

kompaflex ag




Tailor-made Bellows and Expansion Joints
for fusion reactors, cryogenics and high vacuum applications

About kompaflex

kompaflex is a world class supplier of tailor-made expansion joints and bellows for high vacuum applications. With over 40 years of experience, kompaflex is a specialist in the advanced design and individual manufacturing of expansion joints for critical applications.

Founded in 1981 in Switzerland, where our headquarters are located, kompaflex is a family-owned and run company. The manufacturing facility in the Czech Republic was established in 1995, further enhancing our capabilities.

With manufacturing facilities in Switzerland and the Czech Republic, as well as an established specialized representatives and sales network, we meet the demand of our clients worldwide.

kompaflex specializes in tailor-made expansion joints designed to customer needs.

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Manufacturing in
 **Switzerland and**
 **Czech Republic**



Vacuum-tight welding technology

TIG and microplasma welding are the most commonly-used procedures at kompaflex. All of our welders have the required training and experience to weld vacuum-tight.

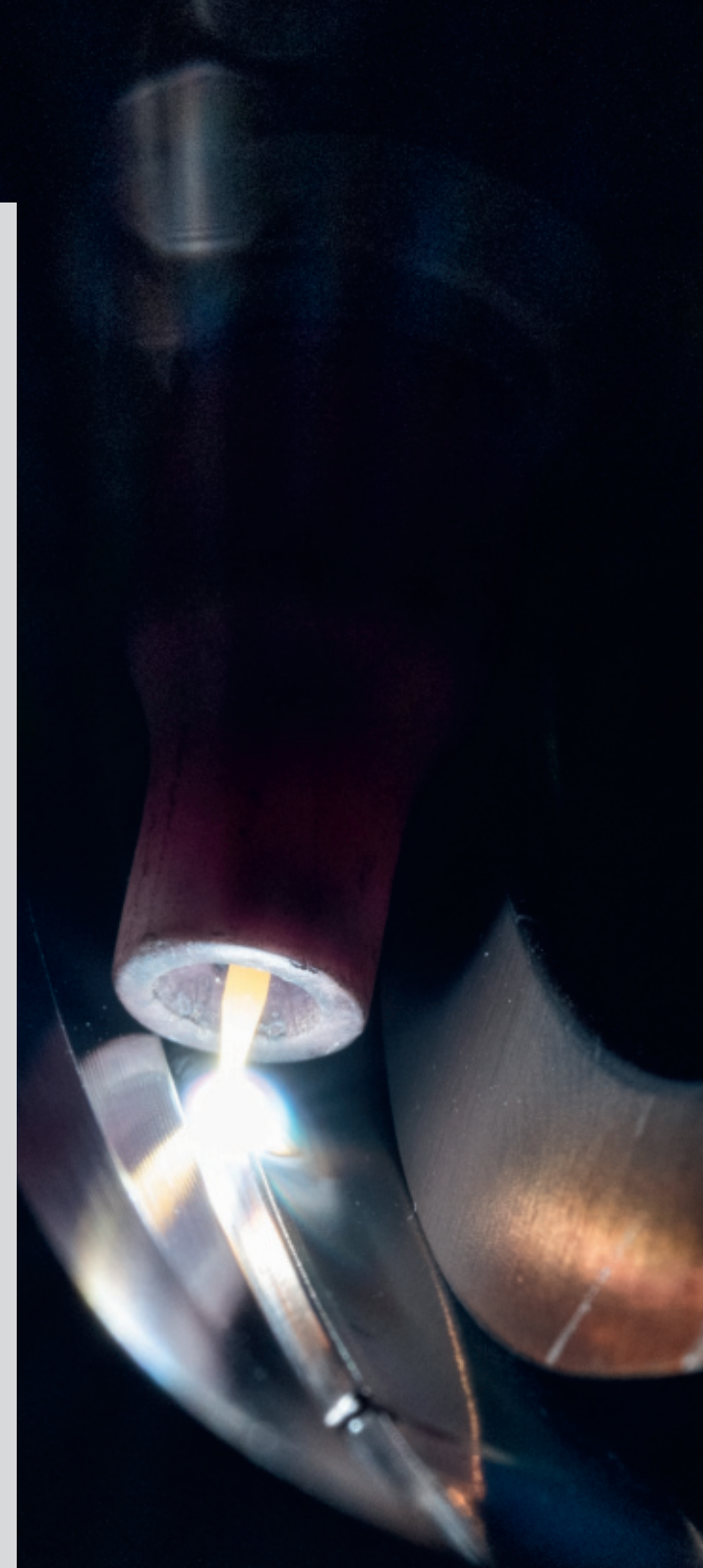
Strict production processes and modern cleaning procedures guarantee clean surfaces to meet the requirements of the vacuum technology entirely.

Welding seam tightness is especially important in the high and ultra-high vacuum range.

At kompaflex, we achieve helium leak rates of up to $<1 \cdot 10^{-11} \text{Pa} \cdot \text{m}^3/\text{s}$.

Welding competencies:

- ✓ UHV tight welding seams according to specified leak rates
- ✓ Certified welders and procedures (EN, ASME, etc.)
- ✓ TIG welding
- ✓ Microplasma welding
- ✓ Welding without any gaps
- ✓ Manufacturing in a pressurised clean room



High vacuum technology

kompaflex is highly experienced in tailor-made bellows, expansion joints and vacuum chambers for critical applications. Our expansion joints are widely used in renowned research institutes and facilities.

We offer expansion joints for:

- ✓ Nuclear power plants
- ✓ Particle accelerators
- ✓ Fusion reactors (Tokamaks and Stellarators)
- ✓ Cryogenic facilities and cryostats
- ✓ Vacuum chambers

Our intensive cooperation with world renowned research institutes offers the following advantages to our customers:

- ✓ Continuous growth and development of our specific know-how
- ✓ Modern and proven technology in various applications
- ✓ Highly advanced testing facilities for materials/bellows and leak testing

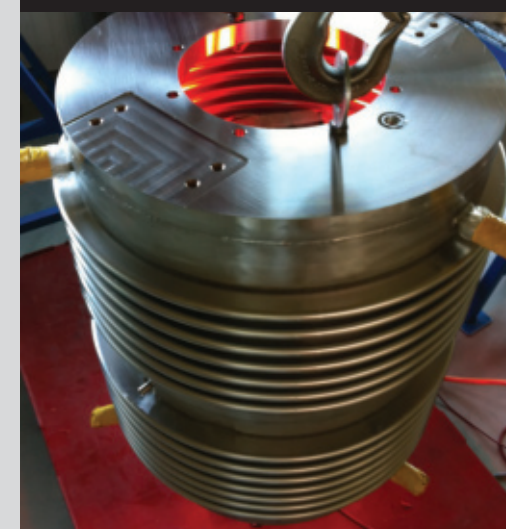
We are specialized in:

- ✓ All sizes, temperatures, pressures and materials
- ✓ Special shapes like oval, elliptical and rectangular
- ✓ Helium leak testing facility, wet and dry
- ✓ Highly specified leak rates
- ✓ Cleanliness and ultrasonic cleaning
- ✓ Movements with very high operational reliability

VCR connection for permanent bellows leak monitoring



Bake out of universal bellows for a fusion reactor



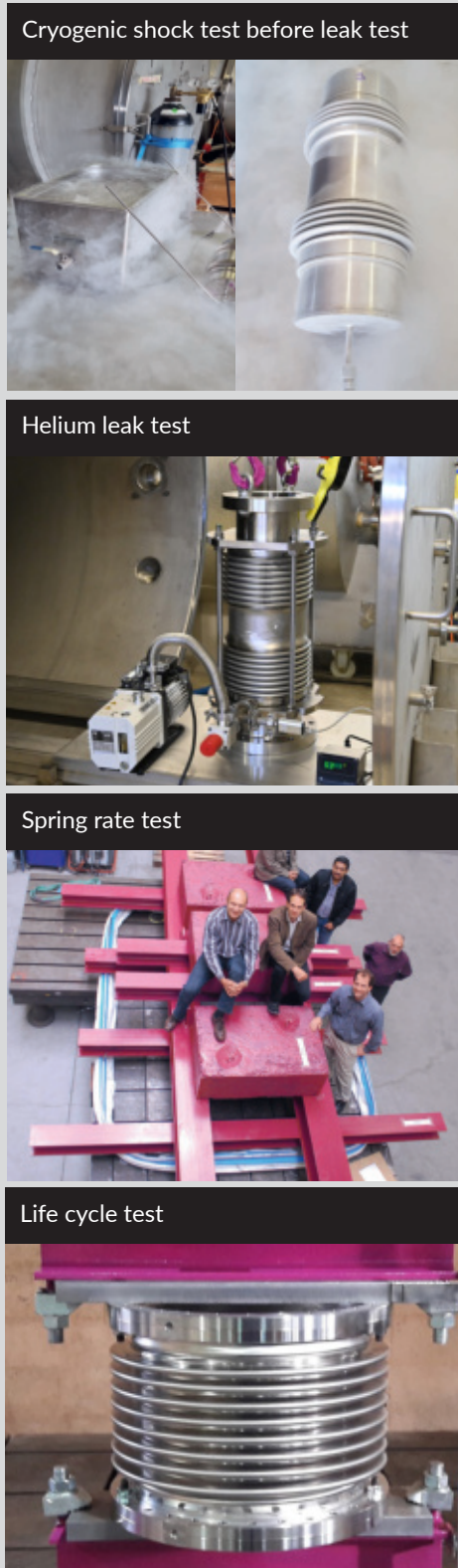
Quality and Testing

To guarantee flawless quality, we conduct extensive tests and inspections before, during and after the production.

Furthermore, we have our own test facilities staffed with certified personnel, capable of conducting helium leak tests in accordance with LT ISO/EN Level II and ASTM Level III standards.

In-house test facilities

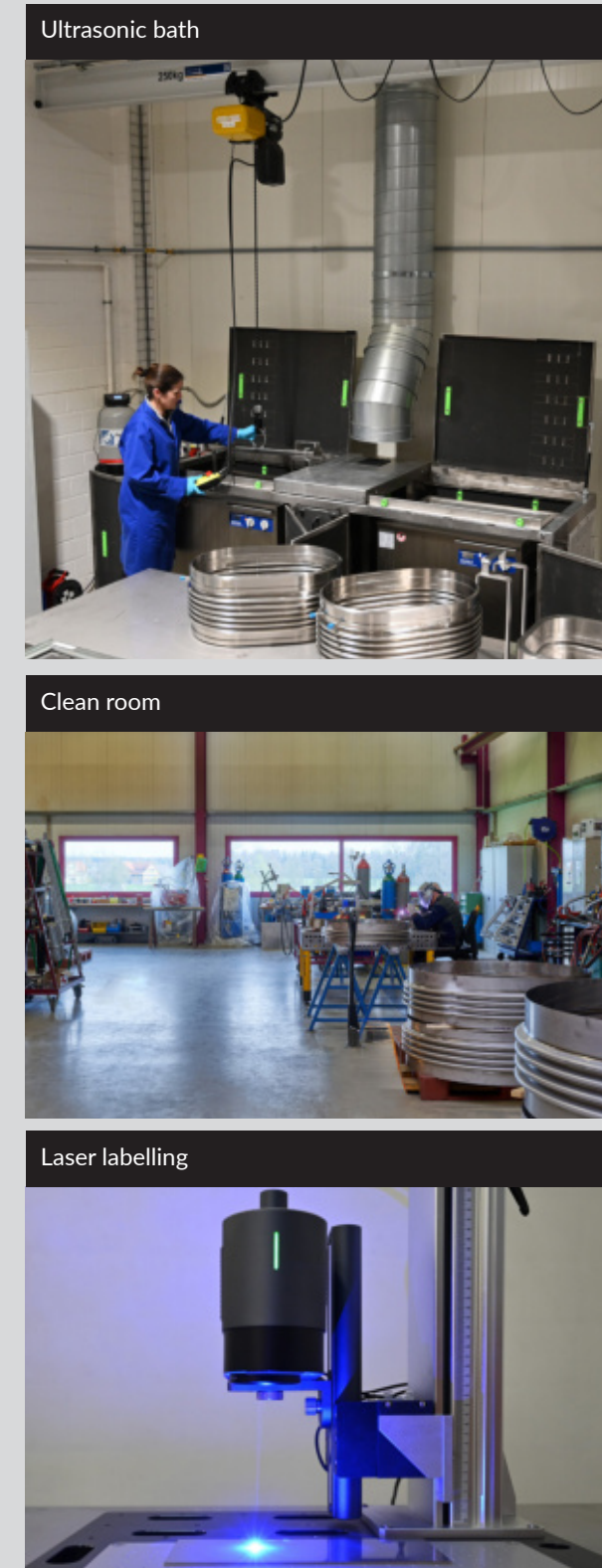
- ✓ Digital Radiography (X-ray)
- ✓ Ultrasonic Testing
- ✓ Penetrant Testing
- ✓ Magnetic Particle Inspection
- ✓ Bubble Leak Testing
- ✓ Vacuum Stability Testing
- ✓ Helium Leak Testing
(eg. EN1779 methods A2, A3)
- ✓ Vacuum chambers for testing
(eg. EN1779 methods A1/B3/B5/B6)
- ✓ Hydrostatic Pressure Testing
- ✓ Pneumatic Pressure Testing
- ✓ Positive Material Identification
- ✓ Spring Rate Testing
- ✓ Pressure tests up to 700 bar
- ✓ Life Cycle Testing
- ✓ Geometric Movement Testing



Cleaning and Packaging

kompaflex has a dedicated manufacturing area for special projects that require specific cleanliness specifications. The 3.2t crane allows the handling of also large expansion joints. A constant overpressure, specialized building materials and strict regulations ensure that we consistently meet our customer's high requirements and quality standards.

The new laser labelling technology enables us to meet various customer specifications with precision and accuracy. We utilize advanced ultrasonic cleaning technology in our ultrasonic bath. After the cleaning process, each expansion joint is carefully inspected to ensure it meets our stringent quality standards. To protect the components, they can be individually packaged in plastic bags filled with nitrogen. This not only safeguards them against external contaminants but also ensures they arrive at our customers in perfect condition.





Vacuum and heated chambers for advanced helium leak tests

kompaflex own advanced helium leak test facilities consisting of various chambers:

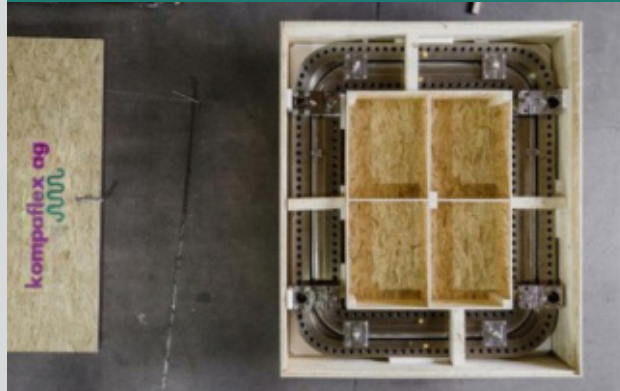
- ✓ Large heatable test chamber, inner length 3200 mm, inner diameter 1690 mm
- ✓ Large vacuum chamber with various connection possibilities inner length 4100 mm, inner diameter 1690 mm
- ✓ Further vacuum chambers in different sizes
- ✓ Leak test facilities wet and dry
- ✓ Various leak detectors featuring the latest technology
- ✓ UHV-Pumping benches incl. various pre-pumps
- ✓ Electronical recording devices

Contribution to ITER

IVC Feedthroughs bellows



Port plug multi-ply rectangular bellows
2318 x 1878 mm



Lower penetration bellows for the vacuum vessel



DN 150/200 double bellows for ITER Japan



TCWS bellow Even Port for UK AEA



Double walled expansion joints for
US ITER / ORNL



Further fusion projects

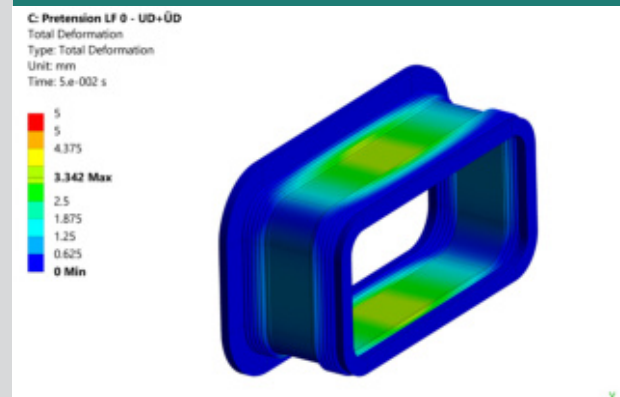
Multi-ply reinforced rectangular bellows for
Commonwealth Fusion, USA



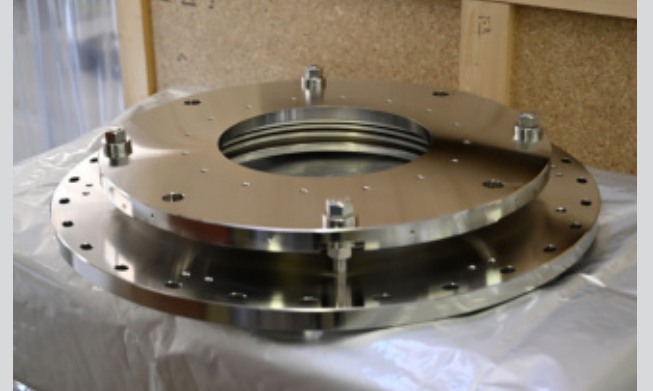
Single-ply expansion joints DN 200 for
Commonwealth Fusion, USA



FEM calculation multi-ply rectangular bellows



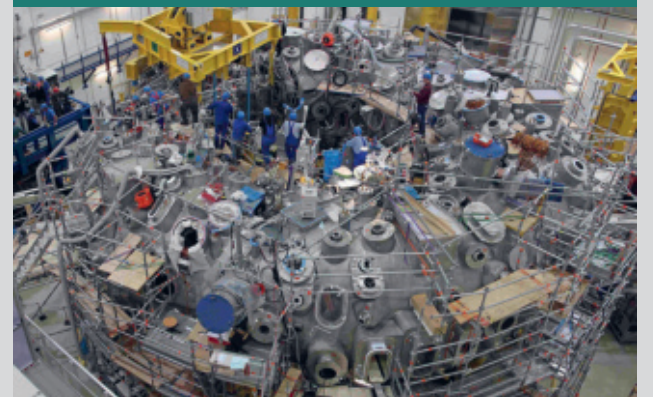
Expansion Joints DN 400 for Tri Alpha
Energy, USA



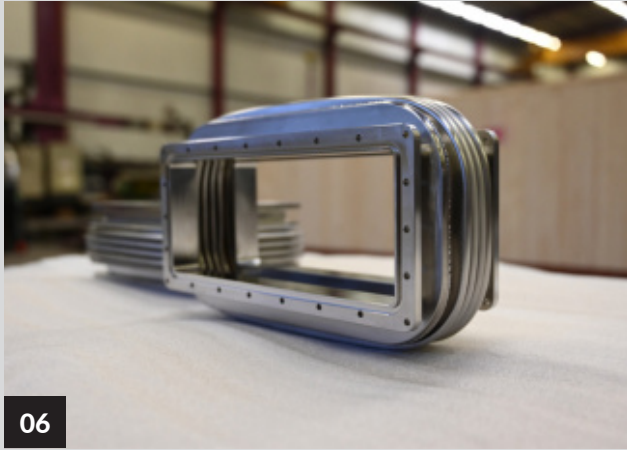
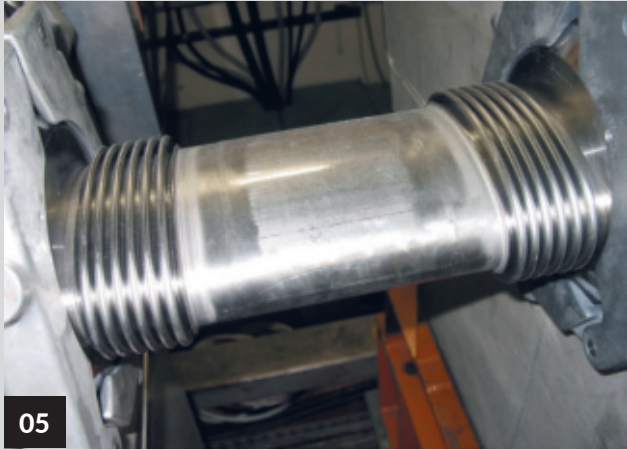
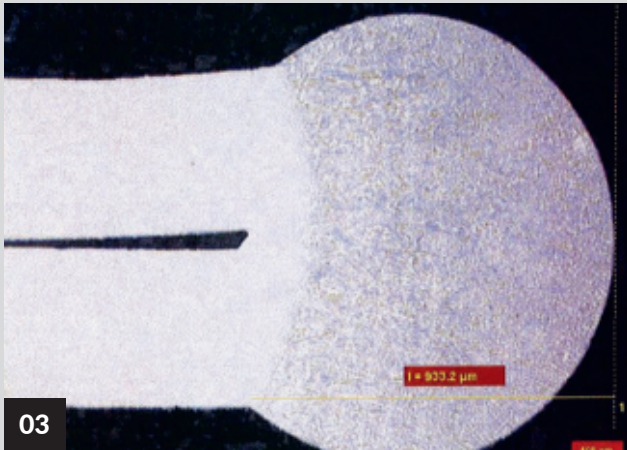
Expansion Joints in two different sizes for
Tri Alpha Energy, USA



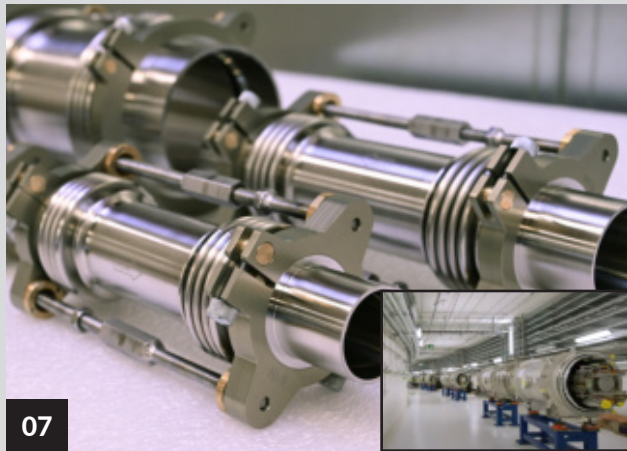
Oval, rectangular & circular multi-ply bellows
for the Wendelstein 7-X Stellarator, Germany



Success stories



UHV applications and accelerators



Nr.	Description
01	Cryolines bellows DN 16 - DN 109
02	Single-ply bellows with a special device for adjusting the bellows length in both directions
03	Micrograph of a lip weld under the microscope
04	Single-ply bellows for the HL-LHC collimators
05	Oval bellows installed at the beam track LHC Cern
06	Rectangular expansion joints to connect two massive vacuum chambers
07	GSI, FAIR accelerator, cryogenic lines for SIS100
08	Rectangular UHV multi-ply bellows 459/140 with reinforcement rings
09	Rectangular multi-ply expansion joints for the High flux reactor, H1-H2 project
10	High vacuum chamber made in Inconel X750 or 625, UHV tight 1*10 ⁻⁹ mbar*l/s (A1)




kompaflex is the trusted partner of:



Contributing to the advancement of key future technologies





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