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Is Enhanced Cleaning during COVID-19 Damaging Your Industrial Equipment?

Recognizing and Mitigating Risks from Cleaning Agent Exposure

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Stakeholders in the retail, logistics, and healthcare industries are currently subjecting industrial equipment, materials, and electronic devices to frequent and aggressive cleaning to protect employees and customers from the spread of COVID-19. While essential for the health and safety of our communities, a sudden change in the frequency of cleaning or choice of cleaning agent may damage equipment or device reliability over time.

Cleaning agents can cause material damage to electronics, sealants, and housings via various mechanisms, particularly corrosion of electronic components. The chlorine containing molecules in bleach aggressively attack a large number of vital metal components common in electronics. In addition, ammonia containing reagents may react with chloride in the environment to form ammonium chloride, which can also aggressively attack metallic components. Alcohol and natural cleaning solutions may in certain cases be less corrosive but can still damage the seals and gaskets that protect electronics from the environment.

Depending on how well residual chemicals are removed, damage from cleaning agents may take a while to appear. Equipment or device failure may occur weeks or months later, even after traditional cleaning protocols have been reinstated.

Health and safety teams can help reduce the risk of costly capital damage by partnering with materials scientists to evaluate materials compatibility and optimize cleaning protocols within their organizations. This can include scientific advice and counsel on matters such as modifications to ensure industrial equipment and electronic devices are less susceptible to chemical damage.

How Exponent Can Help

Exponent's multi-disciplinary topic experts have extensive experience assessing materials compatibility and the impact of chemical exposure on device reliability. Our team can help organizations across industries proactively design or review proposed cleaning procedures to understand the effects of chemicals on different electronic systems and components. If equipment or device reliability is compromised in the field, our team can perform direct-cause and root-cause analysis to determine whether the cleaning agents used contributed to the damage or whether the damage resulted from other factors. Exponent offers a full electrochemical testing suite that can evaluate the susceptibility of metallic components to corrosion as a result of exposure to different chemical species and has extensive experience performing physical characterization and failure analysis on a variety of electronic systems where corrosion has occurred or is suspected.

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