Casting flask: automatic filling process

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Introduction to By-cast and sand casting

By-cast is a company located in Tessenderlo that specializes in the production of industrial heat exchangers. These are primarily made of cast iron, and are thus made through a process called sand casting. By-cast stands in for the full process of creating these heat exchangers. From smelting ores in a blast furnace, to shipping their products across the world. At one point in this process, a casting flask is placed over a profile and filled with sand. By combining two of these flasks a mold is created. Further along the process, this mold is carefully filled with molten iron. After the iron is cooled off, the sand and flasks are removed. The product gets a couple finishing touches and, after inspection, the heat exchanger is shipped off to the buyer.



Objective

Currently, the filling of these sand flasks is done by manually guiding a machine that dispenses sand at high speed over the flask. However, this is very time- and energy-consuming. Additionally, it needs specially trained people to operate this machine. By automating and streamlining this process it can be completed quicker and more effectively. It also minimalizes the risk of manufacturing defects.



The Buffer

The buffer buffers the incoming Sand. It has 2 containers. One for new, fresh sand. And one for recycled sand.



The Bin

A bin moves along the upper rails and sprinkles sand into the flask below. For the first layer, fresh sand is used. For the other layers, recycled sand is used.





The Press

After every layer of sand the bin has placed, a press presses the sand together so it keeps form.

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