



EMDF™ 23-23" ELECTROMAGNETIC DEEP FILTRATION SYSTEM

ALUMINIUM FILTRATION SYSTEM

The EMDF is a Ceramic Foam Filter (CFF) technology used for deep filtration of molten aluminium inclusions to achieve high quality metal. It uses electromagnetic coils to prime the metal through a stack of (up to) three CFFs to achieve high degrees of filtration efficiency via depth filtration.

Once the CFFs have been primed, the metal flow pattern is identical to a regular filter box, using gravity to push its way through the tortuous path created by 3x50mm thick ceramic foam filters. This 150mm thick filter media improves inclusion capture, hence greatly improving filtration efficiency compared to a regular single 50mm thick CFF.

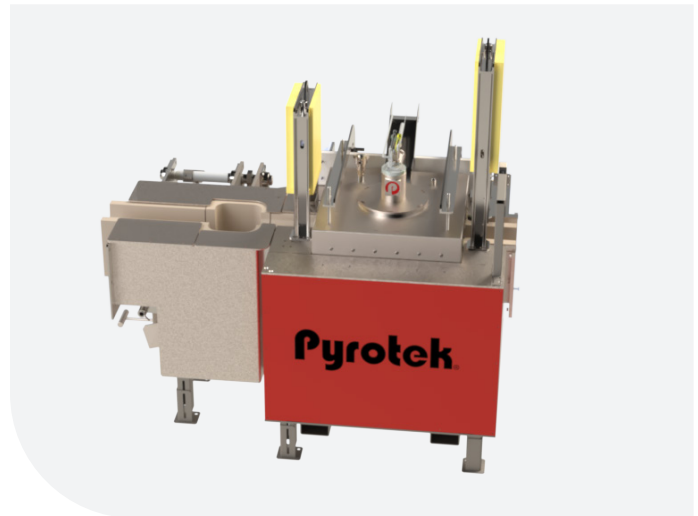
The EMDF 23 system can handle up to 1000 kg/minute (2200 lbs/min) or 60,000 kg/hour (132,000 lbs/hr). It offers great versatility if melt variables such as alloy composition, scrap content and inclusion content change frequently, since the preferred CFF grades can be selected depending on the melt properties and filtration requirements.

KEY FEATURES

- High degrees of filtration efficiency. Excellent priming of up to 3x CFFs using a combination of bespoke filter grades to achieve the required filtration results for each melt/alloy
- High degrees of priming efficiency
- Ability to automatically control priming process via PLC-controlled coil energisation to produce required electromotive/Lorentz forces in the melt for maximum CFF priming
- Filtration operation on fully primed CFFs guarantees: 1) consistent filtration efficiency, 2) stable operation, 3) reliable performance
- Standard filter box design with a similar footprint and precast, but slightly deeper box to allow space for the thicker filter media and induction coils
- EM field applied only during the priming and draining stage, so minimal energy usage
- Patented lifting tool for easy loading and removal of CFFs. A preparation table can be used in conjunction with the tool for convenient preparation of new filters and handling of hot, used filters

PATENT NUMBERS

WO 2013/160754
WO 2018/191281



LIFTING TOOL

- Patented design, engineered to maximise convenience without compromising filtration performance
- Ability for full automation of loading and unloading of CFFs once the lifting tool has been connected to an overhead crane
- Greatly improves operator safety and reduces labour requirements
- Reduces the amount of filter debris that needs to be removed since filters are removed as a whole stack

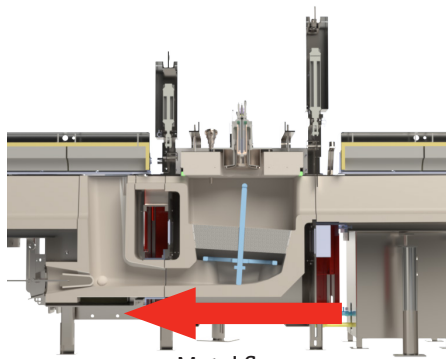
OPTIONS

- Gas heating as standard. Electric heating optional extra
- Allen Bradley or Siemens controls systems as standard
- Can be integrated into existing automation networks
- Filter preparation table for handling new filter stacks and hot, used filters as well as lifting tool maintenance and storage
- Heated lids on inlet and outlet

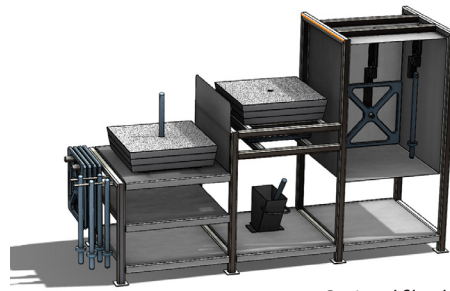
ADDITIONAL BENEFITS

- Fully automated priming control and metal flow control using lasers, dams and programmable logic
- Reduced metal head height for priming compared to that required for a typical gravity head priming process
- Lower running costs and greater flexibility than a typical DBF system
- Ability to drain a portion of the entrapped metal from the CFFs upon completion of the cast to reduce metal losses
- Designed for easy operation and maintenance requirement reduction
- Pneumatic drainage system for easy removal of residual metal
- Up to 30% additional metal recovery when energising the coils during the draining phase

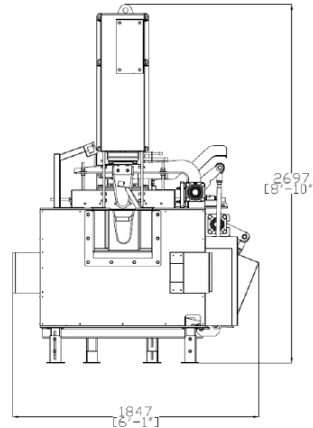
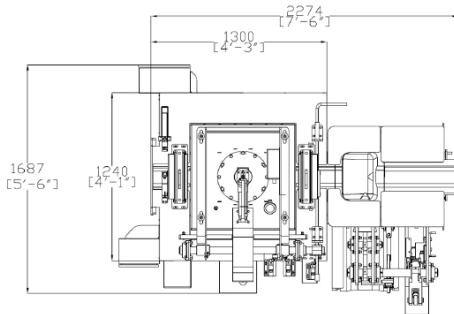




Metal flow
Section through filter box



Optional filter handling



EMDF installation dimensions in AutoCAD format are available upon request. Dimensions marked here are indicative and subject to change.

Electrical Supply Requirements

EMDF 23" (gas heating)	400V, 3-ph, mains frequency 270A (185KVA) FLC, 150A nominal. Typical coil energisation time per cast is 5 minutes.
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Gas Supply Requirements*

Natural gas/LPG	Natural gas at 50-100mbar (0.7-1.5 PSIG)
Compressed air	4-6 bar (60-90PSIG)

*Only required for flat flame burner heating option. For electric heating data, contact your local sales engineer.

Water Supply Requirements for Closed-Loop Water System

Initial supply of ~200L potable water, occasional top-ups required for closed-loop system.

General Specifications

Maximum flow rate, nominal	60,000 kg/hr
Flat flame burner power rating	90kW
Maximum filter bowl drainage amount	~300kg including inlet and outlet launders
Estimated filter box assembly weight	3 tonnes

