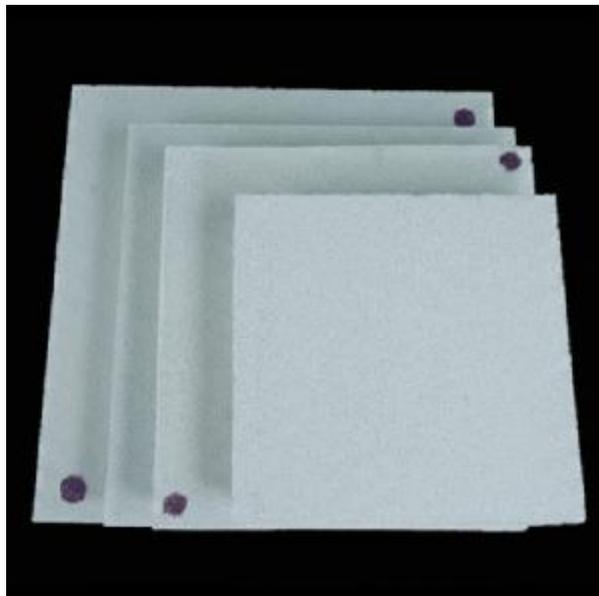


AdTech Foam Ceramic Filters: The Ultimate Technical & Procurement Guide

1. Introduction to AdTech Filtration Technology

AdTech is a global leader in the research, development, and manufacturing of high-performance **Foam Ceramic Filters (CFF)**. Our filtration solutions are engineered to optimize the casting process by removing non-metallic inclusions, reducing turbulence, and ensuring the highest metallurgical quality for aluminum, copper, and steel casting industries.



2. Core Filtration Mechanisms

Engineers should understand that AdTech filters operate on three distinct levels:

Mechanical Sieving: Trapping large inclusions on the filter surface.

Filter Cake Formation: Small particles build up a "cake" layer, which then acts as an even finer secondary filter.

Deep-Bed Adsorption: The unique 3D tortuous path of the ceramic foam forces molten metal to collide with the pore walls, where fine impurities are chemically or physically adsorbed.

3. Product Categories & Technical Specifications

3.1 Alumina (Al₂O₃) Foam Ceramic Filters

Application: Primary and secondary aluminum casting (billets, slabs, foils).

Max Service Temperature: 1150°C.

Key Features: Excellent resistance to molten aluminum erosion, high mechanical strength.

3.2 Silicon Carbide (SiC) Foam Ceramic Filters

Application: Ductile iron, grey iron, and copper alloys.

Max Service Temperature: 1500°C.

Key Features: Superior thermal shock resistance and high temperature load-bearing capacity.

3.3 Zirconia (ZrO₂) Foam Ceramic Filters

Application: Carbon steel, stainless steel, and large iron castings.

Max Service Temperature: 1700°C.

Key Features: Exceptional chemical inertness and extreme temperature stability.

4. Key Technical Parameters (Data Sheet)

Property	Alumina (Al ₂ O ₃)	Silicon Carbide (SiC)	Zirconia (ZrO ₂)
Pore Density (PPI)	10 - 60	10 - 40	10 - 30
Porosity (%)	80% - 90%	80% - 85%	75% - 85%
Compressive Strength (MPa)	≥ 1.0	≥ 1.5	≥ 2.0
Thermal Shock	Excellent	Superior	Outstanding

Property	Alumina (Al ₂ O ₃)	Silicon Carbide (SiC)	Zirconia (ZrO ₂)
Resistance			
Bulk Density (g/cm ³)	0.40 - 0.60	0.45 - 0.65	0.60 - 0.90

1. Alumina (Al₂O₃) Filter Specifications

Property	Unit	Specification	Notes
Pore Size Range (PPI)	N/A	10 to 60	Higher PPI = Finer Filtration
Porosity	%	[80 – 90]%	High porosity ensures minimal pressure drop
Bulk Density	g/cm ³	[0.35 – 0.45]	Lightweight, minimal thermal loss
Maximum Operating Temp	°C	1100	Stable for standard aluminum alloys
Cold Crushing Strength	MPa	≥0.8	Resistance to mechanical damage before use
Thermal Shock Resistance	N/A	Excellent	Withstands pre-heating cycles

2. Silicon Carbide (SiC) Filter Specifications

Property	Unit	Specification	Notes
Pore Size Range (PPI)	N/A	10 to 30	Standard for iron and copper alloys
Porosity	%	[80 – 85]%	Slightly lower porosity due to high strength
Bulk Density	g/cm ³	[0.55 – 0.65]	Higher density due to SiC component
Maximum	°C	1500	Required for high-melting point

Property	Unit	Specification	Notes
Operating Temp			alloys
Cold Crushing Strength	MPa	≥1.5	Excellent mechanical and structural integrity
Resistance to Thermal Shock	Cycles	≥5 (Water Quench Test)	Superior resistance to sudden temperature changes

3. Zirconia (ZrO₂) Filter Specifications

Property	Unit	Specification	Notes
Pore Size Range (PPI)	N/A	10 to 30	Optimized for high-temperature flow
Porosity	%	[85 – 90]%	High filtration efficiency at extreme temps
Bulk Density	g/cm ³	[0.9 – 1.2]	Heavy-duty, high corrosion resistance
Maximum Operating Temp	°C	1700	Ideal for highly demanding steel casting
Cold Crushing Strength	MPa	≥1.0	Stable under high flow rates of dense alloys
Resistance to Corrosive Slags	N/A	Excellent	Withstands aggressive steel and superalloy melts

5. Selection Guide for Engineers

How to Choose the Right PPI (Pores Per Inch)?

10 - 20 PPI: Used for coarse filtration where high flow rates are required (e.g., large sand castings).

30 - 40 PPI: The industry standard for high-quality aluminum alloy casting.

50 - 60 PPI: Used for ultra-pure applications such as aluminum foil and aerospace components.

Sizing and Flow Rate Calculation

The filter area must be calculated based on:

The total weight of the melt.

The required pouring speed (kg/s).

The cleanliness of the raw material.

AdTech recommendation: Always ensure the filter area is large enough to prevent "freezing" during the initial pour.

6. Procurement & Quality Assurance

For procurement officers, AdTech ensures long-term reliability through:

ISO 9001:2015 Certified Manufacturing: Every batch undergoes dimensional checks and strength testing.

Customization: We provide beveled edges (17.5° or 20°), expanded gaskets (ceramic fiber or PE), and non-standard shapes (round, square, custom 3D geometries).

Packaging: Vacuum-sealed and reinforced multi-layer cartons to prevent transit damage and moisture absorption.

7. Operational Best Practices

Preheating: We recommend preheating the filter and filter box to prevent metal solidification upon contact.

Placement: Ensure the filter is seated tightly in the bowl or gating system using AdTech gaskets to prevent "bypass" (unfiltered metal leaking around the edges).

8. Contact Our Engineering Team

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