RUBBER EXPANSION JOINTS

高质量制造  橡胶膨胀节
CO-OPERATION AT ITS BEST

For pipe construction, you will need compensators – to absorb thermal expansion, to reduce vibration and noise. Our “ERV” rubber expansion joints have reliably performed these tasks since 1956. Due to premium quality and fast worldwide delivery service our expansion joints have become the industry standard. This brochure shows the co-operation of CONTITECH and ELAFLEX, gives an overview of technical features and helps to choose the right product for your needs.
Our guiding principle – ContiTech.
Engineering Next Level

As a driver and inspiration for new, cutting-edge technologies and an expert in materials and processes, we at ContiTech remain circumspect and considered as we take things to the Next Level – in every respect. We keep a close eye on changes and trends in society and technology so we can adapt appropriately to provide market-focused solutions for the benefit of our customers and of people around the world. As an innovation leader in natural rubber and plastic products, we are a major driving force behind the future viability of our partners – thanks to our wealth of expertise in materials and processes, which we have gathered over the decades. We are quick to offer the markets the solutions they need – always aiming for the top in quality, speed and service.

Expansion Joints / Rubber Bellows

The expansion joint business of ContiTech belongs to the CT Air Spring Systems company. Expansion joints and air springs are rubber bellow products with textile reinforcement. The design is similar to a bias ply tire. Expansion joints are parts of piping systems for fluid media. Air springs are pneumatic elements for the suspension of machines, cars and trucks.

Types
12 different rubber qualities

Sizes
DN 32 - DN 1000 mm, various lengths

Operating Pressure
PN 10-25 bar, depending on size and type

Temperature Range
-40 °C to +130 °C, depending on rubber quality
ELAFLEX –

Elaflex is a specialist company in safe connections for refuelling and pipe equipment. Since 1923 we stand for values which are typical of a family owned company: the spirit of innovation, reliability, continuity and flexibility in thought and action.

Since the 1960s, ERV rubber expansion joints (co-developed with ContiTech) are an important part of our product portfolio. Between both companies the work is divided. ContiTech takes care about the rubber bellows production side – made in Germany, while Elaflex is responsible for all other tasks.

We are a committed partner to our customers who count on quality engineered and durable products. Chosing ERV expansion joints is a sound investment both in terms of performance and total cost of ownership.

EXPERIENCE YOU CAN RELY ON

Service can be defined by facts such as professional technical advice, reliability, up-to-date online product information or fair handling of claims. Service also means the ability to supply a major part of our product range ex works with short lead times. Our large 4500 m² warehouse and a 1350 m² workshop helps for an efficient delivery capability. More than 25,000 bellows, plus a large number of flanges and accessories are permanently available ex stock.

According to your specification, we supply the assembled product. Our modular system, developed over the years, is important both for efficiency and for safe assembling. Bellows, flanges and accessories always come from one source only and to the latest industry standards. Our operational procedures also translate into better service. An up-to-date warehouse management system helps for good inventory accuracy and confirmation of readiness for delivery to the customer. The ‘pick by voice’ and barcode-assisted stock management minimizes the possibility of incorrect deliveries and speeds up the delivery process.
WHAT ARE RUBBER EXPANSION JOINTS?

Rubber Expansion Joints are flexible connectors for the construction of pipe systems. They relieve system strain by reducing vibration and noise and compensate static or dynamic movements caused by thermal change, load stress, pumping surges and construction setting. They also compensate assembly inaccuracies (misalignment during installation) and can be used as pipe insert pieces to facilitate inspections.

Compared to metal expansion joints...
- rubber expansion joints have no fatigue failure due to too high number of vibrancy cycles,
- show no stress corrosion (flexibility),
- have a better resistance against many media and outer influence,
- have a high shock strength,
- are easier to install & service in narrow spaces
- have superior vibration and noise reduction properties.

Metal expansion joints are usually used when operating temperature or working pressure exceed the limits of rubber expansion joints.
WHY YOU SHOULD CHOOSE THE BEST: ERV.

CONTI / ELAFLEX where the first to introduce the ‘ERV’ type in the year 1956. ERV expansion joints are moulded single sphere type rubber bellows with swiveling metal flanges. Their construction and lengths (installation sizes) have become internationally recognised standard.

Premium products like ERV have their price. This is not a luxury surcharge – in the long run it will pay off for the user.

On the opposite page you can see a list the ERV Quality Facts, a number of arguments to favour our expansion joints compared to other brands.

Elaflex/ContiTech claim that, for the major part of applications, ERV have the lowest Total Cost of Ownership. For a defined period (e.g. 15 years), all direct and indirect costs for a product application with expansion joints are determined and added. Cost factors include initial product price, shipping, indirect acquisition expenses, effort for installation, maintenance, regular checks, mean time to failure, downtime after failure, replacement costs etc.

To put it simple, ERV have a higher initial product price than some competition products, but as they prove to have a superiour lifetime and their use bears less risk of costly plant downtimes, they are trustworthy components for engineers and purchasers who think and calculate in long terms.

Optimal Shape and Construction of the Bellows
- Large axial, lateral and angular range of allowable movement, no double sphere necessary
- Low reaction forces and low inherent resistance
- Optimal dampening properties: the major part of the piping’s structure-borne noise and the low-frequency noise generated by fluids is eliminated, vibration is prevented from being transmitted
- Very suitable to absorb vibrations caused by engines, turbines or compressors

Experience and Know How
- Applications since 1956
- Useful division of labour and competence: expertise by ContiTech, one of the leading international rubber product manufacturers, joined with Elaflex know-how regarding flanges, accessories, assembling, certification, testing and distribution
- Consistent production source and methods, staff and product range ensures a consistent quality

Customer Focus
- Large warehouse of bellows (> 25,000 bellows permanent stock) and flanges/accessories ensure short lead times for standard types
- Technical service: professional advice, documentation, testing certification (audited to European Pressure Equipment Directive)
- Online ERV configurator http://erv-configurator.elaflex.de helps to find and visualize the required product in a few seconds
- Local support in China by ELAFLEX and ContiTech representatives

Warranty
- Minimum warranty period of 24 months
- Reliable, consistent quality results in a claim rate of less than 0.1 % (of which the major part is damaged due to wrong installation and not by production failures)
- Each examination is free of charge, not depending on the result

Easy Installation
- Swiveling flanges and smooth bolt holes make assembling easy
- The highly flexible bellows eases installation in problematic locations

Superior Life Time
- HiTech rubber compounds from ContiTech
- Physical properties of compounds and reinforcements are optimised for each bellows type: elongation at break, ozone and UV resistance, cold flexibility, tensile strength, volumetric extension etc.
- Permanent 24/7 testing of raw material properties – before and during production
- Rubberized reinforcements for superior adhesion of all layers
- Integrated sealing surface with wire core
- Made in Germany, Elaflex/ContiTech quality philosopy
- High operational safety, 1:4 safety factor regarding burst pressure

Large Product Range
- Variety of 13 different types, sizes 1” – 40” (DN 25 – 1000 mm), various lengths and a vast choice of flange type / material and accessories

The Bellows
- ERV fulfill a number of safety standards and are approved for various different applications – for examples please turn to page 19
- International quality reference for some applications, e.g. ERV-G for tank trucks, ERV-R for drinking water, ROTEX for heating systems, ERV-OR for LP Gas
- Some unique products such as ERV-GS (ship engine room type approved), VITEX (FPM liner), ERV-G LT (low temperature down to -40° C), and ERV-G HNBR (large application range, temperature, abrasion & fire resistant)
- Efficient due to standardised bellows lengths

Flanges
- Clear modular system – flanges match with all bellows
- Certified materials, EN 10204-3.1
- Many types with stabilising rim
- Marked with size, standard, material, manufacturer
- Cr(Vi)-free corrosion protection for steel flanges long-lasting and environmentally friendly

Certificates
- Various ERV types are certified for civil and Navy ship construction, drinking water, foodstuffs, heating and gas supply installations
ASSEMBLING & WORKFLOW ELAFLEX

TESTING & QUALITY CONTROL ELAFLEX
REFERENCE LIST - CHINA
for ERV Rubber Expansion Joints

Alfa Laval China Ltd.
Ansteel
BAIC Saab, Beijing
Baoshan Iron & Steel Co. Ltd.
Baosteel
Baotou Steel
Bayer Shanghai
Beijing Hyundai Motor Co. Beijing
BMW Brilliance Shenyang
Chery Dalian
China National Aviation Fuel Corp.
Eaton Fluid Power
FAW-VW Changchun
GAC-FIAT Changsha
Garlock Sealing Technologies
Guangdong Nuclear Power Jointventure Co., Ltd.
Halo Building Materials
Lingao Nuclear Power Station
Luxe Machinery
Mansrich Ltd.
Mawei Shipyard
Nanjing Chenguang
Proco International
SGM Yantai
Shanghai Chengfei
Shanghai Fenghe Industrial Co.
Shanghai GM Norsom, Shenyang
Shanghai Pudong
Shanghai Sungsan Mech. & Elec. Technology Co. Ltd.
Shanxi Victory Group, Changzhi
Shenhua Shendong Coal Group
Suzhou Novartis Pharma Technology
SVW Shanghai, Ningbo
SVW Yizheng
Weihai Guangtai Airport Equipment
Zhenjiang CME
Xiamen Jolac Petrochemical Equipment
### OVERVIEW: OUR PRODUCT RANGE

<table>
<thead>
<tr>
<th>Type</th>
<th>Liner</th>
<th>Key Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water and Waste Water</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERV-R</td>
<td>Butyl (IR)/EPDM</td>
<td>With drinking water approval</td>
</tr>
<tr>
<td>ROTEX</td>
<td>EPDM</td>
<td>TÜV approved for heating systems</td>
</tr>
<tr>
<td>ERV-CR</td>
<td>CR</td>
<td>The economical option</td>
</tr>
<tr>
<td>ERP</td>
<td>Butyl (IR)/EPDM</td>
<td>Extra flexible</td>
</tr>
<tr>
<td><strong>Petroleum Based Products, Liquified Petroleum Gas</strong></td>
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<tr>
<td>ERV-G</td>
<td>NBR</td>
<td>For tank trucks, refineries and petrol stations</td>
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<tr>
<td>ERV-GS</td>
<td>NBR</td>
<td>Fire resistant for 30 minutes at 800°C</td>
</tr>
<tr>
<td>ERV-GS HNBR</td>
<td>HNBR</td>
<td>For extremely demanding conditions: -35°C to 120°C</td>
</tr>
<tr>
<td>ERV-G LT</td>
<td>NBR</td>
<td>For low temperatures up to -40°C</td>
</tr>
<tr>
<td>ERV-OR</td>
<td>NBR</td>
<td>For LPG and other gases up to 25 bar</td>
</tr>
<tr>
<td><strong>Chemistry and Foodstuff</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERV-GR</td>
<td>CSM</td>
<td>For aggressive acids, lyes and chemicals</td>
</tr>
<tr>
<td>VITEX</td>
<td>FPM</td>
<td>For media with more than 50% aromatics, Biodiesel etc.</td>
</tr>
<tr>
<td>ERV-W</td>
<td>NBR light grey</td>
<td>Confirming to foodstuff standards</td>
</tr>
<tr>
<td>ERV-TA</td>
<td>PTFE</td>
<td>Extensive chemical resistance, FDA conform</td>
</tr>
<tr>
<td><strong>Flanges, Accessories and Hints</strong></td>
<td></td>
<td></td>
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<tr>
<td>ZS/ZSS RG</td>
<td>Flanges</td>
<td>DIN, ASA, SAE, BS, VG, TW, JIS</td>
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<td>SR TA/TAS VSD/VSR VSRV</td>
<td>Accessories</td>
<td>Tie rods, axial and angular limiters</td>
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<tr>
<td></td>
<td></td>
<td>Inner protective sleeves, PTFE linings, PTFE vacuum support rings</td>
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<tr>
<td></td>
<td></td>
<td>Vacuum support spinals, -support rings</td>
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<tr>
<td></td>
<td></td>
<td>Flame protection covers</td>
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</tbody>
</table>

### Accessories
- With additional PTFE as limiters (ERV..TA)
- With tie rods as limiters (ERV..ZS)
- With inner protection sleeve of stainless steel, e.g. for granulates (ERV..SP)
- With vacuum support spiral (ERV..VSS) or ring (ERV..VSR)
- Flame protection cover (FSH)

### Types and Key Features

- **ERV-R**: Butyl (IR)/EPDM, with drinking water approval.
- **ROTEX**: EPDM, TÜV approved for heating systems.
- **ERV-CR**: CR, the economical option.
- **ERV-G**: Butyl (IR)/EPDM, extra flexible.
- **ERV-GS**: EPDM, TÜV approved for heating systems.
- **ERV-R**: Butyl (IR)/EPDM, with drinking water approval.
- **ERV-CR**: CR, the economical option.
- **ERV-G**: NBR, for tank trucks, refineries and petrol stations.
- **ERV-GS**: NBR, fire resistant for 30 minutes at 800°C.
- **ERV-GS HNBR**: HNBR, for extremely demanding conditions: -35°C to 120°C.
- **ERV-G LT**: NBR, for low temperatures up to -40°C.
- **ERV-OR**: NBR, for LPG and other gases up to 25 bar.
- **ERV-GR**: CSM, for aggressive acids, lyes and chemicals.
- **VITEX**: FPM, for media with more than 50% aromatics, Biodiesel etc.
- **ERV-W**: NBR light grey, confirming to foodstuff standards.
- **ERV-G LT**: NBR, for low temperatures up to -40°C.
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### CHECKLIST FOR EXPANSION JOINTS

If you are not sure about the required type, execution and flange material, going through this checklist helps us to quote according to your needs.

1. **Medium**
   - Chemical composition
   - Gaseous, liquid, paste-like
   - Abrasion by solid particles expected

2. **Operation conditions**
   - Minimum / maximum temperature
   - Max. pressure / peaks / load changes
   - Vacuum possible
   - Axial range of movement (elongation / compression)
   - Angular load
   - Lateral offset

3. **Installation Site**
   - Indoor or outdoor installation
   - Exposure to sunlight (UV)
   - Salt-containing atmosphere

4. **Testing and Certification**
   - Material certificates or testing required

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### CERTIFICATES

<table>
<thead>
<tr>
<th></th>
<th>ERV-GS</th>
<th>ERV-GS HENR</th>
<th>ERV-G</th>
<th>ERV-R</th>
<th>ROTEX</th>
<th>ERV-CR</th>
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PDF of certificates can be downloaded under [www.elaflex.de/english/certificates/erv](http://www.elaflex.de/english/certificates/erv)
ERV CONFIGURATOR

Fast and efficient: The online ERV Configurator [http://ervconfigurator.elaflex.de](http://ervconfigurator.elaflex.de) helps to combine bellows, flange and accessories in all sizes, for a direct enquiry.

1. choose bellows type
2. size DN + length
3. flange standard + material
4. other flange side
5. special flange form
6. accessories
7. direct enquiry if required
8. save as PDF if required
Bellows manufactured by
ContiTech Luftfedersysteme GmbH
Philipsbornstrasse 1
30165 Hannover, Germany
Tel. +49 511 938 599 02
Internet www.contitech.de

Assembly and international distribution by
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