

FOSECO PRO MODULE – Update 2023

THE FOSECO PRO MODULE FOR MAGMASOFT® - UPDATE 2023



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This year, Foseco and MAGMA celebrate the 20th anniversary of their strategic alliance, with the release of a new version of the Foseco Pro Module.

It features an updated interface with new sleeve types, filter prints & additional complex geometries to accelerate the design of gating and risering systems in MAGMASOFT®6.0.

INTRODUCTION

The Foseco Pro Module is a special module exclusively for MAGMASOFT®, accessible only via a special license key. First launched in 2004, the Foseco Pro Module was the first 3D database of the standard portfolio of Foseco Feeding and Filtration products and their associated performance characteristics. Over the years, it has been regularly revised and expanded to cover more regional databases and is used by many foundries worldwide.

MAGMA have recently released the latest version of their well-known casting process simulation software, MAGMASOFT® 6.0, which features an intuitive new user interface and a fundamentally new user experience. Thanks to the special focus placed on efficiency, ease-of-use and time-to-answer, users analyse their results more precisely to make well-informed decisions, thereby reaching their objectives even faster.

The Foseco Pro module has now been updated and upgraded to meet growing demands in terms of usability and support for new Foseco products. This new, state-of-the-art version of the Pro module is fully integrated into the new MAGMASOFT® 6.0 user interface and allows the MAGMASOFT® user to review and select from the available Foseco product range, loading 3D assemblies of the respective geometries and product properties. The module continues to be fully compatible with MAGMA's unique Autonomous Engineering capabilities, enabling users to select the best possible products for the given quality requirements.

HOW DOES IT HELP THE CUSTOMER?

As a global leader in the supply of foundry consumables, Foseco product technologies aim to help foundries deliver the ever-evolving environmental, casting quality and performance requirements.

Updating and expanding the new Foseco Pro Module provides the MAGMA Simulation engineer with the geometries, material properties and some basic application guidance to be able to test and evaluate products important to the filling and feeding of castings. In the competitive world of foundries, this accelerates the experimentation of the solutions virtually, and ultimately lead to faster, better castings for the customer.

ACCESSING THE FOSECO PRO MODULE

Figure 1 shows how to access the Foseco Pro Module in the MAGMA 6.0 interface – and add it to the favorites bar!

Accessing the Foseco Pro Module in the geometry perspective of MAGMASOFT® 6.0 is via the "Import from database" pop-out menu. For frequent easy access, it is possible to add the Foseco Pro Module icon to a favorites bar by simply right-clicking on the logo as highlighted above. This places a Foseco icon in the toolbar at the top of the workspace, facilitating easy access.

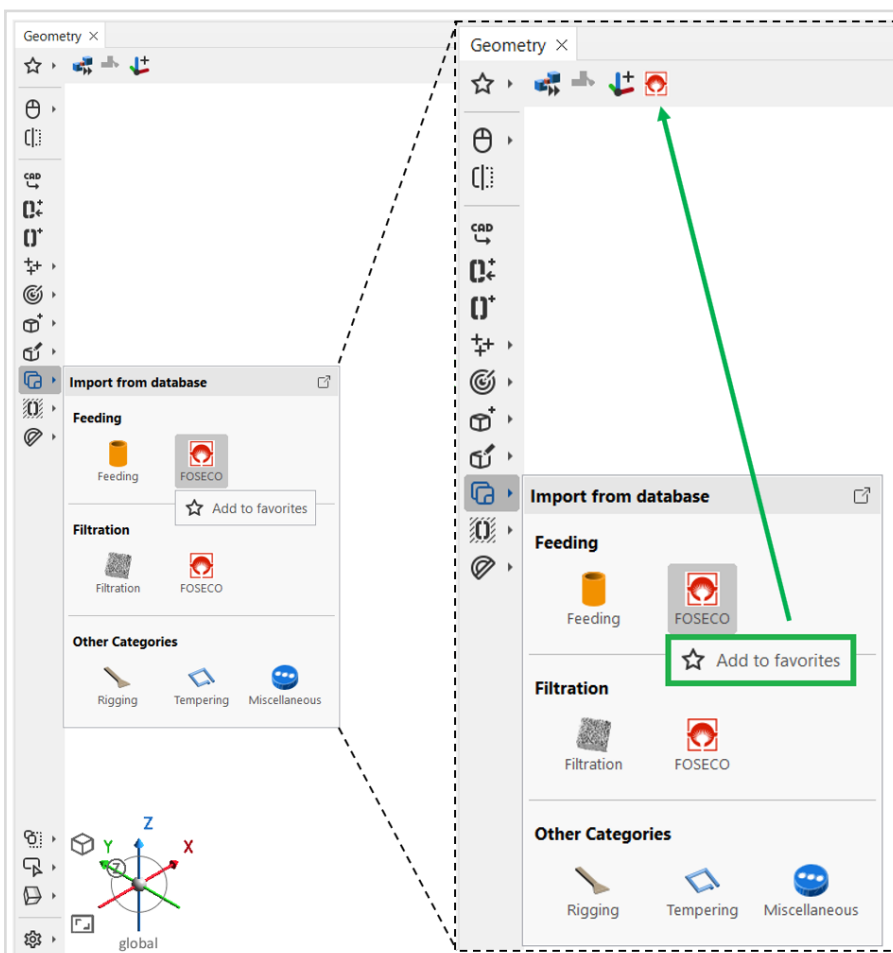


Figure 1. How to access the Foseco Pro Module in the MAGMA 6.0 interface – and add it to the favorites bar!

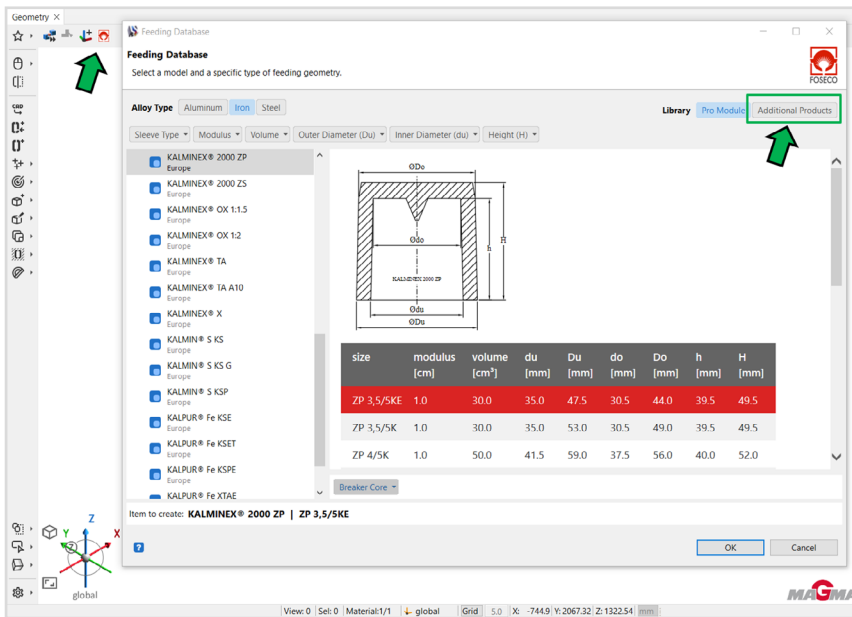


Figure 2. The Pro Module Feeding Database (showing combined libraries)

There are separate databases for Feeding and Filtration in the Pro Module. The geometries in these databases were all fully parametric with automatic assignment of material datasets; that was until geometries such as the FEDEX* SCK range were included in 2019. Such geometries were too complex to parameterize and were therefore included as a separate SCK geometry database with separate access.

The new interface combines these geometry types, parametric Pro Module types, and CAD/MAGMA geometry files in the same user interface, thus allowing the user to click between the different libraries, "Pro Module" & "Additional Products". This new and additional flexibility has allowed for the inclusion of a wider range of Foseco products and complex geometries directly into MAGMA, to run simulation analyses, optimisation and DOE studies.

PRO MODULE FEEDING DATABASE - NEW ADDITIONS AND FEATURES

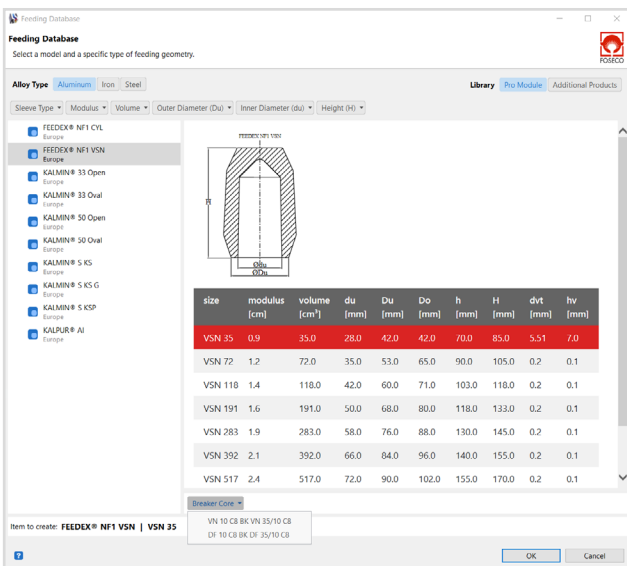


Figure 3. Addition to the Pro Module library is the FEDEX NF 1 range of Exothermic sleeves, for Non-Ferrous applications along with the associated breaker core options.

An example of a casting optimised using FEDEX NF 1 feeder technology will be shown on the FOSECO Stand at GIFA 2023 in Dusseldorf.

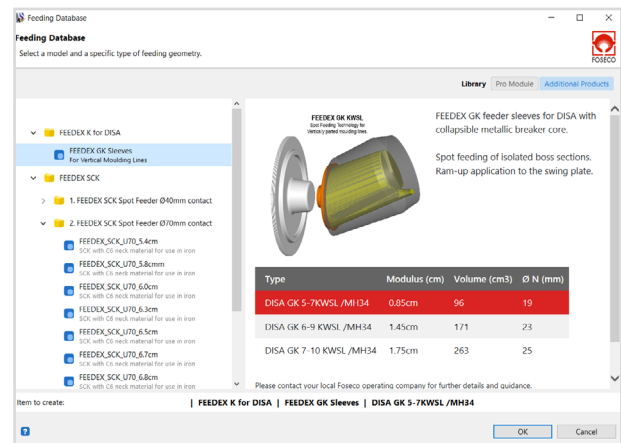


Figure 4. By clicking on the "Additional Products" button, the library changes to show the FEDEX SCK range. Newly available in this library is the FEDEX K for DISA range.

An example of 2 castings optimised using FEDEX K for DISA feeder technology will be shown on the FOSECO Stand at GIFA 2023 in Dusseldorf.



PRO MODULE FILTRATION DATABASE – ADDITIONS AND NEW FEATURES

(Metal) Cleanliness is next to Godliness! Metal quality, metal cleanliness and how a casting is filled have determining roles in the final casting quality. Foseco's range of filter products for iron, steel and aluminium cover a wide range of casting weights, and help to remove oxides and inclusions and reduce turbulence during filling.

Opening the updated Foseco Pro Module Filtration interface shows a catalogue of available filters and their dimensions. To help select the correct number and size of filters needed to filter a particular casting, maximum filtration capacity guidelines per filter have been added for certain alloys (see figure 5). Similar to the Feeding Database, the Filter database also includes an "Additional Products" button to access a second library of more complex filtration related geometries.

Figure 6 shows the list of metal filtration products has been expanded to include, KALPUR* FSC TA sleeves and FEDEX* SCK Direct Pour units, and the recommended filter prints for in-line filtration of iron and steel using SEDEX* and STELEX* filters. In addition, to assist the foundry man in pouring larger steel castings with requirement of mechanical properties, the Pro Module includes the range of HOLLLOTEX* Shroud assemblies including shroud pouring tubes, diverters or filter boxes with integrated filters. The availability of all these geometries will accelerate the design of gating systems and the optimisation of the casting processes using MAGMASOFT®.

Figure 7 shows the HOLLLOTEX Shroud system assemblies in the Pro Module as well as an example of a casting optimised using HOLLLOTEX Shroud pouring system will be shown on the Foseco Stand at GIFA 2023 in Dusseldorf.

In combination with the ROTOCLENE* process, HOLLLOTEX Shroud protects the metal liquid during filling, preventing air entrainment and re-oxidation, raising the casting quality to the highest levels. Castings produced with ROTOCLENE and HOLLLOTEX SHROUD have improved casting surface finish, internal homogeneity, resulting in higher mechanical properties compared to conventional technology. Please see the related Foundry Practice article.

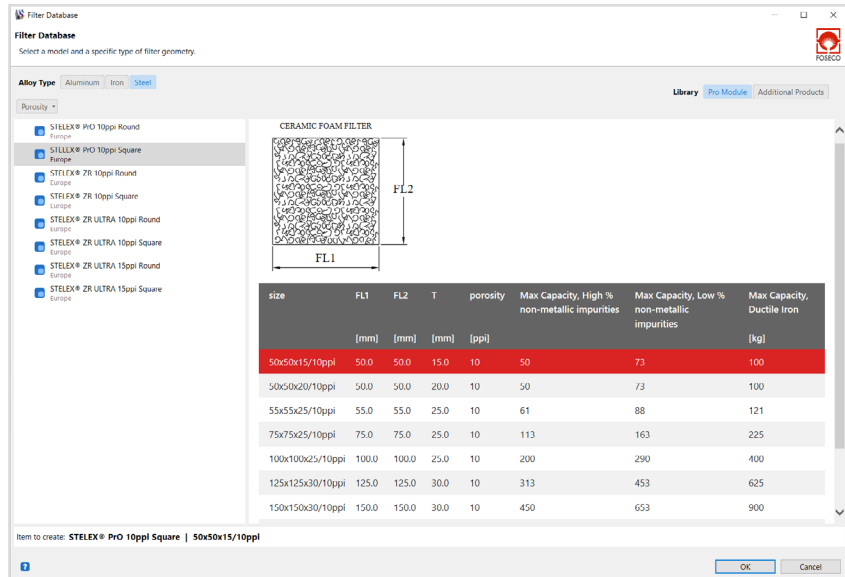


Figure 5 – Pro Module Filtration database

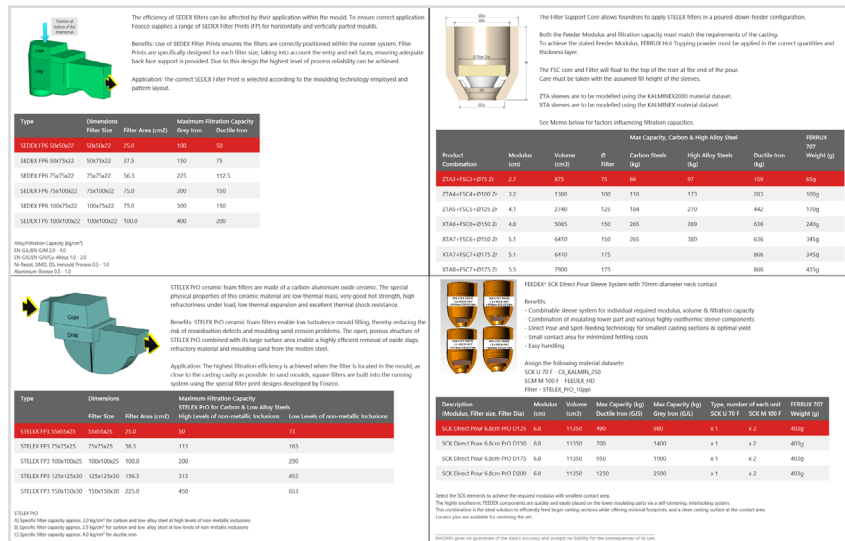


Figure 6. New geometries in the Filtration Database

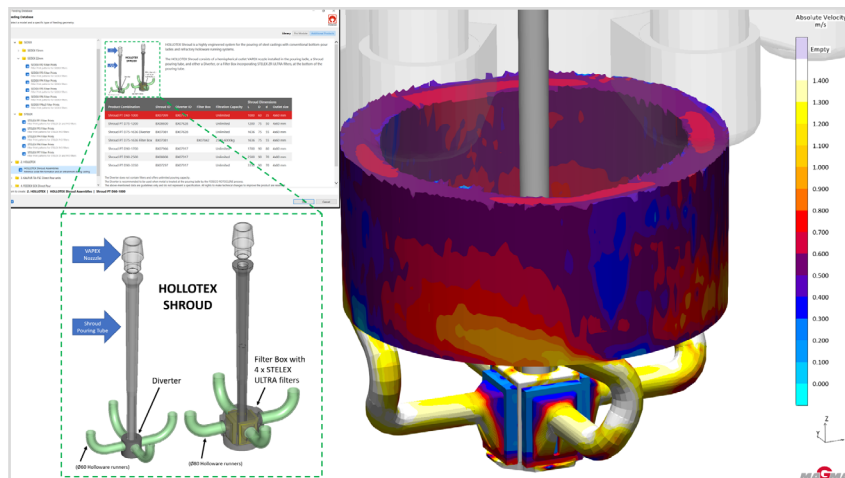


Figure 7. HOLLLOTEX shroud geometries & example from GIFA



Figure 8 shows the newly added FEEDEX SCK Direct pour system as shown in the Foseco Pro Module Filtration database.

The FEEDEX SCK (Sleeve Construction Kit) was introduced at GIFA in 2019. Since then, the SCK range has expanded to include two modified neck pieces that can hold either Ø125, Ø150, Ø175 or Ø200mm filters, increasing the size of the casting that can be filtered for a particular modulus. The modulus range is from 5.4 to 7.1cm, with a filtration capacity range from 490kg to 1250kg of Ductile iron, depending on the filter size chosen.

CASE STUDY EXAMPLE

DEVELOPMENT WORK

Necessity is the mother of invention ! The development of new products often comes from trying to find solutions to particular problems or requirements. Foseco's Foundry R&D Centre is focussed on binders, coatings, feeding systems, filtration and metal treatment development. Equipped with state-of-the-art facilities for the analysis of

thermal properties, and an experimental foundry for the testing of prototypes and production of test castings, this R&D facility actively supports the development of new Feeding and Filtration products and new material datasets for use in the Foseco Pro Module. Future projects with MAGMA include the improving the modelling of flow through filters.

SUMMARY


Tools such as MAGMASOFT® 6.0 and its powerful Autonomous Engineering functionality, combined with the updated Foseco Pro Module and its portfolio of products/potential solutions are critical for the virtual optimisation of casting production methods. The combination of these tools with the knowhow and experience of the foundryman help to deliver optimal casting quality.

The continuous evolution in computer and foundry hardware and software pushing the limits of casting technology won't stop any time soon. FOSECO and MAGMA are committed to continuing their alliance, developing better tools and services for the benefit of their mutual customers.

ABOUT THE AUTHOR

Máirtín has worked at Foseco since 1997 and is currently European Simulation Manager. In his technical leadership role, he is responsible for the regional management of Foseco simulation service capabilities and tools such as the Foseco Pro Module. This involves interaction with simulation and application experts worldwide in combination with the team working in R&D. Máirtín enjoys walking and cycling in the great outdoors and watching rugby.

GET IN TOUCH WITH MÁIRTÍN

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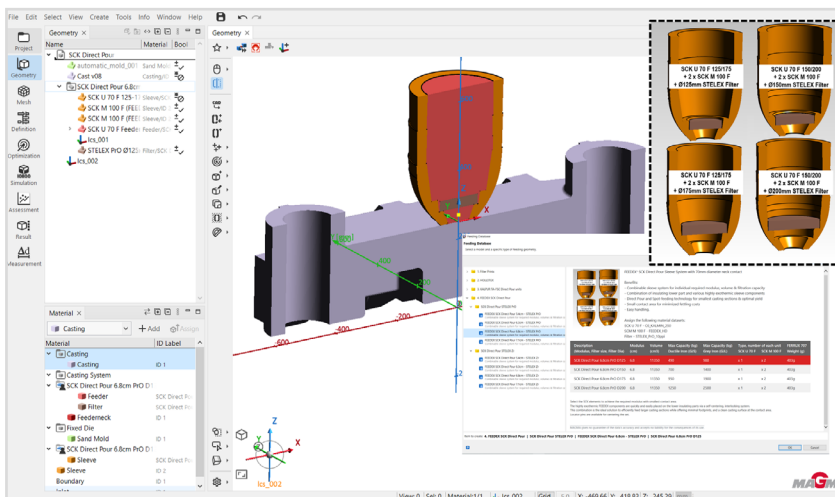


Figure 8. FEEDEX SCK Direct Pour units



Figure 9. Foundry R&D Centre at Enschede