A NEW TREATMENT CHAMBER

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The Open Sandwich- Process and the Tundish Cover- Process have taken over more or less the treatment of Base Iron with Magnesium Alloy, worldwide.

In some cases wire treatment has taken over the job of Open Sandwich or Tundish Cover.

Changing the treatment process to Wire- Process in case of the yield is useless because with the help of the Sandwich Process it is possible to achieve similar results with a high consistency. In order to understand the following improvements, recommended by the author, one has to understand the process to some extent.

*The bubbles out of Mg- vapour, created during reaction, are getting absorbed by the melt while the absorbing capacity of the melt is limited.*

*A long lasting dwelling time of the Mg- bubbles in the melt is very important for a high Mg- yield.*

In view of the physical and metallurgical preconditions one can recognize that most of the reaction chambers used in the foundry industry can not guarantee a good process. (see the sketches 1,2 and 3)

This was the motivation for the author to think more about it in order to achieve improvements.

As a result he has developed the following design for an optimized treatment chamber as shown in sketch 4.

Which is the difference between the new treatment chamber and the usual one?

The simple geometrical, pipe like design makes sure that:

- the Magnesium alloy can be really covered with stampings
• the cover can be optimized in such a way, that the magnesium / iron reaction starts when the treatment ladle is filled – and not before!

Only in this case the bubbles have to go through the full height of the column out of liquid iron, this enables a longer lasting contact between liquid iron and Mg-bubbles.

• the layout of the chamber, as far as the diameter versus the height is correct.

Trials in foundries have shown that savings of 35% of Mg Alloy are possible.

The round treatment chamber and its filling method with the help of a funnel made it sure that all Mg-Alloy particles are fully covered with stampings. In this case a too early start of reaction is impossible and all Mg-Alloy particles are kept down in the chamber.

No particles do swim up and burn off on the surface of the melt which is happening in many cases using the conventional treatment chambers.

After gaining more positive experiences, the preconditions had been given to introduce it into the Production Process.

Smaller investments had been necessary to take over the new system into the daily routine. A funnel and a simple lifting mechanism with counter weights had been required to make it working well and better than before, shown in sketch 5.

An additional improvement was the development of a pre manufactured treatment chamber out of a special refractory material. It enables the operator to change the chamber whenever it’s necessary and the ladle is cold. It was a surprise to notice that the chamber kept itself clean, all the time.

Do you want to know more about it?
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See the chamber sketch bellow:
Different versions of treatment chambers

Sketch 1  Sketch 2  Sketch 3  Sketch 4

Sketch 5

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nothing is permanent
except

change