



SURFACE CLEANLINESS IN BONDING APPLICATIONS



mid-infrared spectroscopy is capable of detecting a wide range of contaminants, there is significant interest in using Exoscan equipped with external reflectance capability for the assurance of surface cleanliness.

As an example, the presence of oil mist is easily observed

The ability to join two materials, whether of similar composition or disparate, is highly dependent on the condition of the surfaces with regard to contaminants. Contamination present on the surface of materials to be bonded or present in the primers and coating necessary to ensure proper bonding, will significantly affect the strength and long term durability of the bond. As more composite materials are used in a widening array of critical applications, the importance of carrying out the bonding procedure exactly to specification will become ever more important.

A wide range of potential chemical contaminants are present in many ambient environments where both metal and/or composite bonding is carried out. These contaminants include oil mists, humidity, and even perspiration and fingerprint oil from human sources. All of these contaminants can affect the quality of the bonding process.

For this reason, analyzers that can detect the presence of contaminants, particularly at the actual site of the bonding process, are important. These devices must provide non-destructive inspection, must be easy to use and provide information to personnel not necessarily trained in analytical methodology. Exoscan has been designed to meet these requirements and since

in bonding primer that had been applied to titanium metal as is shown if Figure 1. The appearance of strong hydrocarbon C-H stretching vibrations in the spectrum of the primer is indicative of the presence of oil. Another important contaminant that infrared is capable of detecting is composite mold release compound. Silicones are strong infrared absorbers which can be observed on the composite surface.

In all cases, in order to successfully use analytical instrumentation for determining the level of contamination present, it is necessary to know what level of contamination is deleterious to the application. This level of contamination must be within the fundamental capabilities of the analytical technique that has been chosen.

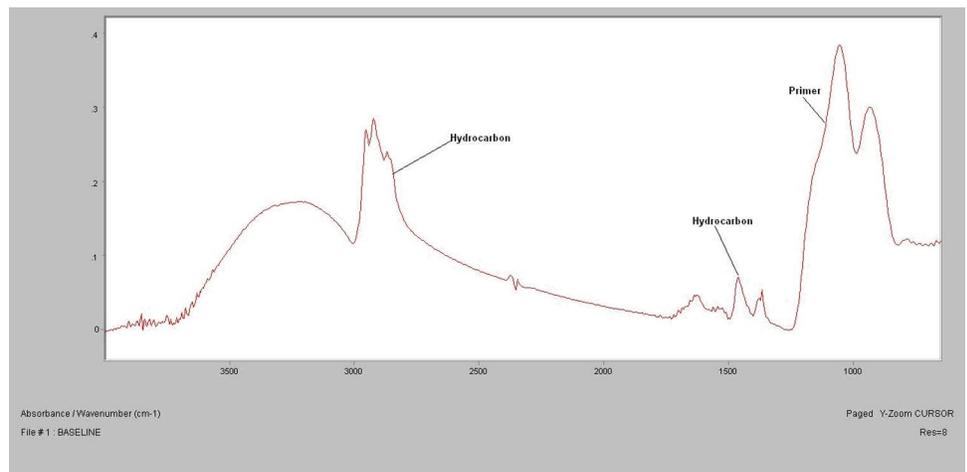


Figure 1 – Hydrocarbon contamination on primed titanium surface measured with the Exoscan.



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