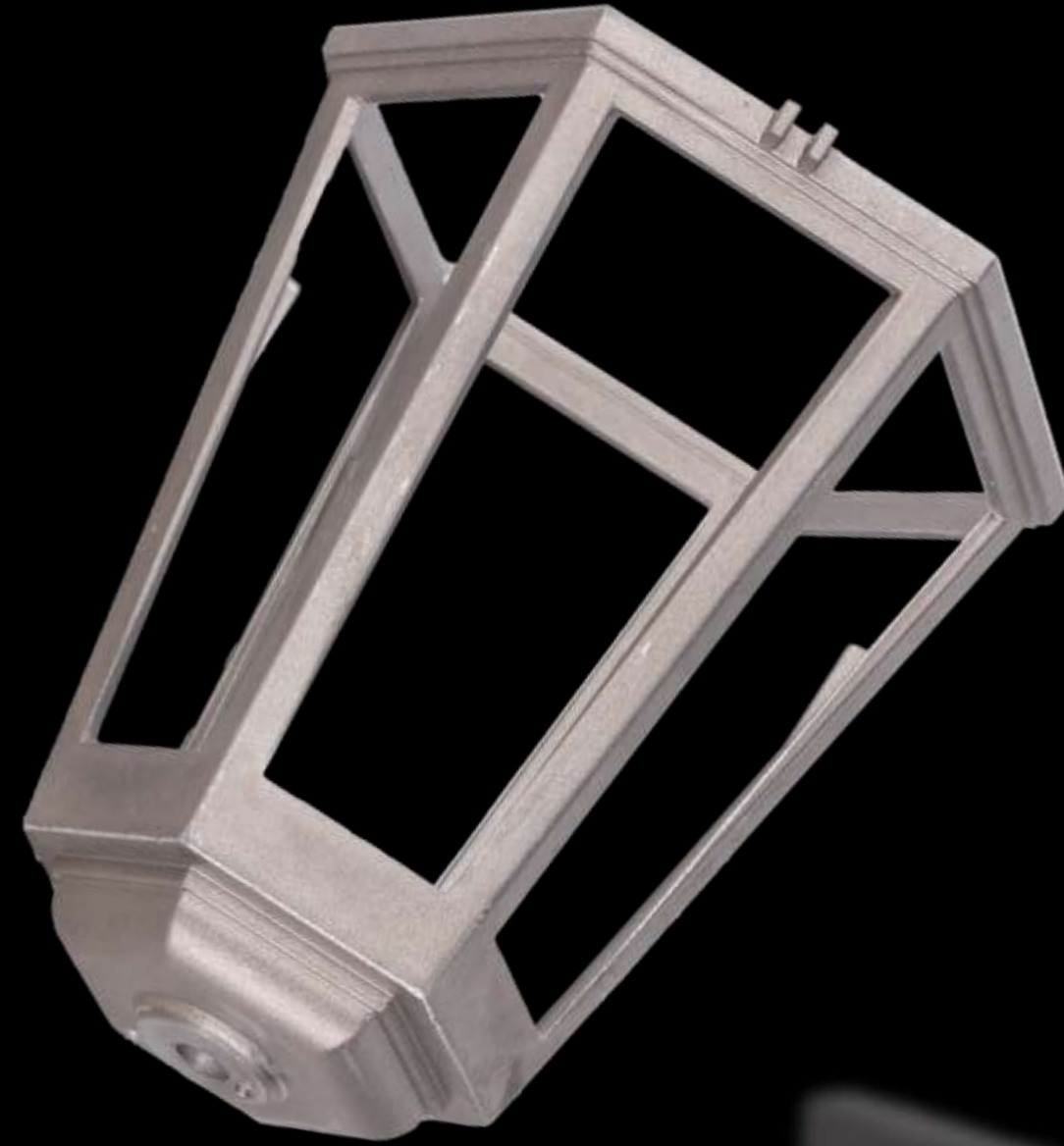


Die casting

NORLYS

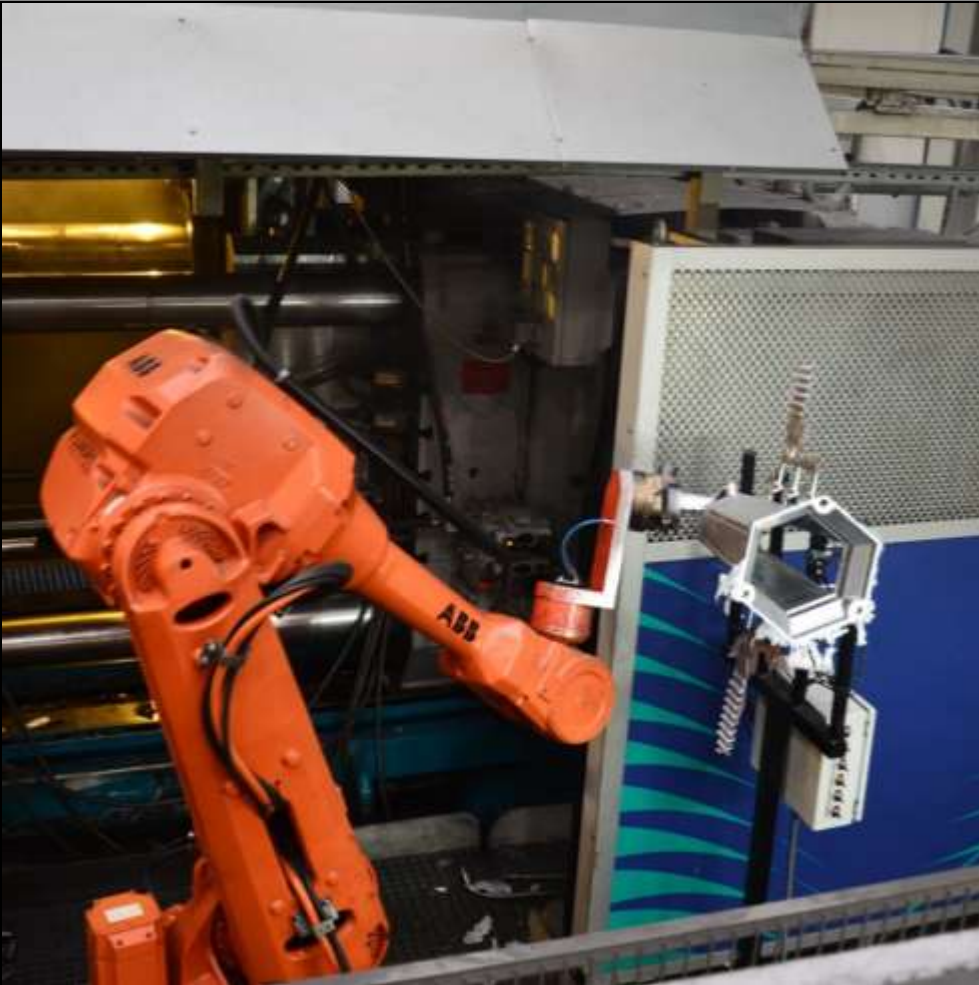


Aluminium die casting

Aluminium (alloys) are one of the most popular raw materials used for production of lantern „cages”. Aluminium provides great flexibility reg. final products shapes and excellent heat transfer from within lantern bodies. On the other hand, it requires quite sophisticated equipment and great technical knowledge in order to achieve highest quality die casts.

NORLYS uses **European sourced aluminium alloys**, **state of the art die casting processes** and finally performs **a multi stage physical and chemical surface treatment along with the final powder painting process**, in order to obtain long lasting anti-corrosion protection for its final products.





Tool Shop Department

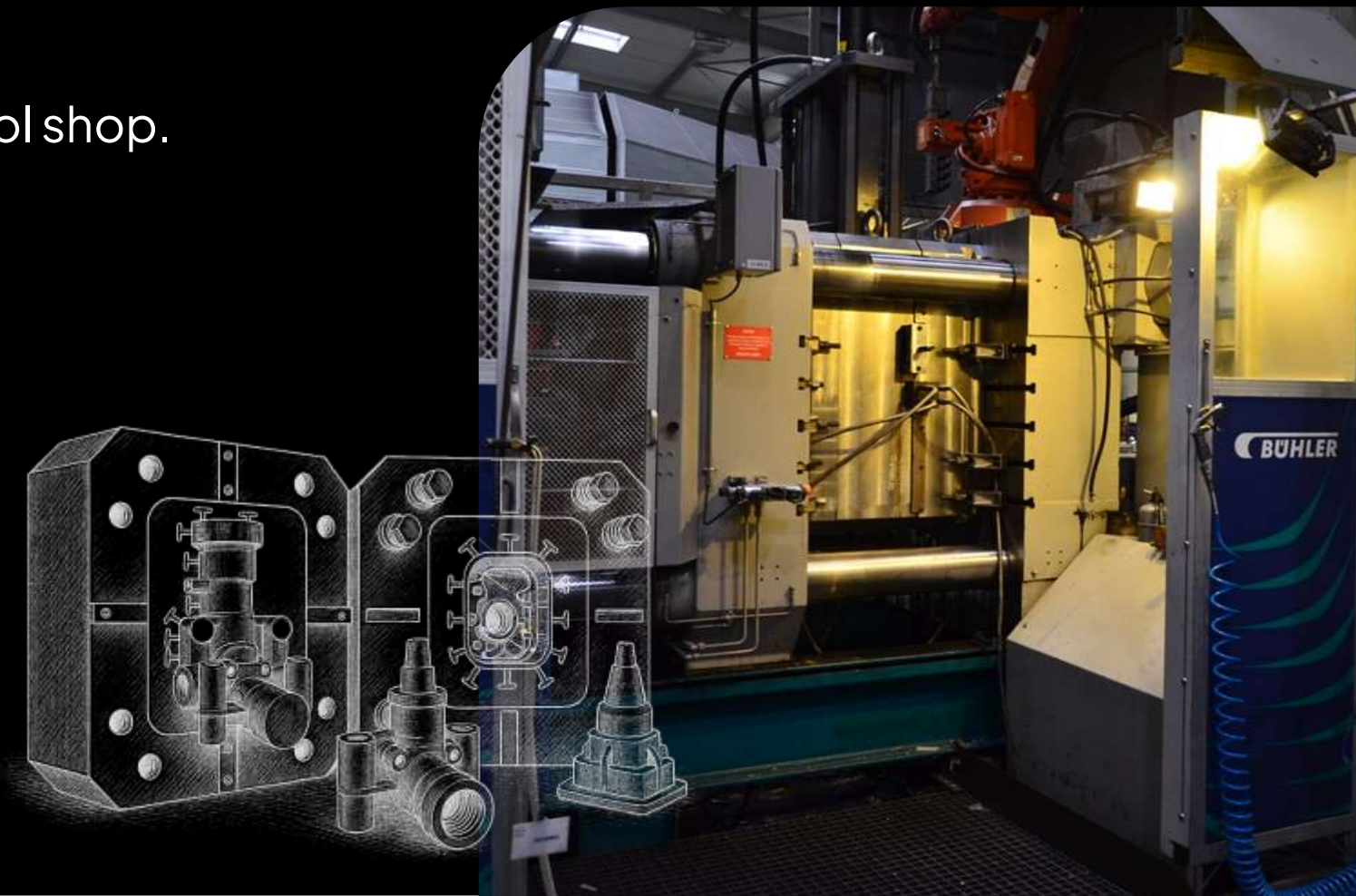


Norlys has a modernly equipped tool room department and a dedicated team of engineers who **design and make high pressure moulds, trimming dies and clamping tools**. We also perform a regular maintenance and refurbishment work on all of the high pressure die casting moulds used by our foundry.

Additionally, we are able to **design and make other types of tools**, which are used within various production departments in whole Norlys factory.

We have a modern **machining park** in our tool shop. Key equipment includes:

- **CNC milling machines**
- **Wire EDM (drilling machine)**
- **Die sinking EDM**
- **Surface grinder**
- **Tools grinder**
- **Mould spotting press**
- **Milling and turning machines**



Aluminium die casting – the process.

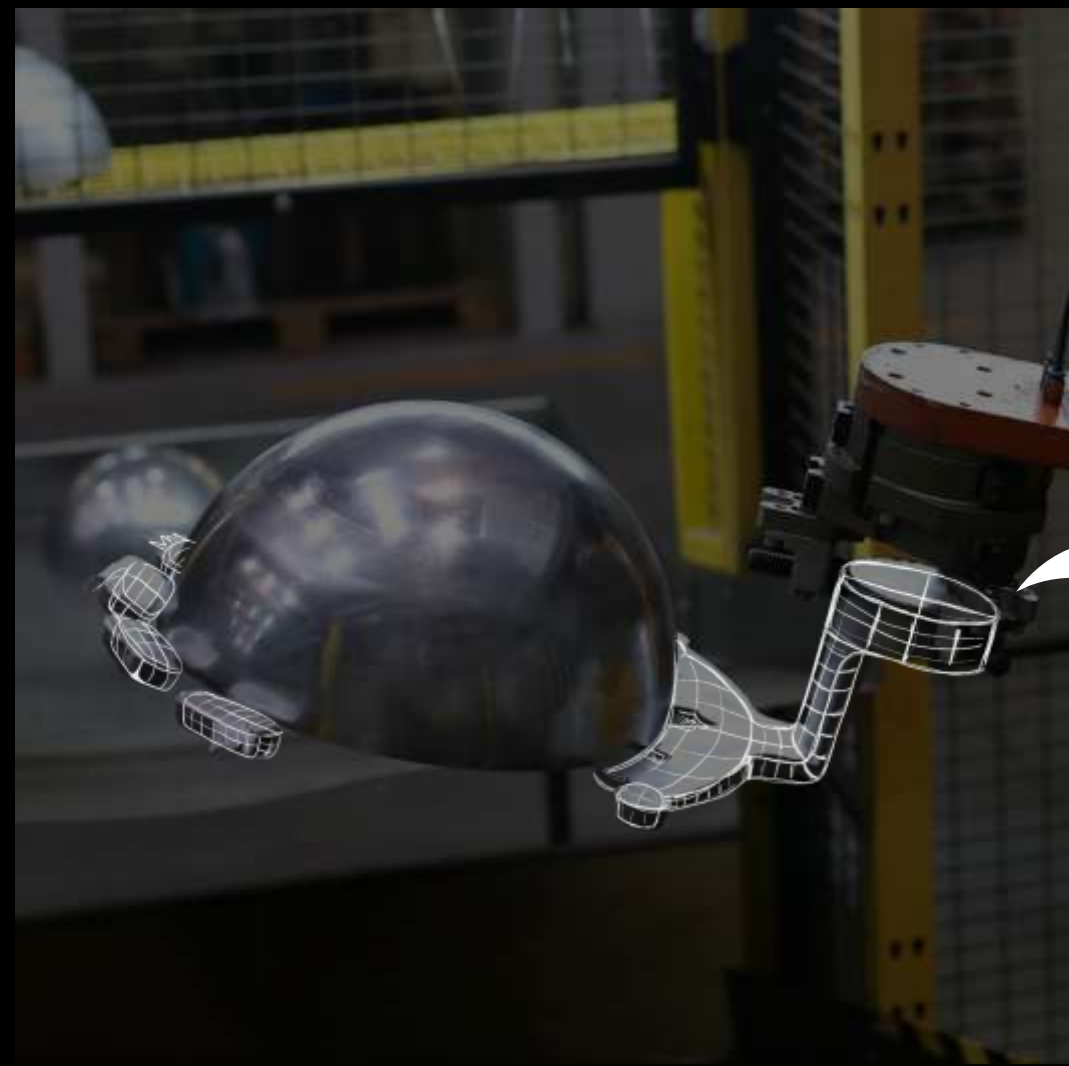
1. Melting the metal (alloy)

Die casting shaft furnace has to be filled up with a proper aluminium alloy, which contains a mixture of ingots (alloy bars) along with „scrap material” acquired at the end of die casting process (trimming).

Such a mixture (raw and processed alloy) has much better properties than ingots alone for overall quality and efficiency of the whole high pressure die casting process.

The shaft furnace provides high enough temperature (720+ Celsius degrees) to liquify solid aluminium alloy.

In our case shaft furnices operate using „natural gas”.



2. Pouring molten aluminium into transport ladle.

Once ready, operator opens furnace and pours molten alloy into a special container (transport ladle) and undergoes further processing. The main purpose of this process is transferring molten metal into die casting machines.

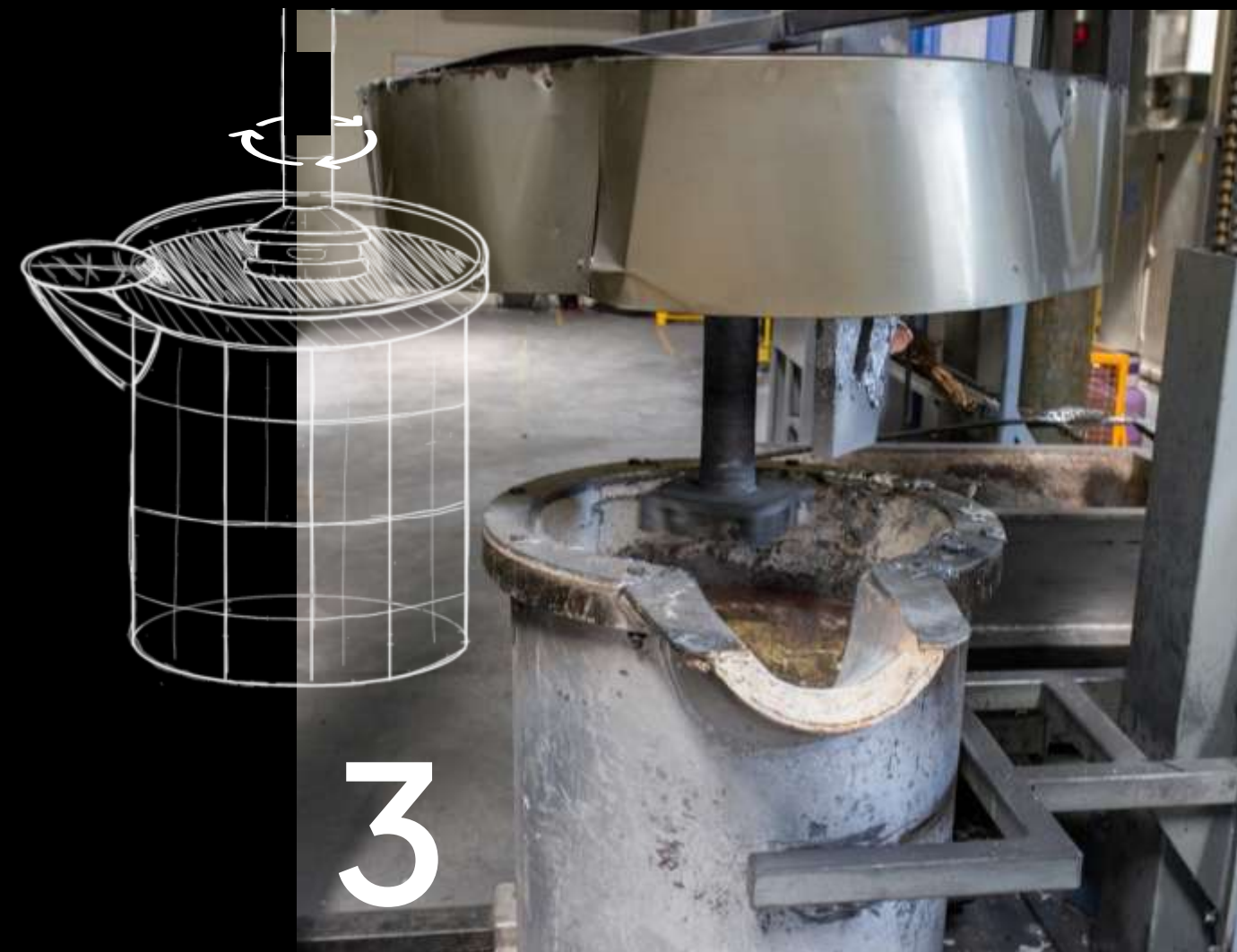


3. Refining

One of the crucial steps in die casting process. In general, it removes various contaminating gasses from molten alloy (degassing).

Skimming off any surface slag (impurities) is also performed at this stage.

This process changes overall density and porosity of die casts. It ensures much better corrosion resistance over time by reducing internal corrosion sources (pores).



4. High pressure die casting

4.1 shot (injection molten metal)

4.2 ejection of the casting

During process (4.1), molten aluminium is injected into a mould. Solidification process starts at this moment. After strictly defined time obtained die cast has to be removed from the mould by a robot (4.2). The cycle ends by spraying special separating agent into the open mould.

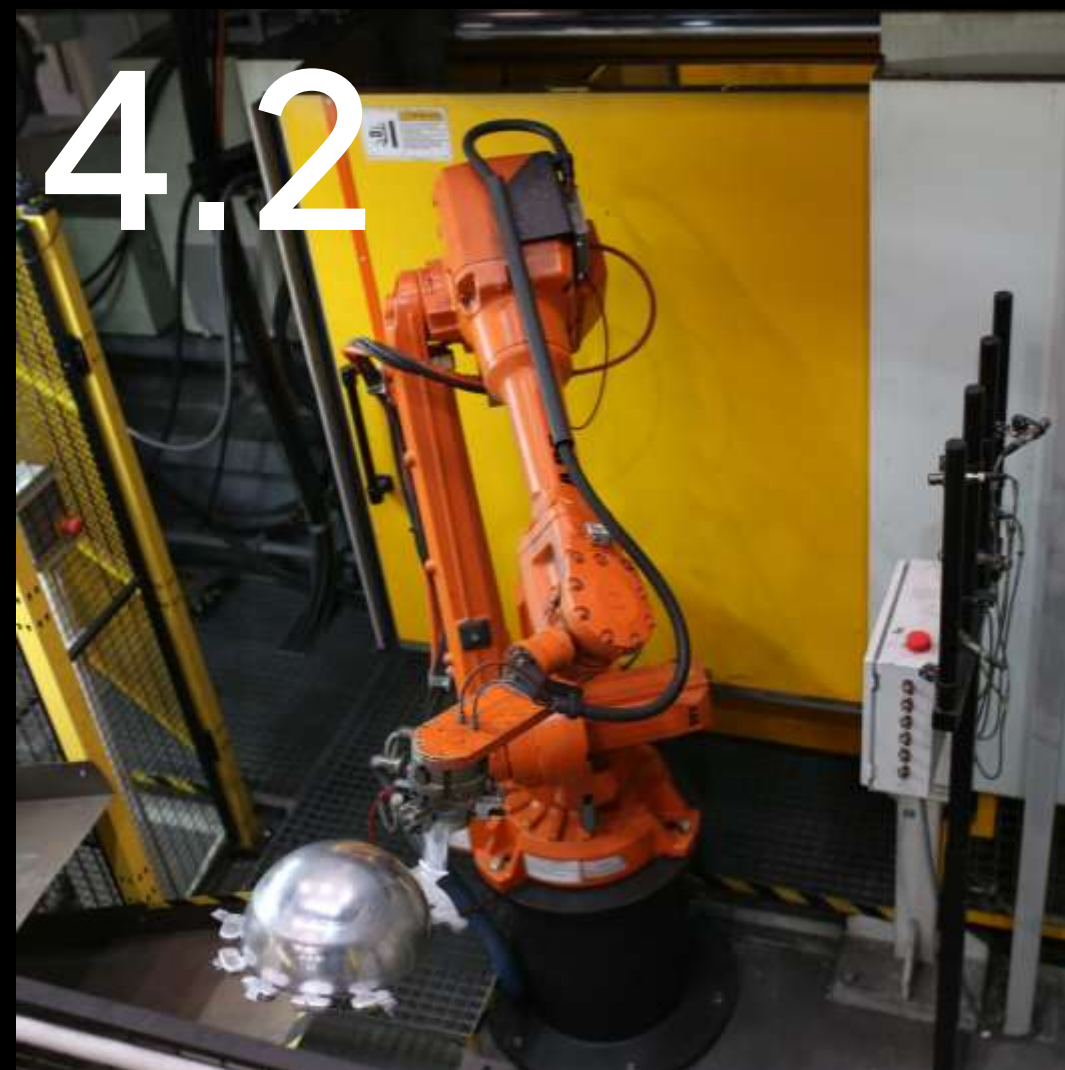


4.1

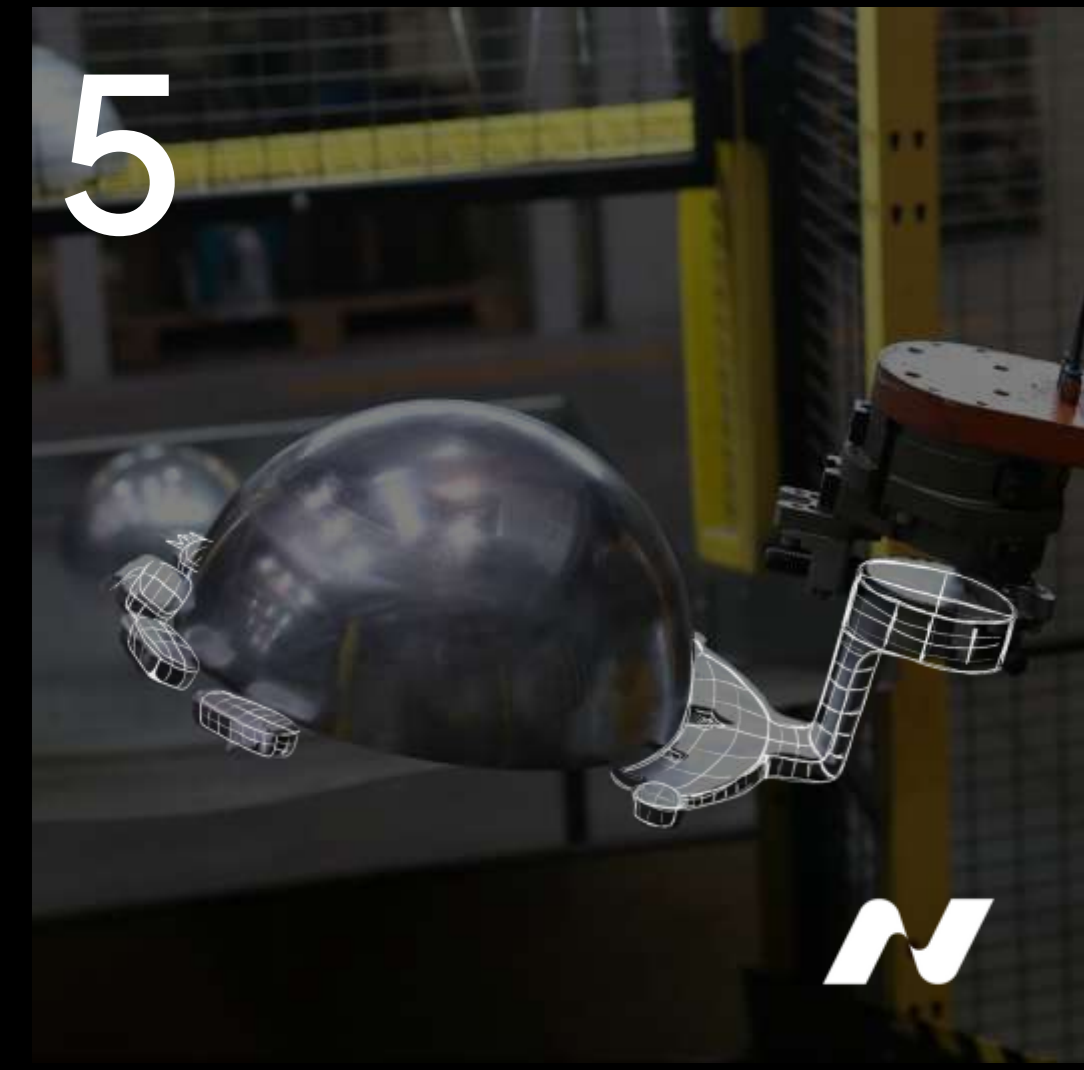
5. Trimming (and punching)

Various trimming and punching tools are utilized in the process of removing „overflow” and „flash” aluminium elements from die casts obtained during the process.

These overflow and flash elements are main sources of „scrap aluminium” which are utilized at the beginning of the whole process.



4.2



5

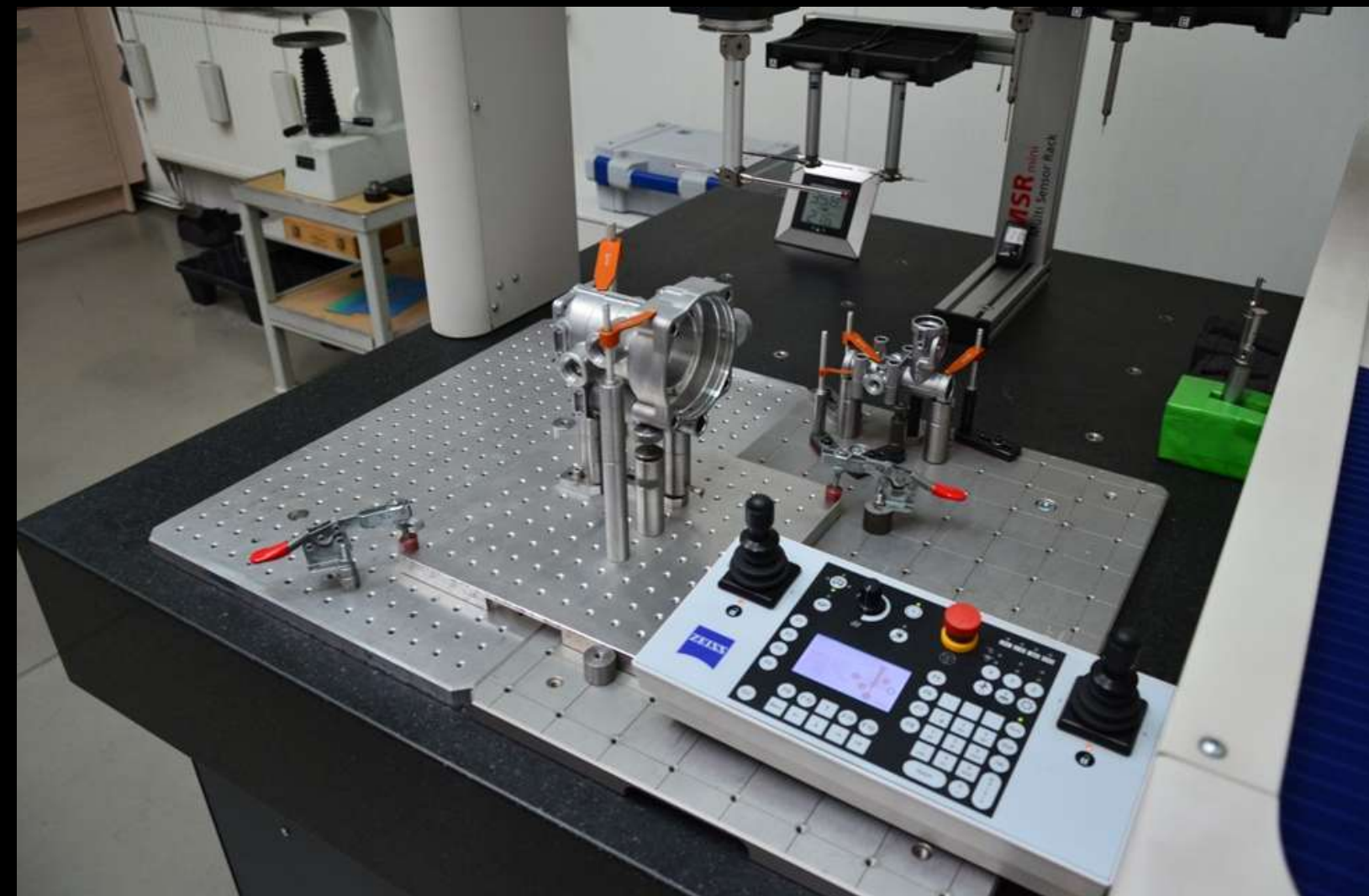


Validation and testing

All previous actions, performed under strictly controlled conditions, would be nothing without the **constant validation and testing**.

NORLYS constantly monitors regular production alloy samples as well as painted elements in its **laboratories**.

These tests, performed in accordance with strict **ISO** standards, are very good indicator of real conditions corrosion resistance performance.





Contact

Norlys AS
Hovfaret 4B, NO-0275 Oslo
P.B 1014 Hoff, NO-0218 Oslo - Norway
info@norlys.com