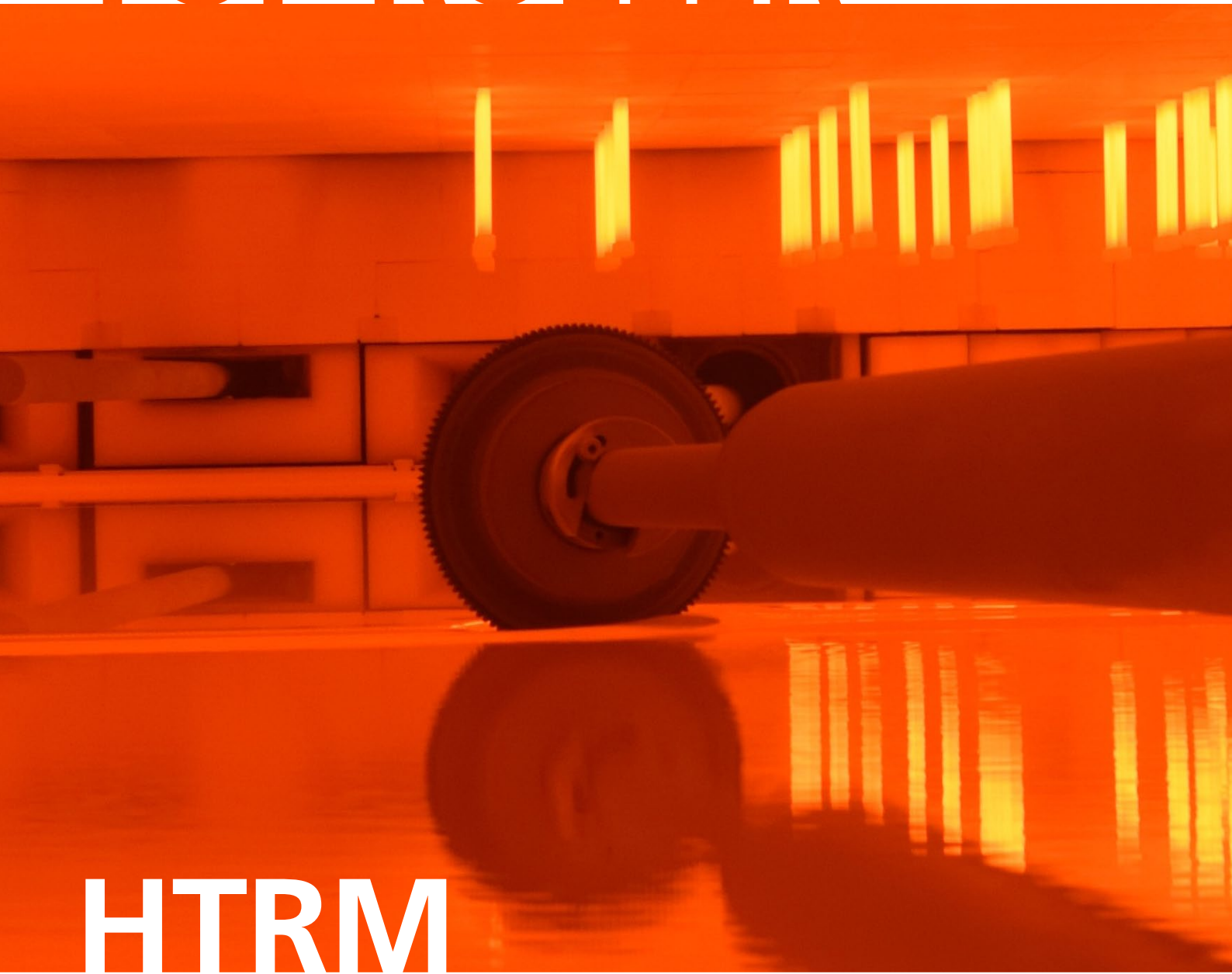


TOP ROLLER



HTRM

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ENGINEERED IN GERMANY

HORN
GLASS INDUSTRIES

HORN TOP ROLLER HTRM

Top rollers are amongst the most important machines of a tin bath. These machines are always used in pairs in the forming section of the tin bath. Each pair, consisting of master and slave, works synchronously and thereby creates optimal conditions for a smooth production process.

Top rollers are always used when products are to be manufactured which cannot be produced in the "direct stretch" process, or more precisely when items are to be produced which are thinner or thicker than 7 mm.

In general one can distinguish between two production processes using top rollers:

- The "assistance direct stretch" (ADS), where the top roller is swivelled in a positive angle towards the tin bath exit
- The "re-assistant direct stretch" (RADS), where the top roller is swivelled in a negative angle towards the tin bath entrance. The number of machine pairs required depends on the glass thickness and the tonnage to be produced

In the ADS process the natural expansion of the glass ribbon is increased. This allows production of glass thicknesses of less than 7 mm. In the RADS process the natural expansion of the glass ribbon is restricted allowing the production of glass thicknesses of up to 15 mm and more.

HORN offers two different types of top roller machines:

- The floor-based top roller, type HRTM-F, which is installed on the hall floor
- The suspended top roller, type HRTM-S, which is suspended from the tin bath steel structure

The most important component of each top roller is the knurl. The knurl is a type of gearwheel with a tooth profile specially adapted to the application process which is screwed onto a hollow shaft. A servomotor allows infinitely adjustable rotation speed of the knurl. A rotary transmission at the end of the hollow shaft ensures optimum cooling water supply for the shaft and the knurl. Installed in a water-cooled casing pipe, the knurl with its drive shaft is optimally equipped to operate inside the hot tin bath.

All machine movements, such as extension and retraction, the adjustment of the angle and positioning of the glass ribbon, the so-called nip, are effected by electric motors.

Manual operation of all machine movements is also possible e.g. in the unlikely case of power failure to remove the machines from the tin bath in order to avoid any serious damage to the machine or plant.

The emergency nip-off which is triggered when there is a failure of the rotary knurl movement is executed by a pneumatic lifting cylinder.

All movements of the top rollers can be controlled both from the control room and at the operating panel on the machine on site. When controlling from the control room, these actions can be supervised by means of a periscope. The periscope shows the operator in the control room what the top roller is doing inside the tin bath following the operator's orders. When operation is effected on site, the operator can see the machine actions inside the tin bath through a window side sealing. In order to facilitate the setup operation and the control on site, each top roller is equipped with an interface for a mobile plug-in touch panel. The number of the supplied panels is freely selectable. These panels greatly facilitate working on the machine on site. Due to this additional feature of the HORN top rollers the machine setup and the local operation on site can be done by one person.

Each movement of the machine is displayed by a flashing light and reinforced by an acoustic signal. So any person present can leave the operating range of the machine in time.

The control system provided for the control room, comprising a control panel, a separate PC with the appropriate control software and visualisation, complete the overall package for the HORN top rollers.

No matter which type of top roller you decide on, the HORN top roller will be a reliable and robust partner for the manufacture of high-quality products.



Benefits HRTM-F and HRTM-S

- Easy and quick installation and maintenance
- Easy operation
- Optimized setup operation and on site control by means of a mobile touch panel
- Compact design with integrated switch cabinet:
The complete wiring and internal pipework up to the interfaces are installed ex works
- Leaves our works mechanically and electrically preassembled and fully tested
- Complete media supply from below at the pivot point of the machine – there are no bothersome hoses etc. in the work area
- High safety standard – safe handling and safe operation for the user