



CASE STORY

# FABRIC EXPANSION JOINTS FOR BIOMASS BOILER DUCTS

Client: Power plant, Sweden



For the Biomass boiler ducts in a power plant in Sweden we have designed and manufactured in total 24 power boiler Expansion Joints. As the Expansion Joint will be installed on different locations in the ducts around the boiler, they are made from different materials as well as having different shapes and different sizes.

#### Client request

The engineering team of the client had made very good specifications and drawings for the project and were very specific in what Expansion Joints they needed. For them it was important that we could design and manufacture according to this as well as meeting their request for delivery time.

#### Belman solution - both Fabric - and Metallic Expansion Joints

According to the client specifications and drawings we designed and manufactured 23 circular Metallic Expansion Joints sized DN 200-5400 and 1 fabric Expansion Joint (shown in the photo).

#### The Fabric Power Boiler Expansion Joints

The fabric Expansion Joint supplied is a type Belman-FG with steel flanges for bolting into the piping system. As the medium is flue gas. The Belman-FG Expansion Joint is a multilayer Fabric Expansion Joint ideally suited for accommodating the working conditions often found in flue gas systems, The sealing layer in the Belman-FG Expansion Joint is made from PTFE, which has excellent resistance to the chemical harsh environment found in flue gas systems. The Fabric Expansion Joint is often used in flue gas systems, where the pressure is relatively low. In flue gas duct systems it is often required that the Expansion Joint

transfers as little reaction forces to the pipeline as possible and here the fabric expansion joint is the preferred product as it in practically sense does not have any spring rate. The Fabric Expansion Joints ability to take up large movements I multiple directions often makes it the preferred choice of Expansion Joint in flue gas systems.

#### The Metallic Power Boiler Expansion Joints

The metallic Expansion Joints with different sizes and specifications depending on the location in the duct. With sizes from DN 200 – 5400 with 23 pcs. designed for 250°C and -0,2/0,2 barg pressure to be installed in the air ducts and the secondary air ducts. The DN 5400 metallic Expansion Joint was designed for 500°C and -0,05/0,05 barg as the medium was flue gas. The bellows of all Metallic Expansion Joints were made from 1.4541 (AISI 321) and the pipe ends were made from P265GH. The metallic Expansion Joints were to absorb axial and lateral movements.

#### DESIGN PARAMETERS

##### Design parameters of the rectangular Fabric Expansion Joint – BELMAN-FG

Quantity: **1 pcs.** • Dimension: **7138 x 1340 mm** • Built-in length: **600 mm** • Medium: **Flue gas** • Design temperature: **550°C** • Design pressure: **+/- 5 kPa** • AX: **+18/-27 mm** • LA: **+/-64 mm**

##### Design parameters of the circular Metallic Expansion Joints

Quantity: **23 pcs.** • Dimension: **DN 200 - 5400** • Built-in length: **190 - 750 mm** • Design temperature: **respectively 250°C and 500°C** • Design pressure: **-0,05/0,05 barg to -0,2/0,2 barg** • AX: **up to +0/-75 mm** • LA: **up to +0/-79,4 mm**



#### BENEFIT FOR THE CLIENT

- Guaranteed on-time delivery
- Cost savings due to a precise delivery
- Remarkable assistance from a manufacturer that provides both Metallic and Fabric Expansion Joints
- Guidance and great cooperation
- The correct and best in class Expansion Joint solution
- Sound and cost-efficient