

# Gloss Measurement Shines

## with Unique UKAS Accreditation

Gloss is often difficult to describe, let alone measure, and everyone has their own idea of what 'gloss' is. It's an important factor in quantifying the appearance of a product in many industries from plastics to cosmetics - in fact, anywhere the perception of a product is dependent on its reflective properties.

Gloss is an optical property related to the reflection of highlights - the ability of a surface to reflect light in a particular direction. Measuring it has to take into account a number of elements: the refractive index of the material, the angle of incident light and the surface topography. Essentially, it involves comparing the amount of reflected light from a sample, to that reflected from a black glass calibration standard with a defined refractive index. Several different angles are used for measurement, with incident angles of 20, 60, and 85 degrees the most common (for high, medium and low gloss surfaces respectively), but other angles are used for specific applications, such as 75 degrees for plastic film, and 45 degrees for vinyl siding.

The increasing importance of being able to quantify gloss, when in the past it has been simply subjective, has led to a large number of different instruments being produced to measure gloss, but these are often sold, and calibrated, without traceability.

That's a problem for companies with (sometimes very specific) obligations under standardized quality management systems such as ISO 9001:2008, or the more prescriptive and industry-related SAE AS9100 / AECMA prEN 9100, in the aerospace sector, or ISO/TS 16949:2009, in the automotive sector, for example. Accredited calibration of instruments is becoming crucial as new requirements specify that traceability and competent measurements are demonstrated by accreditation to ISO/IEC 17025:2005.

Aerospace Metrology & Electromechanical Calibration Ltd (AMECaL) is the company setting the standard for others to follow, building a reputation, and gaining a unique position in the UK, by being awarded the only UKAS accreditation for gloss measurements (and meeting ISO/IEC 17025:2005).

Based in Newcastle upon Tyne, AMECaL has spent four years researching and developing a method of calibration relating to optical gloss measurement. The emergence of an accredited laboratory able to calibrate both the instruments and reference standards will ensure that many more of these instruments can, and will, be calibrated against measurement standards traceable to international/national measurement standards. The company, which has the best facilities in Europe, even manufactures the Reference Standards themselves.





Technical Director, Steve Oxborough, who set up the company after a lifelong interest in calibration, has a passion for the area: "Many companies think - or have been told - that accredited calibration for gloss measurement instrumentation simply doesn't exist. That's left them unable to meet traceability and competent measurement requirements."

"Companies can now get the same standards applied throughout the production process, from preparing metalwork, to painting it and measuring the paint thickness and gloss aspect - ensuring ongoing peak performance and compliance to both standardized quality management systems and international standards for all the equipment used."

The seeds of Steve's passion, which led to UKAS accreditation, were sown back in 2004 when a seemingly idle curiosity about the paintwork on old cars developed into a fascinating area of research for the company. "I noticed that some red cars - and not necessarily very old ones - had faded to a dull pink, when other cars of different ages and colours didn't have that problem. I just wanted to know why - but the search for an answer led me to yet more areas without answers and the path was longer than I imagined." (The answer lies in the sun's ultraviolet radiation breaking down binding chemicals and pigments

in the paintwork, causing the surface to come apart - the effect is more marked on red cars as UV has its strongest effect on red pigmentation.

The innovation of new calibration methods in this highly specialized field is not the only cutting edge development to the company's name; they also cover other complex - and related - areas such as the conductivity of metal structure and paint- and flow-related instruments. Their expertise extends to developing new equipment as well; currently in development is a Gonio photometer - which will have the best accuracies in the world - some 20 times more accurate than the best available today.

Ongoing technical developments in unique and very specialist areas like these, alongside an ability to deal with an ever-increasing portfolio of products, have put the company at the forefront of calibration know-how. It seems that the obligations of standardized quality management systems aren't going to be so difficult for companies to meet after all.

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