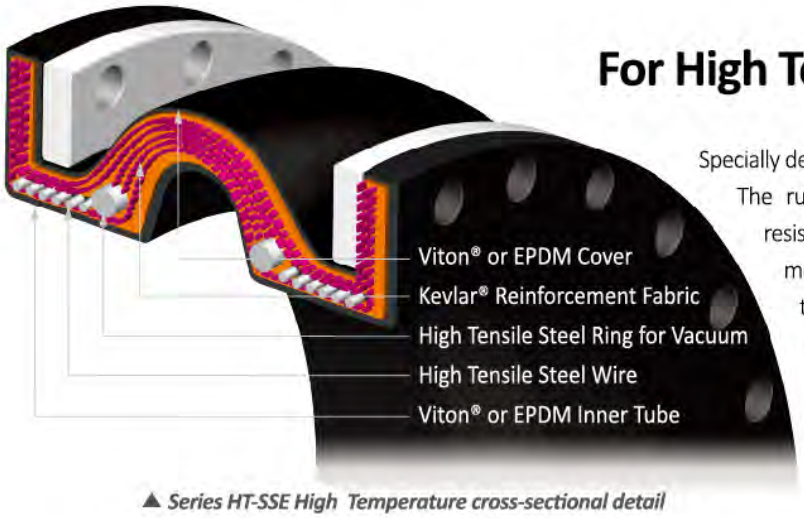
FLANGE DIMENSION 50A ~ 600A : ASME B16.5 150
700A ~ 2400A : AWWA C207 Class D

* The above is Megaflexon's standard. For other sizes, consult with Megaflexon.

SERIES SBE

MAI LIAO POWER PLANT, TAIWAN
172 INCH (DN 4300) X 3560mmL BURIED UNDERGROUND TYPE

SERIES HT-SSE



▲ *Series HT-SSE High Temperature cross-sectional detail*

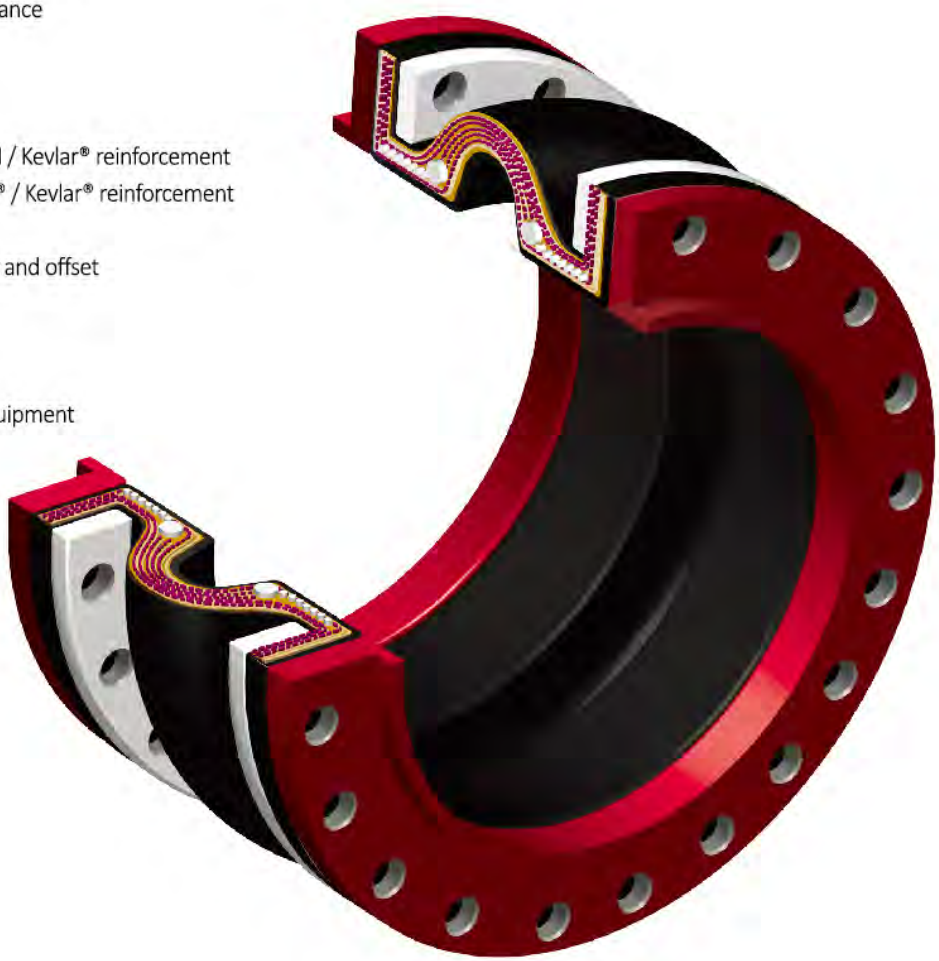
For High Temperature Applications

Specially designed for higher temperature applications. The rubber body is constructed with high temperature resistant EPDM or Viton® rubber with Kevlar® reinforcement and also includes full faced rubber flanges, high tensile steel reinforcement. According to the design conditions, hot dip galvanized retaining rings or integral backing rings are also included. Control units like tie rods or limit rods can be used if load limitations are required.

Features

Design Temperature 170℃~200℃

- Hand-built spool type or custom design type construction
- Standard or custom face-to-face dimensions
- All directional movement available
- Open or filled multiple arches design available
- Excellent chemical and abrasion resistance
- Full vacuum rating available
- Retaining ring hot dip galvanized
- Integral backing ring design available
- **170**℃ continuous service with EPDM / Kevlar® reinforcement
- **200**℃ continuous service with Viton® / Kevlar® reinforcement
- Absorbs noise, vibration and shock
- Compensates for minor misalignment and offset
- Low stiffness and deflection forces
- Simple and easy installation
- No gaskets required
- Provides easy access to piping and equipment



SERIES STF

Rubber Expansion Joint with PTFE Lined

Features

- Superior chemical resistance even at higher temperatures and pressures
- All directional movement
- No gaskets required
- Liner made of PTFE (Teflon)
- Ideal for food, pharmaceutical, chemical and ultra pure water applications
- Multiple arches available

TEFLON LINED TYPE RUBBER EXPANSION JOINT

DN		OAL	MOVEMENT					Effective Area	Max. Design Pressure
			Comp.	Ext.	Lateral	Angular	Torsion		
inch	mm	mm	mm	mm	mm	deg	deg	cm^2	bars
2	50	150	45	22	25	39	4	90	24
2 1/2	65	150	45	22	25	33	3.8	112	20
3	80	150	45	22	25	28	3.7	137	16
4	100	150	45	22	25	22	3.6	195	16
5	125	150	45	22	25	18	3.4	281	16
6	150	150	45	22	25	15	3.2	361	16
8	200	150	45	22	25	12	3.1	569	16
10	250	200	50	25	32	17	3	929	16
12	300	200	50	25	32	14	2.9	1224	16
14	350	200	60	29	32	12	2.8	1559	15
16	400	200	60	29	32	11	2.7	2078	12
18	450	200	60	29	32	10	2.6	2509	12
20	500	200	60	29	32	9	2.56	2980	10
22	550	200	60	29	32	9	2.5	3492	10
24	600	250	65	32	35	8	2.4	4044	10
26	650	250	65	32	35	8	2.4	4759	10
28	700	250	65	32	35	7.5	2.3	5400	10
30	750	250	65	32	35	7	2.3	6082	10
32	800	250	65	32	35	7	2.3	6805	10
34	850	250	65	32	35	6.5	2.2	7568	10
36	900	250	65	32	35	6	2.2	8371	10
40	1000	250	65	32	35	5	2.1	10100	10
42	1050	300	65	32	38	4.8	2.1	10751	10
44	1100	300	65	32	38	4.6	2.1	12186	10
46	1150	300	65	32	38	4.4	2.1	12668	10
48	1200	300	65	32	38	4.2	2	14255	10
50	1250	300	65	32	38	4	2	15350	8
52	1300	300	65	32	38	3.9	1.9	16486	8
54	1350	300	65	32	38	3.8	1.9	17662	8
56	1400	300	65	32	38	3.8	1.9	17962	8
58	1450	300	65	32	38	3.7	1.8	19359	8
60	1500	300	65	32	38	3.6	1.8	21434	8
62	1550	300	65	32	38	3.5	1.8	21904	8
64	1600	300	65	32	38	3.4	1.7	23114	8
66	1650	300	65	32	38	3.3	1.7	25571	6
68	1700	300	65	32	38	3.2	1.7	27032	6
70	1750	300	65	32	38	3.1	1.6	27465	6
72	1800	300	65	32	38	3	1.6	30073	6
74	1850	300	65	32	38	2.9	1.6	31573	6
76	1900	350	65	32	38	2.7	1.5	33277	6
78	1950	350	65	32	38	2.6	1.5	34940	6
80	2000	350	65	32	38	2.5	1.5	35362	6
82	2050	350	65	32	38	2.4	1.4	36984	6
84	2100	350	65	32	38	2.3	1.4	40172	6
86	2150	350	65	32	38	2.2	1.4	40471	6
88	2200	350	65	32	38	2.1	1.3	42459	6
90	2250	350	65	32	38	2.1	1.3	45768	6
92	2300	350	65	32	38	2.1	1.3	47715	6
94	2350	350	65	32	38	2	1.2	47916	6
96	2400	350	65	32	38	2	1.2	51730	6
98	2450	350	65	32	38	1.8	1.1	51875	6
100	2500	350	65	32	38	1.7	1	55780	6

Note

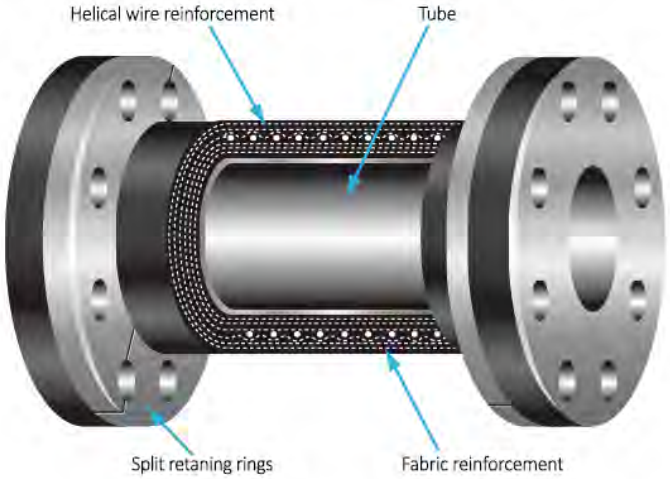
1) For other sizes, consult with Megaflexon.
2) All sizes can be supplied with a filled arch reducing their movements by 50% and increasing the spring rates fourfold.
3) Movements are non-concurrent. For concurrent movements, contact us.
4) Drilling depending on customer specification and requirements

** **WARNING :** Tie rods set must be used when piping is not properly anchored. Number of rods are dependent upon design pressures. Expansion joints may operate in pipelines carrying fluids at elevated temperatures and pressures, so precaution should be taken to ensure proper installation and regular inspection. Care is required to protect personnel in the event of leakage or splash. Adequate floor drains are always recommended.

SERIES - SVD

Spool Type

Vibration Dampeners



▲ *Cross Sectional View of Flanged Type Flexible Rubber Pipe*

Rubber vibration dampeners is possible to manufacture no-arch type expansion joints. It is more common however, to specify flanges pipe connectors having a substantially longer length than an expansion joint of the same pipe size, and this chapter will consider the construction, usage and dimensions of these pipe connectors.
The most common type of rubber pipe incorporates a full face flange integral with the body of the pipe. The flange is drilled to conform to the bolt pattern of the companion metal flanges of the pipeline. The type of a rubber faced flange, backed with a retaining ring, is of sufficient thickness to form a tight seal against the companion flange without the use of a gasket.

MAXIMUM PERMISSIBLE MOVEMENT

PIPE SIZE		FACE TO FACE	COMP.	EXT.	LATERAL	PIPE SIZE		FACE TO FACE	COMP.	EXT.	LATERAL
Inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm	mm
2 & 2 1/2	50 & 65	450	6.5	9.5	9.5	5 & 6	125 & 150	610	16	12.5	9.5
3	80	450	9.5	9.5	9.5	8 & 10	200 & 250	610	20	12.5	12.5
4	100	610	12.5	12.5	12.5	12	300	610	20	16	16

LENGTHS · DIMENSIONS

		L - TYPE (150 PSIG)					H - TYPE (300 PSIG)			
NOMINAL PIPE SIZE I.D. OF DAMPENER		F/F	FLANGE O.D.	BOLT CIRCLE	NO. OF HOLES	SIZE OF HOLES	FLANGE O.D.	BOLT CIRCLE	NO. OF HOLES	SIZE OF HOLES
Inch	mm	mm	mm	mm	ea	mm	mm	mm	ea	mm
1 1/2	40	300	127	98.4	4	16	155.6	114.3	4	22.2
2	50	300	152	120.7	4	19	165.1	127	8	19
3	80	300	190.5	152.4	4	19	209.6	168.3	8	22.2
4	100	300	228.6	190.5	8	19	254	200	8	22.2
5	125	300	254	215.9	8	22.2	279.4	235	8	22.2
6	150	450	279.4	241.3	8	22.2	317.5	269.9	12	22.2
8	200	610	342.9	298.5	8	22.2	381	330.2	12	25.4
10	250	610	406.4	362	12	25.4	444.5	387.4	16	28.6
12	300	610	482.6	431.8	12	25.4	520.7	450.9	16	32

PERCENTAGE OF REDUCTION OF VIBRATION INPUT WITH FREQUENCY AND PRESSURE AS COMPARED TO STEEL PIPE

CENTER FREQ.	200mm I.D. x 150mm F-F EXPANSION JOINT			200mm I.D. x 600mm F-F VIBRATION JOINT		
Hz	10 barG	50 barG	80 barG	10 barG	50 barG	80 barG
40	37%	55%	72%	87%	91%	93%
68	60%	68%	78%	95%	96%	99%
125	44%	50%	60%	98%	99%	99%
250	44%	50%	50%	96%	97%	99%
500	65%	89%	90%	91%	93%	94%
1000	90%	96%	98%	82%	91%	96%
2000	94%	95%	96%	99%	99%	99%
4000	90%	93%	97%	99%	99%	99%
8000	89%	89%	94%	97%	97%	98%

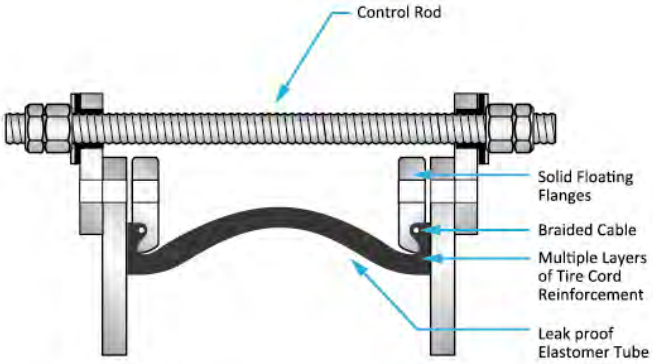
EXAMPLE - If a steel piping system had a major vibration frequency of 1000 Hz at 50 PSIG and an 8" rubber expansion joint was installed in the pipeline, the percentage of reduction of vibration would be 96%.

SERIES - SVD

SERIES MSE

Molded Type

Single sphere expansion joints



Double Sphere Connector with Floating Flanges

STRUCTURE

NO.	DESCRIPTION	MATERIALS
1	Internal Rubber	EPDM or other elastomer
2	Reinforcement Layer	Nylon Tire Core
3	External Rubber	EPDM or other elastomer
4	Wire	Hard Steel Wire
5	Flange	Mild Steel, Stainless Steel

ALLOWABLE MOVEMENT

DN		OAL	MOVEMENT					Effective Area	Max. Design Pressure
			Comp.	Ext.	Lateral	Angular	Torsion		
inch	mm	mm	mm	mm	mm	deg	deg	cm^2	barG
1 1/4	32	130	30	20	20	35	3	53	10
1 1/2	40	130	30	20	20	35	3	65	10
2	50	130	30	20	20	35	3	90	10
2 1/2	65	130	30	20	20	30	3	112	10
3	80	130	30	20	20	30	3	137	10
4	100	130	30	20	20	25	3	195	10
5	125	130	30	20	20	25	3	281	10
6	150	130	30	20	20	15	3	361	10
8	200	130	30	20	20	15	3	569	10
10	250	130	30	20	20	10	3	929	10
12	300	130	30	20	20	10	3	1224	10

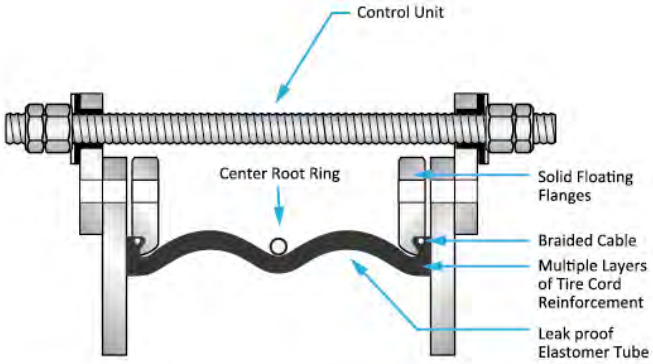
Note

1. Applicable fluids : water, warm water, seawater, weak acids, alkalies, etc.
2. Available flange drilling : JIS, DIN, ANSI, BS and other standard drilling.
3. Available material : Neoprene, Butyl, Nitrile, EPDM, Hypalon, Natural Rubber, etc.
4. Burst pressure : 60kg/cm^2(11/4" to 8") : 40kg/cm^2(10" to 12") (Amb. Temperature)

SERIES MDE

Molded Type

Double sphere expansion joints



Double Sphere Connector with Floating Flanges

STRUCTURE

NO.	DESCRIPTION	MATERIALS
1	Internal Rubber	EPDM or other elastomer
2	Reinforcement Layer	Nylon Tire Core
3	External Rubber	EPDM or other elastomer
4	Wire	Hard Steel Wire
5	Flange	Mild Steel, Stainless Steel

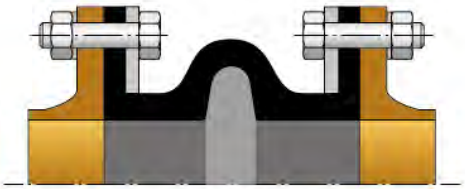
ALLOWABLE MOVEMENT

DN		OAL	MOVEMENT					Effective Area	Max. Design Pressure
			Comp.	Ext.	Lateral	Angular	Torsion		
Inch	mm	mm	mm	mm	mm	deg	deg	Cm²	barG
1 1/4	32	175	50	30	35	40	5	53	10
1 1/2	40	175	50	30	35	40	5	65	10
2	50	175	50	30	35	40	5	90	10
2 1/2	65	175	50	30	35	40	5	112	10
3	80	175	50	30	35	40	5	137	10
4	100	225	60	35	40	35	6	195	10
5	125	225	60	35	40	35	6	281	10
6	150	225	60	35	40	35	6	361	10
8	200	325	65	35	45	30	6	569	10
10	250	325	65	35	45	30	6	929	10
12	300	325	65	35	45	30	6	1224	10

Remarks

1. Request Applicable fluids, available flange drillings and materials to Megaflexon.

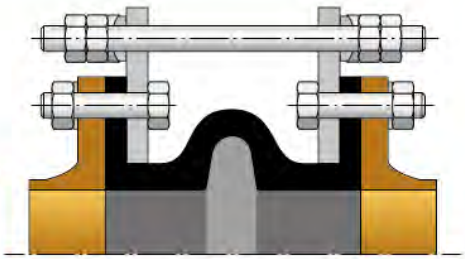
Examples of Installation



INSTALLATION TYPE 01

For axial and lateral movement compensation

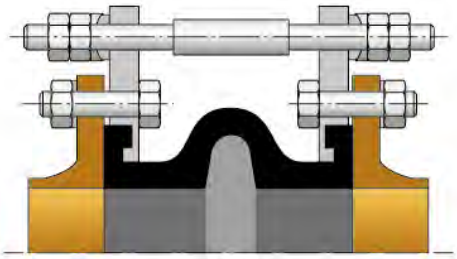
- Backing ring
- Without tie rods.
  Fixed anchor should be located nearby expansion joint.



INSTALLATION TYPE 02

For axial and lateral movement compensation

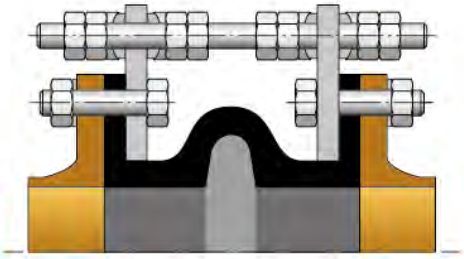
- Integral backing flange and tie-rods
- Tie-rods with spherical washers for acceptance of pressure thrust force



INSTALLATION TYPE 03

For axial and lateral movement compensation

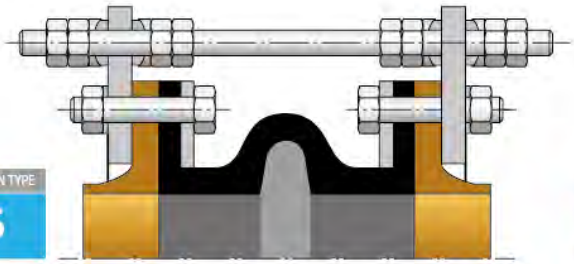
- Integral backing flange with sleeve pipe and tie-rods
- Tie-rods with sleeve pipe as compression limitors for acceptance of pressure thrust force



INSTALLATION TYPE 04

For lateral movement compensation at over and low pressure

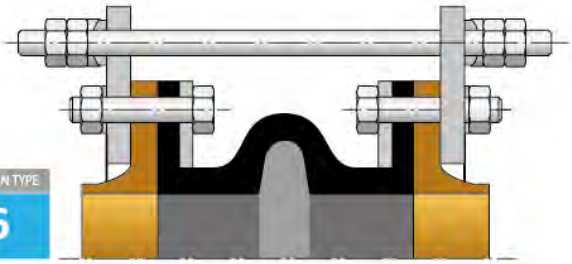
- Integral backing flange and tie-rods
- Tie-rods with spherical washers for acceptance of pressure thrust force



INSTALLATION TYPE 05

For lateral movement compensation at over and low pressure

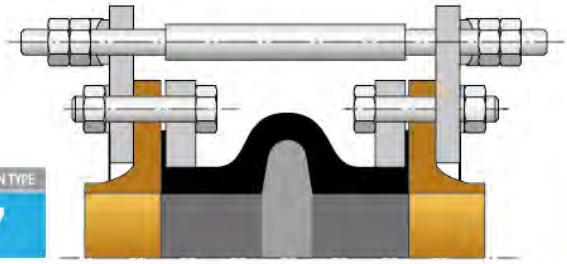
- Gusset plate and external segmental tie-rods
- Tie-rods with spherical washers for acceptance of pressure thrust force



INSTALLATION TYPE 06

For axial and lateral movement compensation

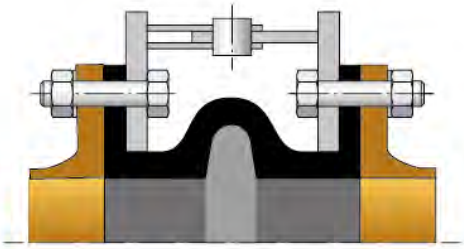
- Gusset plate and external segmental tie-rods
- Tie-rods with spherical washers for acceptance of pressure thrust force



INSTALLATION TYPE 07

For axial and lateral movement compensation

- Gusset plate with support collar and external segmental tie-rods
- Tie-rods with sleeve pipe as compression limitors for acceptance of pressure thrust force



INSTALLATION TYPE 08

For angular(cardan) movement compensation in one plane

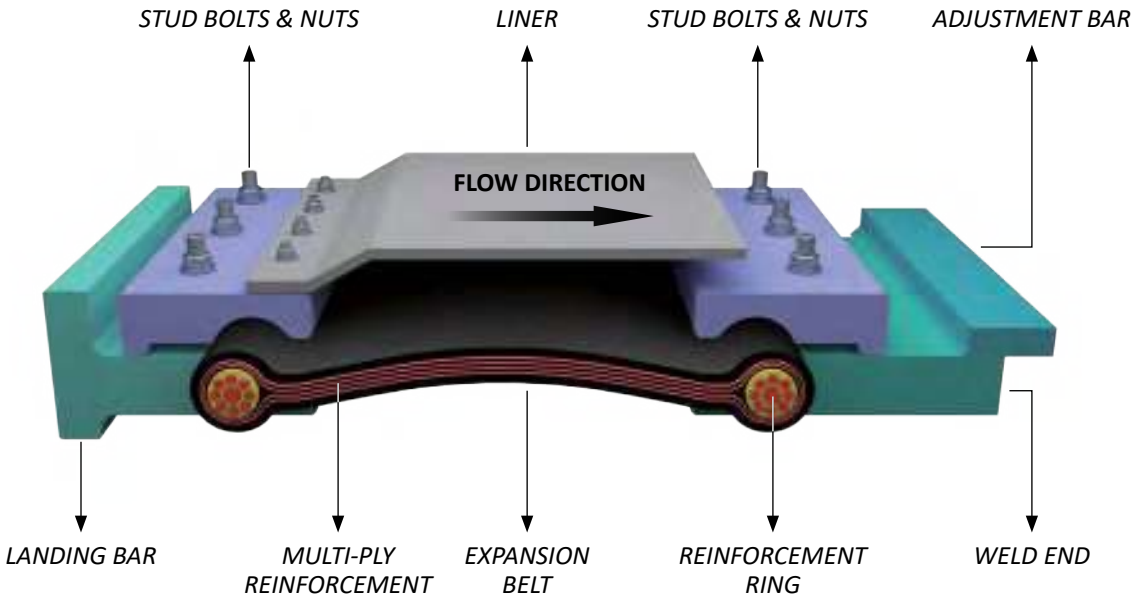
- Backing flange and hinged arrangment
- Recomend two hinged expansion joints with intermediate pipe for extreme movement

* For other other installation types, consult with Megaflexon.

BELT DOGBONE TYPE FOR CONDENSORS

DESIGN

Megaflexon belt-type dog bone expansion joints are designed with an uncompromising standard of quality for years of maintenance free operation in steam turbine/condenser connections at full vacuum to 15 PSIG.



FEATURES

1. EXPANSION BELT

Megaflexon provides a multiply molded belt, with 5/8"thick center and 1 1/4"diameter ends. Nylon fabric reinforces the center, with a 5/8" diameter reinforcing cord in each end. This construction provides a homogenous belt with an ultimate strength of 2850 PSI.

Rated Movement	1" Axial Compression + 1/2" Lateral offset
Temperature	Neoprene 230°F continuous 280°F intermittent
Spring Rate	(lbs/in./perimeter ft.) 350 Axial, 1120 Lateral

2. CLAMP BARS

Precision machined from 1 1/2" thick carbon steel to insure tight sealing of belt under full vacuum or 15 PSIG. Frame corners are rounded to a 13 1/2" inside radius.

3. STUDS

7/8" diameter studs and nuts are spaced on 4" centers.

4. LINER

An internal flow liner of 1/8" thick 304SS is provided to prevent flow induced vibration of expansion belt (other thicknesses available).

5. ENDS

The following methods of attachment are available:
Adjustment Bar: 1/2" thick x 1 1/2" wide for fillet welding to weld end of expansion joint and customers equipment.
Weld End: 1 1/2" thick square cut ends for fillet welding to customers equipment.
Flanges: Thickness and drilling to match customers equipment.
Landing Bar: 1 1/4" thick x 3" wide for fillet welding to customers equipment.

World Class Field Service

Through accumulated experience and know-how, Megaflexon has full knowledge and in-depth understanding in expansion joints and provides customers field service according to customers' requests. It includes inspection, on-site installation and on-site repair, etc. Through this field service, customers can avoid unnecessary downtime, cut labor losses and ensure correct on-line operation.

Field Service

SAFETY

Our primary concern is workers' safety and health. We provide safe and healthful working conditions, safe work procedures and rules based upon experience and safety knowledge and competent work direction for our employees.
We never consider any phase of our operations of greater importance than the safety of our employees, our customers and the general public.

QUALITY

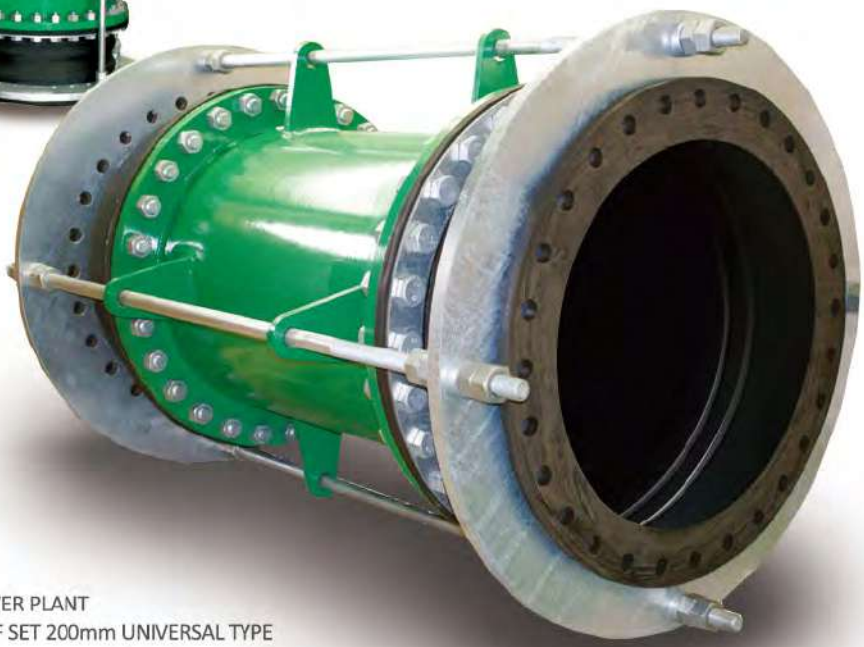
Quality and Services are our most TOP priority. We always put quality and services on our most top priority and will make sure to deliver zero-defect products and service on time to our customers.
In order to ensure our quality commitment, our degreed quality specialists do strictly carry out all required activities for quality assurance.

▲ *Hydrostatic test*

UMM AL HOUL POWER IWPP, QATAR
RUBBER EXPANSION JOINT WITH INTEGRAL BACKING RING TO BE EMBEDDED / DN 2200

Experience

UMM AL HOUL POWER IWPP, QATAR
40 INCH (DN 1000) X 1500mmL
INTEGRAL BACKING RING TYPE



HYUNDAI ENGINEERING Co., Ltd. /
ANGAMOS THERMOELECTRIC POWER PLANT
32 INCH (DN 800) X 2000mmL / OFF SET 200mm UNIVERSAL TYPE

Experience

SIEMENS / HEWEG POWER PLANT, NETHERLAND
78 INCH (DN 1950) X 500mmL
EXPANSION JOINT INSTALLATION VIEW

SIEMENS / HEWEG POWER PLANT, NETHERLAND
78 INCH (DN 1950) X 500mmL
EXPANSION JOINT INSTALLATION VIEW

Experience

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO.,LTD
RAS AL KHAIR POWER & DESALINATION - PH.1
160 INCH (DN 4000) X 500mmL SINGLE OPEN ARCH TYPE

Experience

ISLE OF GRAIN POWER PLANT, U.K.
EXPANSION JOINT INSTALLATION VIEW

Experience

RUBBER FLEXIBLE HOSE
59 INCH (DN 1500) x 6000mmL

70 INCH (DN 1800) x 2500mmL FLEXIBLE JOINT

SLEEVE HOSE

48 INCH (DN 1200) x 1500mmL ECCENTRIC REDUCER TYPE

48 INCH (DN 1200) x 1500mmL CONCENTRIC REDUCER TYPE

Experience

ERGENE SEA OUTFALL PROJECT, TURKEY
87 INCH (DN 2200) x 1800mmL FIVE OPEN ARCH BURIED TYPE

Chemical Resistance Data

CHEMICAL	Natural Rubber	Buna-S (SBR)	Butyl	Nitrile (Hycar, Buna-N)	Neoprene	Hypalon	EPDM	Viton	Teflon
A									
Acetal	C	C	G	D	C	C	G	D	E
Acetaldehyde	C	D	E	D	C	C	E	D	E
Acetamide	C	C	E	G	G	G	E	G	E
Acetate Solvents	C	D	C	D	D	D	C	D	E
Acetic Acid, 10%	G	G	G	G	C	C	G	C	E
Acetic Acid, 30%	D	D	G	D	C	G	E	C	E
Acetic Acid, 50%	D	D	G	C	C	D	E	D	E
Acetic Acid, Glacial	D	D	G	D	C	D	G	D	E
Acetic Anhydride	D	D	G	D	D	D	G	D	E
Acetic Ester (Ethyl Acetate)	D	D	G	D	D	D	G	D	E
Acetic Ether (Ethyl Acetate)	D	D	G	D	D	C	G	D	E
Acetic Oxide (Acetic Anhydride)	D	D	G	D	D	D	G	D	E
Acetone	G	C	E	D	C	C	E	D	E
Acetophenone	C	D	E	D	D	D	E	D	E
Acetyl Acetone	G	D	G	D	D	D	G	D	E
Acetyl Chi oride	D	D	C	D	D	D	C	G	E
Acetylene	D	D	E	E	G	G	G	E	G
Acrylonitrile	C	D	D	D	C	C	D	D	E
Air	E	E	E	E	E	E	E	E	E
Alcohols, Aliphatic	E	G	E	E	E	E	E	C	E
Alcohols, Aromatic	C	D	D	C	C	D	D	E	E
AlkTri(Trichloroethylene)	D	D	D	D	D	D	D	E	E
Allyl Alcohol	E	G	E	E	E	E	E	G	E
Allyl Bromide	D	D	D	D	D	D	D	G	E
Allyl Chloride	D	D	D	D	D	D	D	G	G
Alum(AluminumPotassium Sulfate)	E	E	E	E	E	E	E	E	G
Aluminum Acetate	C	C	E	C	C	G	E	E	E
Aluminum Chloride	E	E	E	E	E	E	E	E	E
Aluminum Fluoride	E	E	E	E	E	E	E	E	E
Aluminum Hydroxide	E	E	E	E	E	E	E	E	E
Aluminum Nitrate	E	E	E	E	E	E	E	E	E
Aluminum Phosphate	E	E	E	E	E	E	E	E	E
Aluminum Sulfate	E	E	E	E	E	E	E	E	E
Ammonia, Anhydrous	E	C	E	E	E	G	E	D	E
Ammonia, Liquid	G	G	E	E	E	E	E	E	E
Ammonia, in Water	G	G	G	G	G	G	E	G	E
Ammonia Gas (Cold)	E	-	E	E	E	E	-	-	D
Ammonia Gas (66℃)	C	-	C	C	G	-	-	-	D
Ammonium Carbonate	E	E	E	C	E	E	E	E	E
Ammonium Chloride	E	E	E	E	E	E	E	E	E
Ammonium Hydroxide	G	G	E	G	G	E	G	G	E
Ammonium Metaphosphate	E	E	E	E	E	E	E	E	E
Ammonium Nitrate	G	E	E	E	E	E	E	E	E
Ammonium Nitrite	E	E	E	E	E	E	E	E	E
Ammonium Persulfate	E	D	E	D	E	E	E	E	E
Ammonium Phosphate	E	E	E	E	E	E	E	E	E
Ammonium Sulfate	E	E	E	E	E	E	E	E	E
Ammonium Sulfide	E	E	E	E	E	E	E	E	E
Ammonium Sulfite	E	E	E	E	E	E	E	E	E
Ammonium Thiocyanate	E	E	E	E	E	E	E	E	E
Ammonium Thiosulfate	E	E	E	E	E	E	E	E	E
Amyl Acetate	C	D	G	D	D	D	G	D	E
Amyl Acetone	D	D	G	D	D	D	G	D	E
Amyl Alcohol	E	E	E	E	E	E	E	E	E
Amylamine	G	G	G	G	G	C	G	D	E
Amyl Borate	D	D	D	E	E	C	D	E	E
Amyl Chloride	D	D	D	D	D	D	D	E	E
Amyl Chloronapthalene	D	D	D	D	D	D	D	E	E
Amyl Napthalene	D	D	D	D	D	D	D	E	E
Amyl Oleate	D	D	G	D	D	D	G	C	E
Amyl Phenol	D	D	D	D	D	D	D	E	E
Anethole	D	D	D	D	D	D	D	G	G
Aniline	D	D	G	D	C	C	D	G	E
Aniline Dyes	G	G	G	C	G	G	G	G	E
Aniline Hydrochloride	G	C	G	G	D	D	G	G	E
Animal Fats	D	D	G	E	G	G	G	E	E
Animal Grease	D	D	D	G	G	D	C	E	E
Animal Oils	D	D	G	E	D	D	C	E	E
Ansul Ether	D	D	C	C	D	D	C	D	E
Antifreeze(Ethylene Glycol)	E	E	E	E	E	E	E	E	E
Antimony Chloride	-	-	E	G	-	-	-	-	E
Antimony Trichloride	D	D	E	G	G	G	G	E	E
Antimony Pentachloride	D	D	C	D	D	D	C	E	G
Aqua Regia	D	D	D	D	D	C	C	G	-
Aromatic Hydrocarbons	D	D	D	C	D	D	D	E	E
Arquad	E	E	E	E	E	E	E	E	E
Arsenic Acid	E	E	E	E	E	E	E	E	E
Arsenic Chloride	D	D	G	D	G	D	G	D	-
Arsenic Trichloride	D	D	G	D	G	D	G	D	-
Asphalt	D	D	D	E	G	D	D	E	G
ASTM # 1 Oil	D	D	D	E	E	G	D	E	E
ASTM # 2 Oil	D	D	D	E	G	C	D	E	E
ASTM # 3 Oil	D	D	D	E	G	C	D	E	E
Aviation Gasoline	D	D	D	E	C	D	D	E	E
B									
Bardol B	D	-	D	D	D	-	-	-	C
Barium Carbonate	E	E	E	E	E	E	E	E	E
Barium Chloride	E	E	E	E	E	E	E	E	E
Barium Hydroxide	E	E	E	E	E	E	E	E	E
Barium Sulfate	E	E	E	E	E	E	E	E	E
Barium Sulfide	E	E	E	E	E	E	E	E	E
Beet Sugar Liquors	E	E	E	E	E	E	E	E	E
Benzaldehyde	D	D	G	D	D	D	G	D	E
Benzene (Benzol)	D	D	D	C	C	D	D	E	E
Benzene Sulfonic Acid	D	D	D	G	E	E	C	E	E
Benzine Solvent (Ligroin)	D	D	D	E	E	C	D	E	E
Benzoic Acid	D	D	G	D	G	G	G	E	E
Benzoic Aldehyde	D	D	D	D	D	D	D	D	E
Benzotrichloride	D	D	D	D	D	D	D	G	G
Benzoyl Chloride	D	D	D	D	D	D	D	G	G
Benzyl Acetate	D	D	G	D	D	G	G	D	E
Benzyl Alcohol	G	G	G	D	G	G	G	E	E
Benzyl Benzoate	C	-	E	D	D	-	-	-	E
Benzyl Chloride	D	D	C	D	D	D	D	E	E
Bichromate of Soda (Sodium Dichromate)	D	D	E	D	G	G	C	E	E
Bismuth Carbonate	E	-	E	E	E	E	-	-	E
Black Sulfate Liquor	G	G	E	G	E	G	E	E	E
Blast Furnace Gas	D	D	C	C	G	G	C	E	E
Bleach Solutions	D	D	G	D	D	C	G	G	G
Borax	G	G	E	G	E	E	E	E	E
Bordeaux Mixture	G	G	E	E	E	E	E	E	E
Boric Acid	E	E	E	E	E	E	E	E	E
Brandy	E	-	E	E	E	E	-	-	-
Brine	E	E	E	E	E	E	E	E	E
Bromine	D	D	D	D	D	C	D	C	E
Bromine Water	D	D	G	C	G	E	G	E	E
Bromobenzene	D	D	D	D	D	D	D	G	-
Bunker Oil	D	D	D	E	G	D	D	E	E
Butane	Refer to Supplier								
Butanol (Butyl Alcohol)	E	E	E	E	E	E	E	E	E
Butadiene	D	D	D	D	C	G	D	E	E
I-Butene (AliphaticHydrocarbon35℃)	D	-	D	-	E	-	-	-	E
I-Butene, 2-Ethyl (35℃)	D	-	D	-	G	-	-	-	E
Butter (Non F.D.A.)	C	C	G	E	E	E	G	E	E
Butyl Acetate	D	D	G	D	D	D	C	D	E
n-Butyl Acetate	C	-	-	D	D	D	-	-	D
Butyl Acetate Recinoeate	C	-	-	E	D	-	-	-	C
Butyl Acrylate	D	D	D	D	D	D	D	D	E
Butylamine	G	C	C	C	D	C	C	D	E
Butyl Benzene	D	D	D	D	D	D	D	E	E
Butyl Bromide	D	D	D	D	D	D	D	G	-
Butyl Butyrate	D	D	C	D	D	D	G	C	-
Butyl Carbitol	D	D	E	G	G	G	E	E	E
Butyl Cellosolve	D	D	E	G	G	G	E	D	E
Butyl Chloride	D	D	C	D	D	D	D	E	G
Butyl Ether	D	D	C	G	G	G	C	D	E
Butyl Ethyl Acetaldehyde	D	D	C	D	D	D	D	D	E
Butyl Ethyl Ether	D	D	C	D	D	G	C	C	E
Butyl Oleate	D	D	G	D	D	D	G	E	E
Butyl Phthalate	D	D	C	D	D	D	C	C	E
Butyl Stearate	D	D	C	G	D	D	C	E	E
Butyraldehyde	C	D	D	D	D	D	D	D	E
Butyric Acid	C	D	C	C	C	G	C	C	E
Butyric Anhydride	C	D	C	C	D	G	C	C	E
C									
Cadminum Cyanide	-	-	E	-	E	-	-	-	E
Calcium Acetate	C	D	E	D	D	D	E	D	E
Calcium Bisulfate	E	E	E	E	E	E	E	E	E
Calcium Bisulfite	E	E	E	E	E	E	E	E	E
Calcium Carbonate	E	E	E	E	E	E	E	E	E

LEGEND

- **E** Excellent. Suitable for continuous service.
- **G** Good. Generally suitable for continuous or intermittent service.
- **C** Conditional. Not recommended for continuous service, but generally suited for intermittent service.
- **D** Do not use.
- **-** No experience.

*Teflon is recommended where deionization levels are critical.

Chemical Resistance Data

CHEMICAL	Natural Rubber	Buna-S (SBR)	Butyl	Nitrile (Hycar, Buna-N)	Neoprene	Hypalon	EPDM	Viton	Teflon
Calcium Chlorate	E	-	E	E	E	E	-	-	E
Calcium Chloride	E	E	E	E	E	E	E	E	E
Calcium Fluorophosphate	-	-	E	-	E	-	-	-	E
Calcium Hydroxide	E	G	E	G	E	G	E	C	E
Calcium Hypochlorite	D	D	G	D	D	C	G	E	-
Calcium Nitrate	E	E	E	E	E	E	E	E	E
Calcium Sulfate	E	E	E	E	E	E	E	E	E
Calcium Sulfide	E	E	E	E	E	E	E	E	E
Calcium Sulfite	E	E	E	E	E	E	E	E	E
Caliche Liquor (Crude Sodium Nitrate)	E	E	E	E	E	E	E	E	E
Cane Sugar Liquors (Non F.D.A.)	E	E	E	E	E	E	E	E	E
Carbitol	D	D	E	D	E	G	G	G	E
Carbitol Acetate	D	D	G	D	D	D	G	D	E
Carbolic Acid (Phenol)	D	D	G	C	C	C	G	E	E
Carbon Bisulfide (See Carbon Disulfide)									
Carbon Dioxide	E	E	E	E	E	E	E	E	E
Carbon Disulfide	D	D	D	D	D	D	D	E	E
Carbonic Acid	E	E	E	E	E	E	E	E	E
Carbon Monoxide	E	E	E	E	E	E	E	E	E
Carbon Tetrachloride	D	D	D	C	D	D	D	E	-
Carbon Tetrafluoride	D	D	D	C	D	D	D	E	-
Castor Oil	C	D	G	E	G	C	G	E	E
Caustic Potash (Potassium Hydroxide)	E	G	E	E	G	E	E	C	E
Caustic Soda (Sodium Hydroxide)	E	G	E	E	E	E	E	C	E
Cellosolve	D	D	G	G	E	G	G	C	E
Cellulose Acetate	C	D	G	D	C	C	G	D	-
Cellulube	C	D	G	D	D	D	E	C	E
China Wood Oil (Tung Oil)	D	D	G	E	G	G	G	E	E
Chlorine Dioxide	D	D	D	D	D	C	D	E	-
Chlorine Gas (Dry)	C	C	C	C	D	G	C	G	-
Chlorine, Water Soins.	C	D	C	D	D	G	C	E	E
Chloroacetic Acid	G	D	C	D	D	D	C	C	E
Chloroacetone	D	D	G	D	D	D	C	D	E
Chlorobenzene	D	D	D	D	D	D	D	E	-
Chlorobromomethane	D	-	D	D	D	D	-	-	E
Chlorobutane	D	D	D	D	D	D	D	E	-
Chlorobutadiene	D	D	D	D	D	D	D	E	-
Chloroform	D	D	D	D	D	D	D	E	-
o-Chloronapthalene	D	-	D	D	D	-	-	-	E
Chlorinated Hydrocarbons	D	D	D	D	D	D	D	E	-
Chloropentane	D	D	D	D	C	D	D	E	E
Chlorophenol	D	D	D	D	D	D	D	G	G
Chloropropanone	D	D	C	D	D	D	C	D	E
Chlorosulfonic Acid	D	D	D	D	D	C	D	D	G
Chlorothene (Trichloroethane)	D	D	D	D	D	D	D	E	G
Chlorotoluene	D	D	D	D	D	D	D	E	G
Chromic Acid	D	D	D	D	D	E	C	C	E
Citric Acid	E	E	E	G	G	E	E	E	E
Coal Oil	D	D	D	E	G	D	D	E	E
Coal Tar	D	D	D	E	G	G	G	E	E
Coal Tar Naptha	D	D	D	C	C	D	D	E	E
Cobalt Chloride	E	E	E	E	E	E	E	E	E
Coconut Oil	D	D	G	E	G	G	E	E	E
Cod Liver Oil	D	D	E	E	G	G	E	E	E
Coke Oven Gas	D	D	C	D	D	G	D	E	E
Copper Arsenate	E	E	E	E	E	E	E	E	E
Copper Chloride	E	E	E	E	E	E	E	E	E
Copper Cyanide	E	E	E	E	E	E	E	E	E
Copper Nitrate	E	E	E	E	E	E	E	E	E
Copper Nitrite	E	E	E	E	E	E	E	E	E
Copper Sulfate	C	E	E	E	E	E	E	E	E
Copper Sulfide	C	E	E	E	E	E	E	E	E
Corn Oil	D	D	G	E	G	G	G	E	E
Cottonseed Oil	D	D	E	E	G	E	E	E	E
Creosote (Wood)	D	D	D	G	C	C	D	E	E
Creosote (Coal Tar)	D	D	D	G	C	C	D	E	E
Cresols	D	D	D	C	C	C	D	E	E
Cresylic Acid	D	D	D	C	C	C	D	E	E
Crotonaldehyde	D	D	E	D	D	D	C	D	E
Crude Oil	D	D	D	E	G	D	D	E	E

CHEMICAL	Natural Rubber	Buna-S (SBR)	Butyl	Nitrile (Hycar, Buna-N)	Neoprene	Hypalon	EPDM	Viton	Teflon
Cryolite 10% (Alum./Sodium Flouride)	-	-	E	G	E	-	-	-	E
Cumene	D	D	D	C	C	D	D	E	E
Cupric Carbonate	C	C	E	G	G	G	E	E	E
Cupric Chloride	C	C	E	E	G	E	E	E	E
Cupric Nitrate	C	C	E	E	G	E	E	E	E
Cupric Nitrite	C	C	E	E	G	E	E	E	E
Cupric Sulfate	C	G	E	E	G	G	E	E	E
Cyclohexane	D	D	D	G	D	D	D	E	E
Cyclohexanone	D	D	D	D	D	D	D	C	E
Cyclohexanol	D	D	D	G	G	D	D	G	E
Cyclopentane	D	D	D	C	D	D	D	E	E
p-Cymene	D	D	D	C	D	D	D	E	E
D									
DDT In Kerosene	D	D	D	E	G	C	D	E	E
Decaline	D	D	D	D	D	D	D	E	E
Deionized Water*	E	E	E	E	E	E	E	E	E
Decane	D	D	D	G	D	D	D	E	E
Detergent Solutions	G	G	E	E	E	E	E	E	E
Diacetone Alcohol	D	D	E	D	D	G	G	D	E
Diamylamine	G	C	E	G	E	C	C	G	E
Dibenzyl Ether	D	D	D	D	D	D	D	C	E
Dibenzyl Sebacate	C	D	G	D	D	C	G	G	E
Dibromobenzene	D	D	D	D	D	D	D	E	G
Dibutylamine	G	C	C	G	E	C	G	D	E
Dibutylether	D	D	D	D	D	D	G	C	E
Dibutylphthalate	D	D	G	D	D	D	E	D	E
Dibutyl Sebacate	D	D	G	D	D	D	G	D	G
Dicalcium Phosphate	E	E	E	E	E	E	E	E	E
Dichloroacetic Acid	D	D	C	D	D	D	C	C	E
P-Dichlorobenzene	D	D	D	D	D	D	D	E	E
Dichlorobutane	D	D	D	D	D	D	D	E	E
Dichloroisopropyl Ether	D	D	C	D	D	D	C	C	E
Dicyclohexylamine	D	D	D	C	D	D	C	C	G
Dichlorodifluoromethane (Freon 12)	D	D	D	G	D	D	D	G	E
Dichloroethane	D	D	D	D	D	D	D	E	E
Dichloroethylene	D	D	D	D	D	D	D	E	E
Dichloroethyl Ether	D	D	D	D	D	D	D	C	E
Dichlorohexane	D	D	D	D	D	D	D	E	E
Dichloromethane	D	D	D	D	D	D	D	E	E
Dichloropentane	D	D	D	D	D	D	D	E	E
Dieldrin In Xylene	D	D	D	D	D	D	D	E	E
Dieldrin In Xylene and Water Spray	D	D	D	G	G	G	D	E	E
Diesel Oil	D	D	D	E	G	C	D	E	E
Diethanolamine	G	C	G	G	G	C	C	G	E
Diethylamine	G	C	G	G	G	C	C	D	E
Diethyl Benzene	D	D	D	D	D	D	D	E	E
Diethyl Ether	D	D	D	G	C	C	C	D	E
Diethylene Dioxide	D	D	G	D	D	D	G	D	E
Diethylene Glycol	E	E	E	E	E	E	E	E	E
Diethylenetriamine	G	G	E	G	G	C	E	C	E
Diethyl Oxalate	E	E	E	D	D	D	E	C	E
Diethyl Phthalate	D	D	E	D	D	D	G	C	E
Diethyl Sebacate	D	D	E	D	D	D	G	C	E
Diethyl Sulfate	D	D	G	D	D	D	G	D	E
Diethyl Triamine	G	C	E	G	G	C	G	C	E
Dihydroxyethyl Amine	G	C	E	G	G	C	G	C	E
Dihydroxyethyl Ether	E	E	E	E	G	E	G	E	E
Diisobutylene	D	D	D	E	G	D	D	E	E
Diisobutyl Ktone	D	D	G	D	D	D	G	D	E
Diisodecyl Adipate	D	D	D	E	D	D	C	E	C	E
Diisodecyl Phthalate	D	D	E	D	D	C	E	C	E
Diisooctyl Adipate	D	D	E	D	D	C	E	C	E
Diisooctyl Phthalate	D	D	E	D	D	C	E	C	E
Diisopropanol Amine	G	C	E	G	G	C	E	C	E
Diisopropyl Benzene	D	D	D	C	D	D	D	E	E
Diisopropyl Ether	D	D	D	G	C	D	D	G	E
Diisopropyl Ketone	D	D	E	D	D	D	E	D	E
Dilauryl Ether	D	D	D	D	D	D	D	C	E
Dimethylamine	G	C	E	G	G	C	E	C	E
Dimethyl Benzene	D	D	D	D	D	D	D	E	E
Dimethylaniline	D	D	D	D	D	D	C	D	G
Dimethylformamide (DMF)	C	C	C	D	C	C	C	D	E
Dimethyl Ketone (Acetone)	G	C	E	D	C	C	E	D	E
Dimethyl Phthalate	D	D	E	D	D	D	G	C	E
Dimethyl Sulfate	D	D	D	D	D	D	D	D	E
Dimethyl Sulfide	D	D	D	D	D	D	D	C	G
Dinitrobenzene	D	D	C	D	C	D	C	E	E
Dinitrotoluene	D	D	D	D	D	D	D	C	E

LEGEND

- **E** Excellent. Suitable for continuous service.
- **G** Good. Generally suitable for continuous or intermittent service.
- **C** Conditional. Not recommended for continuous service, but generally suited for intermittent service.
- **D** Do not use.
- **-** No experience.

*Teflon is recommended where deionization levels are critical.

Chemical Resistance Data

CHEMICAL	Natural Rubber	Buna-S (SBR)	Butyl	Nitrile (Hycar, Buna-N)	Neoprene	Hypalon	EPDM	Viton	Teflon
Dioctyl Adipate (DOA)	D	D	G	D	D	D	G	C	E
Dioctylamine	G	G	E	G	G	C	G	C	E
Dioctyl Phthalate (DOP)	D	D	G	D	D	D	G	E	E
Dioctyl Sebacate (DOS)	D	D	G	D	D	D	G	G	E
Dioxane	D	D	G	D	D	D	G	D	E
Dioxolane	D	D	C	D	D	D	G	C	E
Dipentene (Limonene)	D	D	D	C	D	D	D	E	E
Diphenyl (Biphenyl)	D	D	D	D	D	D	D	E	E
Dipropyl Ketone	D	D	G	D	D	D	G	D	E
Disodium Phosphate	E	E	E	E	E	E	E	E	E
Divinyl Benzene	D	D	D	D	D	D	D	E	E
D.M.P. (Dimethyl Phenols)	D	D	D	D	D	D	D	D	-
Dodecyl Benzene	D	D	D	D	D	D	D	E	E
Diphenyl Oxide (Phenyl Ether)	D	D	D	D	D	C	D	E	E
Dipropylamine	G	G	E	G	G	C	E	C	E
Dipropylene Glycol	E	E	E	E	E	E	E	E	E
Dodecyl Toluene	D	D	D	D	D	D	D	E	E
Dowfume W 40, 100%	D	D	D	D	C	C	C	C	-
Dow-Per (Perchloroethylene)	D	D	D	C	D	D	D	E	E
Dowtherm Oil, A and E	D	D	D	D	D	C	D	E	E
Dowtherm S.R.I	E	E	E	E	E	E	E	E	E
Dry Cleaning Fluids	D	D	D	C	D	D	D	E	G
E									
Epichlorohydrin	D	D	G	D	D	C	G	D	G
Ethanol (Ethyl Alcohol)	E	E	E	E	E	E	E	E	E
Ethanolamine	G	C	G	G	G	C	G	D	E
Ethers	D	D	C	D	D	C	D	C	E
Ethyl Acetate	D	D	G	D	D	C	G	D	E
Ethyl Acetoacetate	D	D	G	D	D	D	G	D	E
Ethyl Acrylate	D	D	C	D	D	D	D	D	G
Ethyl Benzene	D	D	D	C	D	D	D	E	E
Ethyl Benzoate	D	D	G	G	C	C	G	C	E
Ethyl Butyl Alcohol	E	E	E	E	E	E	E	G	E
Ethyl Butyl Amine	G	C	E	G	G	C	G	G	E
Ethyl Butyl Ketone	D	D	G	D	D	D	G	D	E
Ethyl Butyrate	C	-	-	D	D	D	-	-	C
Ethyl Cellulose	G	G	G	G	G	G	G	D	E
Ethyl Chloride	C	C	D	C	C	D	D	E	E
Ethyl Diochloride	D	D	D	D	D	D	D	G	G
Ethylene	D	D	D	E	G	C	D	E	E
Ethylene Bromide	D	D	D	D	D	D	D	E	G
Ethylene Chloride	D	D	D	D	D	D	D	E	G
Ethylene Chlorohydrin	C	-	E	D	E	-	-	-	C
Ethylene Diamine	G	C	E	G	E	C	E	D	E
Ethylene Dibromide	D	D	D	D	D	D	D	G	G
Ethylene Dichloride	D	D	D	D	D	D	D	G	G
Ethylene Glycol	E	E	E	E	E	E	E	E	E
Ethylene Oxide	D	D	C	D	D	D	C	D	-
Ethylene Trichloride (Trichloroethylene)	D	D	D	C	D	D	D	E	G
Ethyl Ether	D	D	D	C	D	D	D	D	E
Ethyl Formate	D	D	G	D	D	D	C	D	E
Ethyl Hexanol	E	E	E	E	E	E	E	G	E
Ethyl Mercaptan	D	-	D	D	D	-	-	-	C
Ethyl Methyl Ketone	C	D	G	D	D	D	G	D	E
Ethyl Oxalate	E	E	E	D	D	D	G	C	E
Ethyl Pentachlorobenzene	D	-	D	C	D	-	-	-	E
Ethyl Phthalate	D	D	E	D	D	D	G	C	E
Ethyl Propyl Ether	D	D	D	D	D	D	D	C	E
Ethyl Propyl Ketone	D	D	G	D	D	D	G	D	E
Ethyl Silicate	C	C	E	E	E	E	E	E	E
Ethyl Sulfate	D	D	G	D	D	D	G	D	E
EX TRI (Trichloroethylene)	D	D	D	D	D	D	D	E	G
F									
Fatty Acids	D	D	D	G	G	G	C	E	E
Ferric Bromide	E	E	E	E	E	E	E	E	E
Ferric Chloride	E	E	E	E	E	E	E	E	E
Ferric Nitrate	E	E	E	E	E	E	E	E	E
Ferric Sulfate	E	E	E	E	E	E	E	E	E
Ferrous Acetate	D	D	E	D	D	D	G	D	E
Ferrous Ammonium Sulfate	E	E	E	E	E	E	E	E	E
Ferrous Chloride	E	E	E	E	E	E	E	E	E
Ferrous Hydroxide	G	C	E	G	E	G	E	C	E

CHEMICAL	Natural Rubber	Buna-S (SBR)	Butyl	Nitrile (Hycar, Buna-N)	Neoprene	Hypalon	EPDM	Viton	Teflon
Ferrous Sulfate	E	E	E	E	E	E	E	E	E
Fish Oil	D	D	E	E	E	E	E	E	E
Fluorobenzene	D	-	D	D	D	-	-	-	E
Fluoroboric Acid	E	C	E	E	G	E	E	C	E
Fluorine (Liquid)	D	D	D	D	D	D	D	D	-
Fluosilicic Acid	G	G	E	G	G	E	G	E	E
Formaldehyde (Formalin)	C	C	E	G	G	G	G	E	E
Formamaide	E	E	E	E	E	E	E	D	E
Formic Acid	G	G	E	C	C	C	C	D	G
Freon 11*	D	D	D	E	G	E	D	E	E
Freon 12*	D	D	D	G	C	D	C	G	G
Freon 13*	E	E	E	E	E	E	E	E	E
Freon 21*	D	D	D	D	G	D	D	D	E
Freon 22*	D	D	E	D	E	D	G	D	E
Freon 31*	G	G	E	D	E	G	E	D	E
Freon 32*	E	E	E	E	E	E	E	C	E
Freon 112*	D	D	D	G	G	G	D	E	E
Freon 113*	C	G	D	E	E	E	D	G	E
Freon 114*	E	E	E	E	E	E	E	G	E
Freon 115*	E	E	E	E	E	E	E	G	E
Freon 142b*	E	E	E	E	E	E	E	D	E
Freon 152a*	E	E	E	E	E	C	E	D	E
Freon 218*	E	E	E	E	E	E	E	E	E
Freon C316*	E	E	E	E	E	E	E	E	E
Freon C318*	E	E	E	E	E	E	E	E	E
Freon 13B1*	E	E	E	E	E	E	E	E	E
Freon 114B2*	D	C	D	G	E	E	D	G	E
Freon 502*	E	E	E	G	E	E	E	G	E
Freon TF*	C	G	E	E	E	E	D	E	E
Freon T-WD602*	C	G	E	E	G	G	G	E	E
Freon TMC*	G	C	G	G	G	G	G	E	E
Freon T-P35*	E	E	E	E	E	E	E	E	E
Freon TA*	E	E	E	E	E	E	E	C	E
Freon TC*	D	G	E	E	E	E	G	E	E
Freon MF*	D	G	D	E	C	G	D	E	E
Freon BF*	D	D	D	G	G	G	D	E	E
Fuel Oil	D	D	D	E	G	C	D	E	E
Fuel, ASTMA	D	D	D	E	E	C	D	E	E
Fuel, ASTMB	D	D	D	E	G	C	D	E	E
Fuel, ASTMC	D	D	D	G	C	D	D	E	G
Fumaric Acid	E	E	D	E	G	G	D	E	E
Furan	D	D	C	D	D	D	C	D	E
Furfural	D	D	G	D	C	G	G	D	E
FurFuryl Alcohol	D	D	C	D	C	C	C	D	E
G									
Gallic Acid	E	E	G	G	G	G	G	G	E
Gasolin, Reg	D	D	D	E	E	C	D	E	E
Gasolin, HiiTest	D	D	D	E	G	D	D	E	E
Gasoline, Lead Free	D	D	D	G	G	D	D	E	E
Gelatin	E	E	E	E	E	E	E	E	E
Gluconic Acid	D	D	C	C	C	G	C	E	E
Glucose	E	E	E	E	E	E	E	E	E
Glue	E	E	E	E	E	E	E	E	E
Glycerin (Glycerol)	E	E	E	E	E	E	E	E	
Glycols	E	E	E	E	E	E	E	E	E
Grease	D	D	D	E	G	C	D	E	E
Green Sulfate Liquor	E	E	E	E	G	E	E	G	E
H									
Halowax Oil	D	D	D	D	D	D	D	E	E
Heptachlor In Petroleum Solvents	D	D	D	G	G	D	D	E	E
Heptachlor In Petroleum Slovents, Water Spray	D	D	D	G	G	D	D	E	E
Heptanal (Heptaldehyde)	D	D	D	D	D	D	G	D	E
Heptane	D	D	D	E	E	G	D	E	E
Heptane Carboxylic Acid	D	D	C	C	G	G	C	E	E
Hexaldehyde	D	D	G	D	G	G	G	D	E
Hexane	D	D	D	E	E	C	D	E	E
Hexene	D	D	D	G	G	C	D	E	E
Hexanol (Hexyl Alcohol)	E	E	E	E	E	E	E	E	E
Hexylamine	G	C	G	G	G	C	G	D	E
Hexylene	D	D	D	E	G	D	C	E	G
Hexylene Glycol	E	E	E	E	E	E	E	E	E
Hexy Methyl Ketone	D	D	G	D	D	D	G	D	E
Hi-Tri (Trichloroethylene)	D	D	D	C	D	D	D	E	G
Hydraulic Fluid (Petroleum)	D	D	D	E	G	G	D	E	E
Hydraulic Fluid (Phosphate Ester Base)	D	D	E	D	D	D	E	D	E
Hydraulic Fluid (Poly Alkylene Glycol Base)	G	G	E	E	E	E	E	E	E
Hydrazine	-	-	-	-	-	-	E	D	-

LEGEND

- **E** Excellent. Suitable for continuous service.
- **G** Good. Generally suitable for continuous or intermittent service.
- **C** Conditional. Not recommended for continuous service, but generally suited for intermittent service.
- **D** Do not use.
- **-** No experience.

*Teflon is recommended where deionization levels are critical.

Chemical Resistance Data

CHEMICAL	Natural Rubber	Buna-S (SBR)	Butyl	Nitrile (Hycar, Buna-N)	Neoprene	Hypalon	EPDM	Viton	Teflon
Hydrobromic Acid	E	D	E	D	C	E	G	E	E
Hydrochloric Acid, 37%	E	G	E	C	C	E	G	E	E
Hydrochloric Acid, 50%	E	C	G	D	D	E	C	E	E
Hydrochloric Acid, 100%	G	C	C	D	D	G	C	C	E
Hydrocyanic Acid	G	C	E	G	C	E	G	G	E
Hydrofluoric Acid	G	D	G	D	C	E	G	G	E
Hydrofluosilic Acid	E	D	E	D	C	E	G	G	E
Hydrogen Gas	G	G	E	E	E	E	G	E	E
Hydrogen Peroxide, 3%	E	G	E	G	E	C	G	E	E
Hydrogen Peroxide, 10%	D	D	C	D	C	C	C	E	E
Hydrogen Peroxide, 30%	D	D	D	D	D	D	C	E	E
Hydrogen Peroxide, 90%	D	D	D	D	D	D	C	G	G
Hydrogen Sulfide	D	D	E	D	E	G	E	E	E
Hydroquinone	G	G	G	D	C	D	G	D	E
Hypochlorous Acid	G	G	G	D	G	E	G	E	E
I									
Ink Oil (Linseed Oil Base)	D	D	G	G	G	G	G	E	E
Insulating Oil	D	D	D	E	G	D	D	E	E
Iodine	D	D	D	D	D	C	D	C	E
Iron Acetate	D	D	E	D	D	D	G	D	E
Iroc Hydroxide	C	C	E	G	E	G	G	C	E
Iron Salts	E	E	E	E	E	E	E	E	E
Iron Sulfate	E	E	E	E	E	E	E	E	E
Iron Sulfide	E	E	E	E	E	E	E	E	E
Isoamyl Acetate	D	D	E	D	D	D	G	D	E
Isoamyl Alcohol	E	E	E	E	E	E	E	E	E
Isoamyl Bromide	D	D	D	D	D	D	D	G	G
Isoamyl Butyrate	D	D	C	D	D	D	C	D	G
Isoamyl Chloride	D	D	C	D	D	D	D	G	G
Isoamyl Ether	D	D	D	D	D	D	D	D	E
Isoamyl Phthalate	D	D	E	D	D	D	G	C	E
Isobutane	D	D	D	E	E	D	D	E	E
Isobutanol (Isobutyl Alcohol)	E	E	E	E	E	E	E	E	E
Isobutyl Acetate	D	D	E	D	D	D	G	D	E
Isobutyl Aldehyde	C	D	G	D	D	D	G	D	E
Isobutyl Amine	G	C	G	D	D	C	G	D	E
Isobutyl Bromide	D	D	D	D	D	D	D	G	G
Isobutyl n-Butyrate	-	-	-	-	D	-	-	-	C
Isobutyl Carbinol	E	E	E	E	G	E	E	G	E
Isobutyl Chloride	D	D	D	D	D	D	D	G	G
Isobutylene	D	D	D	C	C	D	D	E	E
Isobutyl Ether	D	D	D	D	D	D	D	D	E
Isocyanates	C	D	G	D	D	C	G	C	G
Isododecane	D	-	-	E	E	E	-	-	E
Isooctane	D	D	D	E	E	G	D	E	E
Isopentane	D	D	D	E	E	D	D	E	G
Isopropyl Amine	G	C	E	G	E	C	G	D	E
Isopropyl Acetate	D	D	E	D	D	C	G	D	E
Isopropyl Alcohol (Iso-propanol)	E	E	E	E	E	E	G	G	G
Isopropyl Amine	G	D	G	C	E	C	G	D	E
Isopropyl Benzene	D	D	D	D	D	D	D	E	E
Isopropyl Chloride	D	D	D	D	D	D	D	G	G
Isopropyl Ether	D	D	D	C	D	C	D	D	E
Isopropyl Toluene	D	D	D	D	D	D	D	E	E
J									
Jet Fueis (JP 1- JP 6)	D	D	D	E	G	C	D	E	E
K									
Kerosene	D	D	D	E	G	C	D	E	E
Ketones	G	G	G	D	D	D	G	D	E
L									
Lactic Acid	G	G	G	E	E	E	G	E	E
Lacquers	D	D	D	D	D	D	D	D	E
Lacquer Solvents	D	D	D	D	D	D	D	D	E
Lard	D	D	D	E	G	D	C	E	E
Lauryl Alcohol	E	E	E	E	E	E	E	G	E
Lead Acetate	D	D	E	C	C	D	G	C	E
Lead Nitrate	E	E	E	E	E	E	E	E	E
Lead Sulfamate	G	G	E	G	E	G	E	E	E
Lead Sulfate	E	E	E	E	E	E	E	E	E
Ligroin	D	D	D	E	E	D	D	E	E
Lime Water	D	D	E	C	E	E	E	E	E
Lime-Sulphur	G	-	C	E	E	G	-	-	E
Linseed Oil	D	D	E	E	G	G	G	E	E

CHEMICAL	Natural Rubber	Buna-S (SBR)	Butyl	Nitrile (Hycar, Buna-N)	Neoprene	Hypalon	EPDM	Viton	Teflon
Lindol (Tricresyl Phosphate)	D	D	E	D	D	D	E	E	E
Linoleic Acid	-	-	-	G	D	-	-	-	E
Liquid Soap	E	E	E	E	E	E	E	E	E
Liquified Petroleum Gas	D	D	D	E	G	D	D	E	E
Lubricating Oils	D	D	D	E	G	C	D	E	E
Lye (Sodium Hydroxide)	E	G	E	G	E	E	E	D	E
M									
Magnesium Acetate	D	D	E	D	D	D	G	D	E
Magnesium Ammonium Sulphate	-	-	E	-	E	-	-	-	E
Magnesium Carbonate	E	E	E	E	E	E	E	E	E
Magnesium Chloride	E	E	E	E	E	E	G	E	E
Magnesium Hydrate	E	G	E	G	E	G	E	G	E
Magnesium Hydroxide	E	E	E	E	E	E	G	E	E
Magnesium Nitrate	E	E	E	E	E	E	E	E	E
Magnesium Oxide	-	-	E	-	E	-	-	-	E
Magnesium Sulfate	E	E	E	E	E	E	E	E	E
Malathion 50 in Armomatic Solvents	D	D	D	C	C	D	D	E	E
Malathion 50 in Armomatic Solvents, Water Spray	D	D	D	E	E	D	D	E	E
Maleic Acid	D	D	C	D	C	D	C	E	E
Maleic Anhydride	D	D	C	D	C	D	C	E	E
Malic Acid	E	G	D	G	C	G	D	E	E
Manganese Sulfate	E	E	E	E	E	E	E	E	E
Manganese Sulfide	C	E	E	E	G	E	G	E	E
Manganese Sulfite	C	E	E	E	G	E	G	E	E
Mercuric Chloride	G	G	G	C	C	G	C	E	E
Mercuric Cyanide	E	-	E	E	G	E	-	-	E
Mercurous Nitrate	E	-	E	E	E	E	-	-	E
Mercury	G	G	E	E	G	E	E	E	E
Mesityl Oxide	D	-	D	D	D	D	-	-	C
Methane	D	D	D	E	G	G	D	E	E
Metyl Acetate	C	D	G	D	D	D	G	D	E
Metyl Acrylate	C	D	G	D	C	D	G	D	E
Methacrylic Acid	D	D	G	D	G	C	G	G	E
Methyl Alcohol (Methanol)	E	E	E	E	E	E	E	C	E
Methyl Benzene (Toluene)	D	D	D	D	D	D	D	E	E
Methyl Bromide	D	D	G	G	D	D	G	E	E
Methyl Butyl Ketone	D	D	G	D	D	D	G	D	E
Methyl Cellosolve	D	D	G	C	G	C	G	D	E
Methyl Chloride	D	D	D	C	D	D	D	G	G
Methyl Cyclohexane	D	D	D	D	D	D	D	G	G
Methyl Cyclopentane	-	-	-	-	G	-	-	-	E
Methylene Bromide	D	D	D	D	D	D	D	G	G
Methylene Chloride	D	D	D	D	D	D	D	G	E
Methyl Ethyl Ketone (MEK)	G	D	G	D	D	D	G	D	E
Methyl Formate	C	C	G	D	G	C	G	C	G
Methyl Hexanol	E	E	E	E	E	E	E	G	E
Methyl Hexyl Ketone	D	D	G	D	D	D	G	D	E
Methyl Isobutyl Carbinol	G	C	E	G	G	G	E	G	E
Methyl Isobutyl Ketone (MIBK)	D	D	G	D	D	D	G	D	E
Methyl Isopropyl Ketone	D	D	G	D	D	D	G	D	E
Methyl Propyl Ether	D	D	D	D	D	D	D	D	E
Methyl Propyl Ketone	D	D	G	D	D	D	G	D	E
Methyl Methacrylate	D	D	D	D	D	G	D	D	G
Methyl Salicylate	D	D	G	D	D	D	G	C	G
Milk	C	-	C	G	G	E	-	-	E
Mineral Oil	D	D	D	E	G	G	D	E	E
Mineral Spirits	D	D	D	E	G	D	D	E	E
Monobromobenzene	-	-	D	D	-	-	-	-	E
Monochlorobenzene	D	D	D	D	D	D	D	E	E
Monochlorodifluoromethane (Freon 22)	D	D	E	D	E	D	E	D	E
Monoethanolamine	G	C	G	C	G	G	G	D	E
Monomethylether	G	G	E	E	E	C	E	C	E
Monovinyl Acetate	D	D	G	D	D	C	C	E	E
Motor Oil	D	D	D	E	E	D	D	E	E
Muriatic Acid	(See HCL 37%)								
N									
Naphtha	D	D	D	E	G	D	D	E	E
Napthalene	D	D	D	D	D	D	D	E	E
Napthenic Acid	D	D	D	C	D	D	D	E	E
Natural Gas	C	-	C	E	E	E	-	-	E
Neatsfoot Oil	D	D	G	E	G	G	G	E	E
Neu-Tri (Trichloroethylene)	D	D	D	C	D	D	D	E	G
Nickel Acetate	D	D	E	D	D	D	G	D	E
Nickel Ammonium Sulphate	-	-	E	-	E	-	-	-	E
Nickel Chloride	E	E	E	E	E	E	E	E	E
Nickel Nitrate	E	E	E	E	E	E	E	E	E
Nickel Plating Solution	E	D	G	G	C	G	G	E	E

LEGEND

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- **G** Good. Generally suitable for continuous or intermittent service.
- **C** Conditional. Not recommended for continuous service, but generally suited for intermittent service.
- **D** Do not use.
- **-** No experience.

*Teflon is recommended where deionization levels are critical.

Chemical Resistance Data

CHEMICAL	Natural Rubber	Buna-S (SBR)	Butyl	Nitrile (Hycar, Buna-N)	Neoprene	Hypalon	EPDM	Viton	Teflon
Nickel Sulfate	E	E	E	E	E	E	E	E	E
Nicotine Bentonite	-	-	-	G	-	-	-	-	C
Nicotine Sulphate	-	-	-	G	-	-	-	-	C
Nither Cake	E	E	E	E	E	E	E	E	E
Nitric Acid, 10%	D	D	G	D	C	G	G	E	E
Nitric Acid, 20%	D	D	G	D	D	G	C	E	E
Nitric Acid, 30%	D	D	G	D	D	C	C	E	G
Nitric Acid, 30%- 70%	D	D	C	D	D	D	D	C	-
Nitric Acid, Red Fuming	D	D	D	D	D	D	D	D	-
Nitrobenzene	D	D	D	D	D	D	D	G	E
Nitrogen Gas	E	E	E	E	E	E	E	E	E
Nitrogen Tetraoxie	D	D	D	D	D	D	D	D	-
Nitromethane	G	G	G	D	C	C	G	D	E
Nitropropane	C	C	E	D	C	C	G	D	E
Nitrous Oxide	E	E	E	E	E	E	E	E	E
O									
Octadecanoic Acid	D	D	G	E	G	D	C	C	E
Octane	D	D	D	E	G	D	D	E	G
Octanol (Octyl Alcohol)	G	G	G	G	E	G	G	E	E
n-Octrene-2	-	-	-	-	C	-	-	-	E
Octyl Acetate	D	D	E	D	D	D	G	D	E
Octyl Amine	C	C	G	C	G	C	G	D	E
Octyl Carbinol	E	E	E	E	E	E	E	G	E
Octylene Glycol	E	E	E	E	E	E	E	E	E
Oil, Petroleum	D	D	D	E	E	C	D	E	E
Oil, ASTM #1	D	D	D	E	E	G	D	E	E
Oil, ASTM #2	D	D	D	E	E	C	D	E	E
Oil, ASTM #3	D	D	D	E	G	C	D	E	E
Oletic Acid	D	D	G	G	C	C	G	C	E
Oleum (Fuming Sulfuric Acid)	D	D	D	D	D	D	D	D	-
Olive Oil (Non F.D.A.)	D	D	G	E	G	G	G	E	E
Orthodichlorobenzene	D	D	D	D	D	D	D	E	G
Oxalic Acid	C	C	E	G	C	G	E	C	E
Oxygen, Cold	G	G	E	G	G	G	G	E	E
Oxygen, Hot	D	D	D	D	D	D	D	G	E
Ozone	D	C	G	D	G	E	E	E	E
P									
Paint thinner (Duco)	D	D	D	D	D	D	D	C	E
Palmitic Acid	D	D	G	E	G	G	G	E	G
Palm Oil	D	D	E	E	G	G	G	E	E
Papermaker's Alum	E	E	E	E	E	E	E	E	E
Paradichlorobenzene	D	D	D	D	D	D	D	E	G
Paraffin	D	D	D	E	E	D	D	E	-
Paraformaldehyde	D	D	G	G	G	G	G	C	E
Peanut Oil	D	D	C	E	G	G	D	E	E
Pentaclorophenol	D	-	D	D	D	-	-	-	E
Pentane	D	D	D	E	E	G	D	E	E
n-Pentane, 2-Methyl, 3-Methyl	-	-	-	-	E	-	-	-	E
Pentene-2, 4-Methyl	-	-	-	-	G	-	-	-	E
Perchloroethylene	D	D	D	C	D	D	D	E	G
Perchloric Acid	G	G	G	D	E	E	G	E	E
Permachlor (Degreasing fluid)	-	-	-	D	-	-	-	-	C
Petrolatum	D	D	D	E	E	C	D	E	E
Petroleum, Crude	D	D	D	E	G	D	D	E	E
Petroleum Ether (Naphtha)	D	D	D	E	E	D	D	E	E
Petroleum Oils	D	D	D	E	E	C	D	E	E
Phenol	C	C	G	D	C	C	C	E	E
Phenolates (di-nitrols)	D	-	-	D	D	-	-	-	G
Phenols (di-nitrols)	E	-	-	D	G	-	-	-	G
Phenolsulfonic Acid	D	D	C	D	C	D	C	E	G
Phenyl Chloride	D	D	D	D	D	D	D	E	E
Phenyl Ethyl Ether	D	-	D	D	D	-	-	-	C
Phenylhydrazine	C	D	G	D	D	C	C	E	E
Phorone	D	D	E	D	D	D	G	C	E
Phosphate Esters	D	D	E	D	D	D	E	C	E
Phosphoric Acid, 10%	E	E	E	E	E	E	E	E	E
Phosphoric Acid, 10-85%	C	C	E	C	G	E	E	E	E
Phosphorous Trichloride	D	D	E	D	D	D	E	E	E
Pickling Solution	C	C	C	C	C	C	C	G	E
Picric Acid, Molten	C	C	C	C	C	G	C	C	-
Picric Acid, Water Soln.	E	C	E	G	G	E	G	C	E
Pinene	D	D	D	E	D	D	D	E	E
Pine Oil	D	D	D	C	C	D	D	G	E

CHEMICAL	Natural Rubber	Buna-S (SBR)	Butyl	Nitrile (Hycar, Buna-N)	Neoprene	Hypalon	EPDM	Viton	Teflon
Piperidine	D	D	D	D	D	D	D	D	G
Pitch	D	D	D	G	G	C	D	C	E
Plating Solutions, Chrome	D	D	E	G	G	C	E	E	E
Plating Solutions, Others	E	E	E	G	G	C	E	G	E
Polyvinyl Acetate Emulsion (PVA)	C	C	E	C	G	G	E	C	E
Polyethylene Glycol	E	E	E	E	E	E	E	E	E
Polypropylene Glycol	E	E	E	E	E	E	E	E	E
Potassium Acetate	D	D	E	D	D	D	G	D	E
Potassium Bicarbonate	E	E	E	E	E	E	E	E	E
Potassium Bisulfate	E	E	E	E	E	E	E	E	E
Potassium Bisulfite	E	E	E	E	E	E	E	E	E
Potassium Borate	E	-	E	E	E	E	-	-	E
Potassium Bromide	E	-	E	E	E	E	-	-	E
Potassium Carbonate	E	E	E	E	E	E	E	E	E
Potassium Chlorate	E	-	E	E	E	E	-	-	E
Potassium Chloride	E	E	E	E	E	E	E	E	E
Potassium Chromate	D	D	E	D	C	C	G	E	G
Potassium Cyanide	E	E	E	E	E	E	E	E	E
Potassium Dichromate	D	D	E	D	G	C	G	E	E
Potassium Hydrate	E	G	E	G	G	G	E	C	E
Potassium Hydroxide	E	E	E	G	E	E	E	D	E
Potassium Iodide	-	-	E	-	E	-	-	-	E
Potassium Nitrate	E	E	E	E	E	E	E	E	E
Potassium Nitrite	-	-	E	-	E	-	-	-	E
Potassium Permanganate	D	D	E	D	D	D	E	E	E
Potassium Phosphate	-	-	E	-	E	-	-	-	E
Potassium Silicate	E	E	E	E	E	E	E	E	E
Potassium Sulfate	E	E	E	E	E	E	E	E	E
Potassium Sulfide	E	E	E	E	E	E	E	E	E
Potassium Sulfite	E	E	E	E	E	E	E	E	E
Potassium Thiosulphate	-	-	E	-	E	-	-	-	E
Producer Gas	D	D	D	E	G	G	D	E	E
Propanediol	E	E	E	E	G	E	E	E	E
Propyl Acetate	D	D	G	D	D	D	G	D	E
Propyl Alcohol (Propanol)	E	E	E	E	E	E	E	E	E
Propyl Aldehyde	C	D	G	D	D	D	G	D	E
Propyl Chloride	D	D	C	D	C	D	C	G	G
Propylene Diamine	G	G	E	G	G	C	G	C	E
Propylene Dichloride	D	D	D	D	D	D	D	G	G
Propylene Glycol	E	E	E	E	E	E	E	E	E
Pydraul Hydraulic Fluids	D	D	G	D	D	D	G	C	G
Pyranol	D	D	D	C	D	D	D	E	E
Pyridine	D	D	G	D	D	D	G	D	E
Pyroligneous Acid	C	C	G	C	G	G	G	E	E
Pyrrole	C	G	G	D	D	D	C	C	E
R									
Rape Seed Oil	D	D	E	G	G	G	G	E	G
Red Oil (Crude Oleic Acid)	D	D	G	G	G	G	G	E	E
Richfield A Weed Killer, 100%	D	D	D	D	D	D	D	C	G
Richfield A Weed Killer, 33%	D	D	G	G	G	C	D	C	G
Rosin Oil	D	D	D	E	E	G	D	E	E
Rotenone And Water	E	E	E	E	E	E	E	E	E
Rum	E	-	E	E	E	E	-	-	-
S									
Sal Ammoniac (Ammonium Chloride)	E	E	E	E	E	E	E	E	E
Salicylic Acid	E	G	E	D	D	E	E	E	E
Salt Water (Sea Water)	E	E	E	E	E	E	E	E	E
Secondary Butyl Alcohol	E	-	E	E	E	-	-	-	E
Sewage	C	C	C	E	G	E	G	E	E
Shell DD	D	-	D	D	D	-	-	-	C
Silicate of Soda (Sodium Silicate)	E	E	E	E	E	E	E	E	E
Silicate Esters	D	D	D	G	E	E	D	E	E
Silicone Greases	E	E	E	E	E	E	E	E	E
Silicone Oils	E	E	E	E	E	E	E	E	E
Silver Nitrate	E	E	E	E	E	E	E	E	E
Skelly Solvent	D	D	D	E	G	C	D	E	E
Skydrol Hydraulic Fluids	D	D	E	D	D	D	E	D	E
Soap Solutions	E	E	E	E	E	E	E	E	E
Soda Ash (Sodium Carbonate)	E	E	E	E	E	E	E	E	E
Soda, Caustic (Sodium Hydroxide)	E	G	E	G	E	E	E	D	E
Soda, Lime	E	G	E	G	G	G	E	C	E
Soda Niter (sodium Nitrate)	E	E	E	E	E	E	E	E	E
Sodium Acetate	D	D	E	D	D	D	G	D	E
Sodium Aluminate	E	E	E	E	E	E	E	E	E
Sodium Bicarbonate	E	E	E	E	E	E	E	E	E
Sodium Bisulfate	E	E	E	E	E	E	E	E	E
Sodium Bisulfite	E	E	E	E	E	E	E	E	E
Sodium Borate	E	E	E	E	E	E	E	E	E

LEGEND

- **E** Excellent. Suitable for continuous service.
- **G** Good. Generally suitable for continuous or intermittent service.
- **C** Conditional. Not recommended for continuous service, but generally suited for intermittent service.
- **D** Do not use.
- **-** No experience.

*Teflon is recommended where deionization levels are critical.

Chemical Resistance Data

CHEMICAL	Natural Rubber	Buna-S (SBR)	Butyl	Nitrile (Hycar, Buna-N)	Neoprene	Hypalon	EPDM	Viton	Teflon
Sodium Carbonate	E	E	E	E	E	E	E	E	E
Sodium Chloride	E	E	E	E	E	E	E	E	E
Sodium Chromate	D	D	E	D	C	C	G	C	G
Sodium Cyanide	E	E	E	E	E	E	E	E	E
Sodium Dichromate	D	D	E	D	C	C	G	C	E
Sodium Fluoride	E	E	E	E	E	E	E	E	E
Sodium Fluoroaluminate 10%	E	-	E	E	E	E	-	-	E
Sodium Hydroxide	E	G	E	G	E	E	E	D	E
Sodium Hypochloride	C	-	C	C	C	E	-	-	E
Sodium Hypochlorite	C	D	G	D	D	C	G	E	G
Sodium Iodide	-	-	E	-	E	-	-	-	E
Sodium Metaphosphate	E	E	E	E	G	G	E	E	E
Sodium Nitrate	E	E	E	E	E	E	E	E	E
Sodium Nitrite	E	E	E	E	E	E	E	E	E
Sodium Perborate	C	D	E	D	D	D	G	E	E
Sodium Peroxide	G	G	E	G	G	G	E	E	G
Sodium Phosphate	E	E	E	E	E	E	E	E	E
Sodium Salts	E	-	E	-	E	E	-	-	E
Sodium Silicate	E	E	E	E	E	E	E	E	E
Sodium Sulfate	E	E	E	E	E	E	E	E	E
Sodium Sulfide	E	E	E	E	E	E	E	E	E
Sodium Sulfite	E	E	E	E	E	E	E	E	E
Sodium Thiosulfate	E	E	E	E	E	E	E	E	E
Soybean Oil	D	D	G	G	G	G	G	E	E
Stannic Chloride	E	E	G	E	E	E	E	E	E
Stannic Sulfide	E	E	E	E	E	E	E	E	E
Stannous Chloride	E	E	E	E	E	E	E	E	E
Stannous Sulfide	E	E	E	E	E	E	E	E	E
Stearic Acid	D	D	G	E	G	G	C	E	E
Stoddards Solvent	D	D	D	E	C	D	D	E	E
Styrene	D	D	D	D	D	D	D	G	E
Sugar Solutions (Sucrose) (Non F.D.A.)	E	E	E	E	E	E	E	E	E
Sulfamic Acid	C	C	E	G	G	G	E	E	E
Sulfite Liquors	G	G	E	G	G	E	G	E	E
Sulfonic Acid	D	D	D	D	C	C	D	D	G
Sulfur (Molten)	D	D	G	C	C	C	C	E	-
Sulfur Chloride	D	D	D	D	D	G	D	E	G
Sulfur Dioxide	C	C	G	D	G	G	C	E	E
Sulfur Hexafluoride	E	E	E	E	E	E	E	E	E
Sulfur Trioxide	D	D	G	D	D	D	C	E	G
Sulfuric Acid, 25%	G	G	G	G	E	E	G	E	E
Sulfuric Acid, 25-50%	G	D	E	D	C	E	G	E	E
Sulfuric Acid, 50-96%	D	D	C	D	C	G	G	E	E
Sulfuric Acid, Fuming	D	D	D	D	D	D	D	D	G
Sulfurous Acid	G	C	G	C	G	E	G	E	E
T									
Tall Oil	D	D	D	C	G	G	D	E	E
Tallow	D	D	D	E	E	D	D	E	E
Tannic Acid	E	G	E	C	G	G	E	E	E
Tanning Liquors (alum./dichromate)	-	-	C	E	E	G	-	-	E
Tar	D	D	D	G	G	D	D	E	-
Tartaric Acid	E	E	E	E	G	E	E	E	E
Terpineol	D	D	C	D	D	D	C	E	-
Tertiary Butyl Alcohol	E	E	E	E	E	E	E	E	E
p-Tertiary Butyl Catechol	C	-	E	D	E	-	-	-	E
Tertiary Butyl Mercaptan	D	-	D	D	D	-	-	-	E
Tetrachlorobenzene	D	D	D	D	D	D	D	G	G
Tetrachloroethane	D	D	D	D	D	D	D	E	G
Tetrachloroethylene	D	D	D	D	D	D	D	E	G
Tetraethylene Glycol	E	E	E	E	E	E	E	E	E
Tetrachloromethane	D	D	D	C	D	D	D	E	G
Tetrachloronapthalene	D	D	D	D	D	D	D	G	G
Tetraethyl Lead	D	D	D	G	C	D	D	E	E
Tetrahydrofuran (THF)	D	D	D	D	D	D	D	D	E
Tetralin	D	-	D	D	D	D	-	-	E
Thionnyl Chloride	D	D	D	D	D	D	D	G	E
Tin Chloride	E	E	E	E	E	E	E	E	E
Tin Tetrachloride	E	E	E	E	E	E	E	E	E
Titanium Tetrachloride	D	D	D	G	C	C	C	E	E
Toluene (Toluol)	D	D	D	D	D	D	D	E	E
Toluene Diisocyanate (TDI)	C	C	E	C	D	D	E	G	E

CHEMICAL	Natural Rubber	Buna-S (SBR)	Butyl	Nitrile (Hycar, Buna-N)	Neoprene	Hypalon	EPDM	Viton	Teflon
Toxaphene	D	D	D	G	G	D	D	E	E
Transformer Oils (Petroleum Base)	D	D	D	E	G	G	D	E	E
Transformer Oils (Chlorinated Phenyl Base Askereis)	D	D	D	D	D	D	D	E	-
Transmission Fluids,A	D	D	D	G	C	D	D	E	E
Transmission Fluids,B	D	D	D	C	D	D	D	E	E
Triacetin	E	G	E	G	G	G	E	D	E
Tributoxy Ethyl Phosphate	G	-	C	D	C	-	-	-	C
Tributyl Amine	G	G	E	G	G	C	E	D	E
Tributyl Phosphate	D	D	G	D	D	D	G	D	E
Trichloroacetic Acid 10%	C	-	C	G	C	-	-	-	G
Trichlorobenzene	D	D	D	D	D	D	D	G	G
Trichloroethane	D	D	D	D	D	D	D	E	E
Trichloroethylene	D	D	D	C	D	D	D	E	G
Trichloropropane	D	D	D	D	D	D	D	E	E
Tricresyl Phosphate (TCP)	D	D	E	D	D	D	G	G	E
Triethanolamine (TEA)	G	G	E	G	E	E	G	D	E
Triethylamine	G	G	G	G	E	E	G	G	E
Triethylborane	-	-	-	-	-	-	-	-	E
Triethylene Glycol	E	E	E	E	E	E	E	E	E
Trinitrotoluene (TNT)	D	D	D	D	G	G	D	G	-
Triphenyl Phosphate	D	D	E	D	C	C	G	C	E
Trisodium Phosphate	E	E	E	E	E	E	E	E	E
Tung Oil	D	D	C	E	G	G	D	E	E
Turbine Oil	D	D	D	G	G	G	D	E	E
Turpentine	D	D	D	G	G	D	D	E	E
2,4D With 10% Fuel Oil	D	D	D	E	E	D	D	E	E
U									
Ucon Hydrolube Oils	D	D	E	E	G	D	E	E	E
(UDMH) Unsymmetrical Dimethyl-Hydrazine	D	D	E	D	D	E	E	D	C
Undecanol	E	E	E	E	E	E	E	G	E
Uran	G	C	G	G	G	E	G	C	E
Urea	E	C	E	C	E	C	E	C	E
V									
Varnish	D	D	D	G	G	C	D	E	E
Vegetable Oils	D	D	E	E	G	G	E	E	E
Versilube	E	E	E	E	E	E	E	E	E
Vinegar	E	C	E	C	E	E	G	G	E
Vinyl Acetate	D	D	E	D	D	C	C	D	G
Vinyl Benzene	D	D	D	D	D	D	D	E	G
Vinyl Chloride (Monomer)	C	D	D	D	D	D	D	E	E
Vinyl Ether	D	D	D	D	D	C	C	D	E
Vinyl Toluene	D	D	D	D	D	D	D	E	G
Vinyl Trichloride	D	D	D	D	D	D	D	E	E
V.M. & P.Naptha	D	D	D	E	E	D	D	E	E
W									
Walnut Oil	D	-	C	E	G	-	-	-	E
Water, Fresh (Non F.D.A)	E	E	E	E	E	E	E	E	E
Water, Salt	E	E	E	G	E	E	E	E	E
White Liquor	E	E	G	E	E	E	C	E	E
White Oil	D	D	D	E	G	D	D	E	E
Whiskey and Wines	E	-	E	E	E	E	-	-	E
Wood Alcohol (Methanol)	E	E	E	E	E	E	E	D	E
Wool Oil	G	-	D	E	E	-	-	-	E
X									
Xylene (Xylol)	D	D	D	D	D	D	D	E	E
Xylidine	D	D	D	D	D	D	D	C	G
Z									
Zeolites	E	E	E	E	E	E	E	E	E
Zinc Acetate	C	D	E	C	C	C	G	D	E
Zinc Carbonate	E	E	E	E	E	E	E	E	E
Zinc Chloride	E	E	E	E	E	E	G	E	E
Zinc Chromate	E	C	E	E	E	C	E	E	G
Zinc Sulfate	E	E	E	E	E	E	E	E	E

LEGEND

- **E** Excellent. Suitable for continuous service.
- **G** Good. Generally suitable for continuous or intermittent service.
- **C** Conditional. Not recommended for continuous service, but generally suited for intermittent service.
- **D** Do not use.
- **-** No experience.

*Teflon is recommended where deionization levels are critical.

MEGA FLEXON

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