Apogee ceramics inc.

Optiflo CM: Carbon Bonded MATRIX Filters

Application:

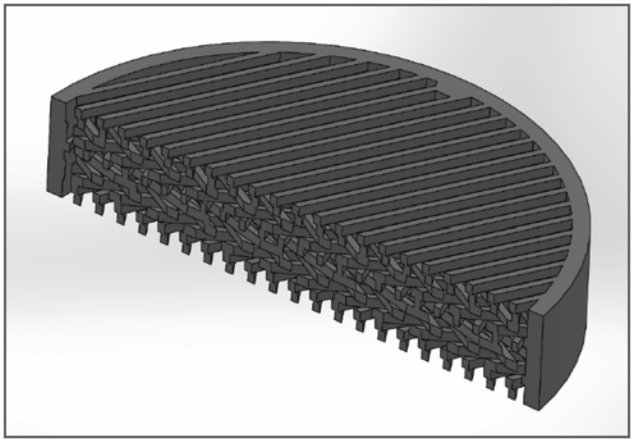
Apogee's Carbon bonded matrix filters are ideal for in-mold filtration of steel and heavy irons. These filters have a very high thermal shock resistance, high resistance to chemical/slag attack and excellent high temperature creep resistance. Additionally they have a lower thermal mass than zirconia filters which means that they do not need the metal to be superheated to ensure they prime. The maximum application temperature for our carbon bonded matrix filters is 1700°C/3092°F.

Molten Metal Filtration:

Apogee's carbon bonded matrix filters are designed for use with all types of steel to prevent non-metallic inclusions and sand grains from entering the mould cavity. They have a consistent and repeatable structure to ensure that each and every filter will have the same flow characteristics. The design of OPTIFLO CM filters ensures effective inclusion capture. In addition a tortuous path through the filter virtually eliminates turbulence in the molten metal stream. This reduces the chance of inclusions being generated from re-oxidation of the molten metal.

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 Carbon Bonded Matrix filters has significant benefits that can be seen throughout the foundry process. Some of the notable benefits include:

- Non-friable.
- Regular and repeatable engineered filter structure.
- Customizable to accommodate customer required flow rates.
- Casting quality improvements with improved surface finish, casting cleanliness.
- Excellent priming performance.
- Excellent thermal shock and chemical attack resistance.
- Excellent flow modification and filtration efficiency.
- 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.

Optiflo CM: Carbon Bonded MATRIX Filters

Physical Properties:

Material Composition	Graphite, Mullite
Maximum Operating Temperature (°C/F)	≤1700°C / ≤3092°F
Color	Black
Available Matrix Size (mm)	2mm, 3mm, 4mm
Available Strut Width (mm)	1mm, 2mm

Dimensions:

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

- **Length/Diameter:** 75mm to 200mm
- **Width:** 75mm to 200mm
- **Thickness:** 20mm to 40mm
- **Dimensional Tolerances:** ±1.0mm for filters under 100mm
  ±2.0mm for filters above 100mm

Flow Capacity:

General filter capacity calculations.

- **Carbon Steel:** Maximum Filtration Weight (kg) = Filter area (cm^2) x 2

  Example: 50 x 50 x 25mm
  Filtering capacity is 5 x 5 x 2 = 50kg

- **Stainless Steel:** Maximum Filtration Weight (kg) = Filter area (cm^2) 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	60	85	4.0 - 6.0	6.5 - 10.0
75 x 75 x 25	113	169	9.0 - 13.5	14.6 - 22.5
100 x 100 x 25	200	300	16.0 - 24.0	26.0 - 40.0
50 x 25	39	59	3.1 - 4.7	5.1 - 7.9
75 x 25	88	133	7.1 - 10.6	11.5 - 17.7
100 x 25	157	236	12.6 - 18.9	20.4 - 31.4

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.

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