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TYPE ME100 Ag/AgCl 0.5M KCl
MAPPING REFERENCE ELECTRODE FOR USE ON CONCRETE

The silver/silver chloride (Ag/AgCl) elements in all Silvion electrodes are manufactured using a "unique" and advanced technique that results in a porous silver matrix. The matrix is then coated with precise quantities of silver chloride to ensure:

1). HIGH RELIABILITY;
2). HIGH STABILITY;
3). GREATER ACCURACY;
4). INCREASED LIFE PERFORMANCE.

NOTE:
The half-cell consists of a highly stable silver/silver chloride element enclosed in a solid inert electrolyte (with 0.5M chloride ion concentration), a porous sintered disc for ionic conduction, a collar enclosing a sponge for measurements on concrete and a solid collar to be fitted during storage. The ME100 mapping electrode has been specifically designed for corrosion technicians to undertake condition surveys on steel reinforced concrete structures and steel framed historic buildings.

The ME100 half-cell is a precision instrument and should be treated accordingly. To increase the usable life of the cell and to maintain the accuracy of the measurements the notes below should be followed:
1). The sensor end of the cell is protected by a "screw storage cap". Prior to use, unscrew the cap and retain it for future use.
2). When making measurements on concrete, wet the sponge in the collar with 3% salt solution and screw it to the tip of the half-cell ensuring that the sponge is in good contact with the ceramic tip.
3). When not in use never leave the half-cell probe on warm surfaces, in direct sunlight or in work vehicles when it is hot.
4). Ideally the cells should be stored in a cool environment of high humidity. Prior to storage wet the sponge in the "screw storage cap" with 3% salt solution and fit the cap. **Allowing the internal electrolyte to dry out will result in permanent damage to the half-cell.**

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OUTER CASING

MATERIALS	Acetal body with porous ceramic sintered disc and nylon cable gland
DIMENSIONS	Length: 167mm (233mm w/ gland); Diameter: Body: 33mm; Cap: 50mm
CERAMIC DISC DIAMETER	20mm
WEIGHT (W/ 1.5M CABLE AND BANANA PLUG)	500g

SILVER CHLORIDE ELEMENT

MATERIALS	Silver compounds are 99.90% pure
DIMENSIONS	Length: 50mm (+/- 2mm); Section: 5mm x 5mm
SURFACE AREA	Geometric: 10cm^2; Real: 500cm^2

ELECTROLYTE ..... Inert electrolyte with 0.5 Molar KCl

PERFORMANCE DATA (See N.B. below for details)

Vs STANDARD HYDROGEN ELECTRODE @25^{0}C	+250mV
IUPAC* GUIDELINES IN 0.5M KCL SOLUTION Vs SCE @ 25^{0}C	+9mV
HISTORIC DNV GUIDELINES IN 0.5M KCL SOLUTION Vs SCE @20^{0}C.	-5mV
ACCURACY	+/-5mV
STABILITY (POTENTIAL DRIFT AT CONSTANT TEMP AND ENVIRONMENT)	+/- 1mV (24 Hrs) @ 5µA load
TEMP COEFFICIENT	-0.65mV/^{0}C
TEMP RANGE	-5 to 70^{0}C
INTERNAL RESISTANCE	Less than 500 Ohms
THEORETICAL DESIGN LIFE	3 years @ 0.1µA load

QA/QC

All our electrodes are fully tested, calibrated and supplied complete with a calibration certificate. They are individually identified with a unique serial number to ensure full traceability. All dimensions +/-1mm unless otherwise stated.

WARRANTY

Our reference electrodes are fully warranted against defects in materials and workmanship for six months from the date of receipt. We will replace/ refund any defect units within this period, but we require the unit(s) for examination to determine any fault.

N.B. Under no circumstances should the reference electrode be connected directly to the structure or the electrode will self-discharge and cease to operate. The minimum input impedance for the voltmeter used to measure the structure to electrolyte potential should be 10 MOhm.

In published literature, potential values for common reference electrodes used in Corrosion are measured with respect to a Standard Hydrogen Electrode (SHE) at 25^{0}C and are shown as a positive value. However, historical DNV guidelines have required Ag/AgCl electrodes to have a potential within the range of -5mV +/- 5mV against a Saturated Calomel Electrode (SCE) at ambient temperatures in seawater (or 3% (0.5M) to 3.5% (0.546M) NaCl or KCl solutions). The DNV guidelines had been based on the value measured when the SCE electrode is connected to the positive terminal of the voltmeter and the Ag/AgCl electrode connected to the negative terminal. Silvion Ltd quote reference electrode potential values in this data sheet using both the electrode connection arrangement originally adopted by DNV giving a negative potential measurement and currently used by *International Union of Pure and Applied Chemistry (IUPAC) which gives a positive potential measurement. It should be noted that the polarity of the reference electrode connection affects the polarity of the potential measurement that is obtained, but not its magnitude.