Fig 1. Dynamic concept high performance scrap preheating system

Innovative approach for recycling

Context of the Industry

The situation in terms of global climate and greenhouse emissions represents a big challenge for our modern society – which requires real actions and new solutions. More and more groups and companies participate in this worldwide effort to bring new opportunities. Aluminium recycling is one piece of the puzzle to achieve the goal of ensuring a greener economy.

Meanwhile, responsible companies integrate aluminium recycling into their marketing strategy. Customers in general are more sensitive to this aspect. So, this is why we observe that these direct customer suppliers ask their suppliers to increase the recycling of their contents in their products. This is how the value chain is solicited.

Availability of Scrap

The availability of post consumer scrap has always been a challenge. In some regions, this type of scrap used to betransported away to be recycled elsewhere. The trend is to minimize transportation and CO_2 emissions through local recycling. The result is that more scrap is available in some markets, as we can see in North America.

Closed Loop Economy

In many processes, an efficient way to recycle is to recover scrap generated in the same value chain. For example, an aluminium slab supplier can recover scrap from its own customers and subcustomers to cast new slabs. The advantage in this is the compatibility of the products in terms of alloys and other characteristics. The required equipment is simpler, and the constant supply of scrap is easier to guarantee.

Dynamic Concept's Approach

Dynamic Concept has been involved in many projects in both process engineering support and adapted equipment solution for casthouses around the world. We can confirm that there is no unique solution in the implementation of recycling. It is a case by case approach. For any adapted solution regarding scrap handling, scrap pre-treatment, melting and metal transfer system, several factors must be taken into account:

- Type of scrap to process
- Existing constraints (for example, room available in existing building)
- Actual/existing metal transfer system or metal route
- Products/requirements of metal to cast
- Configuration of existing casting machine
- Etc.

We propose a flexible approach in terms of design and configuration that would support the customers in all steps of a project.

For recycling project, study all those parameters in order to fit the best solution and configuration is the key for success. Then, we support the client for the further steps project implementation either with our adapted equipment and/or other supplier equipment. The idea is to provide the client the best available solution on the market and implement the best configuration for his needs.

Fig 2. Dynamic concept furnace to furnace metal transfer siphoning system

Solutions and Options to Consider

For scrap handling, changing, treatment and melting, many options are possible depending on the type of material to be recycled. Some require sorting and pre treatment; others can be loaded directly. Many melting solutions are to be considered such as a rotating furnace, a multi chamber furnace, fume post burning requirement, level of automation, preheating requirements, etc. **Fig 1**

Metal transfer is a key factor in the recycling configuration. In some existing plants, crucibles are already used for molten metal transfer or route. So, many options are possible:

- Gravity pouring
- Gravity tap out
- Gravity siphoning
- Aspiration (vacuum/pressure) siphoning
- Pressure siphoning
- Mechanical pump

Dynamic Concept has direct experience with most of these systems. There is no one system that is better, only preferred systems for specific requirements and configurations. **Fig 2/Fig 3/Fig 4**

To select the right equipment for any specific application, we use a PUGH Matrix, which takes into account several factors such as dross generation level, reliability/complexity, maintenance cost, investment, safety, degree of automation, metal level dependency and process requirements.

Conclusion

Our experience has shown that it is very important to analyse the technical requirements according to the existing constraints of the existing production line and the building. Starting with a good analysis of the possible options will guarantee a good project and process efficiency that c/w with a good return on investment.

Dynamic Concept can support the plants in all the steps to implement higher contains of recycling in their production. ■

Contact
www.dynamicconcept.com
patrice.cote@dynamicconcept.com

Fig 3. Dynamic concept automated remove tap hole opening/closing system

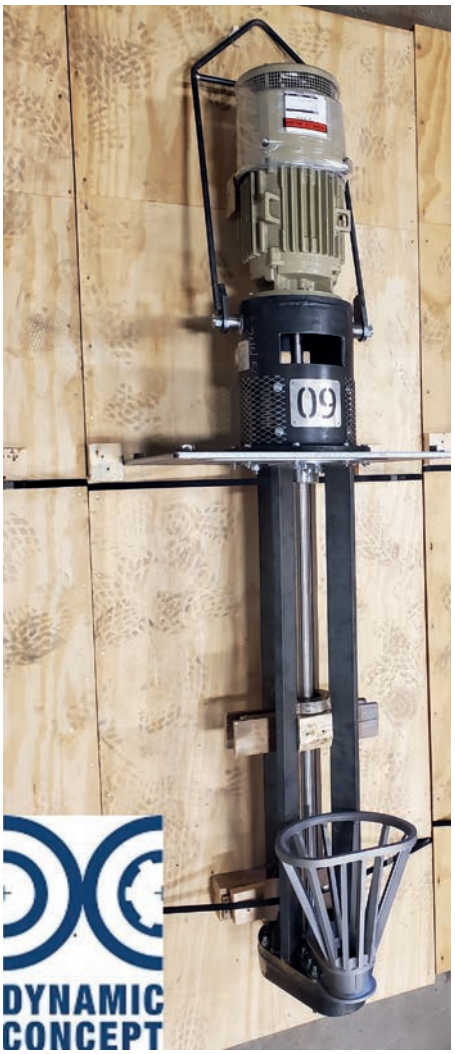

Fig 4. Dynamic concept metal pump (Mg pump on picture)