

ecofurbishing®



THE
INNOVATIVE GLASS PLANT
OPTIMISATION PROGRAM

innovation
ENGINEERED IN GERMANY

HORN
GLASS INDUSTRIES

INNOVATION ENGINEERED IN GERMANY

HORN Glass Industries AG is a German company who specialises in the design and supply of complete glass melting technology and provides innovative solutions for the glass industry, worldwide. With over 130 years experience in glass melting, HORN has extensive know-how when it comes to modernising existing glass melting furnaces as well as the design of new ones. **ECO refurbishing®** is the HORN product which meets the rising demand of the entire glass industry to optimise furnaces in terms of energy, emission values, glass quality, performance and flexibility.

ECO refurbishing® is the result of many years of HORN's experience and innovation which have been proven to be hugely successful at major glass manufacturing plants around the globe. HORN furnaces produce more than 20.000 tonnes of glass per day worldwide, a testament to the company's professionalism, reliable service and commitment to innovations such as our **ECO refurbishing®** glass melting furnaces.

Why furnace optimisation?

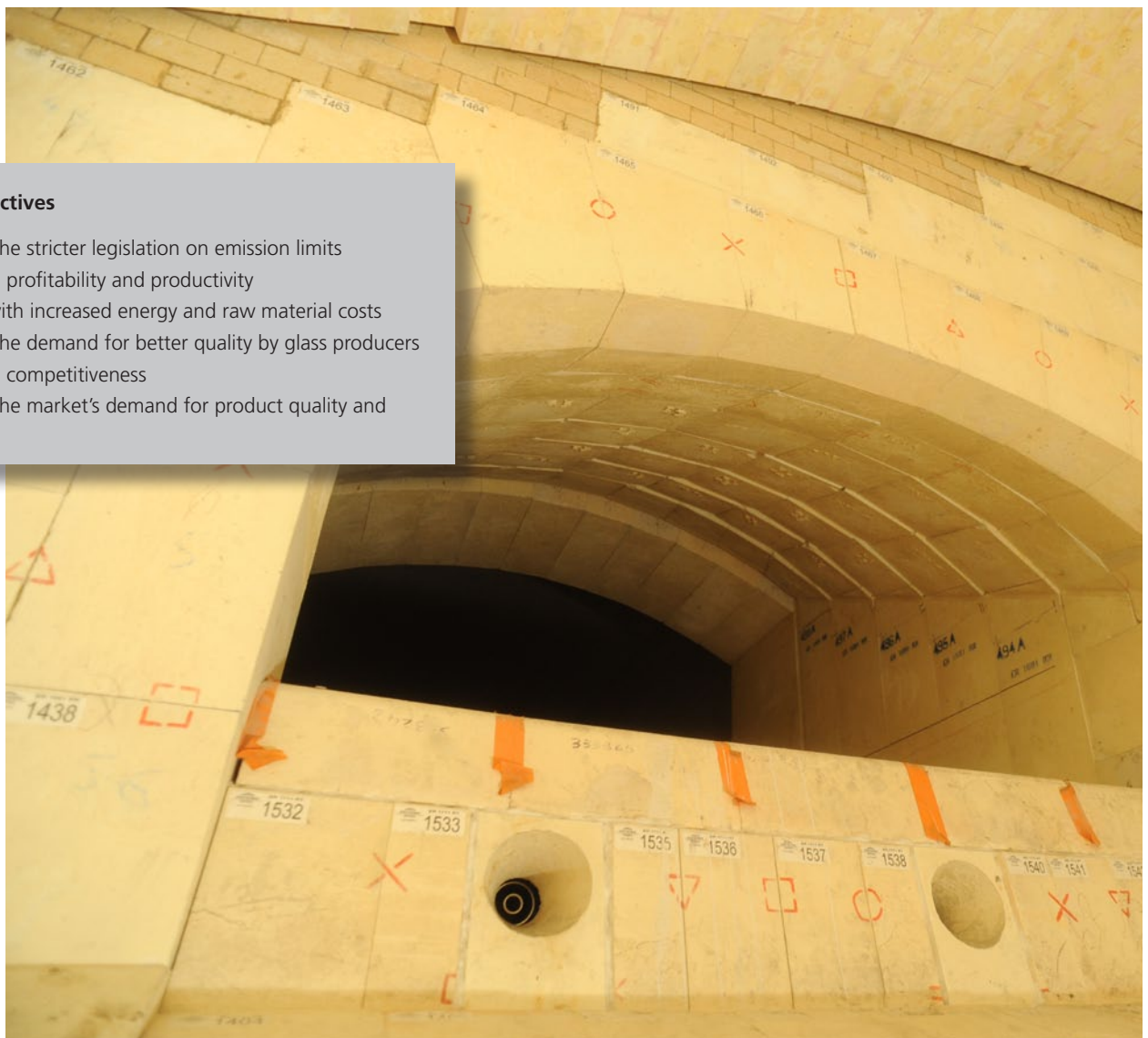
The global glass industry is exposed to the constant pressure of competitiveness due to the many glass producers operating and vying with each other. Therefore glass manufacturers are required to reduce their production costs and sell their products at a lower rate than their competitors. Unfortunately, increasing prices for energy and raw materials counteract these endeavours. Additionally, legislation reduces limits for exhaust emissions while the buyer's market is forcing glass manufacturers with high quality standards as well as a wide product range to produce more flexible glass.

Standard furnaces often cannot live up to these high standards. That is why HORN provides a wide range of solutions to optimise existing glass melting furnaces or build new plants that meet the needs of the operator.



The Objectives

- Meeting the stricter legislation on emission limits
- Improving profitability and productivity
- Dealing with increased energy and raw material costs
- Meeting the demand for better quality by glass producers
- Improving competitiveness
- Meeting the market's demand for product quality and flexibility



With ecological issues becoming more important whilst commercial realities exist, the refurbishment of glass plants makes perfect sense.

HOW ECOFURBISHING® MEETS YOUR NEEDS

At a glance

- Lower energy consumption and optimum NOx emissions
- Unique port neck design in terms of air velocity, mixing point, burner block position, flame touch area and recirculation also taking into account fuel and batch properties
- Superstructure design for complete combustion at low residual oxygen content and low heat loss due to excellent insulation
- Usage of the latest combustion system with dualflame AC or MC with easy to adjust burner brackets. Available with single burner and separate inner and outer nozzle control
- Totally closed doghouse
- Latest batch chargers for totally closed doghouse. With fully adjustable servo motor driven two-paddle system HVR600S-2P and HVR700S-2P for best batch distribution
- Perfectly designed refractory material for optimum energy/cost ratio and lowest leak air
- Optimum ratio of fossil fuel and electric boosting power
- ggENOx-System with sidewall nozzles to inject air for internal recirculation (can be installed at all furnaces while operational)



Benefits

- Long term NOx level less than 600 mg/Nm³
- Energy reduction
- Higher glass quality
- Increased furnace output
- Flexible furnace in terms of performance, glass colour and fuel usage
- Increased furnace lifespan
- Optional application with batch preheater system
- Thermal homogeneity



ECOFURBISHING® IN ACTION



Increase in glass quality and furnace output

- Electric melting boosting and barrier boosting
- Bubbling system
- Weir wall
- Optimum glass bath design including melting area, doghouse position and glass bath depths

Usage of preheated batch

- Completely closed and prolonged doghouse lifespan
- Reduced carry over
- Outstanding burner port design in order to meet the requirements of the preheated batch e.g. for the lowest carry over

Higher furnace flexibility

- Furnace with barrier wall and refining area
- Multi-colour furnace using electricity and bubbling for fast colour change
- Electric refining boosting for faster change of colour
- Particular furnace design for multi-colour furnaces

Flexibility in terms of fuel

- The Dualfuel burner allows firing with gas and/or oil, and fast reaction to fuel price fluctuations
- Fuel supply stations for oil and gas
- Mixing stations for biogas or biomethane
- Installation of measuring devices for recognition of changing heating value and implementation in process control system

Increase in furnace lifetime

- Automatically controlled flux line cooling
- Paving of flux line (triple paving provision)
- Ceramic welding (with cooperation partner)
- Hot repair service
- Furnace hot inspection service by endoscope
- Low carry over in regenerators by portneck and doghouse design
- Regenerator design for lowest ageing effect
- Refractory quality assessment by experienced specialists (support for companies which buy their refractories themselves)

Trouble-shooting

- Technical assistance in terms of batch composition, raw material application and furnace adjustment
- Computer modelling
- Analysis of glass quality problems with solution report
- Consultancy for furnace colour change
- Combustion optimisation