



# FLOAT GLASS TECHNOLOGY

INNOVATION ENGINEERED IN GERMANY

# EXPERIENCE WHEN AND WHERE IT IS NEEDED MOST

For over a hundred years, the German furnace manufacturer, HORN, has formed reliable partnerships with glass producers worldwide, supplying our renowned range of glass melting furnaces for container glass production through to float glass lines.

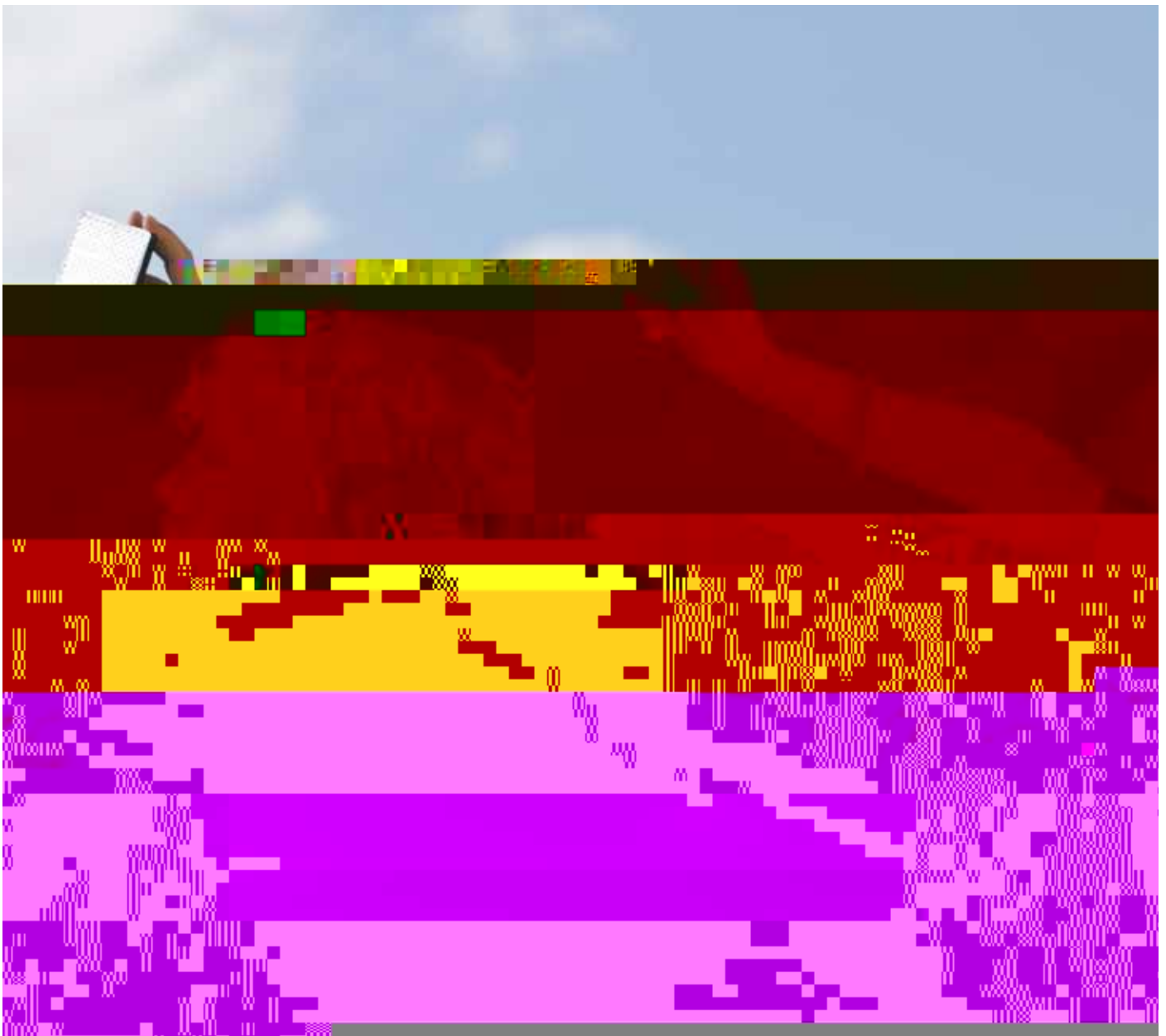
Based on our comprehensive know-how in float glass furnace design, HORN, together with our glass-producing partners throughout the world, handles the complete project management of float glass facilities, this from planning right through to final commissioning. To ensure HORN compliant quality throughout the process, a comprehensive team of experts attends to every detail of the production plant, from raw material preparation up to the final cutting of the float glass. HORN undertakes the complete float line, from the initial design meeting at the outset up to final operator training at the new plant. An integrated management contract

between HORN and the customer forms the final link in seamless and accountable project handling.

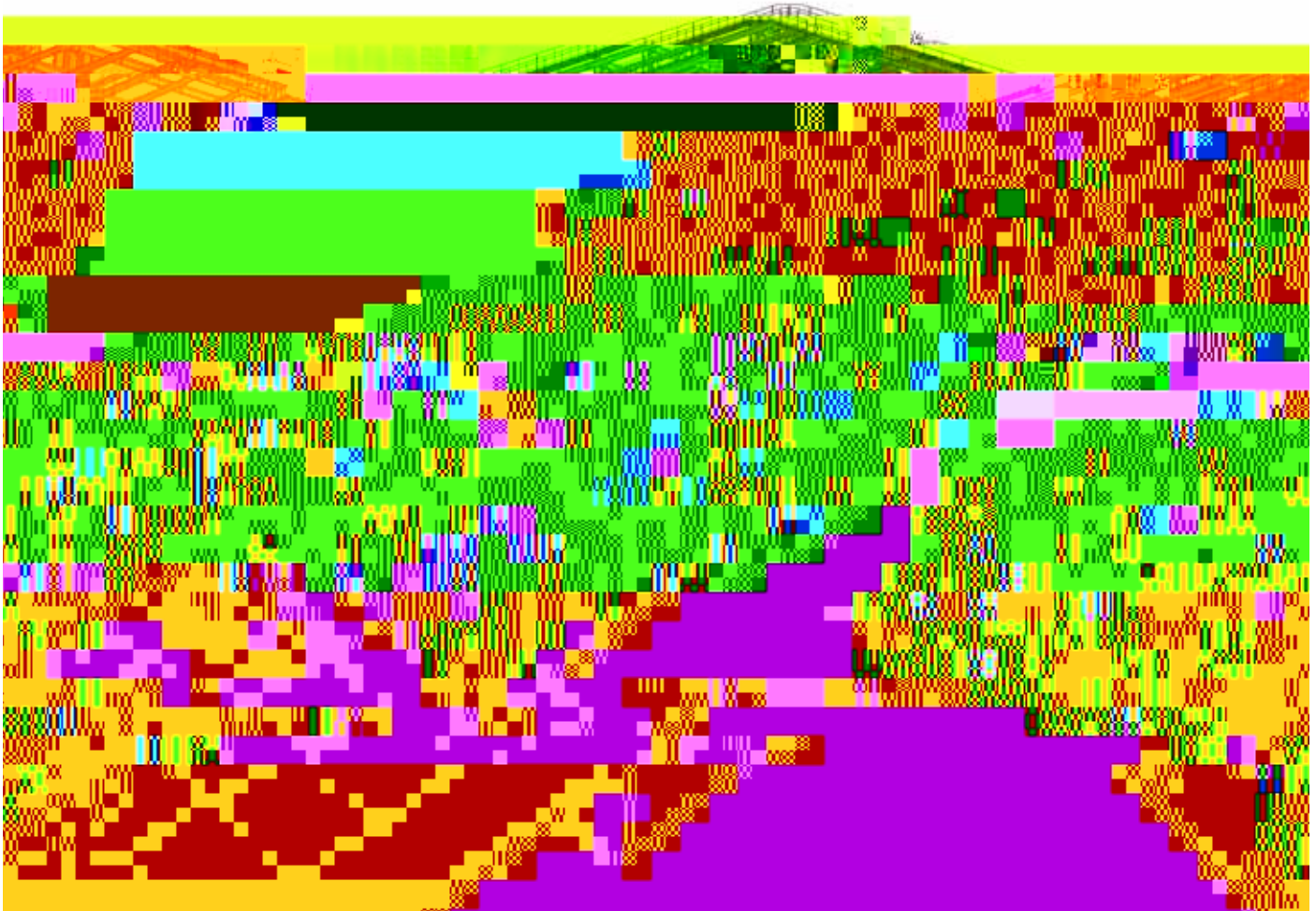
Apart from supplying the technology, HORN offers additional added value by providing expert, hands-on assistance and technical services tailored to each project. This added value is further extended through the provision of plant management, basic engineering guidance and assistance with installation.

HORN customers can rely on an experienced and transparent partner with international experience over many years in highly successful float glass projects. HORN continues striving to ensure the highest, most innovative quality and the best cost-benefit ratio according to its philosophy "Innovation engineered in Germany."

It is this ethos and approach which has led to the long-lasting and beneficial partnerships which we pride ourselves on.



... and even with or years of experience with float glass, we've never forgotten its magic.



## MODERN PROJECT MANAGEMENT

### Complete Management from Concept to Production

Complete float glass manufacturing plants are technically high complex. New players in the glass industry as investors or experienced float glass producers demand a professional project management.

The advantages of such an external project management are clear:

- reduced risk of delays in the project progress
- reduced technical risk due to many interfaces between different suppliers
- reduced own staff for the project management

HORN has the know how to manage the production line from the first layout to the training after start-up of the plant.



#### Project management service

- General Layouts, foundation layout, media layouts
- Time schedule management
- Contract management
- Interface management between various suppliers
- Engineering and manufacturing control
- Documentation
- Integrated logistics
- Installation and commissioning coordination
- Execution of performance test
- Training and trouble-shooting



#### Production line supply

- Batch preparation and cullet return
- Float glass melting and conditioning
- Tin bath
- Annealing
- Inspection, cutting, packing
- Utility equipment
- Plant automation



# BASIC ENGINEERING

Visual information from a reliable and modern technology provider.

Carefully worked out and comprehensive basic informations are the key for successful projects. The basic engineering contains the necessary information to project the float line in detail and consists of:

- Design meetings with suppliers and customer
- General layout of production plant
- Furnace layout
- Foundation load plan
- Media layouts
- Media List



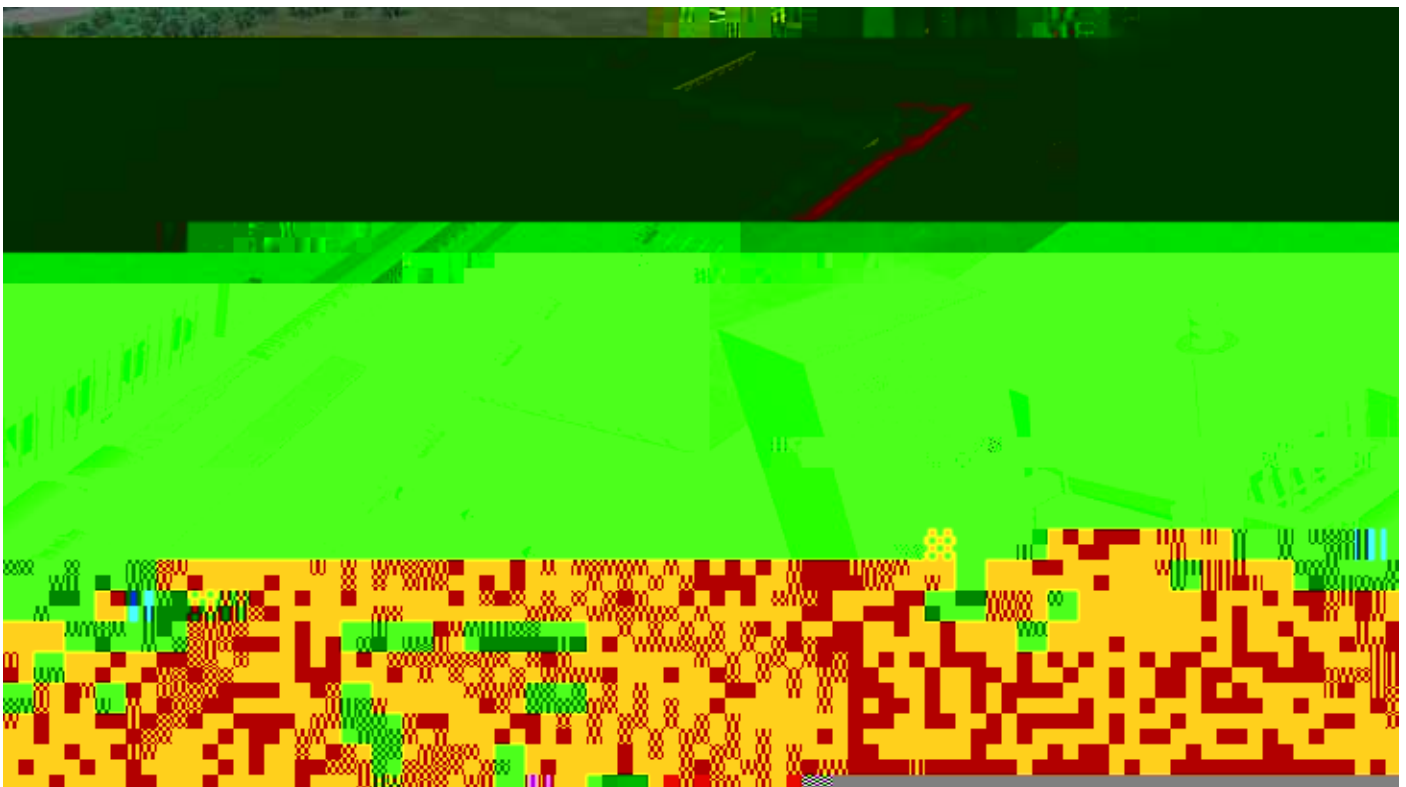
# TECHNOLOGICAL FLOAT GLASS LINE

Specialized technology and dedicated special equipment in the present and provide tomorrow's technology solutions.

Carefully selected suppliers are the cornerstones for a technologically efficient plant and a project supplied in time.

HORN provides complete float glass lines from leading international companies including:

- Mixing plant
- Float furnace
- Float bath
- Online coating
- Roller annealing lehr
- Cutting line
- Utility plants
- Plant automation



# FLOAT GLASS FURNACE

Tried and tested float glass technology available for high demand.

## Planning and supply of refractory material

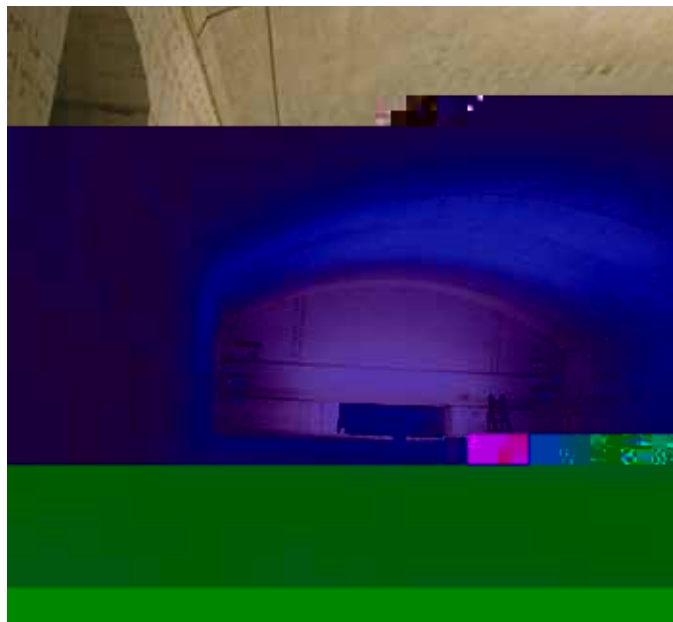
HORN provides detailed engineering drawings for refractory material together with a material list including quality specifications for its customers for purchasing refractory materials independently from any supplier worldwide. Refractory can be delivered by HORN together with the plant or may be ordered directly from the manufacturers.

## Suspended back wall

The suspended back wall is specially designed for the furnace and is engineered by HORN's second-tier suppliers.

## Steel design and supply

HORN supplies steel design drawings including fabrication drawings, assembly drawings, material list and specifications.



## Combustion system

Long term expertise in providing combustion technology for glass melting furnaces is the basis of HORN to plan and manufacture combustion equipment for float glass furnaces. The system is planned in-house by well educated engineers and only highly reliable components are used to manufacture the combustion system.

## Measurement and control system

The latest developments in measurement and control equipment are integrated in the float furnace. Renowned manufacturers such as SIEMENS supply the equipment. Complete wired and tested control cabinets are supplied for trouble free installation.

## Conditioning equipment incl. stirrers

HORN designed conditioning equipment, such as water cooled stirrers, is used in the conditioning area.

## Reversing system

Durable and robust components are installed for reversing.

## Furnace cooling

Specially designed cooling system for refractory cooling at flux line ensures a long furnace life span.



