

I DROSS BOX

HORN

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GLASS INDUSTRIES

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ENGINEERED IN GERMANY

DROSS BOX

The dross box is the most important instrument for a smooth transfer of the glass ribbon from the tin bath into the annealing Lehr. For this purpose the dross box needs to perform numerous important functions simultaneously:

- It ensures constant production conditions in the tin bath with minimised oxygen influx
- It maintains the optimal protective atmosphere consisting of nitrogen, which prevents the influx of air from the annealing Lehr
- Its lift-out rollers lift the glass ribbon out of the tin bath for optimal transport into the annealing Lehr

The dross box consists of two main components: the dross box casing and the dross box hood with curtains.



DROSS BOX CASING

The dross box casing is connected gas-tight to the tin bath casing by a special bolt system. The complete DB-Casing is insulated to reduce heat losses to a minimum. Special sealing of the lift-out rollers (LOR) ensures a maximum atmosphere tightness of the bottom part. The casing is connected to the strong base-frame in such a way that they can move freely relative to each other, thus ensuring a controlled heat expansion without deformation. Special design and welding procedures ensure minimal to no heat deformations during heat-up and operation.

The individual LOR bearing system works independent of the casing and is adjustable within ± 25 mm. No water or oil cooling is required. An individual drive system for lift-out rollers is available as an option. A special pneumatically controlled graphite LOR-cleaning mechanism serves for perfect sealing and cleaning of the three LORs. The pressure can be adjusted on a control panel within seconds. The graphite blocks are reliably placed in a solid cast-iron U-beam and are quickly and easily exchangeable. Hot swapping of the lift-out rollers under a running glass ribbon is possible.

DROSS BOX HOOD & CURTAINS

The dross box hood is connected gas-tight to the tin bath roof. The hood suspension is installed on the same supporting steel structure as the roof, allowing for heat expansion of the roof. The hood is fully insulated to reduce heat losses.

There are four curtains inside the dross box hood, which are adjustable in height via motors. The curtains serve to minimise oxygen influx into the tin bath. For this purpose the curtains are positioned as close to the glass ribbon as possible. Curtain positioning can be monitored through the inspection window in the side sealing.

Operation via hand wheels is also possible in case of power or control failure. The curtains above the glass ribbon and the lift-out rollers below it form individually sealed chambers, which creates a labyrinth sealing and reduces atmosphere and heat losses to a minimum.

LIFT-OUT ROLLERS

The glass ribbon is lifted from the liquid tin in the tin bath by means of the lift-out rollers (LOR) and transported into the annealing Lehr through the dross box. This design can accommodate various types of lift-out rollers (steel, ceramic, ceramic coated). The lift-out rollers are adjustable in height, so they can adapt optimally to the required properties of the glass ribbon.

The lift-out curve depends on factors like glass temperature and glass thickness. Therefore the adaptability of the lift-out rollers is essential. The lift-out rollers can be driven by the mechanical drive system of the annealing Lehr or optionally by an independent drive system. With an independent drive system each lift out roller can be driven individually.

MEDIA SUPPLY

Various injection points for N_2/SO_2 , as well as temperature/pressure sensors, are located on the casing and hood. The nitrogen for the casing is preheated in the tin bath exit lip before injection. All parts of the dross box are designed to the customer's specific requirements in order to improve glass quality and yield.

BENEFITS

- Casing and hood completely insulated to reduce heat losses
- Special design to reduce atmosphere losses and heat deformation to a minimum
- Casing and hood connected by a special bolt connection without welding
- Special pneumatic LOR-cleaning system
- Individual LOR bearing system with vertical and horizontal adjustment
- Motorised curtains, individually adjustable
- Exchanging LORs under glass ribbon possible