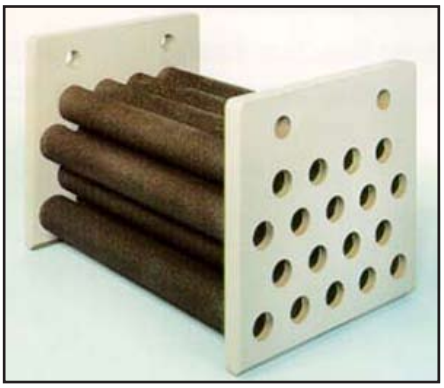
# METAULLICS CARTRIDGE FILTER (MCF®)

## SUPERIOR FILTRATION FOR WROUGHT ALUMINIUM CASTERS



The bonded-particle cartridge filter is growing in popularity with foundry managers world-wide. The Metaullics Cartridge Filter offers wrought aluminium casters the ultimate in filtration capability for producing high value-added end products in such quality demanding areas as can stock, foil, litho sheet, memory disc, bright trim and aircraft components.

Cartridge filter technology is based on the same concept as employed in heat transfer: establishing a high surface area in the smallest possible footprint - in this case, a high filter media surface. For molten metal filtration capability, the high surface area afforded by the cartridge tube bundle permits a much finer filter media to be employed for a given casting flow rate. This results in very high filtration efficiency compared to other filter devices. The finest grade filters are fully capable of removing virtually all particulates down to 5 microns*.

MCF filter tubes consist of controlled size aluminia particulate and a proprietary molten aluminium resistant binder. Metaullics Cartridge Filter tubes and assemblies are produced to exacting standards with full compositional verification on all raw materials and full traceability on manufacturing process steps. Complete dimensioning, visual inspection, strength and lot permeability testing assure you'll receive the highest quality; Metaullics systems is certified to ISO 9001: 2000 standards.

The MCF tube bundles are assembled into nitride-bonded refractory end plates. Filter assemblies are installed into properly configured cartridge filter furnaces using special tools and wedge blocks. Preheat required for uniform priming and thermal equilibrium is usually 24 - 30 hours for larger assemblies. Smaller assemblies (7 tubes) may be adequately preheated in 16 hours or less. For optimum priming and subsequent performance, preheat maximum temperature soak should be 800°C (1472°F).

**ADVANTAGES**

- Excellent filtration efficiency for high-value end products.
- Multiple design configurations to meet different customer process requirements.
- Finest filter pore size available.
- Creates significant metal quality improvements over other filtration processes.
- Proven technology in use for more than 30 years—an original Metaullics innovation.

## FILTER MEDIA PROPERTIES

The pore diameters of bonded particle MCF tube media are given in Figure 1 as a function of grit size.

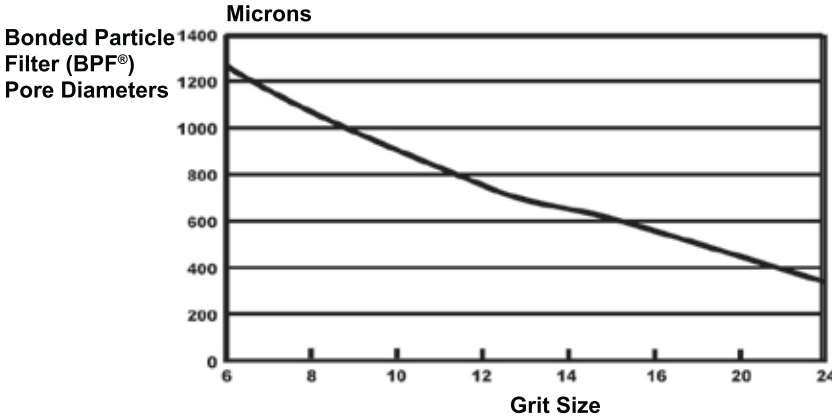



Figure 1 - Pore Diameters

Pore size distribution for the finest grits (20–24) show very good uniformity. Results were obtained by computed tomography analysis (CAT Scan).

## THROUGHPUT

Filter life is dependant on many factors: alloy, melt stock, general melting and furnace practices, performance of upstream degassing, and especially grain refining practices. In general, Figure 2 demonstrates the nominal filter life that is attainable with careful attention to all process parameters.

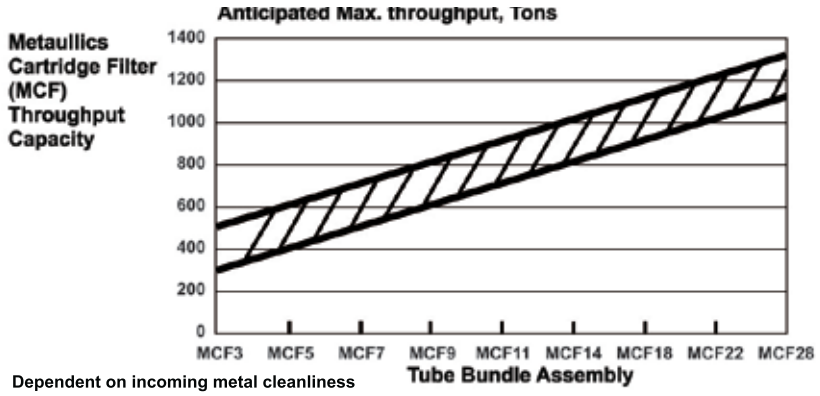



Figure 2 - Anticipated Nominal Filter Capacity

## FILTRATION EFFICIENCY

Filtration efficiency depends upon a number of factors. The superiority of the bonded particle MCF is based upon its pore structure and fineness, specific binder system and large surface area provided by the cartridge configuration. Factors such as metal flow rate and inherent incoming metal cleanliness also affect filtration efficiency. Generally, the 20 and 24 grit filter grades are capable of removing 90%+ of 5 micron particulate and larger (* see Page 1 note).

## SPECIFICATIONS

MCF tubes are bundled into assemblies of 3 to 28 tubes. The assembly size is determined by metal flow rate, grit size of the filter media, throughput desired and quality expectations. Fine grits permit higher flow rates and higher thoughput for a given tube bundle assembly. Very fine grit sizes, provide the highest filtration efficiency levels, with larger tube assemblies necessary to accommodate the specific casting flow rate and throughput required.

## METAULLICS CARTRIDGE FILTER TUBE BUNDLE APPLICATIONS

Standard Tube Flow Capabilities Per Tube

Very Fine Grits 20–24: 25-40 lb/min/tube (15–20 kg/min/tube)

Fine Grits 14–16: 50–150 lb/min/tube (20–70 kg/min/tube)

| Tube Bundle | Filter Surface Area | Recommended Max Flow Rate * | | Anticipated Max Throughput ** |
|---|---|---|---|---|
| MCF | Sq ft | lb/min | kg/min | Metric Tons |
| 3 | 9 | 120 | 55 | 300-500 |
| 5 | 15 | 175 | 80 | 400-600 |
| 7 | 21 | 250 | 115 | 500-700 |
| 9 | 27 | 300 | 135 | 600-800 |
| 11 | 33 | 400 | 180 | 700-900 |
| 14 | 42 | 500 | 225 | 800-1000 |
| 18 | 54 | 740 | 336 | 900-1100 |
| 22 | 66 | 880 | 400 | 1000-1200 |
| 28 | 84 | 1120 | 510 | 1100-1400 |

* For very fine grits 20–24.

** Actual cartridge life will depend on a number of factors, including alloy, melt stock, general melting and furnace practices, performance of upstream degassing, and especially grain refining practices.

## METAULLICS CARTRIDGE FILTER FLOW RATE CAPABILITY

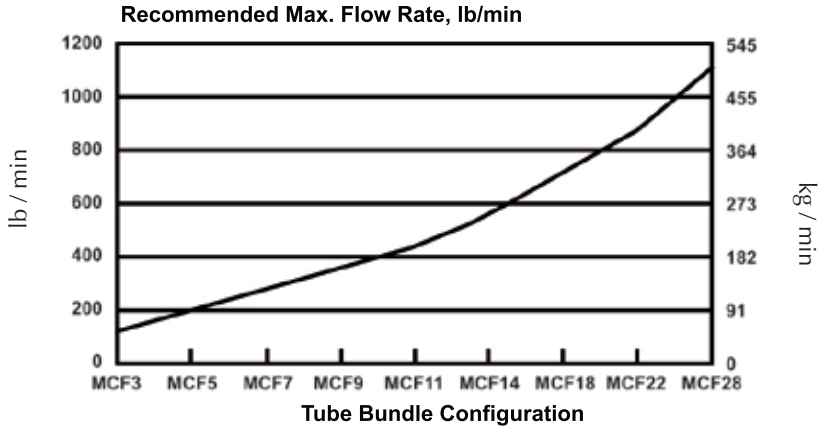



Figure 3 - Flow Rate Capability

## TUBE CONFIGURATIONS AVAILABLE

### Standard Tube Size

Metaullics produces standard tube sizes and assemblies which are compatible with competition. Custom sizes can be developed and are available for other specific needs.

### Tube Bundles

Metaullics Cartridge Filters are available in the following tube bundle assemblies.
3, 5, 7, 9, 11, 14, 18, 22, 28
End plates are constructed from nitride-bonded silicon carbide. Wedge blocks are cast from suitable molten aluminium-resistant refractory compositions.

## CARTRIDGE FILTER FURNACES

Pyrotek Engineered Systems designs and builds filtration furnaces to house the various size cartridge tube bundles. Resistance heating is employed (45–175/KVA depending on size), with full SCR controls.

- Refractory construction provides for best heat insulation.
- Various inlet / outlet positioning possible.
- Specific engineered approval drawings are submitted after receipt of order and before fabrication can begin.
- Full installation, operation and maintenance manuals are provided.
- Start-up assistance provided as negotiated.

Note: The physical and chemical properties listed represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice.


## REGIONAL HEADQUARTERS

**EUROPE/RUSSIA/MIDDLE EAST**

| | |
|---|---|
| Czech Republic | (420) 516-527-111 |
| Germany | (49) (0)2182-81020 |
| Italy | (39) 010-846-8627 |
| Russia/CIS | (7) 495-230-71-63 |
| Sweden | (46) (0)534-62000 |
| Spain | (34) 976-222-545 |
| Switzerland | (41) (0)27-455-8264 |
| Turkey | (90) 212-230-30-33 |
| United Arab Emirates | (971) (0)4-883-77-00 |
| United Kingdom | (44) (0)1 908-561155 |

**AFRICA**
(27) (0)35-797-4039

**ASIA**
(86) 755-26632324

**AUSTRALIA**
(61) (0)2 9631-1333

**CANADA**
(819) 477-0734

**INDIA**
(91) 2137-668000

**JAPAN**
(81) (0)78 265-5590

**NEW ZEALAND**
(64) (0)9 272-2056

**SOUTH AMERICA**
(55) 11-4786-5233

**PYROTEK INC. • CORPORATE OFFICE • 9503 E. MONTGOMERY AVENUE • SPOKANE VALLEY, WA 99206, USA • P: 509-926-6212 • F: 509-927-2408**
**www.pyrotek.info • email: info@pyrotek.info**


**Product Type: 131**

**Commodity Code: 05004**

**JUL-07-E4-867**