

Ceramic Filter Elements – Product Data

What They Do

Remove solid particles from gases in difficult conditions.

Particles are removed to prepare the gas for a downstream process, such as catalytic reaction, or for discharge to atmosphere. Alternatively, the objective may be to collect the solids i.e. product recovery.

The elements are highly refractory, able to operate at temperatures at up to 900 °C or in the presence of corrosive gases such as SO₂ or HCl.

How They Work

A pressure difference is applied to the element, low pressure at the **open end**. This pressure difference draws gas from the dirty side of the filter, through the annular **wall** of the filter element and up its **core** to be discharged into the clean chamber. The solid particles are retained on the **surface** of the element.

From time to time a reverse pulse of air or other gas is applied to the open end of the element. This causes a momentary reverse flow of gas which dislodges the accumulated solids from the element surface, allowing them to be collected in a hopper beneath.

Typically, a number of elements are mounted vertically open end uppermost hanging from a header plate. The header plate separates the dirty and clean sides of the filter. The elements are often arranged in rows and the reverse pulses are applied to one row at a time in a controlled sequence.

The elements are made from aluminosilicate ceramic fibres. These fibres are approximately 2.5 µm in diameter, which is very fine compared to most cleanable filter media. This very fine structure, coupled with the 8 mm wall thickness of the medium, gives excellent solids removal efficiency, normally 100%.

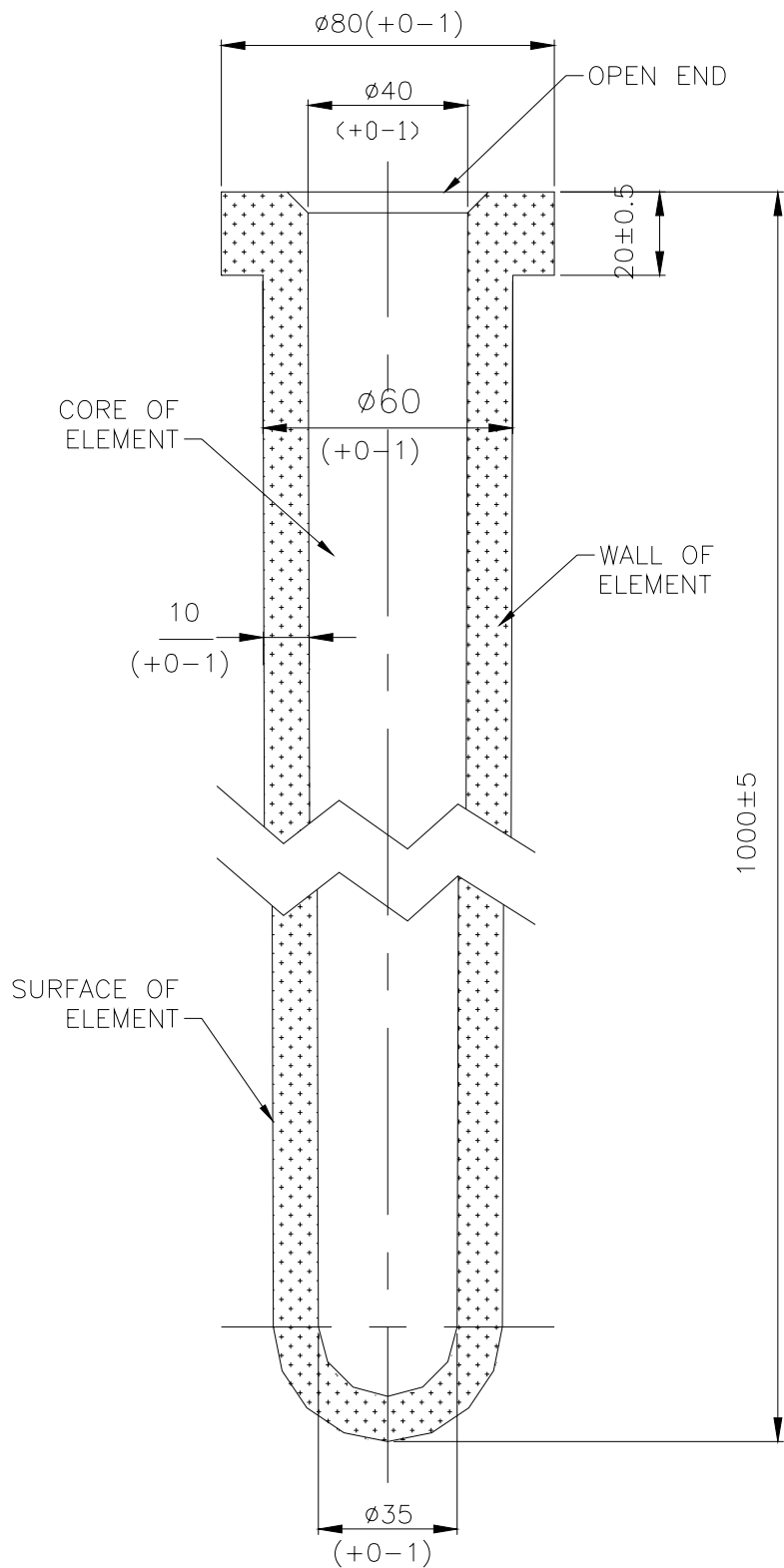
The Caldo ceramic filter element is stronger than competitive products. This is achieved by a secondary binder impregnation process which incorporates a novel anti-migration feature. Conventionally, binder migration limits the quantity of secondary binder - if there is too much binder it concentrates at the surface and increases pressure drop across the system. The anti-migration feature ensures that the binder stays where it should be, imparting strength to the element without inhibiting process gas flow.

Properties

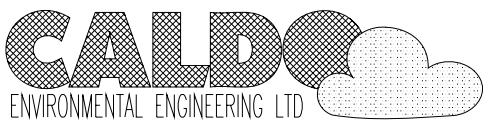
Porosity	87.5 - 91.0 % void
Composition (after firing)	SiO ₂ ...65 % Al ₂ O ₃ ...35 %
Density	300 - 400 g/l
Temperature service limit	900 °C
Corrosion limitations	not suitable for use with HF
Element Dimensions	see drawing overleaf. Note this is compatible with the industry standard element, 1000 mm long x 60 o.d.
Filtration area	0.18 m ² / element
Weight	typically 775g / element
Virgin pressure drop	<250 Pa at a face velocity of 3 cm/s at 20 °C

Installation

Spacing between elements	>100mm centres to avoid bridging
Orientation	these elements are suitable for vertical installation only
Gaskets etc.	see Caldo 'Support & Gaskets for Ceramic Filter Elements' product data sheet (DS003)
On-line cleaning	see Caldo 'Reverse Pulse Cleaning' product data sheet (DS004)



DIMENSIONS
IN MILLIMETERS



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Customer	SALES
Project	CERAMIC FILTER
Drawn By	CJW
Date	22.05.04

Title	CERAMIC FILTER ELEMENT
Drawing No	DS002