

SMF-02

PRECISE TUBE FILTER

- Master of high-end materials
- In the global aluminum processing industry

SGJ[®]

ZHEJIANG SHANGGUI JULI SPECIAL MATERIAL TECHNOLOGY CO., LTD.

Founded in 2018, Zhejiang ShangGui Juli Special Material Technology Co., Ltd.(SGJL for short) is a high-tech enterprise specializing in R&D and production of special ceramic materials. After several years of rapid development,SGJL has become a high-end material backbone supplier specializing in serving the global aluminum processing industry.

At present, the brand "Shang Gui" has seven series of products with global leading quality:

- **SG-28 Silicon Nitride Ceramic Series**
- **TA-03 Aluminium Titanate Ceramic Series**
- **OS-11 O'Sialon Ceramic Series**
- **SMF-02 Precise Tube Filter Series**
- **HTE High Thermal Conductivity Immersion Heater Series**
- **HTA High Reliability Immersion Heater Series**
- **TP-02 All-Ceramic Pump Parts Series**

SGJL's mission is to provide various high-end material solutions for the global aluminium processing industry and even the non-ferrous metal processing industry. And we will rely on our outstanding technological research and development capabilities to continuously create a leading high-end material foundation for the upgrading of the entire industry.



SMF-02

PRECISE TUBE FILTER

As the aluminum casting industry faces increasingly stringent requirements for molten aluminum purity, along with growing demands for high-end manufacturing and environmental sustainability, traditional filtration technologies have shown limitations. In response, SGJL as a leading global enterprise and a master of high-end materials, who is especially serving the aluminum processing industry, has independently developed SMF-02 Precise Tube Filter Series.

This innovative solution is primarily applied in high-precision, quality-critical products such as: Aerospace, Automotive, Aluminum foil, Aluminum Can, Aluminum curtain wall profiles, Transportation components, Light rail car bodies and parts, 3C consumer electronics.

By significantly enhancing filtration efficiency and durability, the SMF-02 series has made substantial contributions to **cost reduction**, **efficiency improvement**, and the **circular economy** across the industry.



All of the Aluminum productions are applicable to SGJL's PTF (Precise Tube Filter).

Below are the **specific applications** and **characteristics** of the SGJL tube filtration technology

Precise filtration of molten aluminum

Application scenarios

- **On-line purification of molten aluminum:** to remove the inclusions in the aluminum melt (aluminum oxide, magnesium oxide, non-metallic compounds, solvent residues, etc.).

Tube Filter Material

Brown Fused Alumina (BFA)

Compressive Strength

≥300MPa

Mohs Hardness

9 (slightly below Diamond)

High-temperature Resistance

≥1200°C

Pore Size Range

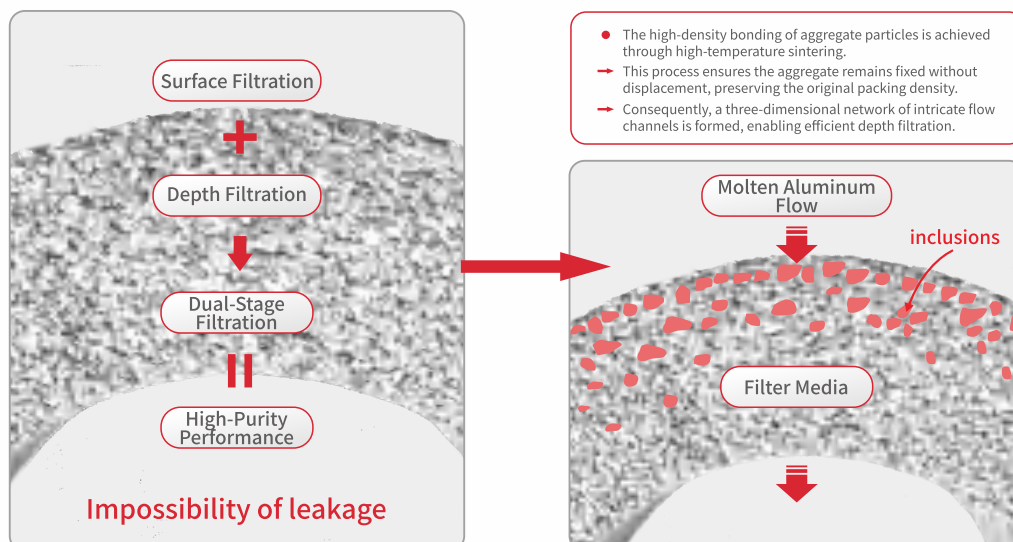
10~100μm (customizable)

- High thermal shock resistance
- High aggregate stability

※The above data is the raw material of Brown Fused Alumina.

Filter mechanism

- **Surface filtration:** An alumina layer (also called a 'cake layer') forms on the surface, which sieves out larger inclusions.
- **Depth filtration:** Finer and smaller inclusions are adsorbed through the complex internal pathways of the aggregate.



Key Advantages of SGJL's SMF-02 Precise Tube Filter Series

High Filtration Precision

Controlled Low Flow Velocity



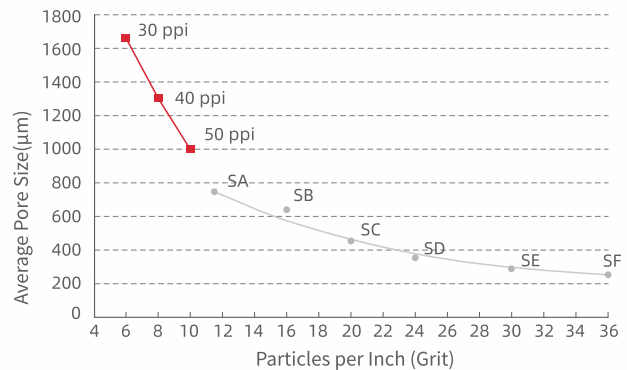
Large Effective Filtration Area

Modular Flexibility

High-Precision Filtration

- The SMF-02 Precise Tube Filter Series, independently developed by SGJL, utilizing premium **brown fused alumina (BFA)** as the core material, represents a breakthrough in ceramic filtration technology.
- The SMF-02 Precise Tube Filter Series utilizes a dual-mechanism technology combining surface filtration and depth filtration to capture impurities. To meet different filtration precision requirements, SGJL has developed six precision-graded Products (**SA, SB, SC, SD, SE, and SF**) with significantly smaller pore sizes than other filtration tubes on the market, achieving highly precise filtration performance.

Filtration Accuracy and Particle Count by Grade



PTF has uniform pore diameter distribution, ensures consistent filtration efficiency; PTF has exceptional thermal shock resistance which requires minimal preheating time; and its high structural strength that eliminates particle shedding or fracture during operation.

Controlled Low Flow Velocity

The filtration speed is inherently low due to the material's porosity and the complex internal pathways of the aggregate structure.



CFF

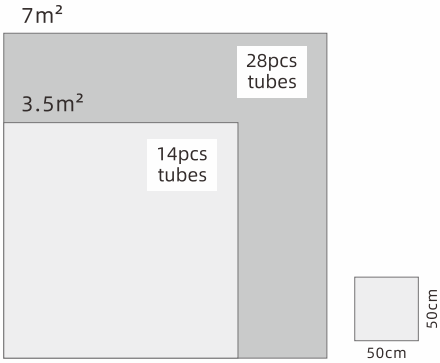


PTF

- Enhanced micro particle capture effectively traps fine impurities (e.g., micron-sized particles), making it ideal for high-purity applications such as electronic-grade aluminum foil.
- Lower flow velocity minimizes particle impact on the filter, delaying clogging and reducing backflush frequency.

KEY ADVANTAGES

Large Effective Filtration Area



Single tube surface area: **2500cm²**
equivalent to standard **20"** ceramic filter plate.
This type of filter tube achieves ultra large area
filtration in a limited space of the filtration device,
with a maximum specification of **28 filter tubes** per
group.

Modular Flexibility

According to different customer requirements, various combinations of filter tubes can be selected.

List of specifications for
Precise Tube Filters

• 0701

• 1101

• 1401

• 2201

• 2801

• 2202

• 2802

• 2803

Combination of filter tubes

7pcs / 11pcs / 14pcs / 22pcs / 28pcs

Model	Number of Tubes (tubes/group)	Filtration Area (square feet)	Filtration Area converted to 23 inch ceramic filter plate	Molten Aluminum Flow Rate (tons/hour)	Total Filtration Capacity(ton)				
					SA	SB	SC	SD	SE
PTF07	7	21	5.7 piece	6.72	1200	700	400	100	70
PTF11	11	33	8.9 piece	10.56	1800	1100	600	150	110
PTF14	14	42	11.3 piece	13.44	2300	1400	700	200	140
PTF22	22	66	17.8 piece	21.12	3600	2200	1100	300	220
PTF28	28	84	22.7 piece	26.88	4500	2800	1300	400	280

PTF

DBF

CFF

Comparison of the Three



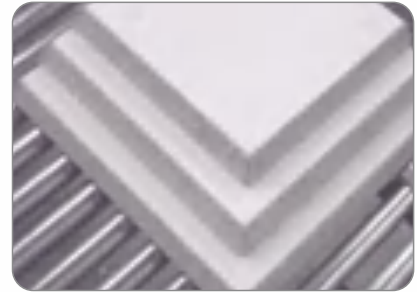
PTF

**High-Value Product
Manufacturing**
(electronics, aerospace, etc)



DBF

**High-Volume Semi-Continuous
Production**



CFF

**Standard Foundry Applications
(coarse filtration)**

Parameter	PTF	DBF	CFF
Filtration Accuracy (μm)	$\leq 20\mu\text{m}$ (5-20 μm)	$\geq 20\mu\text{m}$	$\geq 20\text{-}30\mu\text{m}$
Inclusion Removal Rate	100% (>20 μm) $\geq 95\%$ (<5 μm)	$\geq 90\%$	75-90%
Filtration Efficiency	high	medium	low
Thermal Shock Resistance	high	medium	low
Replacement Frequency	low	medium	high
Cost	high	medium	low

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