ADVANCED AEROSPACE COATING

The aerospace industry needs accurate coating thickness measurement whenever plating, anodizing, powder coating or other coatings are required. This is particularly important when the coatings play a critical role in preventing the corrosion or wear of metal substrates. Properly applied coatings, with thickness measured in mils (.001 inch) or microns (.001 mm) are crucial to avoid coating breaches leading to corrosion of the underlying substrate.

"Incorrect paint consistency can affect drying times or eventual flaking of the paint film," says John Bogart, Managing Director of Kett US, a manufacturer of a full range of coating thickness testers. "Too little paint coating and you are left with cosmetic issues in opacity, and protective issues like corrosion, wear, and exposure."

Until recently, conducting frequent laboratory-quality coating thickness tests throughout the manufacturing process or in the field has been difficult. Traditionally, this required meticulous sampling and preparation, as well as taking the sample to the lab for evaluation. Although portable coating thickness gauges are not new, most fail to provide the accuracy, speed, or simplicity required for anyone to conduct quick checks as needed on the production line or in the field. Fortunately, handheld devices are now available that allow personnel to easily and quickly perform lab-quality coating thickness measurements.

In response, aerospace industry innovators have developed a number of

LZ990 Portable Coating Thickness Gauge (Kett)

advanced designs for handheld coating thickness test devices. One example is Kett's LZ990 portable coating thickness gauge which combines two of the most widely used measurement methods, magnetic inductance and eddy current, in a dual mode device that can measure the coating thickness of almost any non-magnetic coating on both ferrous (magnetic) and non-ferrous (non-magnetic) substrates. Since the unit is able to automatically determine the substrate and use the appropriate measurement circuit, this enables instant, non-destructive testing on painting, plating, anodizing, and organic coatings with accuracy up to 0.1 um. Such testing takes less than a second to display the measurement.

Because the key to providing accurate, repeatable measurements is the operator's ability to reliably make consistent contact between the instrument and the test surface, the unit also utilizes a spring-loaded probe to generate a consistent contact pressure with the measured surface. This integrated probe also includes built in edge guides to enable easy measurement of even curved and edged surfaces. To ensure device stability during measurement, the foot of the probe is also designed to provide a firm platform when placed onto the test piece. According to Bogart, a number of other design considerations in handheld coating thickness gauges can also simplify measurement and improve versatility. In order to improve accuracy and durability on the aerospace factory floor or in the field, it is best for the unit to have no moving parts, other than the probe.

Similarly, the unit should be impervious to vibration, with measurement independent of its orientation. To save time during the testing process, Bogart recommends utilizing a unit with a large screen that enables the quick reading of results. Those results should be able to be stored in the gauge and transferred to a computer and/or printer for documentation and averaging purposes. An instrument that stores many test measurements is best so operators can perform numerous tests before downloading the results.

"Easier, more accurate aerospace coating and plating measurement with handheld units will help to improve quality checks wherever needed," added Bogart. "So, defects can be immediately detected and corrective action undertaken to minimize scrap and faulty components or aircraft."

More info: kett.com