CASE STUDY

Corrosion Analysis of Materials under Severe Process Conditions

Corrosion is and continues to be an expensive problem that plagues industries such as petroleum and refining, waste, coatings and linings, transportation, pulp and paper, and power to name a few. According to a recent article on the economic effects of metallic corrosion in the United Sates, over $100 billion dollars per year result from avoidable corrosion.

Corrosion is the deterioration of a material due to its interaction with the surrounding environment. It is critical that industries, dealing with reactive chemicals/materials, asses the reactivity and corrosivity of their materials/chemicals under the proposed process conditions including plant materials of construction. More often than not, very limited data on a particular corrosion phenomenon is available at the desired process condition for specific materials of construction. Therefore, laboratory testing of metal coupons is the quickest and most satisfactory means to determine reactivity and corrosivity of chemicals to various materials. The findings of the laboratory studies would assist with resolving process problems, implement process improvements, and allow for improved transportation containment by identifying suitable materials of construction for problematic chemicals.

DEKRA Process Safety has the expertise, special facilities, and equipment needed for testing of materials for corrosion studies under extreme conditions of temperature (350°C) and pressure (10,000psi).

To better understand corrosion phenomena, we offer state-of-the-art investigative techniques. The range of techniques include but is not limited to a variety of advanced surface characterisation methods, i.e., scanning electron microscopy (SEM), energy dispersive x-ray (EDX), and transmission electron microscopy (TEM). This approach provides micro-analytical analyses to better define failure mechanisms, as well as examination and identification of corrosion products.

Working at high temperatures and pressures, basically pushes the boundaries of the science and technology of our understanding of corrosion effects and mechanisms. Our experts will work with you to obtain a clearer understanding of your corrosion related problems. We can develop custom test methodologies, which can then simulate your process or field conditions including a worst-case scenario. Our goal is to generate reliable data that will assist you to solve a wide array of corrosion related problems and allow your project to proceed under a wide variety of conditions.

DEKRA Process Safety has fully equipped laboratories to conduct all the required tests and consulting staff to conduct corrosion studies under extreme conditions of temperature.

DEKRA Process Safety

The breadth and depth of expertise in process safety makes us globally recognised specialists and trusted advisors. We help our clients to understand and evaluate their risks, and work together to develop pragmatic solutions. Our value-adding and practical approach integrates specialist process safety management, engineering and testing. We seek to educate and grow client competence to provide sustainable performance improvement. Partnering with our clients we combine technical expertise with a passion for life preservation, harm reduction and asset protection. As a part of the world's leading expert organisation DEKRA, we are the global partner for a safe world.

Process Safety Management (PSM) Programmes

- Design and creation of relevant PSM Programmes
- Support the implementation, monitoring, and sustainability of PSM Programmes
- Audit existing PSM Programmes, comparing with best practices around the world
- Correct and improve deficient Programmes

Process Safety Information/Data (Laboratory Testing)

- Flammability/combustibility properties of dusts, gases, vapours, mists, and hybrid atmospheres
- Chemical reaction hazards and chemical process optimization (reaction and adiabatic calorimetry RC1, ARC, VSP, Dewar)
- Thermal instability (DSC, DTA, and powder specific tests)
- Energetic materials, explosives, propellants, pyrotechnics to DOT, UN, etc. protocols
- Regulatory testing: REACH, UN, CLP, ADR, OSHA, DOT
- Electrostatic testing for powders, liquids, process equipment, liners, shoes, FIBCs

Specialist Consulting (Technical/Engineering)

- Dust, gas, and vapour flash fire and explosion hazards
- Electrostatic hazards, problems, and applications
- Reactive chemical, self-heating, and thermal instability hazards
- Hazardous area classification
- Mechanical equipment ignition risk assessment
- Transport & classification of dangerous goods

We have offices throughout North America, Europe, and Asia.
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Would you like to get more information?

Contact Us

DEKRA