Reflective Films on Stainless Steel

Instructional Bulletin #6.11 (Revision 3)
Dated: 12/31/14

1.0 Why Are Reflective Films Not Recommended on Stainless Steel Substrates?

Reflective films on stainless steel will gradually exhibit dull spots in the film. The phenomenon that causes dull spots in reflective film can be explained by the interaction of the metallized layer of the reflective film with the stainless steel substrate. The inherent differences between the two metals, specifically in the property termed "electronegativity," cause the establishment of a galvanic corrosion cell. The difference in electronegativity between these two metals creates a voltage or potential difference, which is the driving force for an electric current to flow between these two metals. As a result of this reaction, the metallizing in the reflective film will begin to oxidize and degrade with time.

2.0 Where Does The Reaction Take Place And How Can It Be Prevented?

This type of film degradation can occur on any part of the film, but is more likely to be noticed at the edges, where the adhesive layer has possibly been "squeezed out," thus, leaving the metallized layer of the film in direct contact with the substrate. An effective means of controlling the degradation is to create a barrier between the stainless steel and the metallizing. Possible solutions include painting or topcoating the substrate or adding additional pressure- sensitive material in between the film and substrate.

3.0 How Does Water Or "Application Fluid" Affect The Reaction?

Water or application fluid is an electrolyte in this corrosion cell that will accelerate the rate of degradation therefore, wet application is not recommended.

4.0 What Reflective Films Can I Use On Stainless Steel?

Contact Avery Dennison 's Customer Technical Support for special reflective films for stainless steel. These films are designed to slow down or eliminate the "galvanic" reaction between the different metals.

Revisions have been italicized.