

Analysis of an explosion protected cemented flame path

Hazardous environments place high demands on their products. Explosion protected cameras are designed for use in these environments. The purpose of this work was to analyze a cemented flame path of such a camera and suggest improvements, while navigating through the extensive requirements that apply.

It is assumed that it is impossible to prevent flammable gasses from penetrating a product. Therefore, an explosion can occur if an ignition source is present inside the product. One of the goals of explosion protected cameras is to contain and restrain the explosion so that flames cannot spread outside the camera housing. One way to enclose the explosion is through flame paths, which can be thought of as a connection between two parts. One type of flame path is a cemented joint that is designed to prevent the flames from spreading outside the product.

The objective of this work was to analyze the assembly of a glass window and its cemented joint. The idea was to use the analysis and the already known problems to find out if and how improvements could be made. The problems, which were known

from the beginning were, for example, that the silicone sealant risks being smeared onto the glass which can lead to poorer image quality. Digging further, it also became clear that the material must be tested annually. This is both time consuming and costly, so avoiding these tests became another objective. It was found that the tests can be avoided by switching to a material with a specific classification. Two areas were then investigated: analysis of production with the original material and evaluation of materials with that classification.

The results were nothing but successful. Both areas led to findings that should benefit Axis immediately and in the long term. The development of the current production results in immediate benefits as the most prominent, production-related issues have been drastically minimized. The tools and procedures provide both consistency and ease of use. The material evaluation has yielded two potential materials. They will be tested later, and one will ultimately be changed to if it performs well. This would save Axis time and money in the long run and, with adjusted production methods, also keep previous problems at bay.