

# I LINEAR MOTOR



**HORN**  
GLASS INDUSTRIES

*innovation*  
ENGINEERED IN GERMANY

# LINEAR MOTOR



The HORN® linear motor of Type LM influences the tin flow in the tin bath by means of an electromagnetic field, which generates a magnetic force on the tin surface. As a result, the molten tin circulates along the flux lines of the magnetic field, moving from the middle of the tin bath towards its edges and back.

Thus, tin flows are generated, which facilitate balancing the temperature profile of the tin all over the glass ribbon. Moreover, the linear motors can be used at the dedrossing pockets to clean the surface of the liquid tin of dross (tin oxide) at the end of the tin bath. A second positive effect of the linear motors at the dedrossing pocket is the circulation of the tin at the exit end by virtue of the angled return channel. During heat-up of the tin bath the linear motors are used to homogenise the tin temperature, as well as to clean the tin.

The HORN® linear motor Type LM is installed on a mobile carriage which can be moved on the hall floor along the tin bath to ensure that the tin flows can be influenced flexibly. There are plugs provided along the tin bath where the mobile linear motor can be connected.

Stationary linear motors of the dedrossing pockets are installed on the tin bath casing, as these are used here permanently. The two versions of the linear motor also differ in that the stationary linear motor can be switched between the clockwise and counterclockwise direction of the field at the press of a button. In the mobile version the field direction can be changed at the connector plug.

The HORN® linear motor Type LM comprises four individual parts: a linear motor head, a water-cooled support arm, a mobile carriage and a water distributor.

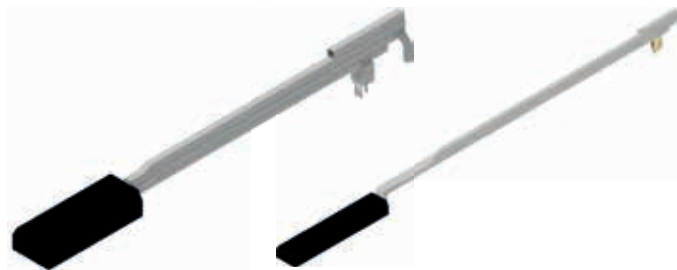
## LINEAR MOTOR HEAD

The linear motor head consists of water-cooled copper coils embedded in refractory concrete, which serves as protection from heat and molten tin. The linear motor head is firmly integrated in the support arm, forming one unit with it.



## WATER-COOLED SUPPORT ARM

The water-cooled support arm serves as an electrical connection and cools the linear motor head.

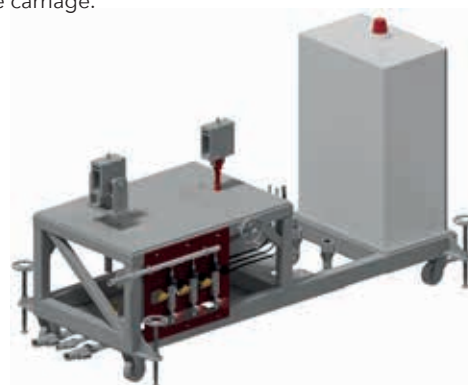


Water-cooled support arm with 6-pole linear motor head

Water-cooled support arm with 12-pole linear motor head

## MOBILE CARRIAGE

The carriage, which is used for the mobile linear motor, has a castor on each corner for easier movement on the hall floor. The switch cabinet, water distribution box and the water-cooled support arm with the linear motor head are installed on the carriage.



## WATER DISTRIBUTOR

The water distributor contains a shut-off valve, a flow sensor and a needle valve per coil pair. The distributor is installed on the return line of the linear motor head.

