

Technical Bulletin 0011

Subject: High Temperature Operation of the Stelth[®] Ag-AgCl and Stelth[®] 8 Ag-AgCl Reference Electrodes in Water Immersion Conditions

The **Stelth[®] water** and the **Stelth[®] 8 thru-hull** silver-silver chloride reference electrodes can be operated in the water immersion mode at elevated temperatures. The materials that make up the construction of the reference cell (the housing, wire, sensing element, chemistry, epoxy, etc.) are designed to withstand temperatures up to and including 90° C (194° F).

The two limiting factors which must be considered in operating a reference cell above 25° C (77° F) are:

1. **At Temperatures above 25° C (77° F) the potential of the reference electrode will change in the negative direction by 0.6 mV per degree Celsius increase in temperature.** Therefore, at 80° C (176° F), the potential of the reference electrode will be 33 mV more negative than at 25° C (77° F). This difference must be considered when establishing criteria for protection.
(see Technical Bulletin #0009 "Temperature Corrections for Reference Electrodes")
2. **At elevated temperatures, the rate of leaching of the electrolyte from the reference electrode increases, if the chloride content is below 30,000 PPM; thus the life of the reference cell between "Electrolyte Revitalization (recharging)" can be diminished.**

When checked against a new **Stelth[®]** silver-silver chloride reference electrode, the stationary reference electrode should be revitalized (recharged) when the difference in potential between the electrodes exceeds 10 mV. The electrode can be revitalized (recharged) by immersing the electrode in a saturated solution of sodium chloride for a period of 24 hours. It should then be checked against a new **Stelth[®]** reference electrode to insure that the potential of the revitalize (recharged) electrode has returned to the specification potential.

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