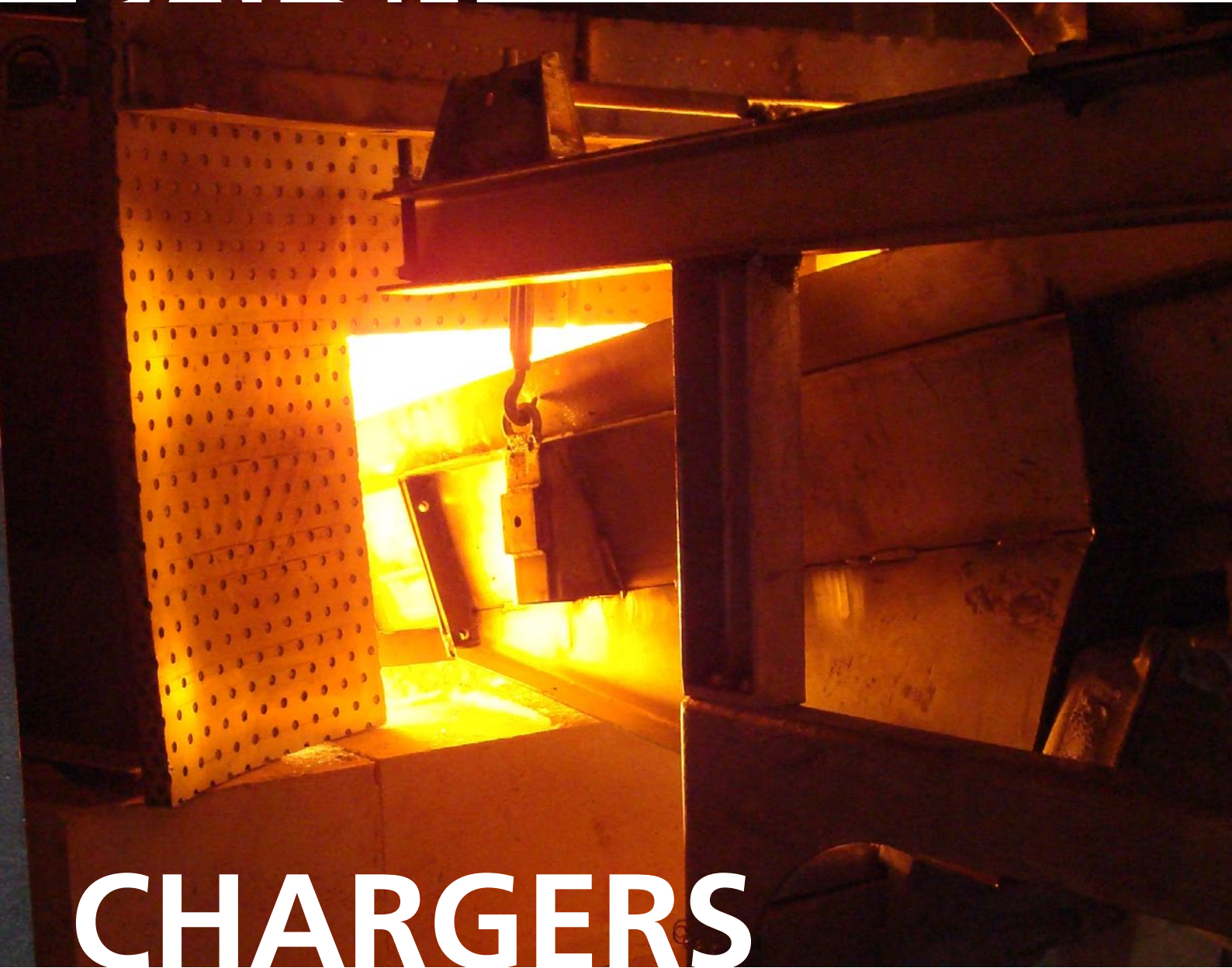


# BATCH



# CHARGERS

*innovation*  
ENGINEERED IN GERMANY

**HORN**  
GLASS INDUSTRIES

# BATCH CHARGER MODEL HVR

## General

The HVR batch charger is used for furnaces with lateral or frontal doghouses. HORN's batch charger type HVR is the most classic and popular batch charger of HORN Glass Industries AG on the market. There are 3 different types of it. The most common type HVR F is available with 5 different chute widths which all have individual charging performance, according to your requirements. Invented and constructed since the founding of HORN Glass Industries AG the HVR is still the most popular and reliable batch charger for your glass plant.

In order to fulfill the current regulations regarding NOx values and also to save more energy when producing glass HORN Glass Industries AG developed the batch charger HVR 700F-2P. HVR 700F-2P is very reliable and HORN Glass is very satisfied with its performance, however, HORN never stops learning and always looks to improve its products. To meet its customers' requirements, HORN invented its latest batch charger HVR 600S-2P and HVR 700S-2P.

The difference is the "S" in HVR 600S-2P. It stands for servo drive whereas "F" in the previous model HVR 700F-2P stands for frequency-drive. In order to positively influence the batch charging process by defined paddle controls, the gear motors were replaced by servo drives and can be set into three different operating modes, which are: Independent, synchronal and batch cutting.

Through the servo drives, which are centrally controlled by a 2-axis control, it is now possible to define the absolute number of vertices and transition rate percentage of the set point while oscillating.



## Heat shield

The heat shield, in combination with a refractory doghouse hood, brings about the sealing of the doghouse whereby secondary air supply is eliminated. The heat shield also protects the batch charger from too much heat radiation.

## Charging system

The batch is evenly spread on the vibrating chute with the help of the charging hopper. The end piece of the vibrating chute is made of heat resistant steel and is exchangeable in order to avoid downtime if a repair is required.

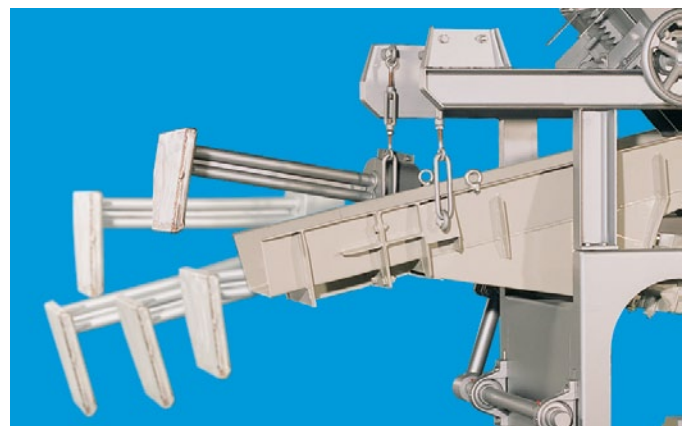
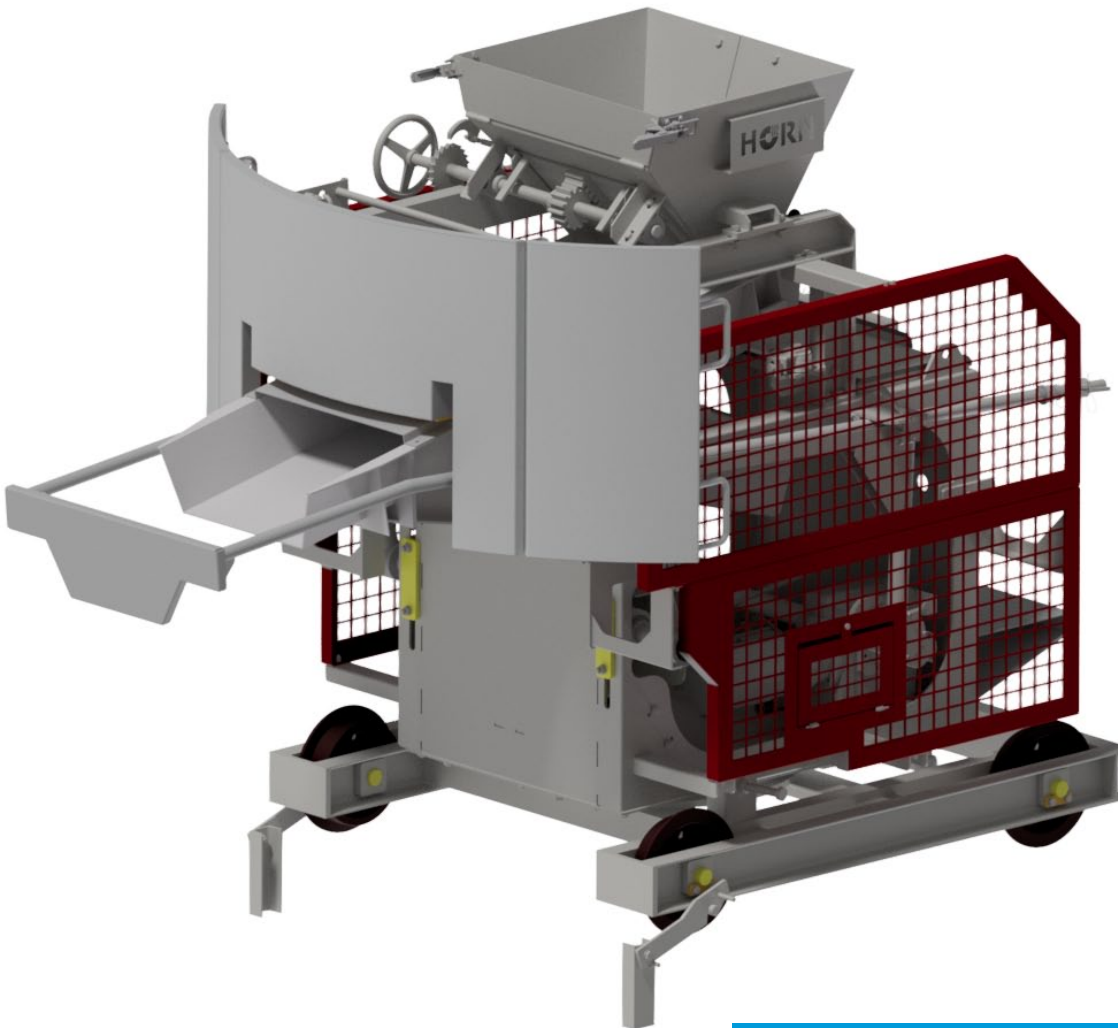


## HVR 300 F / 400 F / 500 F / 600 F

The batch charger is fixed to a moveable carriage with a rotary frame. The frame turns on a ball bearing which is fixed between the frame and the carriage. The slewing motion of the rotating frame is caused by a controllable pneumatic cylinder. The movement of the paddle is carried out by a lever system which is connected to a frequency controlled gearbox motor.

The swing gear for the batch charger HVR 500 F and HVR 600 F always slews from the middle position to the right and to the left, regardless on which side of the furnace the batch charger is set up.

A water-cooled paddle is situated at the end of the oscillating charging chute. The paddle pushes the batch evenly from the vibrating chutes into the glass melting end and creates batch piles. The speed of the pusher is inverter-controlled. The stroke length and the submersion depth of the pushers can be adjusted manually.



### Benefits:

- Dust reduction through insulation
- Reduction of heat radiation due to thermal shield
- Durability due to stable construction, utilisation of high quality components and excellent workmanship
- Increased melting rate by means of melting of smaller portions of mixture and uniform distribution via swing gear

# BATCH CHARGER MODEL HVR

## HVR 600/700 F - 2P

This type of HVR is also fixed to a movable carriage but in this case with a separated, non-rotating frame. This rigid construction allows better sealing of the doghouse which increases the inside temperature. This already causes pre-glazing of the batch inside the doghouse, which allows the use of preheated and non preheated batch.

The straight heat shield is designed with reinforced insulation. There is an inspection port in the doghouse hood.

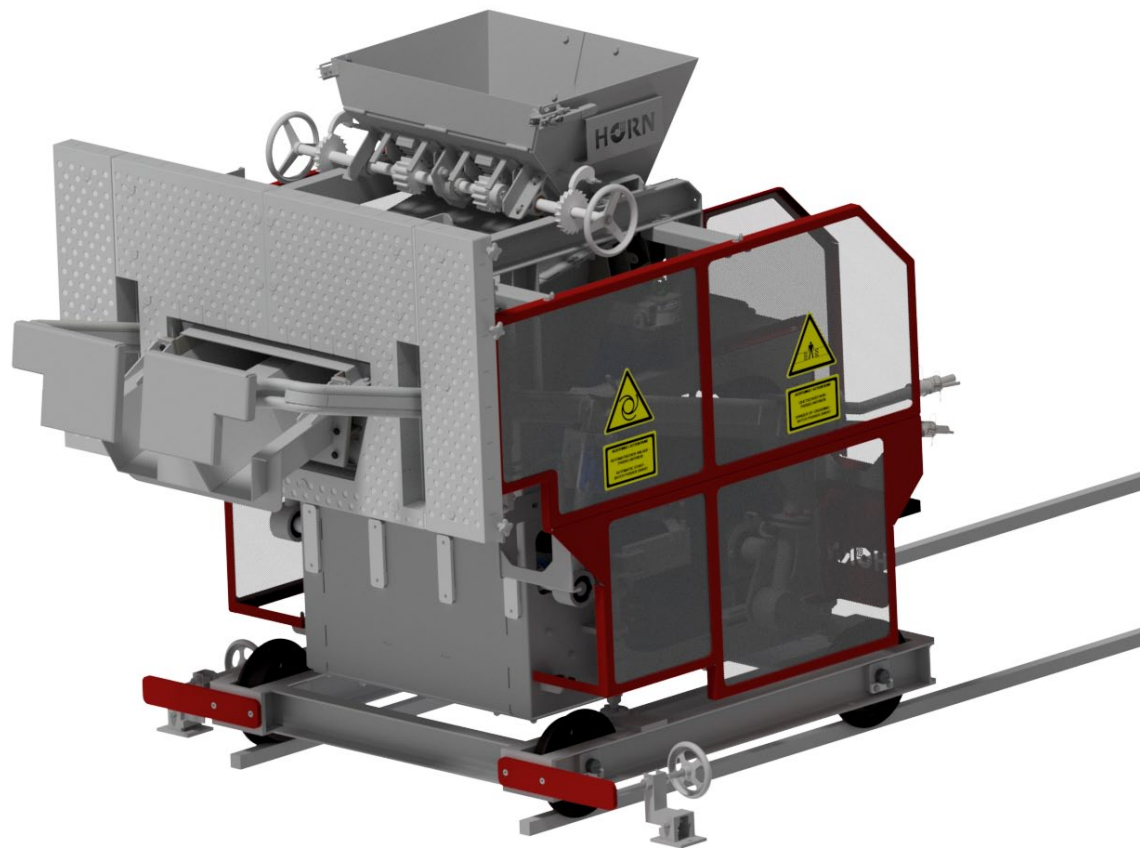
The HVR 700 F - 2P has a single vibrating chute which is separated lengthwise in the middle through a bar and a separate pusher for each side of the chute. The end piece of the vibrating chute, which is made of heat resistant steel, is exchangeable. Two water-cooled paddles are situated at the end of the vibrating chute. The paddle pushes the batch evenly from the vibrating chute into the glass melting end and creates batch piles. The speed of the pusher is inverter-controlled (HVR F). By separating the vibrating chute with the help of two pushers it is possible to influence the batch distribution at the glass furnace. The stroke length and the submersion depth of the pushers can be adjusted manually.

The two water cooled pushers can be operated in three modes. Operation of the pushers can be totally synchronised, synchronised but schfted at 180° or can operate independently.



### Benefits:

- The elimination of the rotary motion allows better sealing of the doghouse and thereby less excess air from outside into the furnace
  - Temperature rises in the doghouse enabling to use preheated and non preheated batch due to lower batch carry-over
  - NOx emission is reduced
  - Furnace energy consumption decreases
- Influencing the batch by way of the asynchronous adjustable pushers
- Fast paddle change within 20 minutes



Types available	HVR 300 F	HVR 400 F	HVR 500 F	HVR 600 F/S-2P	HVR 700 F/S-2P
Chute width (top/bottom) [mm]	300	400	500	2 x 275	2 x 325
Capacity at 50 Hz: [T/day]	120	240	420	240	420
Capacity at 60 Hz: [T/day]	90	180	315	180	315
Spool strokes [strokes/min]	2,2 - 16	2,2 - 16	2,9 - 16	2,9 - 20	2,9 - 20
Cooling water requirement [l/min-1]	12 - 16	16 - 20	20 - 26	50 - 60	50 - 60

## HVR 600/700 S - 2P

The difference to the HVR F is the "S" in HVR 600/700S-2P. It stands for servo drive whereas "F" in the previous model HVR 700F-2P stands for frequency-drive. In order to positively influence the batch charging process by defined paddle controls, the gear motors were replaced by servo drives and can be set into three different operating modes, which are: Independent, synchronal and batch cutting mode.

The new charger model is designed to positively influence the batch charging process by defined paddle control.

Through the servo drives, which are centrally controlled by a 2-axis control unit, it is now possible to divide one rotation of the paddle in several vertices and define the rotation speed for each part separately.

The individual vertices can easily be adjusted by using the included 9" touch panel.

The HVR S-2P type works differently as in this version it is more important that the heat shield is air tight in order to reduce NOx emissions.

Two water-cooled paddle are situated at the end of the vibrating chute. The paddle pushes the batch evenly from the vibrating chutes into the doghouse and creates batch piles. The speed of the pusher is servo-controlled (HVR S). By separating the vibrating chute and with the help of two pushers it is possible to influence the batch distribution in the furnace.

The stroke length and the submersion depth of the pushers can be adjusted manually.



### Benefits:

- HVR 600S-2P as well as HVR 700S-2P work with two water cooled servo engines. For one rotation 18 segments can be defined individually. Each segment consists of a start / end position and the speed for this section.
- A peephole included within the doghouse cover enables easy inspection of the charging
- Optimal distribution of the batch through separated paddle control. Thus better melting of the batch can be achieved.
- Reduction of emissions in terms of NOx and dust
- Suitable for preheated batch
- Elimination of the rotary motion allows better sealing of the doghouse and thereby less excess air from outside into the furnace



	HVR 600 S-2P	HVR 700 S-2P
Chute width (top/bottom) [mm]	2 x 275	2 x 325
Capacity at 50 Hz (T/d)	240	420
Capacity at 60 Hz (T/d)	180	315
Spool strokes (strokes/min)	2,9-20	2,9-20
Cooling water requirement (l/min-1)	50 – 60	50 - 60

# COLD TOP BATCH CHARGER HVFE

The cold top batch charger is used for electrically heated furnaces.

The batch charger is manufactured in a solid welded and screwed construction and runs in two axes – x and z – through two carriages. Each carriage is driven by a frequency controlled gear motor. In this way, the vibrating feeder moves just above the glass surface in the furnace and feeds parallel batch layers on top of the surface. The positions of both axes of the charging machine are monitored by initiators.

The charging machine is equipped with a batch hopper and level detectors. When the hopper is nearly empty, the charger moves automatically to a filling and docking station to be refilled.



## Benefits:

- Long life due to rugged construction, using high quality components and exceptional processing
- Uniform mixture distribution due to an accurate approximation of the mixed spinning records during the insertion process and the smooth insertion movement

	HVFE
Max. capacity	5 - 50 T/day
Max . insertion depth into the furnace	2,500 mm

# FLOAT BATCH CHARGER HFB

One of the latest batch chargers in HORN's product range is the HORN FLOAT BATCH CHARGER, which is used to continuously feed the float glass furnace.

The chargers are installed at the front part of the melting end at the doghouse across its full width. The operating element of the charger is driven by an electric motor. All batch chargers in the charging system are constructed identically. The Float batch charger consists of a main frame as well as a mobile sub frame, which can be moved through four heavy duty castors. The machine is fixed to the position in front of the wall using floor mounts.

The batch is supplied on the operating element from the special hopper located at the top of the furnace. The day silo which is situated in front of the melting tank, drops the batch into the funnel of the charging machine. By continuous lifting motion of the charging chute the batch is loaded into the doghouse area of the furnace. The lifting motion is powered by a driving unit.

Batch and cullet chargers are controlled in such way that the glass level in the melting tank measured by the level control system is constant.

The gap between the melting end and the chargers is covered over the total width of the doghouse and is executed in two parts. The charging quantity of the individual machine can be adjusted via a layer height adjustment.



## Benefits:

- Wear parts can be changed easily
- Complete concept for high batch loads up to 1000 to/day
- Reduced wear and tear due to fewer mechanical parts

	HFB 2025	HFB 2900
Chute width (top/bottom) [mm]	2.025	2.900
Charging performance [to/day]	40 - 150	60 - 250
Chute lift [strokes/min]	0,38 – 3,8	0,55 - 5,5

# SMALL LOADING AMOUNTS / CLOSED DOGHOUSE

## HK Piston Batch Charger

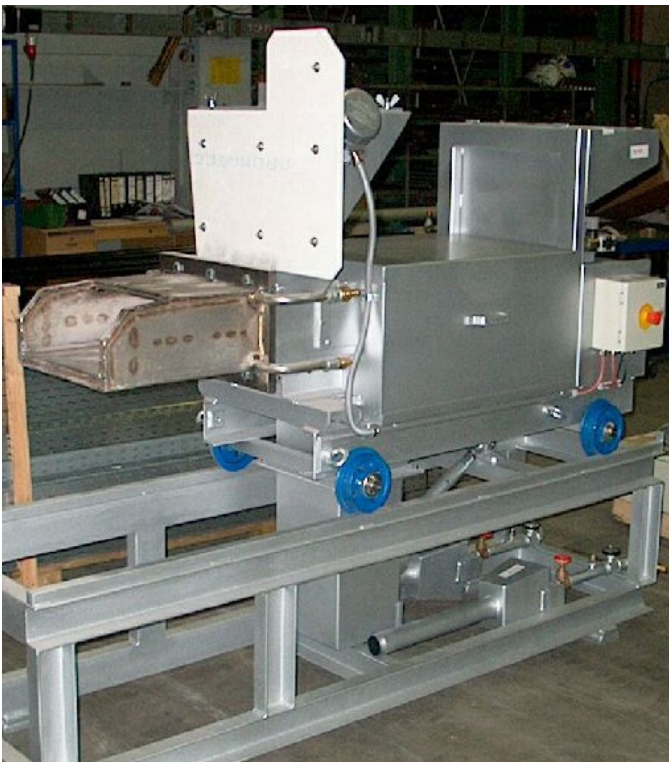
The batch charger consists of a fixed-mounted base and a movable upper structure with a charging hopper. If the hopper is filled by means of a vibrating chute, an electrical level sensor in the hopper is used.

A hydraulically actuated piston presses the batch with shards through the water-cooled insert attachments into the furnace. The control of the piston is inserted through the glass level control and can be fixed with a timing device.

By two non-contact, adjustable limit switches, the stroke of the piston can be set.

A broken glass size of 50 mm edge length must not be exceeded. Larger pieces of glass could get between the front edge of the piston and the front edge of the squeezed transition hopper and cause increased wear.

The fine dust is sucked through a dust removal unit. After a coarse separator the dusty air also passes through several fine filters.



Types available	HK 250	HK 350	HK 500
Capacity [T/day]	1 - 15	1 - 20	1 - 30
Cooling water req. [l/min-1]	20 - 30	26 - 42	26 - 42

## HS Screw Batch Charger

The batch charger is mounted on a movable cart.

If the mixture is filled directly from the furnace day hopper in the charging hopper, the hopper may serve as a transitional piece between the furnace hopper and charging machine. The mixture can also be transported via a screw conveyor or a vibrating chute, etc. and fed into the charging hopper.

On request a fill sensor can be installed in the batch hopper, which forwards the signal to a dry contact. This contact can be used to control the screw conveyor, vibrating chute. The funnel spreads the mixture evenly over the screw. A water-cooled insert pipe and screw conveyor are placed in the furnace wall and transport the batch into the furnace.

An insulated fixing ring which is installed at the pipe of the batch charger seals the opening within the furnace wall.



Types available	HS 170	HS 200	HS 250
Capacity [T/day]	1 - 15	1 - 35	1 - 50
Cooling water req. [l/min-1]	20 - 27	24 - 30	30 - 36