

Eirich Mixing Cascade EMC[®] for Anode Paste Preparation

The Cost-Optimized Solution for
Anode Paste Mixing and Cooling



Picture: Paste plant at Sohar Oman

The Pioneer in Material Processing[®]



Eirich Mixing Cascade EMC® for anode paste preparation

Based on own expertise of more than 30 years and in close cooperation with some of the biggest aluminum producers in the world, Eirich developed the machines for the so-called Eirich Mixing Cascade EMC®, a continuously operated system which is working without any use of conventional kneaders.

The main achievements are:

- same or higher paste quality compared to a classical line with two kneaders in series
- lower investment costs
- lower operating and maintenance costs

Preparation technology

The Eirich intensive mixer is the key element of the EMC®, enabling the replacement of short-time pitch penetration with long-time pitch penetration

through careful intensive mixing. The retention time in the machine is approximately twice as long as in a conventional kneader. The introduction of liquid pitch, has allowed hotter mixing temperatures, reaching up to 180°C or even higher. However, with the paste viscosity being lower now, conventional kneaders need a very narrow outlet gap to ensure their specific mixing energy and bear the risk of particle degradation.

Benefits of the Eirich solution:

- Low capital expenditure (CAPEX): savings of at least 40-50 % per line
- Low operational expenditures (OPEX): savings of at least 30 % per line
- Perfect adaptation to low raw material quality and property fluctuations
- Throughput rates of more than 65 t/h in one single line
- Low variation of retention time during mixing
- Optimum mixing and cooling conditions for excellent paste quality
- Simple machine design
- Vibrocompacting of anode paste up to 165 °C without vacuum system



Eirich Mixing Cascade 35 t/h

Intensive mixers are well-known for their high homogenization effect based on a strong horizontal and vertical mass flow caused by the rotating mixing pan with one or two rotor tools. A relatively low energy input is already sufficient to produce an anode paste of high green density. Compared to a Conti kneader, the retention time variation during the mixing process is significantly reduced.

The EMC® process

Coke preheating screw

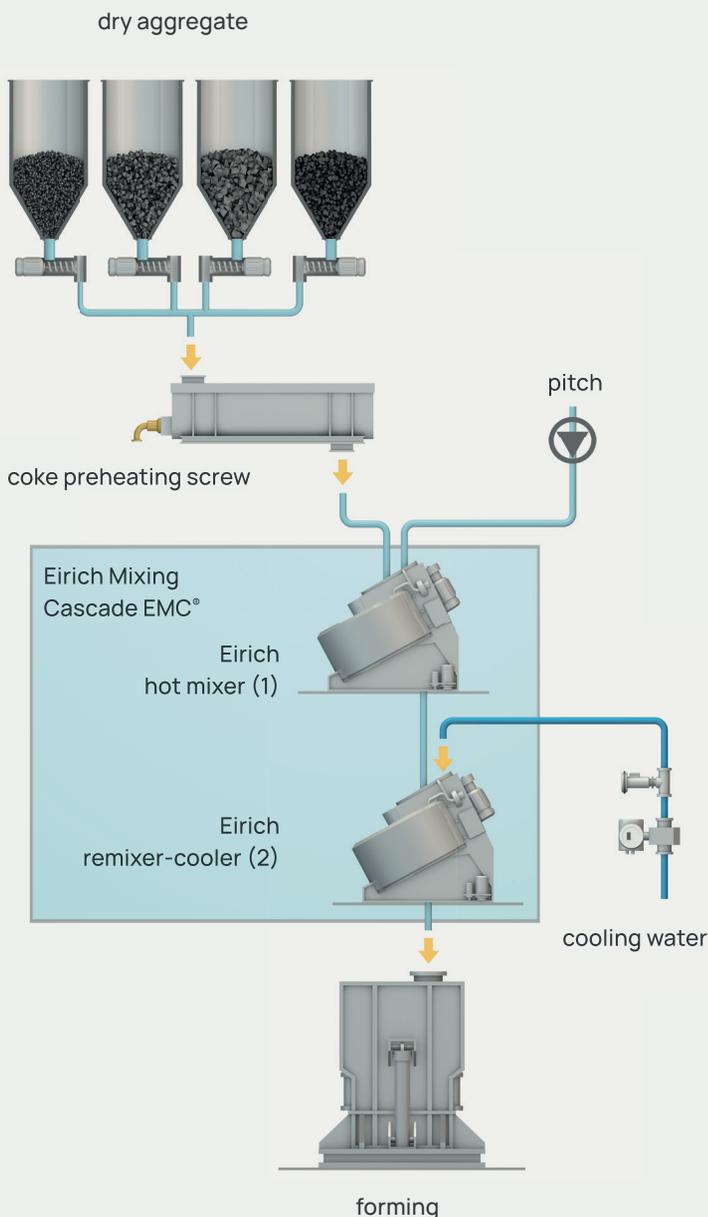
Hot thermal fluid (HTF) circulates inside the screw spirals from the coke discharge end to the feeding end, thus showing a very efficient countercurrent thermal exchange. The heat exchange is completed by an additional flow of HTM circulating inside the double envelope of the screw trough. A variable speed drive unit helps to maintain a consistent filling level of coke above the screws, regardless of the production rate, maximizing the active heating area and avoiding any wear problem on the screw spirals at the feeding end.

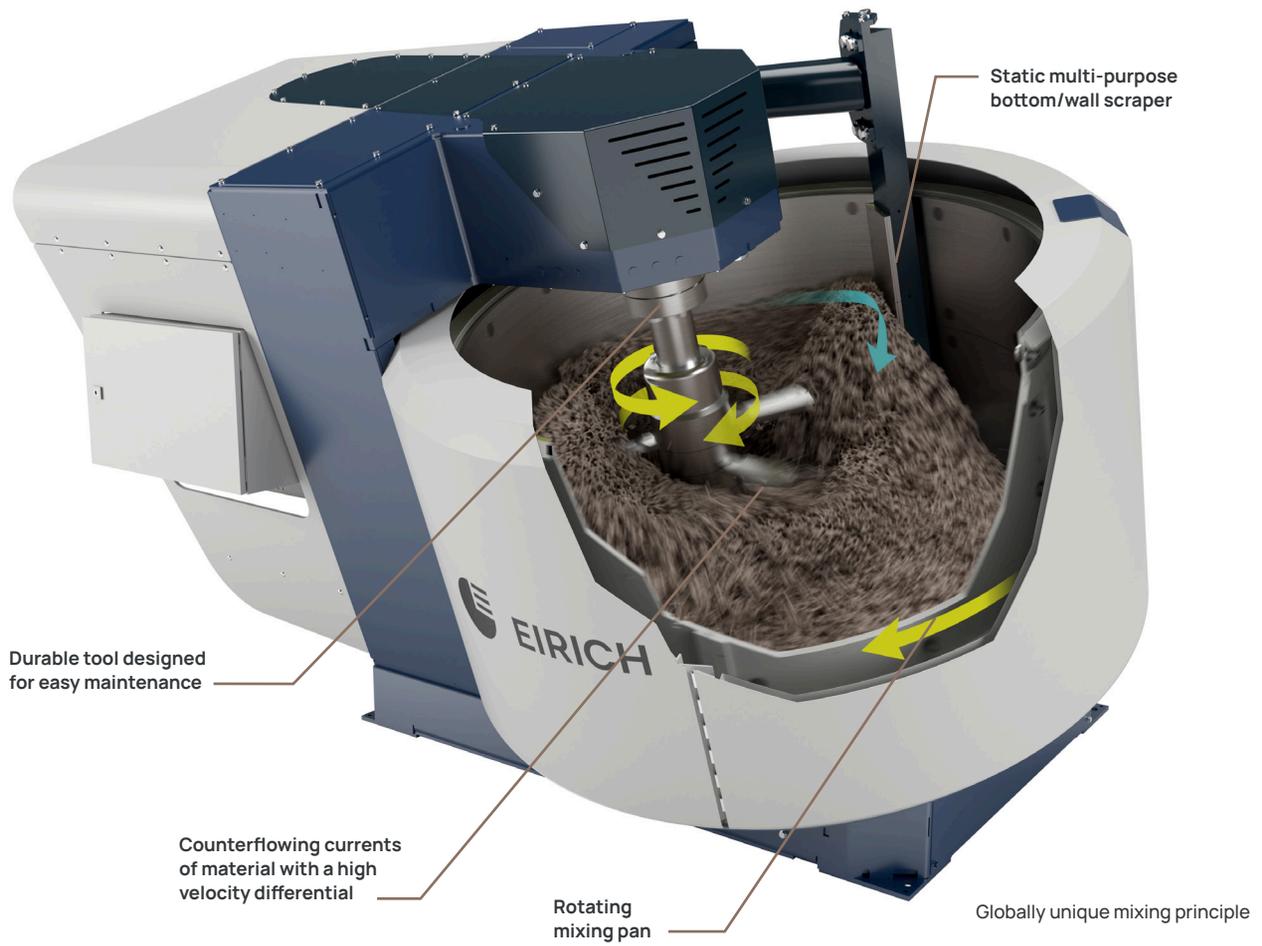
Eirich hot mixer

The preheated dry aggregate together with the binder pitch (in liquid or solid form) is fed into the hot mixer. The continuous mass flow through the machine is controlled by means of a swiveling discharge gate in the center of the mixing pan bottom. The mixing tools are easily accessible from the outside. All wear parts are small and of simple shape. One maintenance shift (8 hours) is sufficient to replace the rotor blades completely.

Eirich remixer-cooler

The paste from the hot mixer is simultaneously remixed and cooled through a similar continuous mass flow control and mixing tool system as that of the hot mixer. The intensive cooling effect is achieved by injecting water into the anode paste and causing immediate evaporation. The discharge temperature is accurately controlled with a variation of less than $\pm 3\text{ }^{\circ}\text{C}$. Steam and pitch fumes are led to the exhaust air treatment center using saturated air flowing through the machine.





Eirich preparation technology in operation



Paste plant at Sohar Oman

More information at
www.eirich.com