Institut de la Corrosion
French Corrosion Institute

nke INSTRUMENTATION

# AIRCORR O

## System for real-time monitoring of outdoor corrosivity and air quality

Real-time information on the actual air corrosivity is crucial for effective corrosion protection of valuable equipment and objects. AIRCORR O measures and registers the change over time in the electrical resistance (ER) of a thin metal track applied on an insulating substrate. If the metal corrodes, the cross-sectional area of the track decreases and the ER increases. The changes in ER can be directly translated into corrosion depth and corrosion rate.

The AIRCORR monitoring system is comprised of four principal parts:

- Electronic logger for measuring and recording ER, AIRCORR O;
- Metal sensor that actually corrodes in the environment;
- Non-contact communication interface between the logger and computer, Data pencil;
- User-friendly software programme, WINAIRCORR.

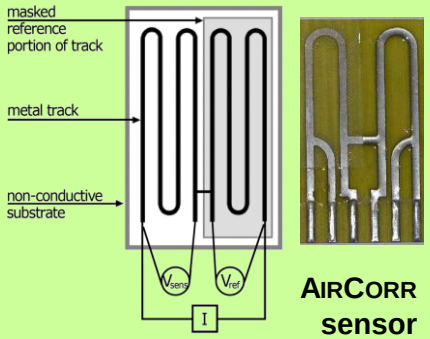
### *Main features*

- AIRCORR O logger is **small and can be placed virtually anywhere**.
- AIRCORR O is **battery-driven** and designed to be **autonomous for up to five years**.
- AIRCORR O is fully **watertight**.
- Due to the great precision of the electronic device and the geometry of the metal track, both **a quick response time and a highly sensitive measurement are achieved**.
- **A wide range of sensors** is available.
- The logger lid with attached sensor **metal sensors can be replaced** with lids by end-users, which reduces the operational costs.
- **Non-contact data reading** allows the logger to remain in place while also allowing the data to be monitored.
- User-friendly WINAIRCORR software provides **rapid interpretation of results** in terms of corrosion depth and corrosion rate and classifies the air quality and corrosivity with the help of four **standards and recommendations**.

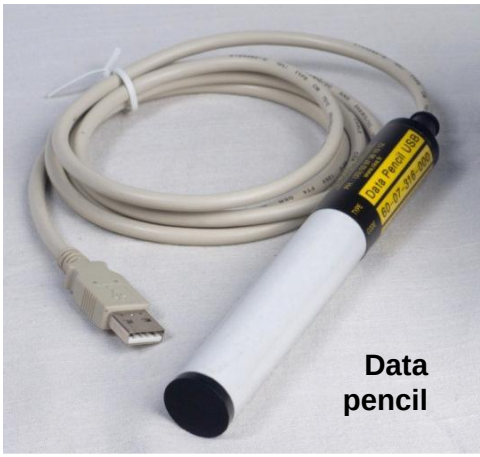
### *Examples of applications*

- *Transportation and storage*. Design of better measures for corrosion protection of vehicles and transported goods.
- *Infrastructure*. Assessment of environmental impact on buildings, bridges, etc.
- *Research and development*. Development of corrosion tests, understanding of corrosion mechanisms.
- *Cultural heritage*. Control of anticorrosion measures in open-air museums and in specific environments.

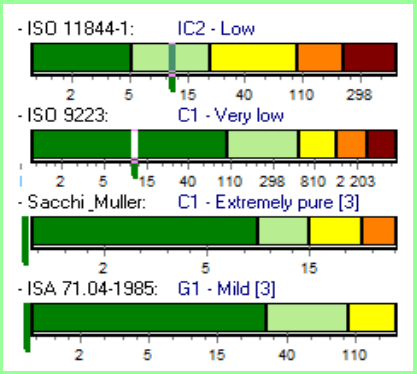
LOGGER AIRCORR O



AIRCORR sensor



Data pencil



Corrosivity classification

## *Specifications*

### AirCorr O logger

- Outdoor logger with fixed sensor, water tightness IP65.
- Polycarbonate box of 100×65×42 mm, weight 185 grams.
- Optimal / Maximal operating temperature range: from 0 to 30 °C / from –5 to 45 °C.
- Measurement frequency: Adjustable from 1/second to 1/day.
- Accuracy of corrosion depth measurement at temperatures from 0 to 30 °C: <0.3% of sensor thickness.
- Resolution of corrosion depth measurement at temperatures from 0 to 30 °C: <0.01% of sensor thickness.
- Two lithium batteries LS14500 (3.6 V / 1.8 Ah). Lifetime of over 5 years at measurement frequency of 1 hour at temperatures from 5 to 30 °C.
- Capacity of memory: Over 10 years with measurement frequency of 1 hour.

### Sensors

- Glass-fibre reinforced epoxy resin substrate.
- Fixed to a plastic lid, exchangeable with the lid.
- Size 55×31 mm.

### Data pencil

- USB non-contact data reader.
- Data reading from maximal distance of about 10 mm.
- Drivers for Windows provided on a USB flash drive.

| Sensor | Sensing material | Resistance range [Ω] | Life span [µm] | Resolution [nm] [1] |
|---|---|---|---|---|
| Fe-250µm | Carbon steel | 0.01–0.1 | 125 | 200 |
| Zn-50µm | Zinc | 0.1–1 | 25 | 7 |
| Fe-25µm | Carbon steel | 0.1–1 | 12.5 | 3 |
| Zn-25µm [2] | Zinc | 0.1–1 | 12.5 | 5 |
| Cu-12µm | Copper | 0.1–1 | 6 | 4 |
| CuZn37-10µm [2] | Brass Cu-37Zn | 0.1–1 | 5 | 1 |
| Cu-5µm [2] | Copper | 0.1–1 | 2.5 | 1 |

*[1] Minimum measurable change in the corrosion depth assessed in laboratory conditions. [2] Available upon request.*

### WinAirCorr software

- Installation version provided on a USB flash drive.
- Works with Windows XP, Vista and Windows 7.
- Air quality and corrosivity classification according to ISO 9223 (outdoor, C1–CX for Fe, Zn, Cu and Al), ISO 11844-1 (indoor, IC1–IC5 for Ag, Cu, Fe and Zn), ANSI/ISA S71.04-1985 (indoor, G1–GX for Cu), and Sacchi and Muller (indoor, S1–S5 for Ag, C1–C5 for Cu).
- Data exportable in txt format.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