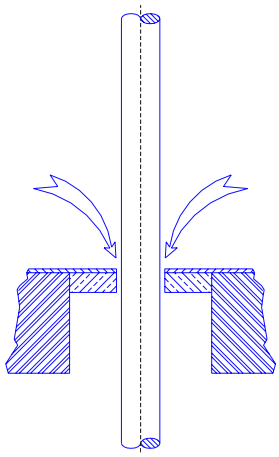
Application Datasheet

Refrex® Multi Tube Bellows

(to stop air ingress)

The Problem

In an average size process heater, the opening around the tubes allows cool air to be drawn inside, with all the costly consequences . The following calculation for costs of fuel consumed heating excess air are based on a case history for a steam methane reformer:



Physical data

Area of 0.5"annular gap around 6"dia tube	A = 0,071 ft2
Internal draft @ P=.35"H_2O	ω = 1,92 lbs air/sec FT^2
Internal heater temperature	T = 1950°F (1060° C)
Energy required to heat ambient air	H = 495 BTU/lbs
Heating cost per million BTU's	$ 2,50/1 x 10^6 BTU
Numbers of tubes (and tube openings)	100

Calculation:

Number of tubes		**Annular Area**		**Air Draft**		**Seconds/ year**		**Heat Energy**		**Fuel Costs**
100	x	0,071 ft2	x	= 1,92 lbs air/	x	31,5 x 10^6 sec/	x	495 BTU	x	$ 2,50/
				sec ft2		year				1 x 10^6 BTU

The costs of heating the air ingress is up to EURO 500.000 per year!

To avoid this problem many heaters utilize an insulation padding or an insulation blanket around the tube. However, these methods to keep the heat inside are ineffective at sealing off the flow of air through and around the heater. In some cases, "seals" block only 10% of the ingress air. In 1984 the Insulcon Engineers group started to develop a flexible tubing-passing sealing system to block **all** the air ingress: Refrex® Multi Tube Bellows.

Application

Depending on operating temperatures Refrex® Multi Tube Bellows are filled with refractory blanket ore loose refractory bulk fiber. All Refrex® Multi Tube Bellows are made out of Refrex® fabrics. Fixing systems are up to the requirements of the client and vary from endless steel fixing profiles, separate (tube by tube) fixing bands and Refrex® tie-cords, fully inserted in the Refrex® fabric topside of the Refrex® Multi Tube Bellows.

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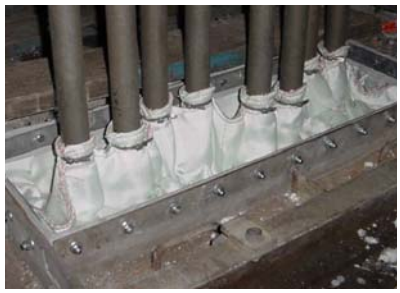
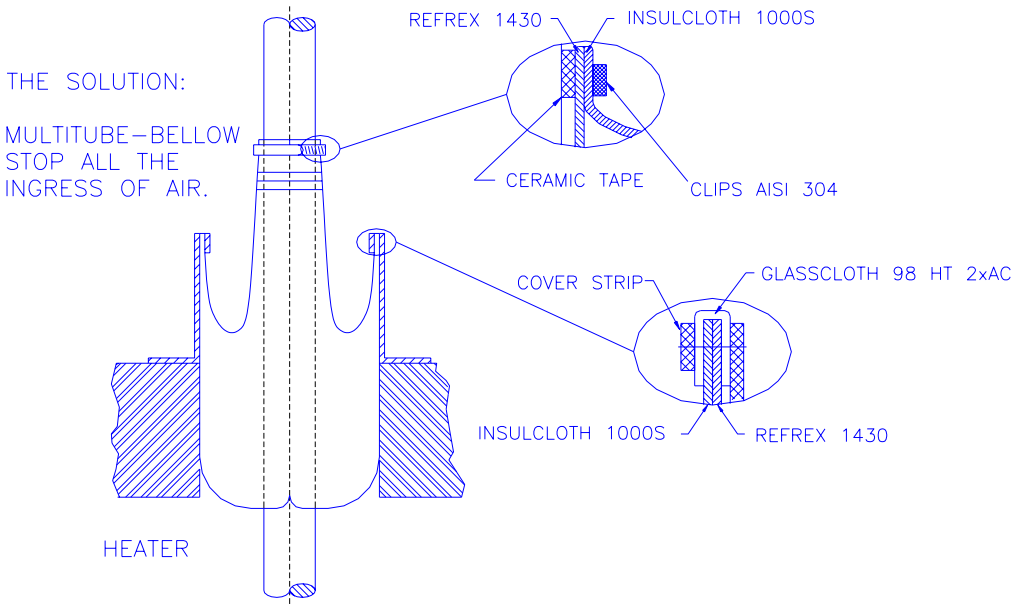
Summary of advantages

Refrex® Multi Tube Bellows

- save a lot of energy (high reduction of cold air ingress);
- have a short payback period (calculation on request);
- are applicable up to 1370°C;
- Does not block the tubes (free movement);
- reduce your maintenance costs;
- can always be adjusted (tube fixation).





References
Reference list will be send to you on request. Email: info@insulcon.com

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