

Corrosion and Aging Testing

Evaluation of material behavior and their surface treatments against corrosion phenomena



Products and materials are subject to deterioration phenomena caused by corrosion and /or aging over their useful life. This process will depend on the aggressiveness of their environment.

Manufacturers have to characterize their product's protection and coating systems and thus determine their performance and their ability to withstand the environmental conditions they will face.

Corrosion tests for materials, components and products

Applus+ offers a corrosion and aging tests service for materials, components and products from any industrial sector. We have experts and laboratories specialized in weather testing and material characterization.

Our service covers:

- Evaluation of the protection and coating systems on materials (nature, thickness, uniformity, adherence, corrosion resistance and accelerated aging).
- Customized testing plan design and implementation
- Results analysis
- Failure analysis and advice on corrosion problems and material selection
- Process reengineering.

International, industry and brand standards

We perform standardized corrosion tests according to international standards as well as corrosion tests according to specific industry or brand standards (automotive, construction, aeronautics, oil and gas, among others):

- International standards: general EN ISO, ISO, ASTM, and DIN standards (among other possible ones)
- Industry standards: VDA, MIL-STD, RTCA, DNV and API (among other possible ones).
- Brand standards: NISSAN, RENAULT, GENERAL MOTORS, VOLKSWAGEN, TOYOTA, MERCEDES, BMW, PSA, VOLVO, and AIRBUS (among other possible ones).

Corrosion testing capabilities

- Material and coating (metal and polymeric) chemical characterization tests: ICP, AA, spark spectrometry, IR, EDX.
- Physical characterization tests for coatings: Thickness, uniformity, adherence, hardness.
- Corrosion and accelerated aging tests: NSS, AASS, CASS, Q-UV, Kesternich, condensation, cyclic corrosion
- Specific corrosion tests, among others:
 - Susceptibility to intergranular attack in stainless steels
 - Effectiveness of chemical passivation of stainless steels
 - Resistance to dezincification in brasses
 - Resistance to stress corrosion in copper alloys and steels
 - Resistance to exfoliation corrosion in aluminum alloys
 - Corrosive effect of chemicals on materials
 - Microscopic examination of samples (stereoscopic magnifiers, optical metallographic bench microscope, scanning electron microscope (SEM)).
 - ASTM G48: Methode A,B,C,D
 - ASTM G28

Applus+ has a long track record working with leading industrial sectors (aeronautics, automotive, construction, electrical and electronic equipment, power and renewable energies, oil and gas, etc.) in corrosion and aging tests.

Benefits

- Improved product design for longer useful life
- Verify the performance and uniformity of the surface treatment of a part or product
- Lower non-quality costs for the product
- Optimize the maintenance measures based on the material and its coating