BOA Group

Globalny biznes, lokalny partner, zespół ekspertów dla Ciebie, w zakresie kompensatorów dedykowanych dla przemysłu chemicznego

Helmut Novak

Sales Manager, industrial processes and equipment

Your Flexible Solutions Partner

Historical milestones

- **1872:** Founding of the “Patronenhülsenfabrik” Henry Ehrmann &Cie

- **1894**: Patent for “Flexible Metal Tubes with Folds”

- **1961**:Development of hydraulic bellows forming

- **1982:** Development of and patents for “Decoupling Joints”
- **1989/90:** Reorganization & acquisition of various expansion
- joint -and metal hose manufacturers in Europe and the USA.

- **2002:** Cooperation with FAMAS

- **2007:** Start of production at our BOA Shanghai various
- **2011:** Acquisition of Flexial , USA
- 2012: Renamed to **BOA GROUP**

Global presence

Flexial
USA – Cookeville (TN)

American BOA /
USA – Cumming (GA)

Tubest /
F – Fère-en-Tardenois

BOA NL /
NL - Tillburg

BOA Polska
Famas / PL - Lodz

BOA Metallschlauch /
D - Ditfurt

Local representative

BOA SBT
CN / Shanghai

SFZ / F –

Chassieu

BOA AG / CH - Rothenburg

BOA BKT / D - Stutensee

Dinatecnica /
BR – Embu

Dinatecnica /
AR – Buenos Aires

Competence centre for petrochermical applications

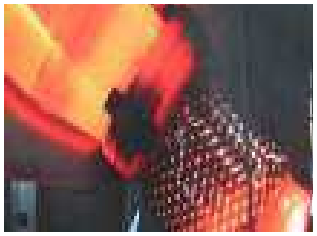
Global lead centre

Design, Manufacture and Supply :

1. Metal bellows expansion joints
2. Metal flexible hoses
3. Rubber expansion joints
4. Precision and instrument bellows
5. Decoupling systems
6. Flexible tubing

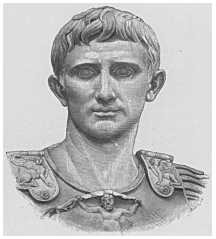
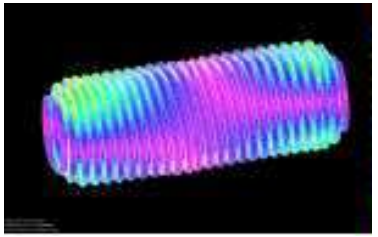






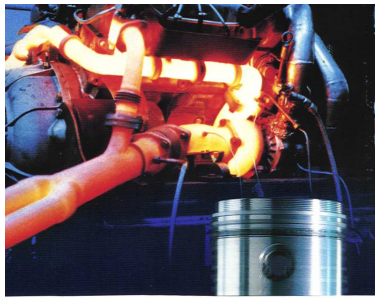

Engineering and Services :

1. Pipe stress analysis (i.e. Caesar II FEM)
2. Validation
3. Installation supervision
4. Inspection
5. Repairs and Clamshell installations


Divisions & Market-focus

Automotive Div.

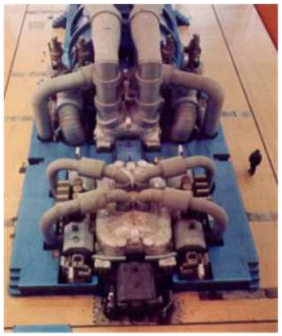


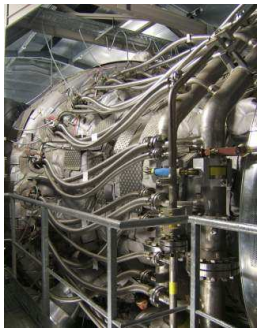
Industrial Div.

Energy

Transportation

Industrial processes





The SFZ Quality System (Manual) is certified to meet:

- ISO 9001-2008
  - PED 97/23/EG
    - ASME „U“Stamp
      - AD 2000 HP0

SFZ Memberships include:

- Euroqualiflex
  - EJMA

Customer recommendations & majo clients

SFZ/ BOA are recommended by UOP

SFZ S.A.S
8, rue des Freres Lumiere
F-69680 Chassieu, Lyon, France
Phone: (49)-7244-99-0, Fax: (49)-7244-99-232
www.boagroup.com

UOP
A Honeywell Company

UOP LLC • 25 East Algonquin Road • Des Plaines, Illinois 60017-5017 • Tel: 847.391.2000 • Fax: 847.391.2253

FCC Expansion Joint Suppliers
September 28, 2009

Expansion Joint suppliers must have the capability to design, fabricate, and deliver FCC Expansion Joints in accordance to the UOP Project specifications. The following reference of suppliers is intended only to serve as a listing of suppliers who have successfully complied with UOP Specifications and have demonstrated the capability to manufacture reliable equipment in the past. This list is not exclusive, and the products from an Owner-preferred supplier that can satisfy the design and functional requirements of the UOP design specification will be acceptable.

KE-Burgmann-EJS
10035 Prospect Avenue, Suite 202
Santee, California 92071, USA
Phone: (619)-562-6083, Fax: (619)-562-0636
www.ejsus.com

Flexider Spa
10156 Torino, Italy
Corso Romania 501/24
Phone:(39)-1126-27-462, Fax:(39)-1126-20-904
www.flexider.com

SFZ S.A.S
8, rue des Freres Lumiere
F-69680 Chassieu, Lyon, France
Phone: (49)-7244-99-0, Fax: (49)-7244-99-232
www.boagroup.com

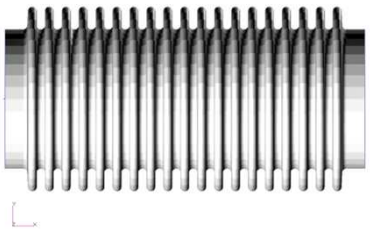
Senior Flexonics Pathway
2400 Longhorn Industrial Drive
New Braunfels, Texas 78130, USA
Phone: (830)-629-8080, Fax: (830)-629-0068
www.mvej.com

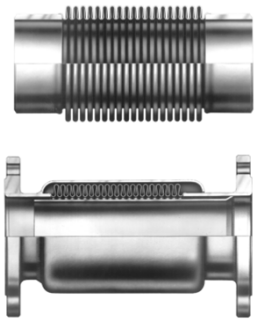
SFZ /BOA is a preferred supplier for:

Total (Leuna)
BP (Gelsenkirchen)
PCK (Schwedt)
FPC (Mailiau)
QP (Messaieed)

Movement compensation in 1 plane

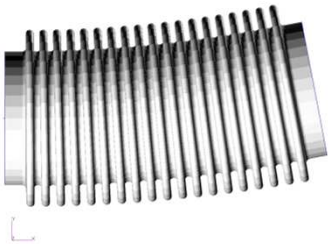
Axial movement

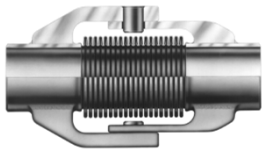




Axial Expansion joints

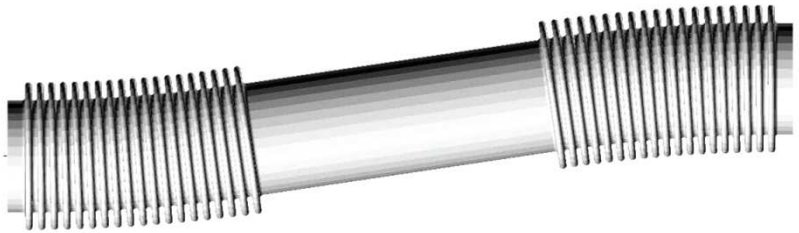
Angular rotation

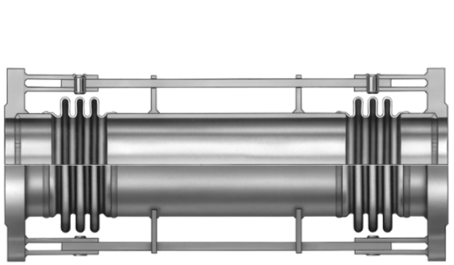




Angular / Single Hinged Ex.J

Lateral movement

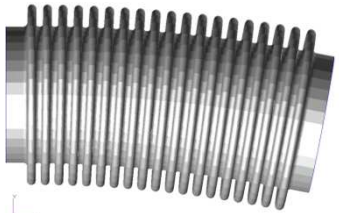


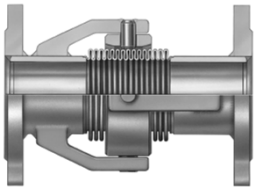


Lateral / Double Hinged Ex.J

Movement compensation in 2 planes

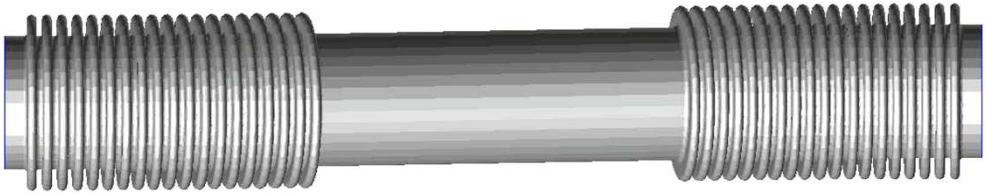
Cardanic rotation

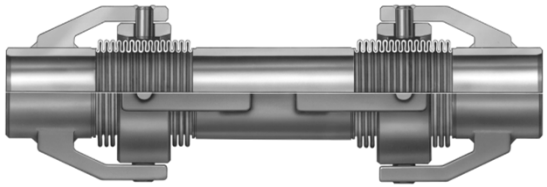




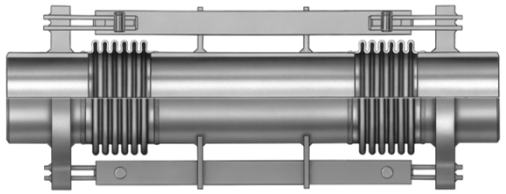
Gimbals Ex.J.

Universal



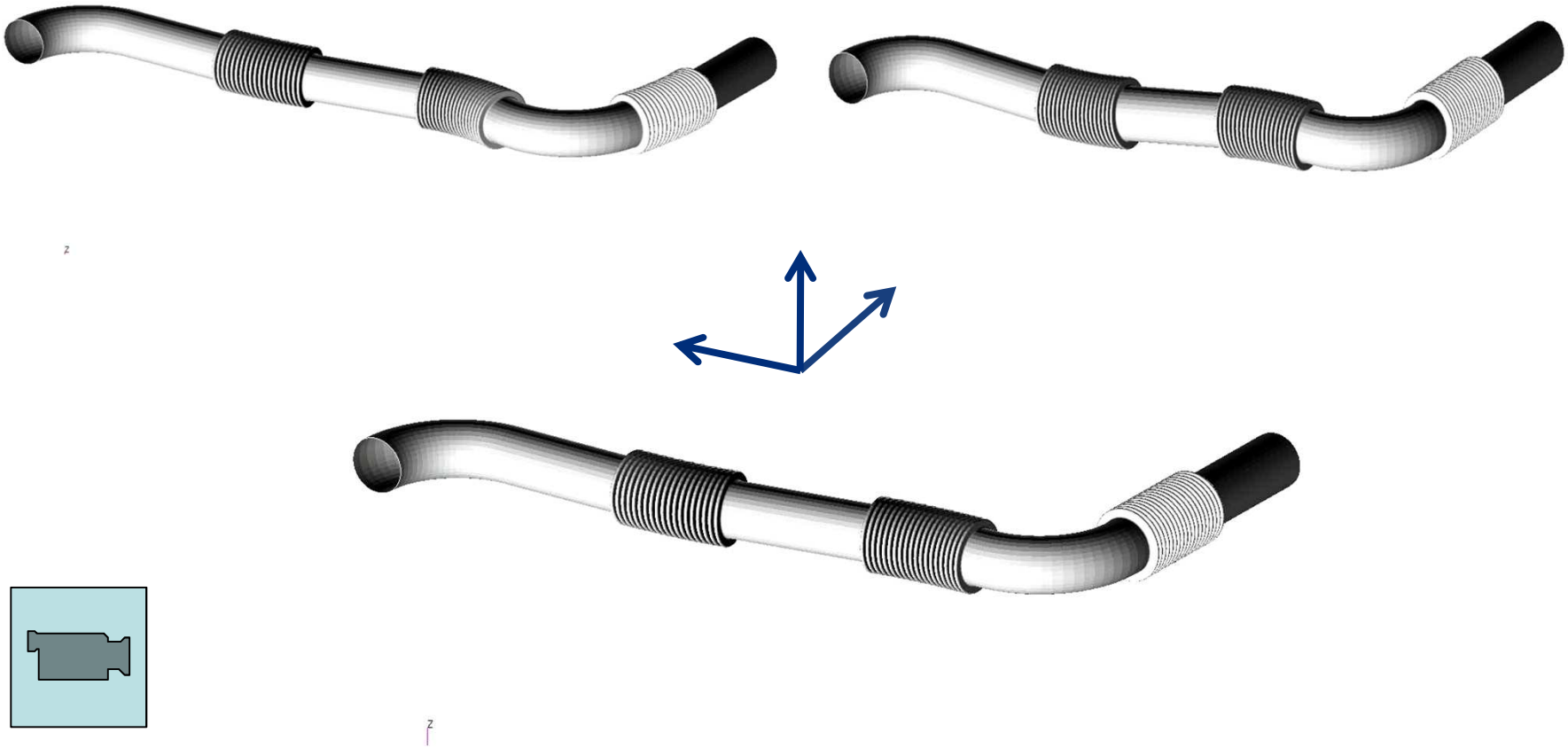


Double Gimbals Ex.J.



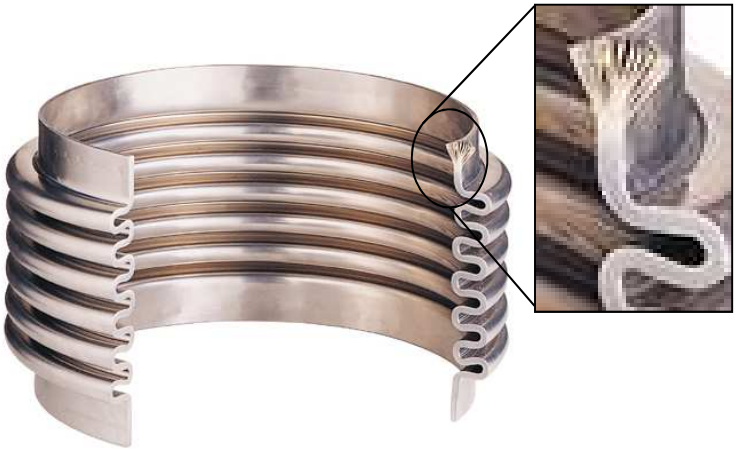
Universal Ex.J.

Movement compensation in 3 planes (typical expansion joint system)



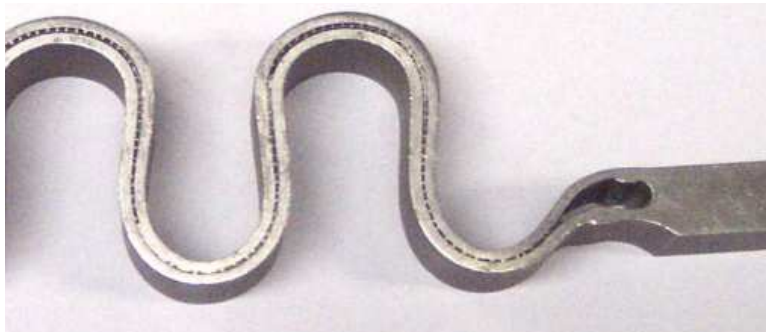
Metal Bellow -Profiles

Single ply “U” shaped



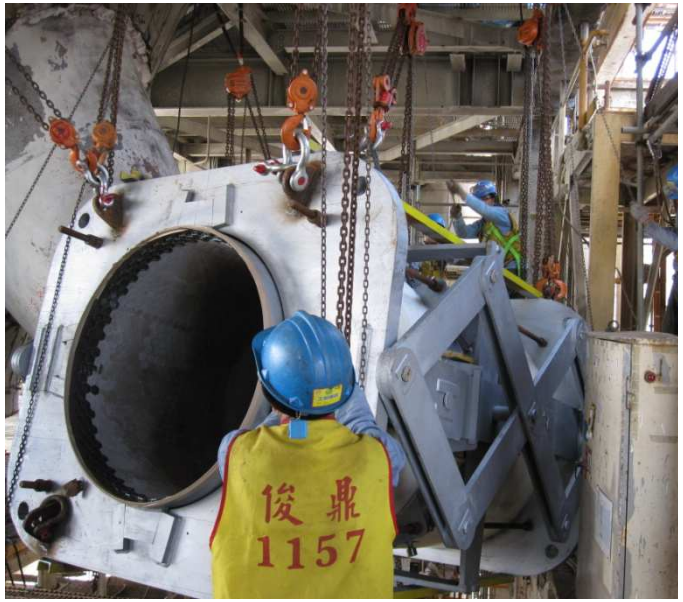
Multy ply “U” shaped

Single ply toroid-(Omega) shaped

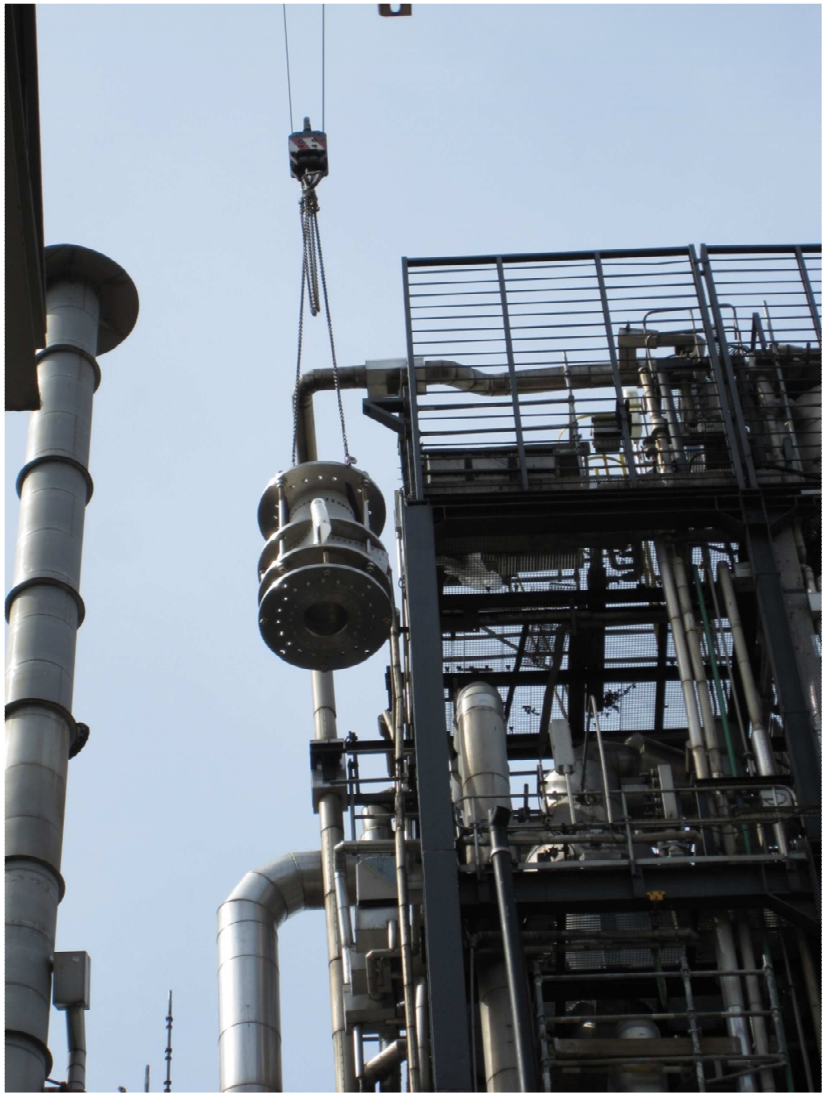


2 – ply testable

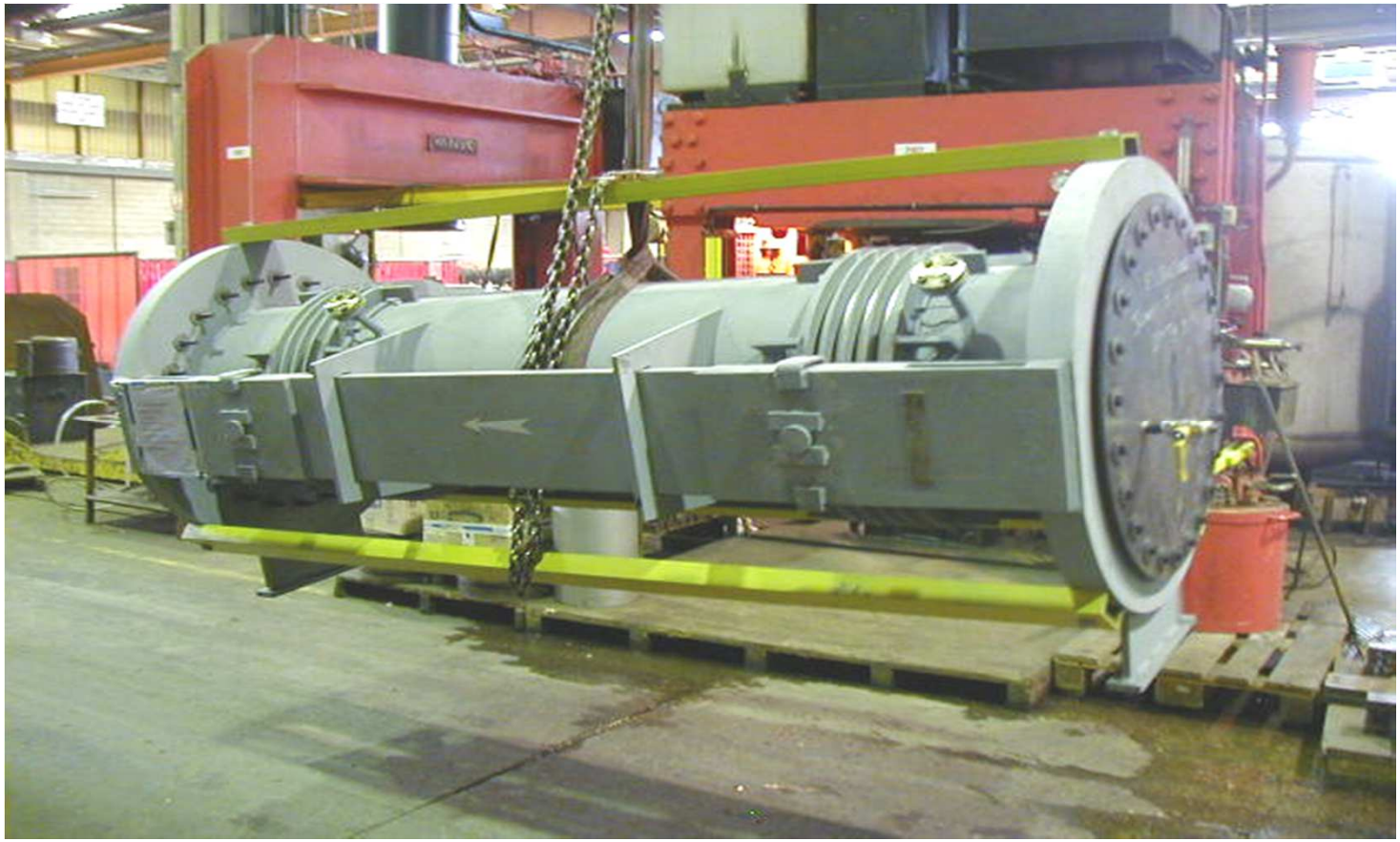
Oil refineries
i.e.
Catalytic Crackers



Petrochemical plants
i.e.
Melamine Plant

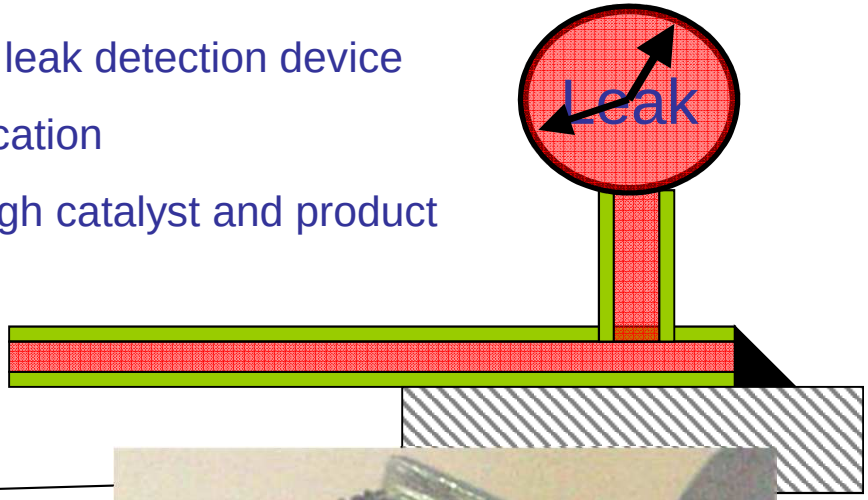


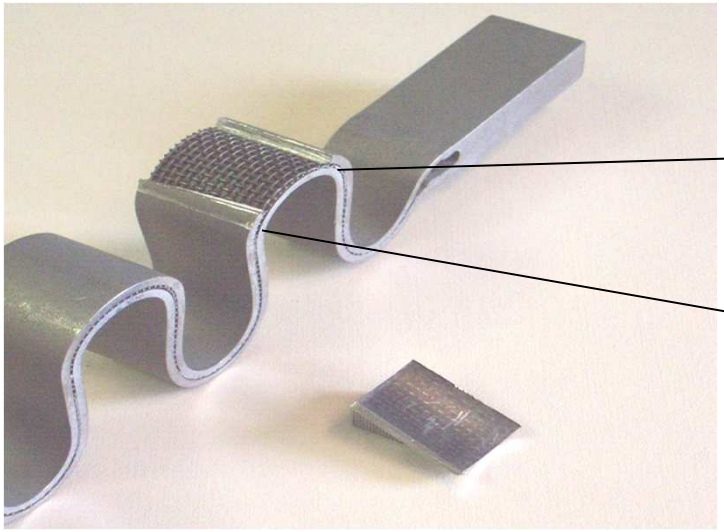
Petrochemical plants
i.e.
HDPE Plants

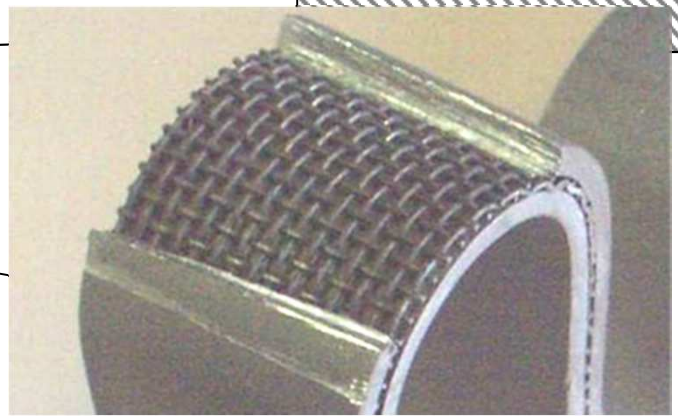


Leak monitoring

- Each ply is designed for design conditions
- Wire mesh provides free flow-path from leak to leak detection device
- Wire mesh ensures quick and reliable leak indication
- Wire mesh eliminates the risk of plugging through catalyst and product
- **Allows maximum time to planning**







Leak monitoring

Temperature monitoring

- Recommended for critical Standpipe* and Flue-gas Expansion Joints
- Permanent recording of BST to identify hot or cold spots
- **Optional** used to actuate heating blankets to avoid dew point condensation.

Heating coils

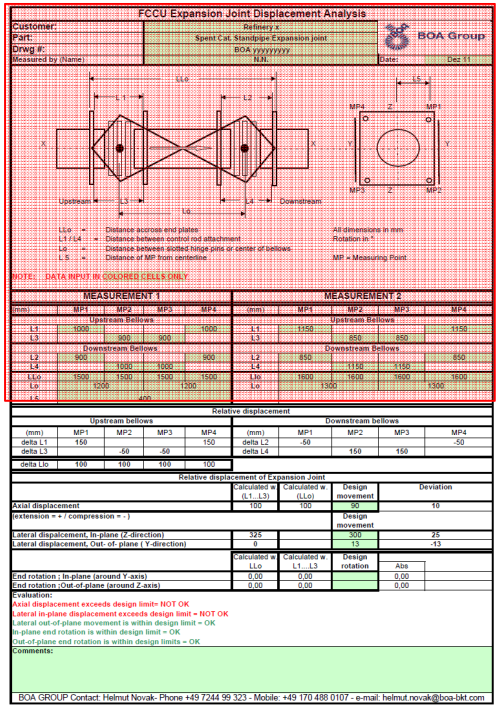
Thermocouple wiring

Junction box

Control panel

* Except Spent Catalyst Ex.J

Movement monitoring


FCCU Expansion Joint Displacement Analysis

Customer: Refinery x
Part: Spent Cat. Standpipe Expansion joint
Drwg #: BOA yyyyyyyyy
Measured by (Name): N.N.
Date: Dez 11

LLo = Distance accross end plates
L1 / L4 = Distance between control rod attachment
Lo = Distance between slotted hinge pins or center of bellows
L 5 = Distance of MP from centerline

All dimensions in mm
Rotation in °
MP = Measuring Point

NOTE: DATA INPUT IN COLORED CELLS ONLY

MEASUREMENT 1

(mm)	MP1	MP2	MP3	MP4
Upstream Bellows				
L1	1000			1000
L3		900	900	
Downstream Bellows				
L2	900			900
L4		1000	1000	
LLo	1500	1500	1500	1500
Lo	1200		1200	
L5	400			

MEASUREMENT 2

(mm)	MP1	MP2	MP3	MP4
Upstream Bellows				
L1	1150			1150
L3		850	850	
Downstream Bellows				
L2	850			850
L4		1150	1150	
Llo	1600	1600	1600	1600
Lo	1300		1300	

Relative displacement

Upstream bellows (mm)	MP1	MP2	MP3	MP4	Downstream bellows (mm)	MP1	MP2	MP3	MP4
delta L1	150			150	delta L2	-50			-50
delta L3		-50	-50		delta L4		150	150	
delta Llo	100	100	100	100					

Relative displacement of Expansion Joint

	Calculated w. (L1 ; L3)	Calculated w. (LLo)	Design movement	Deviation
Axial displacement (extension = + / compression = -)	100	100	90	10
Lateral displacement, In-plane (Z-direction)	325		300	25
Lateral displacement, Out- of- plane (Y-direction)	0		13	-13

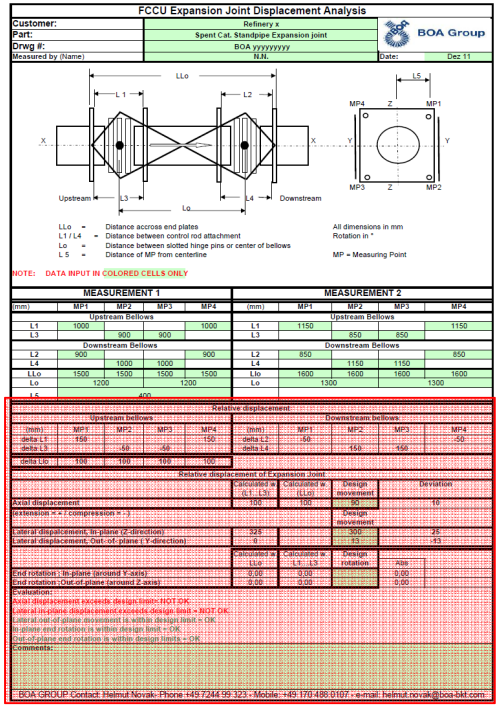
	Calculated w. LLo	Calculated w. L1 ; L3	Design rotation	Abs
End rotation ; In-plane (around Y-axis)	0,00	0,00		0,00
End rotation ;Out-of-plane (around Z-axis)	0,00	0,00		0,00

Evaluation:
Axial displacement exceeds design limit= NOT OK
Lateral in-plane displacement exceeds design limit = NOT OK
Lateral out-of-plane movement is within design limit = OK
In-plane end rotation is within design limit = OK
Out-of-plane end rotation is within design limits = OK

Comments:

BOA GROUP Contact: Helmut Novak- Phone +49 7244 99 323 - Mobile: +49 170 488 0107 - e-mail: helmut.novak@boa-bkt.com

Movement monitoring



FCCU Expansion Joint Displacement Analysis

Customer:	Refinery x
Part:	Spent Cat. Standpipe Expansion joint
Drwg #:	BOA yyyyyyyy
Measured by (Name)	N.N.
Date:	Dez 11

BOA Group

LLo = Distance accross end plates
L1 / L4 = Distance between control rod attachment
Lo = Distance between slotted hinge pins or center of bellows
L 5 = Distance of MP from centerline

All dimensions in mm
Rotation in °

MP = Measuring Point

NOTE: DATA INPUT IN COLORED CELLS ONLY

MEASUREMENT 1				
(mm)	MP1	MP2	MP3	MP4
Upstream Bellows				
L1	1000			1000
L3		900	900	
Downstream Bellows				
L2	900			900
L4		1000	1000	
LLo	1500	1500	1500	1500
Lo	1200			1200
L5		400		

MEASUREMENT 2				
(mm)	MP1	MP2	MP3	MP4
Upstream Bellows				
L1	1150			1150
L3		850	850	
Downstream Bellows				
L2	850			850
L4		1150	1150	
LLo	1600	1600	1600	1600
Lo	1300			1300

Relative displacement

Upstream bellows					Downstream bellows				
(mm)	MP1	MP2	MP3	MP4	(mm)	MP1	MP2	MP3	MP4
delta L1	150			150	delta L2	-50			-50
delta L3		-50	-50		delta L4		150	150	
delta Llo	100	100	100	100					

Relative displacement of Expansion Joint

	Calculated w. (L1...L3)	Calculated w. (LLo)	Design movement	Deviation
Axial displacement	100	100	90	10
(extension = + / compression = -)			Design movement	
Lateral dispalcement, In-plane (Z-direction)	325		300	25
Lateral displacement, Out- of- plane (Y-direction)	0		13	-13

	Calculated w. LLo	Calculated w. L1....L3	Design rotation	Abs
End rotation ; In-plane (around Y-axis)	0,00	0,00		0,00
End rotation ;Out-of-plane (around Z-axis)	0,00	0,00		0,00

Evaluation:

Axial displacement exceeds design limit= NOT OK

Lateral in-plane displacement exceeds design limit = NOT OK

Lateral out-of-plane movement is within design limit = OK

In-plane end rotation is within design limit = OK

Out-of-plane end rotation is within design limits = OK

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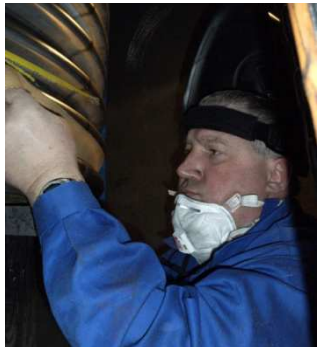
Field service

24/7 **Task Force** comprising of experienced engineers, inspectors, welders and boiler-makers are specialzed to perform:

- **Supervision and inspection of the initial installation (commissioning).**

- **Inspection of expansion joints on live plants or during plant turnaround.**



- **Repair and installation of clamshell – or FLEXBOX assemblies**

- **Failure analysis**

Thank you

شكرا

謝謝

Danke

Merci

Dziękuję

Kiitos

דאַנק

Grazie

Спасибо

Gracias