

TOPIC: Expansion bellow damages.

Symptoms:

- Hole in soft part
- Crack damaged steel parts
- Flange leakages
- Burn marks or discoloured soft part
- Heat damage to near by equipment
- High turbine enclosure temperature

Consequences:

- Non-compliance with HES Requirements
- Non-compliance with Zone Requirements
- Exhaust leakages to surroundings
- Heat damages to near by equipment
- Heat damage to Expansion Bellow soft part
- Heat damages to surface protection
- Exhaust leak inside turbine enclosure may cause turbine trip

How to inspect:

- Visual inspect Bellow internals and externals for cracks
- Inspect guide plates for contact marks.
- Inspect Bellow flanges for deformations and light openings
- Inspect flanges for missing bolts and gaskets
- Thermography
- Inspect for heat damages to surrounding equipment

Non-confirmance reasons:

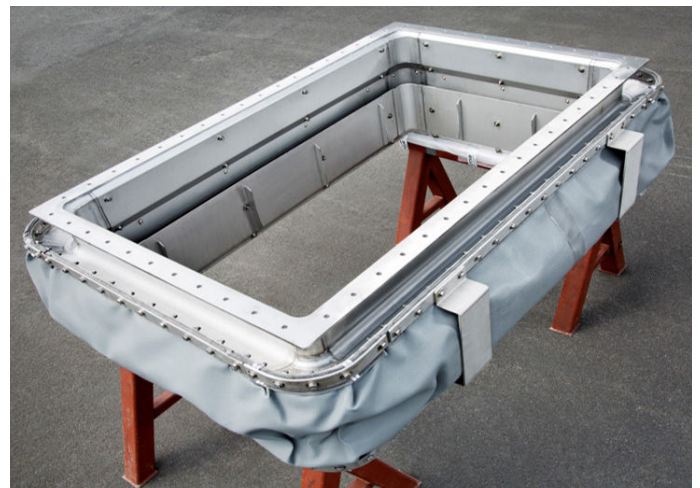
- Bolt is bent due to buckled and non-parallel flanges
- Incorrect fastener material selection
- Incorrect fastener pre-tension torque and procedure
- Flange gasket damaged or blown out
- Softpart mechanical damages from surroundings
- Expansion Bellow has been exposed to movements beyond design limits

Corrective actions:

- Verify Bellow real movement requirements.
- Replace Bellow soft part with type AlphaFlex™
- Replace Bellow steel parts with type AlphaFlex™
- Install new gaskets and bolts type HotBolt™ and HotSeal™
- Pre-tension bolts in 3 steps to avoid embedment relaxation
- Protect HotBolt™ Extension Sleeve from heat radiation
- Lock bolts with HotBolt™ Locking Plates.

AlphaFlex™ Expansion Bellow.

- Patented by Noble Installation
- Soft part designed for long life.
- Steel parts designed for 500+ start cycles.
- Steel material selection: Inconel 625, AISI 321, Alloy 800.
- Soft part material selection: Knitted long fiber Silika.
- 4 years operational guarantee



AlphaFlex™ Expansion Bellow for exhaust systems