

### Application:

Apogee's Zirconia ceramic foam filter is formulated from a Partially Stabilized Zirconia (PSZ) that has very high thermal shock resistance, high resistance to chemical/slag attack and excellent high temperature creep resistance. The maximum application temperature for our PSZ Zirconia foam filters is 1700°C/3092°F.

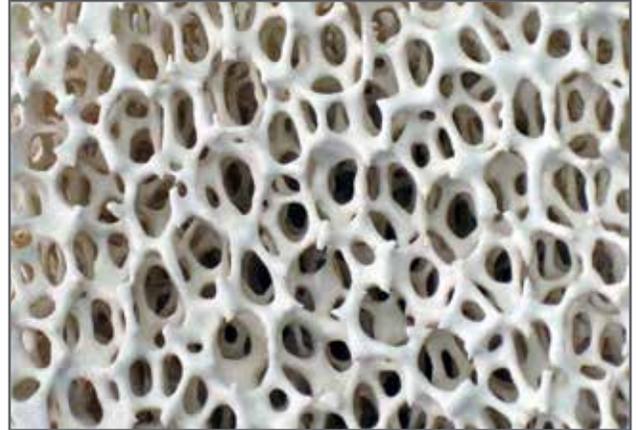
### Molten Metal Filtration:

Apogee's zirconia foam filters are designed for use with all types of steel to prevent non-metallic contaminant residues and sand grains from entering the mould cavity. The characteristically large surface area of the reticulated foam is well suited to intensive filtration and even finely distributed slag and oxidation particles are retained both on the filter surface and in the filter structure. Apogee's foam filters exhibit high filtration effectiveness and reduced gating turbulence.



### Filtration Efficiency:

Apogee's filters can be positioned vertical, horizontal or diagonally depending on the design of the runner gating system. Filtration efficiency is dependent on the correct application and positioning of the filter. Apogee's Technical Sales teams are able to provide technical support for the design of gating systems. For optimal filter efficiency it is recommended that the filter is positioned correctly and sized according to our guidelines.



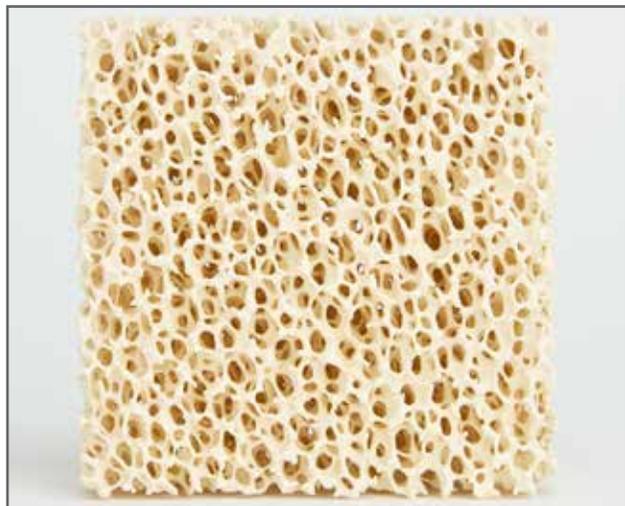
### Filtration Benefits:

The use of Apogee's Zirconia filters has significant benefits that can be seen throughout the foundry process. Some of the notable benefits include:

- Casting quality improvements with improved surface finish, casting cleanliness.
- Improved mechanical properties due to cleaner metal and reduced internal defects.
- Lower scrap costs by reducing scrap levels.
- Reduced casting machining costs.
- Higher Production yield per tonnage of metal melted due to simplified gating systems.
- Reduced machining costs due to reduced tool wear.
- Reduced inspection costs - destructive and non-destructive.

## Physical Properties:

Material Composition	Partially Stabilized Zirconia
Maximum Operating Temperature (°C/F)	≤1700°C / ≤3092°F
Color	Yellow
Hole density (ppi)	10/20 ppi (+/- 2 ppi)
Open Volume (%)	80-90
Compressive Strength (MPa @ 25°C)	≥1.75
Bulk Density (g/cm <sup>3</sup> )	0.7 - 0.85



## Dimensions:

Apogee's Zirconia foam filters can be designed to suit any foundry application. Filters within the below range can be produced:

- **Length/Diameter:** 35mm to 200mm
- **Width:** 35mm to 200mm
- **Thickness:** 11mm to 40mm
- **Dimensional Tolerances:** ±1.0mm for filters under 100mm  
±2.0mm for filters above 100mm
- **Pore size:** 10/20 ppi (pores per inch)
- **Pore Tolerance:** ± 2 ppi

# Optiflo ZF: Zirconia ceramic foam filter

## Flow Capacity:

General filter capacity calculations.

- **Carbon Steel:** Maximum Filtration Weight (kg)  
= Filter area (cm<sup>2</sup>) x 2

Example: 50 x 50 x 25mm  
Filtering capacity is: 5 x 5 x 3 = 50kg

- **Stainless Steel:** Maximum Filtration Weight (kg)  
= Filter area (cm<sup>2</sup>) x 3

Example: 50 x 50 x 25mm  
Filtering capacity is: 5 x 5 x 3 = 75kg

Typical Filter Dimension (mm)	Maximum Pour Weight (kg)		Suggested Flow Rate Range (kg/s)	
	Carbon	Stainless	Carbon	Stainless
50 x 50 x 25	50	75	3.5-5.0	5.3-7.5
75 x 75 x 25	113	169	7.9-11.3	11.8-16.9
100 x 100 x 25	200	300	14.0-20.0	21-30
50 x 25	39	59	2.8-3.9	4.1-5.9
75 x 25	88	133	6.2-8.8	9.3-13.2
100 x 25	157	236	11.0-15.8	16.5-23.6

*NOTE: Above capacity and flow rate figures are for reference only. Metal type and gating system will dictate the final values for each size of filter.*

**Apogee**  
ceramics inc.