



HYDROPOX[®]

For the perfect finish.

Partner of choice for all your glass treatment needs

Experience counts

We have many years of experience in flame-based glass surface treatments and channel these insights into the ongoing evolution of our innovative HYDROPOX[®] offering. Having successfully implemented more than 60 projects around the world, we cover the entire spectrum of flame treatments for glass.

Deep process know-how

Our team of experts has proven experience across the full glass treatment application spectrum. Covering the full solution lifecycle, from design and build to install and support, we also deliver the accompanying control system and gas supply concept. And our support does not cease on

successful installation of your system – our experts are always on hand if you run into operational issues or have optimisation questions.

Supply and supporting services

Depending on your volume requirements, we can supply your gases in cylinders or in bulk, always ensuring the highest reliability and safety standards. For added efficiency, we offer gas management services such as automated tank level monitoring or Internet-based tank and cylinder tracking so you are free to concentrate on your core business.

Let's discuss how we can help you.



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Figure 1: Fundamental difference between pre-mixed and surface-mixed burners

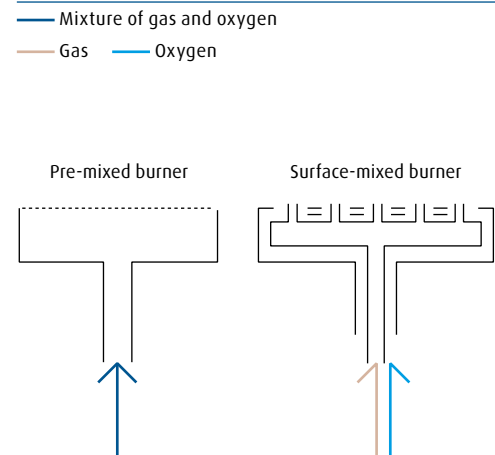
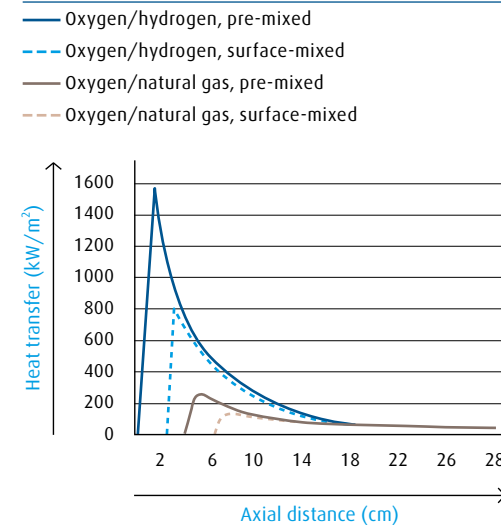


Figure 2: Axial distribution of the heat transfer for O₂/H₂ vs. O₂/natural gas flames



Configured to individual needs

To suit individual needs, HYDROPOX® is designed to run on either oxygen and hydrogen or oxygen and natural gas. The process parameters of these burner technologies, such as flow velocities and heat transfer rates, working distances, flame shapes, etc., can all be configured to enhance the efficiency of your glass surface treatment and fire polishing processes.

We have the pre- or surface-mixed model to suit your individual requirements. The main differences between the various models and gas combinations are outlined in the table below.

For your convenience, HYDROPOX® comes with all the building blocks you need for a ready-to-run installation. The following components are included as standard:

- Burner technology
- Electropneumatic burner control units
- Central mixing unit with an exact pressure regulation system and gas ratio regulation system
- Burner flowtrains

Meeting today's glass challenges

Faced with growing cost and productivity pressures, many glass manufacturers are looking for ways to differentiate themselves from the competition through an enhanced, premium quality finish. Ideally this should combine the speed of a machined finish with the finesse of hand-crafted glass. This is especially true in the high-end tableware (e.g. wine glass), container glass (e.g. flacons, designer bottles) and specialty glass (e.g. display cases, oven doors) segments.

HYDROPOX®, our flame-based glass surface treatment solution, is an effective way to address these challenges.

HYDROPOX® for the perfect finish

Increased brilliance

HYDROPOX® overcomes the problems associated with mould-related defects or cloudy appearances in articles produced by press or blow process technology. It does this by briefly heating the glass surface to a temperature above its weakening point, thus creating a smooth and brilliant surface.

Eliminated seams and edges

It also eliminates seams and edges that often remain on the final product. Highly focused flame impingement helps to remove these seams and edges – from wine glasses for instance – by heating the surface above its weakening point, thus enabling it to seamlessly combine with its surrounding.

Healed micro-cracks

For many glass products, especially in the technical, high-end and premium domain, it is important to minimise micro-cracks and failures caused by the production process. By applying the HYDROPOX® flame treatment, micro-cracks and failures are healed. This leads to higher temperature sensitivity and significantly reduces the risk of early glass cracks.

Benefits at a glance

- Significant reduction in rejection rates
- Support for the production of high-end glass products
- Enablement of new features, e.g. premium-priced wine glasses without seams
- Increase in productivity – combining the benefits of hand-crafted products with normal line speeds

A closer look at the technology

Our sophisticated HYDROPOX® burners come in both pre- and surface-mixing designs to meet individual requirements.

Surface-mixed burners work with separate gas and oxygen feeds, whereas pre-mixed burners work with one combined feed (see figure 1). They are designed to run on either oxygen and hydrogen or oxygen and natural gas.

Pre-mixed burners ensure a more homogenous flame curtain. As a result, the same energy is applied to each spot on your workpiece for an extremely uniform surface finish.

Oxygen/hydrogen mixtures offer greater efficiency than oxygen/natural gas mixtures, with pre-mixed models outperforming surface-mixed models in both cases (see figure 2).

Pre-mixed benchmark in efficiency

	Oxygen and hydrogen	Oxygen and natural gas
Pre-mixed burner technology	<ul style="list-style-type: none"> → Most effective heat transfer → Ideal for thin glass (≤ 1 mm) → Ideal for fast, large series production (art & tableware: > 60 cuts/min, container glass: > 250 cuts/min) → Very precise working area → Working distance: 10-20 mm 	<ul style="list-style-type: none"> → Significantly less efficient heat transfer than O₂/H₂ mixture → Suited to glass with walls > 2 mm → Medium speeds – max. 30 cuts/min → Large working area → Working distance: 40-100 mm → Lower OPEX with natural gas instead of H₂
Surface-mixed burner technology	<ul style="list-style-type: none"> → Relatively high heat transfer but significantly lower than pre-mixed → Suited to thicker glass (2-4 mm) → Suited for medium speed, large series production (> 40 cuts/min) → Relatively wide working area 	<ul style="list-style-type: none"> → Lowest heat transfer effectiveness of all → Suited to glass walls > 3 mm → Suited to manual production → Large working area → Lower OPEX with natural gas instead of H₂