

Overview

“Seeing is believing,” and what we see is scattered light.

ScatterScope™ is a new light scatter instrument developed to monitor and characterize the surface finish of common commercial surfaces such as automobile paint, plumbing fixtures, kitchen appliance trim, door knobs, paper, extrusions, rolled surfaces and many other items manufactured in bulk.

ScatterMaster™ is the software package that performs automated analysis of ScatterScope™ measurements. The objective is to monitor surface appearance during production so that out-of-tolerance problems can be identified before scrape is produced. By combining industry experience with the new technology it will be possible to produce the same surface appearance to products that are produced in different years and/or countries.

Light scatter metrology has been successfully used for several decades to measure the low level roughness on optically smooth surfaces (such as mirrors and computer disks) because there is a simple one-to-one relationship between surface roughness and related light scatter.

Unfortunately, there is no such relationship for the rougher (and far more complex) industrial surfaces in question here. Monitoring these surfaces has traditionally been done visually by experienced technicians. Because “beauty is in the eye of the beholder” and because visual inspections are not quantified, consistency over time and location is problematical.

Past attempts to quantify the appearance of surface finish have been limited to gloss measurements. Gloss is a measurement of near specular reflection taken over a small solid angle and ignores easily observable variations in hemispherical scatter.

It is obvious that a single (gloss) number is not enough to characterize something as complex as surface appearance. The new technology rapidly combines and analyzes hundreds of measurements in a manner that is influenced by input from experienced factory technicians to achieve real appearance measurements.

The two products, ScatterMaster™ and ScatterScope™, are described more completely in the following sections.