SEDEX* ULTRA

THE CERAMIC FOAM FILTER FOR IRON CASTINGS

+ Highest filtration efficiency
+ Improved Yield
+ Consistent flow rates
SEDEX ULTRA
A new generation of filters for Iron Castings

SEDEX ULTRA ceramic foam filters represent the latest development in the filtration of Ductile, Grey and Malleable Iron castings. Using a unique production process, the edges of the filter are closed on all 4 sides, resulting in improved edge definition.

In addition, SEDEX ULTRA filters use an optimised ceramic composition, which allows filter weight to be reduced, resulting in a consistently more open pore structure. This enables SEDEX ULTRA to deliver the highest levels of filtration efficiency as foundries can use finer pore filters, whilst maintaining their pouring times and metal flow rates. In some cases, foundries have been able to reduce the size of filter employed, whilst maintaining the same pouring time, with the added advantage of reducing the weight of liquid metal contained within the filter core print – improving casting yield.

The closed edges of the SEDEX ULTRA filter also give improved handling characteristics, particularly with automated placement systems and reduce the chance of metal bypass as the filters seal in the core print more effectively.

Key benefits of SEDEX ULTRA filters include:

- Cleaner Castings and Reduced scrap
  - Use of finer filters to increase inclusion capture and improve flow modification
  - More open structure allows casting pouring times to be maintained
- Improved Casting Yield
  - Filters can be downsized, reducing the weight of the gating system and improving casting yield
- Consistent Flow Rates
  - More open pore structure ensures more consistent pouring times in many applications
**SEDEX ULTRA filters**

Cleaner castings and increased yield

**Calculation of the gating system**

In gating systems using SEDEX ULTRA filter, the smallest cross-section or choke area should be at the base of the downsprue.

The calculation of this choke area \( (C_A) \) is based on the “general downsprue formula” as shown below:

\[
C_A = \frac{22.6 \times W}{\xi \times Q \times t \times \sqrt{H}}
\]

- \( C_A \): downsprue \([\text{cm}^2]\)
- \( 22.6 \): constant
- \( W \): poured weight \([\text{kg}]\)
- \( \xi \): friction factor
- \( Q \): density \([\text{g/cm}^3]\)
- \( t \): required pouring time \([\text{s}]\)
- \( H \): effective pouring height \([\text{cm}]\)

Based on the higher flow rate capacity of the ULTRA product, depending upon application, the filter area may be reduced by up to 20% and a finer filter can be employed. The following capacity guidelines can be used:

<table>
<thead>
<tr>
<th>Filter capacity kg/cm²</th>
<th>Iron alloy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 - 1.2</td>
<td>NiResist, SiMo, GJS (Inmol)</td>
</tr>
<tr>
<td>1.0 - 2.4</td>
<td>GJS / GJV</td>
</tr>
<tr>
<td>2.0 - 4.8</td>
<td>GIL / GJM</td>
</tr>
</tbody>
</table>

**Application example of SEDEX ULTRA**

In this example of a ductile Iron flywheel, we can see how the application of SEDEX ULTRA enables the use of a smaller filter area, providing improved casting yield.

The top image shows the initial conventional unfiltered gating system, with a total poured weight of 25 kg – pouring time 15.5 secs.

In the first optimisation, a conventional SEDEX filter 50x50x15mm/20ppi was applied, reducing scrap rate and at the same time reducing poured weight to 23.7 kg – pouring time 10.5 secs.

In the second optimisation, the gating system is modified to accept a SEDEX ULTRA 20 40x40x15. Poured weight is further reduced to 23.5 kg – a metal saving of 0.2 kg per casting compared with the standard filtered gating system. Pouring time was again maintained at 10.5 secs.

The last modification alone results in a returns saving of 10,000 kg per annum. Together with the pouring time reduction and returns saving from the initial modification, this results in a significant commercial improvement for the foundry.
Quality Assured

Higher quality and lower costs

Quality management
The Foseco quality management system is certified against DIN ISO 9001, VDA 6.1 and ISO 14001. All relevant product quality features of SEDEX ULTRA filters are controlled and recorded according to these quality standards.

Important product attributes monitored in this way include:

+ Filter dimensions
+ Filter weight
+ Cold compression strength
+ Porosity
+ Thermal shock resistance (impingement test)

Next to filtration effectiveness, thermal shock and erosion resistance to the liquid iron are the most important product attributes. These properties are evaluated regularly using liquid cast iron. A special test procedure, the impingement test, has been specifically developed for this purpose. Extensive use of this test has enabled Foseco to continually improve the quality and consistency of the SEDEX iron filter.

It ensures that the filters are tested under the most severe conditions possible, in terms of ferrostatic pressure and filter support. This test represents the most relevant quality measure for our customers.