Product Information Sheet

Purefrax®

Fiberfrax® Purefrax® Hot Gas Filters

Description

Purefrax® filter elements are vacuum formed using Unifrax's refractory ceramic fibers (Fiberfrax®) made into a slurry, together with organic and inorganic binders. The unique binding system means that low levels of organic binder are present so that the Purefrax filters retain strength and integrity when exposed to heat. The manufacturing process ensures that the outer surface of the filter is denser to promote cake filtration. The filters are a rigid tube, having one end closed and one end used as the clamping flange.

The Purefrax elements are fully machined on all exterior faces, to ensure dimensional accuracy and narrow tolerance windows. The machining process also ensures a uniform wall throughout the filter to allow uniformity of dust deposition, excellent cleaning characteristics and controlled porosity.

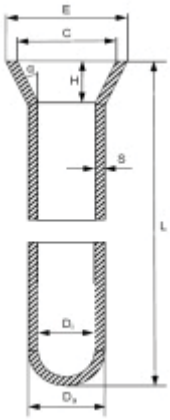
Our elements are manufactured to be tapered down the length of the piece (both ID and OD equally) which promotes easier installation into application, aerodynamic flow between elements and easier cake cleaning.

High temperature filtration of gases using filter elements made of high temperature wool (HTW) can offer significant key economic and environmental benefits when compared to other types of industrial air pollution control technologies.

Dimensions

Purefrax Elements can be formed to any length and diameter required. As they are machined to shape, the existing product range shown below can be tailored to suit individual needs. High levels of control are in place to ensure dimensional accuracy on all key dimensions.

Description	Area (m2)	L – Length (mm)	C – Flange Dia (mm)	H – Flange Height (mm)	D1 – Inner Diameter (mm)*	D2 – Outer Diameter (mm)*	S – Wall Th (mm)
150 x 1350	0.55	1350	165	65	110	150	20
150 x 1500	0.62	1500	160	65	110	150	20
150 x 1600	0.70	1600	160	65	110	150	20
150 x 1800	0.80	1800	160	65	110	150	20
150 x 2000	0.90	2000	160	65	110	150	20
150 x 2200	1.00	2200	160	65	110	150	20



*Note: All of our Purefrax Elements are manufactured with an internal and external diameter taper down the length of the piece. The taper is consistent 5mm per 1000mm. Purefrax Elements are fully machined on the outside so outer diameters can be altered to suit specific customer requirements.

Specific drawings for each of our Purefrax Elements are available on request, with full tolerances listed.

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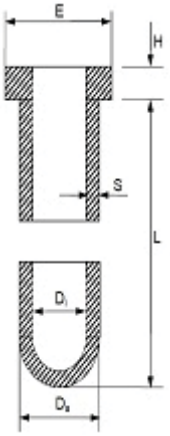
Description	Area (m2)	L – Length (mm)	E – Flange Dia (mm)	H – Flange Th. (mm)	D1 – ID at top (mm)*	D2 – OD under Flange (mm)*	S – Wall Th (mm)
60 x 1000	0.17	1000	80	20	40	60	10
60 x 1250	0.21	1250	80	20	40	60	10
60 x 1500	0.28	1500	80	20	40	60	10
125 x 1500	0.55	1500	160	15	105	125	10
155 x 1500	0.69	1500	160	30	135	155	10
125 x 2000	0.74	2000	160	30	105	125	10
130 x 2000	0.77	2000	160	30	110	130	10
150 x 2000	0.88	2000	195	30	110	150	20
150 x 3000	1.35	3000	195	30	110	150	20
150 x 4000**	1.68	4000	210	30	110	150	20



**4000mm length Purefrax elements are manufactured using 2 x 2000mm length elements and the Unifrax bespoke coupling system

Efficiency

The Filtration efficiency was determined using the BS3928 Sodium Flame Test, which challenges the media with an aerosol of NaCl particles with a mass medium size of 0.6 micron.

The table below shows our results gained from an independent laboratory, based on 12 tests of unused filter media at 3 different face velocities.

The Filter elements were fitted in a section of duct with a flame photometer sampling the test aerosol before and after the filter.

Measurements were recorded from which the % penetration and % efficiency were calculated.

Tests	Efficiency at 2cm/s (%) – 1.2m/min	Efficiency at 3cm/s (%) – 1.8m/min
1	97.37	96.332
2	96.585	95.095
3	96.875	95.353
4	95.37	93.231
5	97.522	95.633
6	96.7	94.573
7	96.123	94.489
8	96.412	94.153
9	98.094	96.771
10	96.796	95.353
11	97.985	96.893
12	96.817	94.927
Average	**96.887**	**95.234**

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Typical Chemical Analysis

	Fiberfrax
Al_2O_3	30%
SiO2	70%
CaO	_
MgO	–

Physical Properties

Colour	White/Cream
Density Range	350 Kgs/m³-400 Kgs/m³ typical
Porosity	>80%
Virgin Element Pressure Drop	10mm Wall Thickness = 20-25mm Water Gauge 20mm Wall Thickness = 30-35mm Water Gauge Measured @ 3.0 cm/s face velocity, ambient temp.
Maximum Temp	900°C continuous application
Filtration Velocity	Up to 3m/min (application dependent). Typical application 1m/min
Typical Particulate Emission	<1 mg/m³ in filtered gas
Element Length	Up to 3000mm
Element Outer Diameter	As elements are machined on OD this can be altered to customer requirements

Gaskets

T Flange

Manufactured from the same fiber chemistry as the Purefrax filters but using a latex binding system to allow flexibility and good sealing characteristics, gaskets are available as pre-cut shapes up to 20mm thick and supplied alongside the elements to be fitted at installation. Standard is usually 10mm thick paper, compressed 50% in application.

Conical Flange

Manufactured from the same fiber chemistry as the Purefrax filters, the gaskets are supplied in either blanket or felt material ranging from 6mm-25mm thickness. The gasket is attached to the flange using a high temperature glue for easier installation. Standard material is usually 13mm thickness x 128Kgs/m3 density.

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General Properties/Benefits

- Self-supporting
- Temperature resistant up to 1260°C*
- Insensitive to sparks and non-flammable
- Removes the fire risk from using conventional filter media at high temperatures
- Outstanding temperature fluctuation resistance
- High efficiency of filters not just limited to high temperatures
- High temperature filtration can prevents de-novo synthesis of Dioxins/Furans and increase efficiency of sorbents
- Final filter systems do not require cyclones, dilution air, spark arrestment or other ancillary abatement equipment – enabling lower power consumption and simpler operation
- Usable in corrosive atmospheres
- High porosity and air permeability
- Successful utilization with sorbent injection to control full range of emissions
- Reduction of emissions by almost 100%
- Minimal pressure drop
- Consistent wall thickness for more even filtration
- Long established manufacturer of hot gas filters
- 100s of applications worldwide.

*Shrinkage will occur and alter product characteristics

Typical Applications

- Dedusting of melting furnaces and fluidized bed processes
- Power station: gasification of coal, gasification of waste
- Gasification of biomass e.g. wood, sewage sludge etc.
- Cement industry
- Glass industry
- Waste incineration plants
- Chemical manufacture
- Catalyst/Precious Metals Recovery

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