

gated, since it dissolves slowly in the melt and its oxidising action continues throughout the melting period. The oxidising effect of sodium nitrate, on the other hand, occurs mainly during the initial fusion of the batch and it is lowered by prolonging the melting period or raising the temperature. Hence it is easily seen that sodium nitrate will be more effective in oxidising platinum in the borate glasses than in the higher-melting silicate glasses. Oxygen, which was bubbled through the melt only after fusion, was less effective in oxidising platinum in the borate and phosphate glasses than in the silicate glasses.

This indicates that if the platinum becomes reduced in the early stages of melting it will be quite difficult to reoxidise, except in the silicate glasses.

In those glasses where ionic (oxidised) platinum can be retained, about 0.01 per cent platinum must be present to give a noticeable colour to glasses having a thickness of about 4 mm. In the reduced state, however, as little as 0.001 per cent platinum gives a noticeable grey colour. Hence, if platinum contamination is unavoidable, melting under oxidising conditions will reduce the visible evidences of the contamination.

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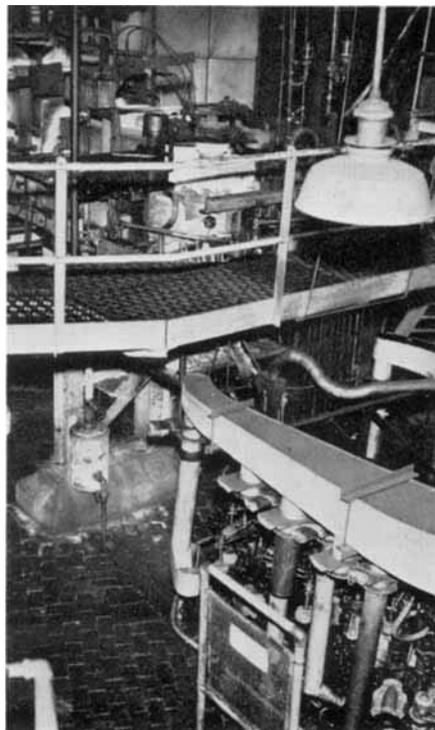
Temperature Control in Glass Manufacture

CONTINUOUS MEASUREMENT WITH PLATINUM THERMOCOUPLES

In the manufacture of glass bottles accurate control of temperature is necessary, and it is usual to check the temperature of the flowing glass in the channel and again in the feeder and to apply automatic corrections to the fuel supply. Continuous measurement with platinum : rhodium-platinum thermocouples is generally employed.

The thermocouple assemblies installed for this purpose by Honeywell Controls Ltd. at the works of Rockware Glass Ltd. are specially designed for instantaneous temperature measurement under severe conditions. They are fitted with platinum : 13 per cent rhodium-platinum couples in twin-bore refractory insulators and are housed in composite all-metal sheaths. These have a nickel stem passing through the tank wall, welded to a platinum or rhodium-platinum tip 0.2 inch thick, the tip projecting into the flowing glass.

A secondary sheath of impervious mullite protects the assembly for most of its length, but leaves the platinum tip uncovered. To provide the necessary sensitivity for rapid temperature control, the hot junction of the couple is held in contact with the inside of the sheath.



Platinum thermocouple assemblies installed by Honeywell Controls Ltd. at the Greenford works of Rockware Glass Ltd. are designed for instantaneous temperature measurement of flowing glass in severe conditions