

Conventional Fossil Fired Boilers
 Fluidised Bed Boiler Cyclone Joint



On the down-comer from the cyclone on a fluidized bed boiler, there is an expansion joint to take the axial expansion of the duct.

The normal design is a standard fabric expansion joint, with upstands of the refractory lined duct.

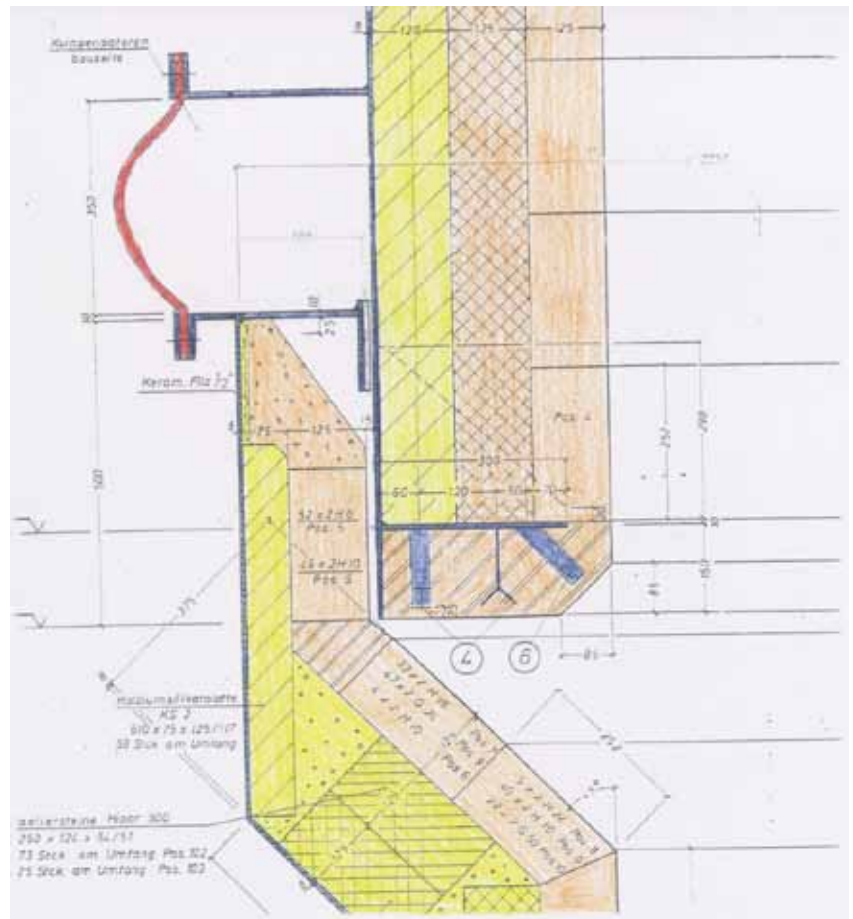
This system operates well for a short period of time, but due to high ash content in the duct, a seizing up of the joint cavity soon takes place. This blocking of the joint imposes large forces into the ducting causing cracking.

DEKOMTE have worked on an engineering solution which surpasses the lone function of the fabric component, and considers how to develop an envelope of space allowing movement of the duct.

The introduction of sealing air as part of the internal refractory and flow plate design, ensures space for the axial compression of the joint.

DEKOMTE have in service many joints which are functioning for over 10 years with no maintenance.

Original Solution at Ville Berrenrath installed by OEM





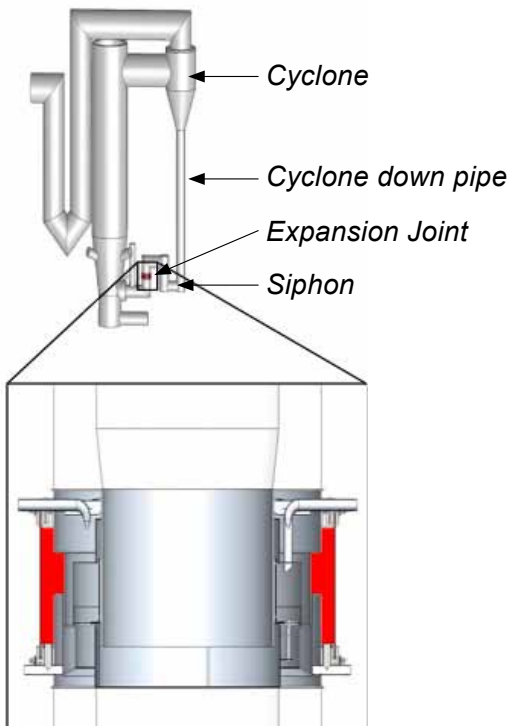
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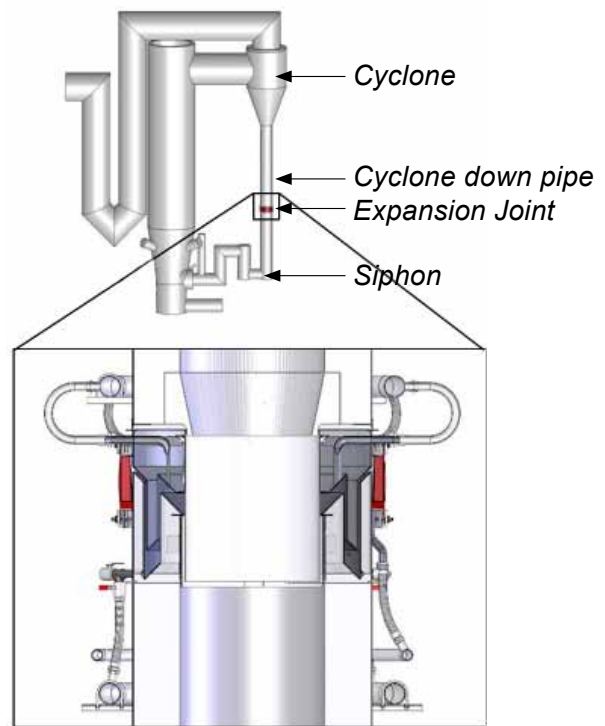
Mlada Boleslav / Sko-Energo

Position of Expansion Joint Installation
Element in Mlada Boleslav



Ville Berrenrath / RWE

Position of Expansion Joint Installation
Element in Ville Berrenrath





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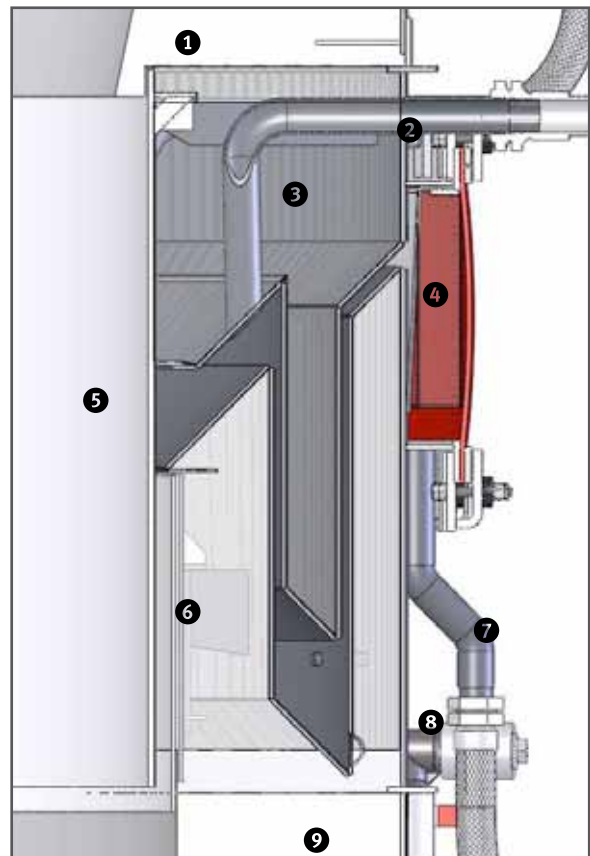
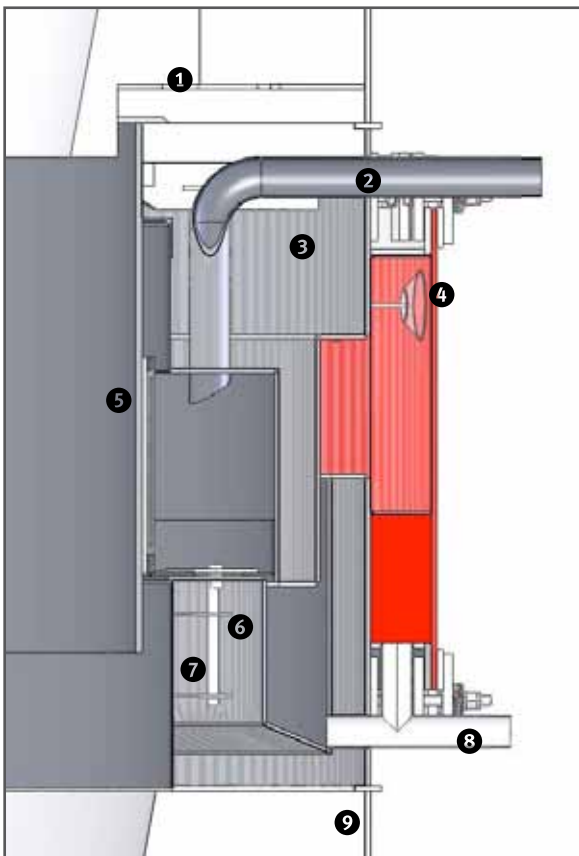


Inner construction: Mlada Boleslav

- 1 Refractory
- 2 Permanent sealing air
- 3 Inlet frame
- 4 Fabric expansion joint
- 5 Inner floating sleeve
- 6 Suspension of segmented floating sleeve
- 7 Segmented floating sleeve
- 8 Temporary extraction
- 9 Refractory

Inner construction: Ville Berrenrath

- 1 Refractory
- 2 Temporary sealing air
- 3 Inlet frame
- 4 Fabric expansion joint
- 5 Inner floating sleeve
- 6 Segmented floating sleeve
- 7 Permanent air supply for expansion joint bellow
- 8 Temporary extraction
- 9 Refractory



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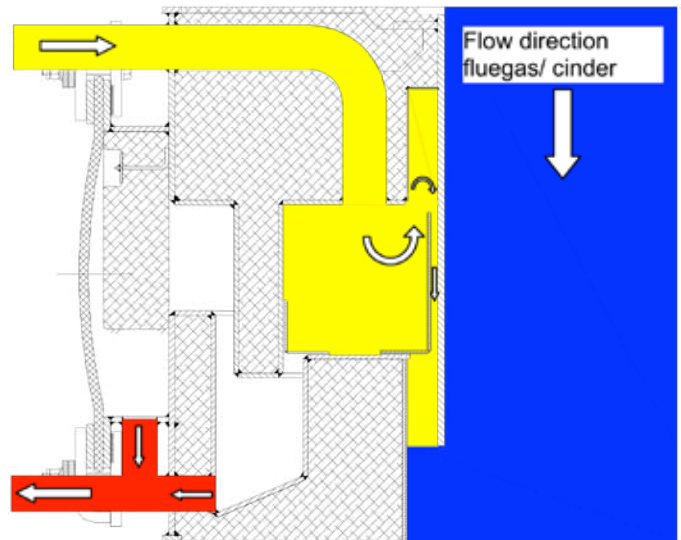
Expansion joint with aerodynamic ash barrier in Mlada Boleslav

Operating conditions:

Temperature in down pipe: 900°C
 movement: axial: 120mm (expansion)
 lateral: $\pm 20\text{mm}$

In operation since beginning of 2002

- Permanent sealing air (75mbar, $0,59\text{m}^3/\text{s}$)
- Temporary extraction ($0,59\text{m}^3/\text{s}$)
- Flue gas / Ash down pipe



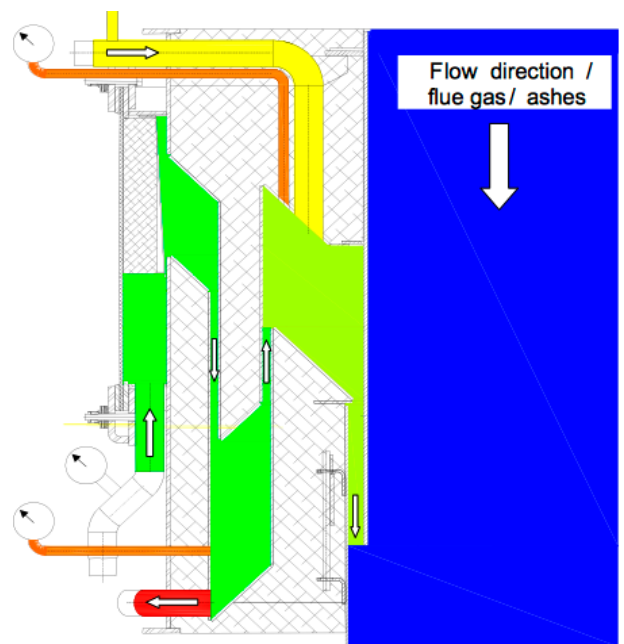
Expansion joint with aerodynamic ash barrier in Ville Berrenrath

Operating conditions:

Temperature in down pipe: 870°C
 movement: axial: 190mm (expansion)
 lateral: $\pm 10\text{mm}$

In operation since beginning of June 2006

- Permanent sealing air (40mbar, $0,1\text{m}^3/\text{s}$)
- Temporary sealing air (75mbar, $0,59\text{m}^3/\text{s}$)
- Temporary extraction ($0,59\text{m}^3/\text{s}$)
- Flue gas / Ash in down pipe
- Manometer connections





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Ville Berrenrath compared to Mlada Boleslav

Aerodynamic sealing through directed sealing air admission and guidance through defined annular gap.

Type Mlada Boleslav:

- single-level additional air admission:
 - permanent scavenging air

Type Ville/ Berrenrath:

- double-level additional air admission:
 - permanent scavenging air, minimised amount of scavenging air
 - temporary scavenging air

Installed DEKOMTE Solution Ville Berrenrath / RWE

DEKOMTE fabric expansion joint as a compensation element with aerodynamic ash barrier in a cyclone down pipe of a fluidized-bed boiler.





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Comparison EJ installation after operation

Mlada Boleslav

View from top to inner flow plate after 2 years in operation



Ville Berrenrath

View from bottom to inner flow plate and duct after ½ year in operation

