

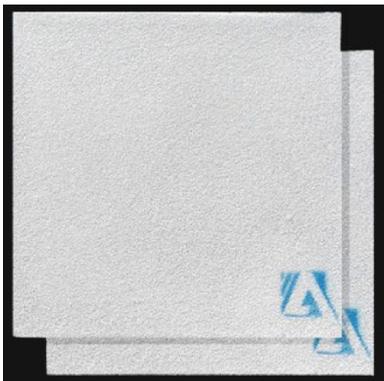
Technical Data Sheet–Ceramic Foam Filter

AdTech has been concentrating on R&D, producing and marketing high-adsorption Ceramic Foam Filter (CFF) for aluminum alloy casting since 2012. The technology of AdTech's ceramic filter plate has been widely accepted by the market and applying for multitudinous series of aluminum alloy, such as micron-grade aluminum raw foil, Baseboard of PS printing, can materials, elastic packaging materials, rail transit, aerospace products, cables and wires, etc.

1. Product Description

Ceramic Foam Filter is a special functional ceramic product with a three-dimensional net-like tridimensional and inter-penetrating porous structure. The main material of CFF is high quality and high purity alumina with three-dimensional reticulated polyurethane as skeleton. It is produced finally after extruding, drying, and high temperature sintering. It is installed inside plate-type filter using for filtration, purification, and impurity removal of melted aluminum, to meet the production requirement of high value-added, high-tech performance aviation, transportation, and other aluminum alloy precision casting.

For higher quality requirements, a double-stage filter is recommended. The CFF in the front box has a bigger pore, and the one in the second box has a smaller pore. It recommends using 30/50ppi and 40/60ppi, etc. For example, 30/50ppi double-stage filter box can be used for molten aluminum of double-zero aluminum foil, PS board base, can making materials, etc.



2. Technical Parameter

2.1 Specification

The sizes of the ceramic foam filter are 7in, 9in, 12in, 15in, 17in, 20in, 23in, 25in, 26in, etc. The dimensions are shown as follows.

| Specification /in | Basic length /mm | Tolerance /mm | Thickness /mm | Diagonal tolerance /mm | Warpage /mm | Inclination angle /° |
|-------------------|------------------|---------------|---------------|------------------------|-------------|----------------------|
| 7 | 178 | -2~+1 | 50±2 | ≅2 | ≅2 | 17.5±1.5 |
| 9 | 229 | | | ≅2 | ≅2 | |
| 12 | 305 | | | ≅2 | ≅2 | |
| 15 | 381 | | | ≅2 | ≅2 | |
| 17 | 432 | | | ≅3 | ≅2 | |
| 20 | 508 | | | ≅3 | ≅2 | |
| 23 | 584 | | | ≅3 | ≅3 | |
| 25 | 635 | | | ≅3 | ≅3 | |
| 26 | 660 | | | ≅3 | ≅3 | |

The deviation of diagonal and four corners is as follows.

| Parameter | Value | Tolerance |
|-----------------------------------|----------------------|-----------|
| Difference of diagonal lengths,mm | 0.6%*CFF side length | - |
| Angle between CFF sides | 90° | ±1 |

2.2 Pixels Per Inch

PPI of ceramic foam filter is divided into national standard 15PPI, 20PPI, 30PPI, 40PPI, 50PPI, 60PPI, and European standard 20PPI, 30PPI, 40PPI, 45PPI, 50PPI, 60PPI. The surface aperture size is listed as follows.

| PPI Specification | PPI | Surface aperture size / μ m |
|-------------------|-----|-----------------------------|
| National Standard | 15 | 2500~3200 |
| | 20 | 2300~2700 |
| | 30 | 2000~2300 |
| | 40 | 1750~2000 |
| | 50 | 1400~1550 |
| | 60 | 1280~1400 |
| European standard | 20 | 2300~2700 |
| | 30 | 1750~2000 |
| | 40 | 1550~1750 |
| | 45 | 1130~1280 |
| | 50 | 1000~1130 |
| | 60 | 850~1000 |

2.3 Physical Index

| Density g/cm ³ | Compressive strength in 25°C /MPa | Compressive strength in 800°C /MPa | Porosity % |
|---------------------------|-----------------------------------|------------------------------------|------------|
| 0.4~0.45 | ≥0.8 | ≥0.4 | ≥85 |

2.4 Surface

| | | | | |
|------------|-------|------------|----------------------------|---------------------|
| Chromatism | Crack | Blind hole | Pit | Corner |
| Surface no | No | ≤15% | < φ 5mm length, <2mm depth | ≤5mm length & depth |

Remark: Blind hole includes blind holes in surrounding edges.

2.5 Filtration efficiency

PODFA(multi microporous circular plate) was used for filtration analysis. Molten aluminum will pass through the CFF under pressure after being poured into the container. Weight clean molten aluminum, remove CFF and cut it from the center. Quantitative metallographic analysis was performed and used to measure the purity of molten aluminum. The data of different PPI working on 8series is as follows.

| Specification | Alloy series | Input slag mm ² /kgAl | Output slag mm ² /kgAl | Filtration efficiency % |
|--------------------------|--------------|-------------------------------------|--------------------------------------|----------------------------|
| National Standard 40 ppi | 8series | 0.0011 | 0.0006 | 45.45 |
| National Standard 50 ppi | | 0.006 | 0.0026 | 56.67 |
| National Standard 60 ppi | | 0.011 | 0.0028 | 74.5 |
| European Standard 40 ppi | | 0.009 | 0.0043 | 52.2 |
| European Standard 50 ppi | | 0.016 | 0.0023 | 85.62 |
| European Standard 60 ppi | | 0.013 | 0.0012 | 90.77 |

3. Product Performance

3.1 Fully automated production, multi-test&calibration, high dimensional accuracy , and high fit with filter box can prevent floatation and leakage of molten aluminum.

3.2 High porosity, high filtration efficiency, easy replacement, low cost, and strong adaptability.

3.3 The filter is adopted the adsorption principle, which can effectively remove large inclusions in molten aluminum and absorb small-sized inclusions.

4. Usage

4.1 Check and clean the sundries on the surface of the filter box to keep the filter box clean and free from damage.

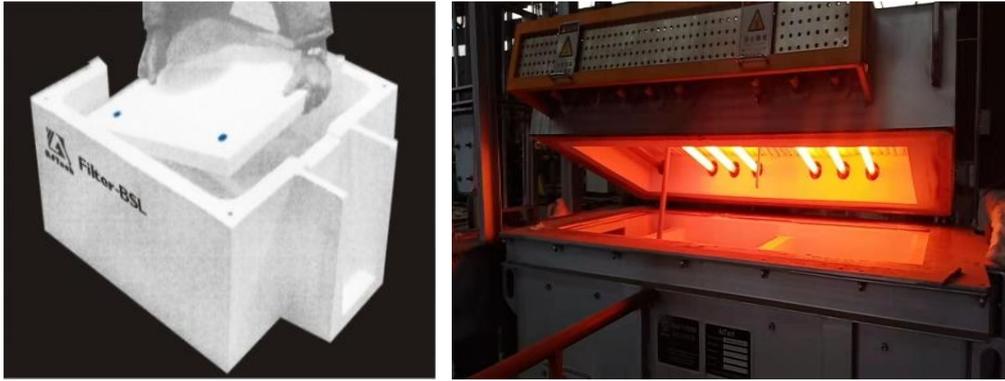
4.2 Put foam filter into filter box gently, and press the surrounding sealing gasket tightly to prevent molten aluminum from floating or leaking.

4.3 Preheat filter box and foam filter evenly to make sure the temperature as close as molten aluminum. The preheating temperature can not lower than 550 °C . Preheating can remove adsorbed water to help open the pore in a short time and prevent partial hole blockage due to thermal expansion and cold contraction. Electric or gas heating can be used for preheating, and heating time shall not be less than 30 minutes.

4.4 Pay attention to the change of the pressure drop during casting, and maintain the control of normal demand of molten aluminum.

4.5 Knocking and vibrating the foam filter is prohibit during the normal filtration process. Meanwhile, the launder should be full of molten aluminum to avoid the fluctuation of the molten aluminum.

4.6 Take out CFF and clean the filter box in time after finishing the process.



5. Common problems and solutions

5.1 Low filtering precision

Main reasons: ①The aperture of foam filter is a little large. ②The flow rate of molten aluminum is too high. ③Original molten aluminum has too many conclusions.

Treatment measures: ①Replace foam filter with a higher PPI, such as replacing 30PPI with 40PPI. ②Replace the filter box with a larger size and choose a larger foam filter to reduce the flow rate. ③Use a double-stage filtration box.

5.2 Crack and collapse during use

Main reasons: ①The preheating process of CFF is uneven and causes cracks inside. ②The preheating speed of CFF is too fast. ③The bump and shake may cause cracks during transportation. ④Knocks and vibrations may cause cracks during use.

Treating method: ①Foam filter should be baked uniformly following heating temperature& schedule before use. The flame should be moved evenly if flame baking available. ②During transportation, avoid external force hitting the package and try to avoid bumps. ③Knock and vibrate of foam filter is forbidden during use.

5.3 Poor access of aluminum

Main reasons: ①Preheating of foam filter is insufficient and preheating temperature is not up to the standard. ②PPI is high. ③Conclusion content in molten aluminum is high.

Treatment measures: ① Fully preheat foam filter to prevent partial hole blockage caused by thermal expansion and cold contraction. ② If there were too many impurities in molten aluminum, replace the CFF in time or use a double-stage filtration system. ③Stir molten aluminum properly during use, and clean out accumulated slag on the surface of the CFF without knocking. ④ For new customers, make sure the original CFF matches ours before placing new orders to avoid flow poor caused by PPI differences.

5.4 Floating

Main reasons: ① The installation of the CFF is not firm. ② The air in the lower part of the CFF is not exhausted.

Treatment measures: ① Carefully check the edge size and inclination angle of the CFF before use, and the CFF with many deviations is forbidden to use. ② Check how well the two fit between filter box and CFF, and press the CFF tightly. ③ Control the flow rate of molten aluminum as used so that the air under the CFF can be completely exhausted.

6. Packaging& storage

6.1 Packaging

The sealing gasket of the CFF classifies fiber paper, fiber cotton, and expanded cotton. The CFF is packed in an individual carton. The information of the inner carton label includes model, size, weight, production date, batch number, porosity, compression strength, and ppi. Five pieces are in one carton, packed in wooden pallets, four corners fixed with iron frames, and the overall height of the pallet is not higher than four layers.

6.2 Storage

Store in a ventilate and dry environment to prevent moisture, and do not place objects on it.