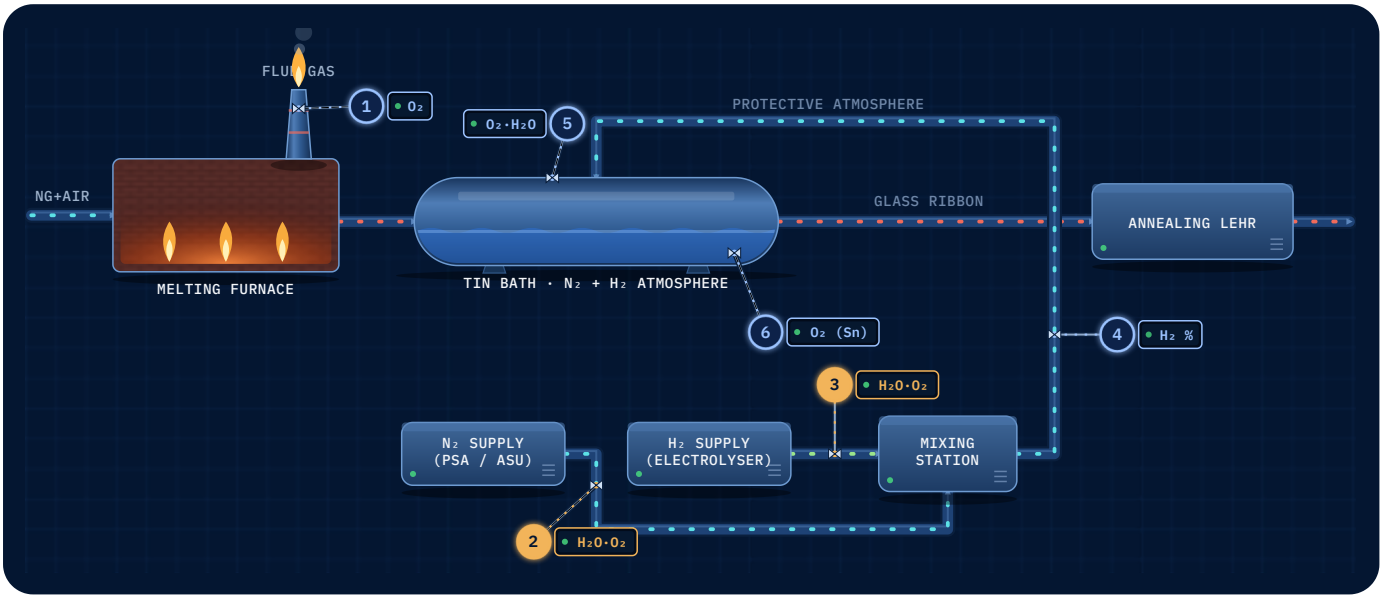
# Float glass: where to measure moisture, $O_2$ and $H_2$ in the tin bath

Follow the glass from the melting furnace over the tin bath to the lehr, and the protective gas from the $N_2$ and $H_2$ supply to the bath. Each point shows what is measured and which analyzer fits.




● YORK instrument ○ Integrated system (supplied through YORK)

## How the process works

Molten glass floats on a bath of molten tin under a nitrogen–hydrogen atmosphere. Any oxygen or water that reaches the tin forms tin oxide and glass defects, so the protective gas and its supply are watched closely.

1. **Melting.** A regenerative furnace melts the batch with natural gas and air.
2. **Forming on tin.** The glass ribbon spreads and flattens on molten tin under a slight positive pressure of protective gas.
3. **Protective atmosphere.** A mixing station blends dry nitrogen with hydrogen, which scavenges oxygen in the bath.
4. **Annealing.** The ribbon cools slowly in the lehr to relieve stress.

Interactive version with animation:
https://www.yorkinstrument.ae/guides/float-glass-tin-bath-measurement-points/

## Measurement points

| # | POINT | MEASURES | TYPICAL VALUE / LIMIT | RECOMMENDED SOLUTION |
|---|---|---|---|---|
| 1 | Melting furnace flue gas | Combustion oxygen | Set by the furnace combustion design | POA3500; Integrated system: in-situ zirconia oxygen probe |
| 2 | Nitrogen supply to the mixing station | Dew point and trace oxygen | Very dry, low-ppm oxygen nitrogen; limits set by the plant specification | DPT830, POA200, PGA500 |
| 3 | Hydrogen supply to the mixing station | Dew point and trace oxygen | High-purity hydrogen; limits set by the plant specification | DPT990-EX, PGA500-EX |
| 4 | Mixed protective gas to the bath | Hydrogen content | Nitrogen with a few percent hydrogen, typically up to about 10 % | Integrated system: thermal-conductivity hydrogen analyzer |
| 5 | Tin bath atmosphere (several zones) | Oxygen partial pressure, dew point, $H_2$ % | Monitored by zone; a rising inlet dew point flags air ingress | Integrated system: heated extractive zirconia and thermal-conductivity analyzer system |
| 6 | Molten tin | Dissolved oxygen | Patent trial: reduced from 40 ppm to 2 ppm | Integrated system: in-melt electrochemical oxygen probe |

Typical values from published standards, regulations and technical literature. Your contract, licensor or plant specification always governs. Integrated systems are supplied by YORK through its partner integration factory.

## Key references

1. US6094942A: Method and apparatus for reducing tin defects in float glass — Google Patents