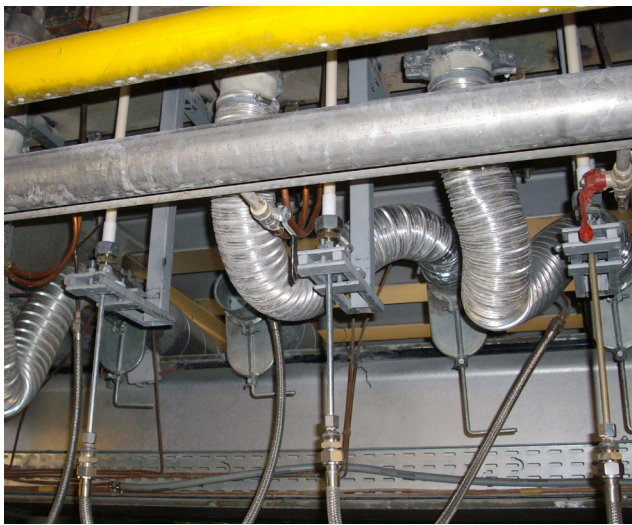


Bubbler



- Increased bottom temperate
- Reduced fuel consumption up to 5%
- Reduced Furnace Temperatures
- Batch barrier to the Refining area
- Improved homogeneity
- Quicker colour change
- Increased production

A bubbling system creates a controlled disturbance in the glass melt. Air or other gases are blown through special bubbler nozzles into the furnace. Depending on the design, multiple or large bubbles rising from the bottom installation to the glass surface, where the bubbles exhaust the gas into the furnace atmosphere.

These bubbles bringing cooler glass from the bottom of the furnace towards the surface, where it can absorb the heat from the flame, thus avoiding excessive crown temperatures to bring heat to the furnace bottom.

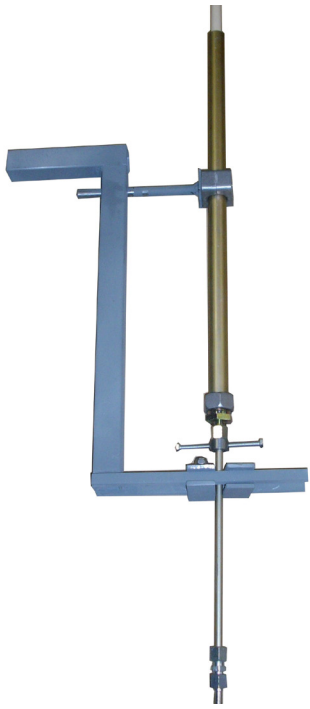
The bursting bubbles on the glass surface also create an effective barrier that prevents unmelted batch from moving forward. Thus producing a physical barrier to the batch/foam blanket.

Benefits of bubbling are not only decreased fuel consumption and reduced firing temperature but also an increase of production capacity and quality of the product due to the improved homogeneity. The improved glass flow in the furnace help to eliminate cords.

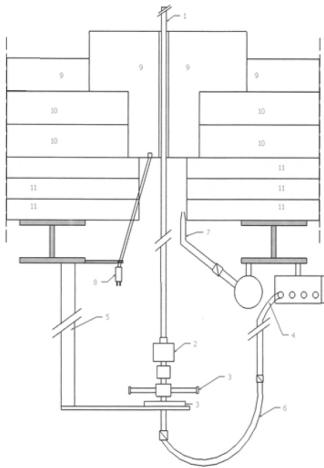
The System has major advantages for the melting of coloured glass as it reduced product loss due to stone inclusions.



Ceramic Bubbler with mutli holes up to 1950°C operating Temp.



Typical Ceramic Bubbler Installation sketch



Pos	Description
1	Ceramic Bubbler: 1500mm long Bubbler diameter: 15mm Core Drill: 38mm
2	Bubbling connector 32 / 18 / 8mm incl. High heat-resistant sealing.
3	Adjusting ring 22/10/12 incl. 2 screws and one heat resistant washer 50/5
4	Supply pipe to be supplied and installed by client (e.g. copper)
5	Bubbler Bracket see separate drawing Fit to client installation
6	Heat resistant rubber hose (15/8mm) 600mm long incl. 2 hose clamp
7	Air-cooling tube ~50mm, incl valve, Supply and installation by customer
8	Thermocouple Ni-Cr-Ni (Type K)
9	Fuse cast B block/AZS (Example) 10/11 Insulation (Example)

On site Installation and Maintenance - Service availability 24/7



Our Bubbling Technology is available for:

- Fiberglass
- Container Glass / Tableware
- Float Glass
- Special Glass, Crystal etc.

Our Bubbler Tubes can be made off::

- Ceramic (Operating Temp. 1950°C)
- Water Cooled
- Platinum or Platinum Coated
- Inconel

Advantage of our Ceramic Bubblers:

- Multi holes improve Bubbling effect
- Bubblers can be „switched off“ without glass blocking the holes later on
- Bubblers can be pushed to avoid wear out of furnace bottom/paving
- Equipment and Installation cost are budget friendly

Our Complete Supply features:

- Bubbler Tube
- Control System for Air/N2/O2
- Design and Engineering
- Bubbler Holders
- Installation and Hot Drilling
- Overcoating and replacement
- Maintenance and pushing services

Our References (mid 2016):

- over 100 customers worldwide
- over 15 years of expirience

Emergency availability 24/7
Hot Replacement
100+ Bubbler in Stock
Worldwide shipping

Swiss Quality and German Reliability complete engineering and supply



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