ATAS METSTAR
DUCTILE IRON OPTIMIZER MODULE

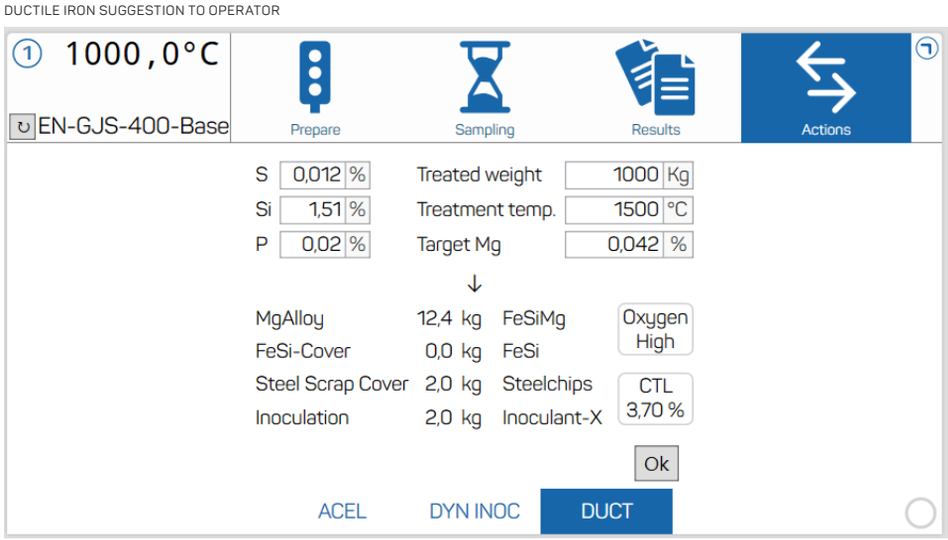
Traditionally, foundries add the same amount of Mg-alloy to every treatment, e.g. 1.5%. However, the active magnesium content might vary depending on the amount of oxygen, nitrogen and sulphur in the base iron as well as its nucleation level.

A spectrometer analysis shows the total amount of Mg regardless of how it is available in the iron. The total amount includes dissolved, active Mg as well as Mg combined as oxides, sulphate, nitrides, silicates, etc. If the same amount of Mg-alloy is added to each treatment, then the amount of active Mg might vary although the spectrometer shows the same amount of Mg e.g. 0.04%. This leads to variations in nodularity, shrinkage tendency and other casting defects that cannot be detected by spectrometer analysis.

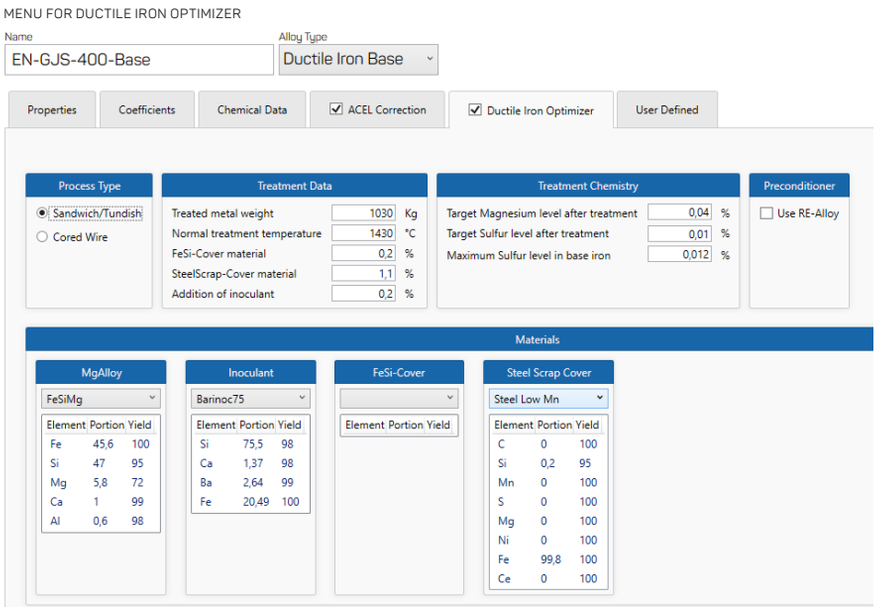
ATAS Ductile Iron Optimizer solves the problem by combining thermal and chemical analysis to calculate optimal additions of magnesium alloy for a given base iron.

The calculation of the additions is based on the:
- Evaluated oxygen content from ATAS MetStar
- Silica level in base iron
- Content of Sulphur in base iron
- Treatment temperature
- Ladle/batch size
- Target Magnesium content

DUCTILE IRON SUGGESTION TO OPERATOR



The first step is to set the process type, sandwich/Tundish or cored wire. ATAS MetStar has possibility to automatically connect to some of cored wire machines on a market. Next step is to set the treatment data, default ladle/batch weight and normal treatment temperature. These numbers could be changed directly in the production interface in order to have the real values. The following three materials, FeSi, Steelscrap and addition of inoculant have set values in percent and will be calculated to fit the treated melt weight. Treatment chemistry is set by defining the target Mg and Sulphur after treatment. Both of these values have a strong influence on the calculated amount of FeSiMg material. Maximum Sulphur level is set in order to give a warning to the operators if they by mistake work with higher Sulphur levels.



Benefits of using Ductile Iron Optimizer:

- Stabilization and optimization of the magnesium treatment process.
- Calculation of amount of magnesium based on all available information from ATAS MetStar and spectrometer which reduces magnesium consumption.
- If cored wire machine connection to ATAS MetStar is used, then full automatization is available.
- Less variations, less defect, less problems
- Better melt quality = reduced scrap rate