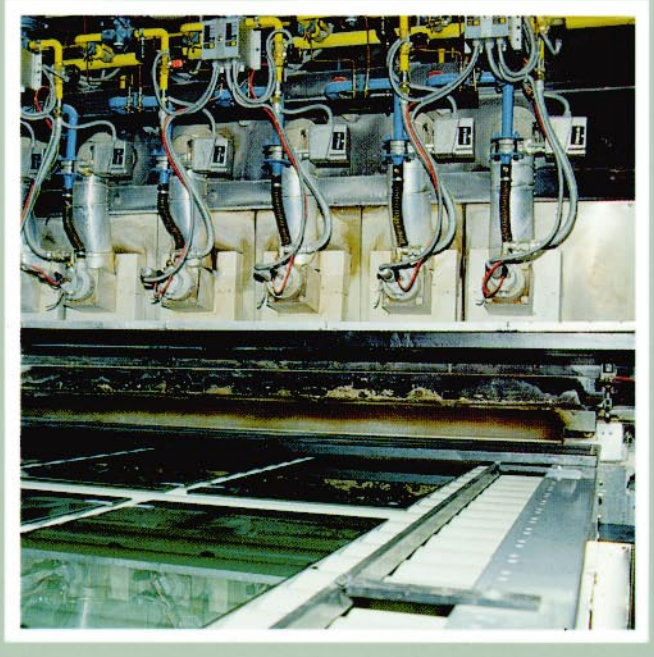
NATURAL GAS
AND THE GLASS INDUSTRY



Snam

INTRODUCTION

Natural gas offers great ecological as well as energy advantages in the glass industry which have led to the development of gas-based technologies for the optimization of the production, processing and treatment of glass.

The new natural gas furnace for smooth, glass plates tempering, aimed at the building, car, furniture industry witnesses such development.

Tempering occurs when glass is heated to 700°C temperature. Then the glass undergoes a cycle of rapid, uniform air cooling through hyper-convection.

Successfull tempering depends on a good heating process and adequate temperature. As a matter of fact it is important to reach the temperature of 700°C in a gradual, uniform way on the whole surface. That is why, until now, electrical resistors have been used. Recently, however, theoretical/experimental studies for the optimization of heat exchange systems as well as important campaigns for the engineering of new burners have made the creation of natural gas furances possible. Natural gas furnaces are ideal for all the requirements of the technological process and offer a high-quality, low-cost (especially when compared to electrical furnaces) product.

The main feature of these furnaces is that they use natural gas-powered, recuperative, radiant tube burners. Radiation is uniform over the whole emitting surface and, thanks to the recycling of the heat, remarkable energy savings and economic advantages are guaranteed.

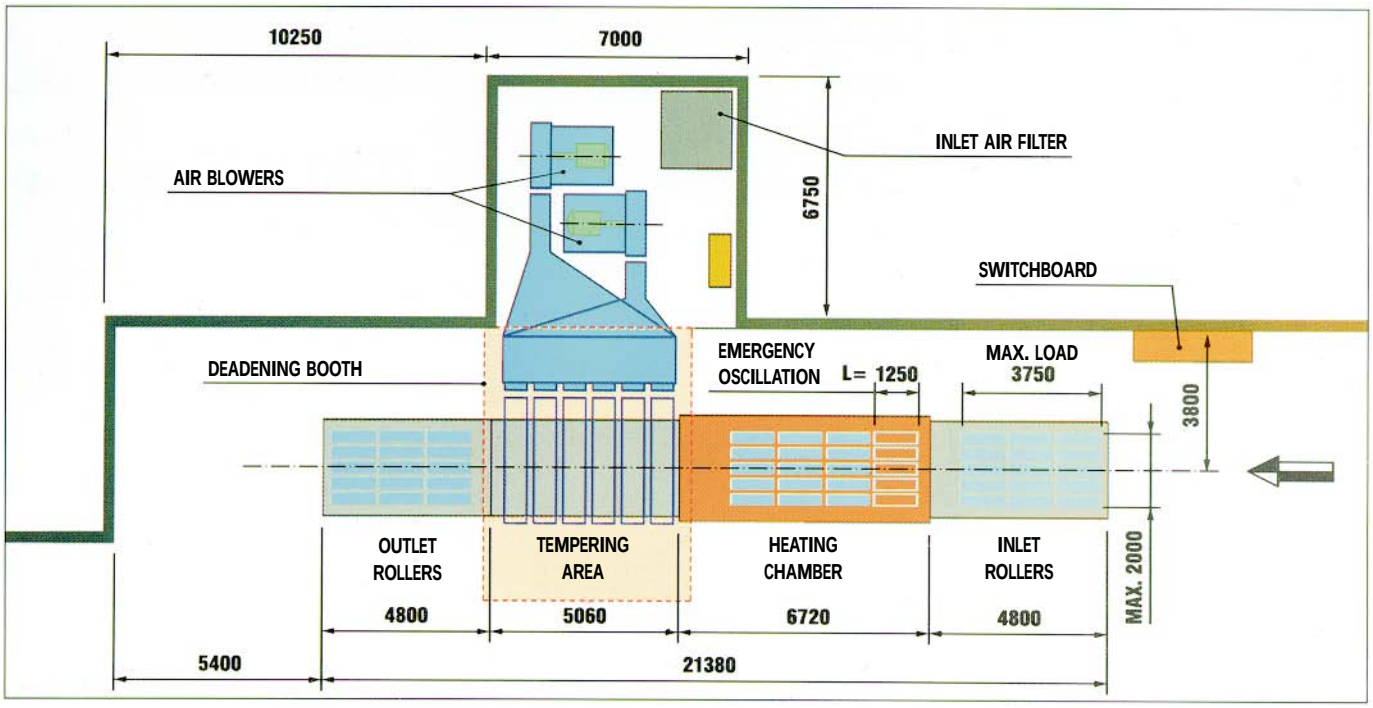
HORIZONTAL, NATURAL GAS FURNACE FOR SMOOTH, GLASS PLATES TEMPERING
VETRERIA ARTISTICA MATTESCO S.P.A. - MARON DI BRUGNERA (PN)

The Vetreria Artistica Mattesco deals with the processing of 1,800,000 m2 glass every year aimed at the Italian and foreign furniture industry.

The company has decided to install a new type of natural gas furnace for smooth, glass plates tempering in order to optimize the energy use and increase the efficiency of the company.

The furnace is made up of a load module, a heating chamber, a rapid cooling area and an unload module where tempered products come out.

A particular, "crossed" installation of the radiant tubes allows for a uniform distribution of the temperature in the heating chamber. Two refractory steel plates, over and under the conveyor belt on which plates are transported (between the burners and the glass), guarantee a uniform temperature along the whole glass heating section.



Information on the plant

Oscillating roller furnace	Poppi S.p.A.	Tempering temperature changes	± 3 °C
Heat power	750 kW	Air blower power	300 kW
Radiant burners	ESA S.r.l. Inc. Pyronics	Thickness of glass	4÷10 mm
Type of burners	recuperative	Plate heating time	180÷360 sec
Material of radiant tubes	INCONEL 600/AISI310 S	Hours/Year furnace in service	3,000
No. burners	18 longitudinal; 11 transversal	Start-up	March 1991
Specific heat power of tubes	30 kW/m^2		

Energy parameters

Fuel use index	85%
Primary energy saving compared to the electrical system	32%
Yearly saving on energy costs	50%

TECHNICAL ASSISTANCE AND QUALIFICATION OF SERVICE NETWORK
Piazza Vanoni 1 - 20097 San Donato Milanese (MI) - Tel. 02.52037453

Technical Assistance
North-west
Via Agadir 38
20097 San Donato M.
(Milano)
Tel. 02. 5204476

Technical Assistance
North-east
Via D. Valeri 23
35100 Padova
Tel. 049. 8209211

Technical Assistance
Center
Via M. Ghetaldi 64
00143 Roma
Tel. 06. 50096759

Technical Assistance
South
Via G. Ferraris 40/E
80142 Napoli
Tel. 081. 5697111

Snam