ACUITY
corrosion technology

Corrosion Monitoring Systems

Autonomous Monitoring in Harsh Environments

Acuity systems provide long-duration, autonomous monitoring of corrosivity and environment severity in service and test environments. The systems continuously collect and store measurements of single-alloy corrosion (free corrosion), dissimilar materials corrosion (galvanic corrosion), surface contaminants, air temperature, and relative humidity. Measurement systems can mount directly onto structures and subsystems of aircraft, automobiles, ships, or other assets that operate in harsh environments. For accelerated testing, Acuity systems are installed onto outdoor test fixtures and inside laboratory test chambers.

- Corrosion rates of aluminum, steel, stainless, zinc, CFRP, titanium, and more
- Measure contaminant loadings that contribute to corrosive conditions
- Consolidated data collection, capturing a full suite of corrosion parameters
- Continuous, reliable, long-lasting, and highly sensitive sensors
- Ruggedized devices to withstand harsh service and testing environments
- Simple operation
- Integrate into existing health management systems or other networked systems
- Analysis and modeling support
- Standardized methods

Acuity LS

- On-asset testing of coatings and engineering materials
- Qualified for flight safety
- Battery powered
- Corrosion sensors made with user-defined engineering materials
- Easily pretreat, coat, and scribe the sensor panel

Acuity ES

- Track corrosivity in any environment: accelerated tests, outdoor exposures, aircraft, automobiles, or infrastructure
- Battery powered
- Corrosivity tracking by monitoring salt deposition on the surface
- Re-use in testing

Acuity CR

- High-throughput corrosion testing of coatings and engineering materials in accelerated environments
- Easily pretreat, coat, and scribe the sensor panel
- Battery or line powered
- Access data in real-time via PC

Acuity systems are compliant with the following standards:

ISO 22858:2020 | ANSI/NACE TM0416-2023 | AMPP TM21449-2021 | SAE AIR6970

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Acuity Product Specifications

Surface Temperature	± 0.3 -40 to +85 ºC
Air Temperature	± 0.3 @ -40 to +85 ºC
Relative Humidity Limits	± 2 @ 0 to 100%
Conductance (Low Freq)	Gold IDE conductance using a 20 mV peak-to-peak, 10-hertz excitation signal, units in micro-Siemens
Conductance (High Freq)	Gold IDE conductance using a 20 mV peak-to-peak, 25 kilohertz excitation signal, units in micro-Siemens
Total Conductance (Low Freq)	Gold IDE time-integral of conductance to obtain total charge passed per unit voltage, units of coulombs per volt
Total Conductance (High Freq)	Gold IDE time-integral of conductance to obtain total charge passed per unit voltage, units of coulombs per volt
Free Corrosion Rate	Free corrosion current using a 20 mV peak-to-peak, 0.5 hertz excitation, units in microamperes
Galvanic Corrosion	Galvanic corrosion current using a ZRA, units in microamperes
Total Free Corrosion	Time-integral of free corrosion current to obtain total charge passed, units of coulombs
Total Galvanic Corrosion	Time-integral of galvanic corrosion current to obtain total charge passed, units of coulombs
Continuous Operating Temperature	Acuity LS and CR Systems: -40 to +85 ºC Acuity CR Battery Module: -20 to +60 ºC
Battery Life	Estimated battery life is based on the selected sampling rate: At 60-minute measurement intervals, LS is approximately 4.5 years, CR 2.5 years, and ES 11 years
Dimensions and Weight	Acuity LS, ES: 1.1" x 4.7" x 3.5" and 0.75 lbs Acuity CR: 12.0” x 3.5” x 3.2” and 2.5 lbs

Coatings performance monitoring:

With coated sensor panels, Acuity systems continuously quantify corrosion mitigation properties and barrier properties of coating systems.

AMPP TM21449 "Continuous Measurements for Determination of Coating Protective Properties"