Surface Appearance & Gloss Measurement

Innovative solutions for quantifying the quality appearance of surfaces
Surface appearance is a key quality indicator for producers of paints, coatings, plastics and metal products, used to quantify the degree of reflection from the surface. The collection and analysis of gloss data alone will not provide a comprehensive assessment of surface appearance quality, a number of secondary characteristics can significantly impact the customer’s perception of quality. By measuring an abbreviated photometric in-plane BRDF reflection curve (displayed: 17°-23° related to the 20° illumination angle, complete curve from 12.75° to 27.25° with Software) the IQ-S not only measures gloss but also near-gloss appearance parameters.

Aside from Gloss (a measurement proportional to the amount of light reflected from a surface), the Rhopoint IQ-S instruments available from Konica Minolta Sensing measure $R_{\text{spec}}$ (the specular peak gloss value), Reflectance Haze (an optical effect caused by microscopic textures or residue on a surface) as well as DOI (“Distinctness of image”) and RIQ (“Reflected Image Quality” - a measure of how clearly a reflected image will appear in a reflective surface).

Using accurate and ISO 17025 traceable measurement instruments to provide data on these additional surface conditions will help to remove subjectivity from the process and allow operators to identify the effects of processes, conditions, components or raw materials on the finished product. In using a single instrument to capture this valuable data operators will gain efficiency and certainty in their processes and the quality of finished products.

Enhanced Surface Data

**quantify surface parameters**

- **$R_{\text{spec}}$ (Specular Peak Reflection)**
  By measuring the specular reflectance over a very narrow angle, small changes in surface and “true” glossiness can be more easily detected.

- **Haze (Reflectance)**
  An optical effect caused by microscopic texture or residue on a surface, resulting in a “milky finish” that is apparent on the surface with a loss of reflected contrast. Reflectance Haze can be a major issue for high gloss and metallic surfaces, where “a milky appearance” of the otherwise high gloss surfaces can be visible, e.g. for black high gloss plastics, mirror-like materials or chrome parts.

- **DOI “Distinctness of Image”**
  A measure of how clearly a reflected image will appear in a reflective surface. Application issues can cause visible brush marks, orange peel and waviness which would be seen as a sign of poor quality and whilst immediately apparent to the eye.

- **RIQ “Reflected Image Quality”**
  RIQ measures the same effects as DOI but with an improved correlation to human visual perception. This is particularly valuable in quality coatings such as automotive, aviation or marine finishing.
Surface Measurement Solutions for all gloss levels and sample sizes

Rhopoint IQ-S
Exclusively available through Konica Minolta Sensing, the Rhopoint IQ-S was designed and built to exceed automotive exterior and interior gloss measurement standards.

Standard glossmeters only measure how much light is reflected and are not sensitive to diffuse gloss effects which dramatically reduce appearance quality. The IQ-S measures not only “traditional” 20°/60°/85° Gloss but also $R_{\text{spec}}$, Reflectance Haze and DOI/RIQ, parameters that would otherwise require multiple measuring instruments.

As IQ-S gloss measurements are fully compatible with existing micro-TRI-gloss-S and micro-haze results, the IQ-S is the ideal upgrade for manufacturers or supply chains where professional surface appearance is of primary concern (all units are close tolerance selected for maximum accuracy and resolution in all gloss applications).

IQ Flex 20-S
Exclusive to Konica Minolta Sensing, the IQ Flex 20-S is a single angle (20°) instrument with IQ gonioreflectometer functionality. The device is designed with a remote receptor head for small, challenging high gloss samples such as car door handles, antennae and similar parts. The IQ Flex 20-S can be customised with custom 3D printed measuring heads or jigs to capture the appearance of otherwise unmeasurable parts. Data from the IQ Flex 20-S is fully compatible with the IQ-S.

Novo-gloss Flex 60
Developed to measure the gloss of surfaces that cannot be measured using a traditional gloss meter. The Novo-Gloss Flex 60 combines the functionality of a 60° gloss meter with a lightweight remote measuring head that complies with ISO 2813 and ASTM D523.

The Novo-Gloss Flex 60 has been designed specifically to measure low gloss surfaces (<10GU @60° Gloss). It features an additional measuring scale (GUh) with a high-resolution 10 times greater than standard glossmeters, precise to the 2nd decimal, offering an unprecedented level of gloss control of low gloss surface finishes.

Novo-gloss 60 KM
Simple, cost effective 60° single angle gloss meter. The 60° Novo-gloss is ideal for measuring medium gloss surfaces. Compliant with major international standards such as ASTM D523, ISO 2813, ASTM D2457.

Full specifications and a comparison of the units is available at www.konicaminolta.eu/measuring-instruments
Your local product specialist can assist with a trial or demonstration at your convenience.
Rhopoint TAMS™: Total Appearance Measurement System

Rhopoint TAMS™ is an innovative device for measuring surface conditions, developed to look not only at a single surface or panel but to measure, compare and assess all surfaces of a product. Developed in collaboration with Volkswagen AG and AUDI AG, Rhopoint TAMS™ models the human perception of surface appearance quality, providing new parameters that revolutionise the understanding and communication of visual appearance information.

Rhopoint TAMS™ utilises variable focus machine vision to model quality perception measuring the reflection for Contrast, Sharpness, Waviness and Dimension. Where existing systems provide complex results that require subjective assessment the Rhopoint TAMS™ uses the research conducted with Volkswagen AG and AUDI AG to compile measurements into two criteria: QUALITY and HARMONY.

QUALITY: The total appearance quality of a surface corresponding to the visual rating of the customer. 100% indicates a smooth finish with perfect image reflection.

HARMONY: Based on extensive human perception research by AUDI AG, HARMONY indicates the acceptability of adjacent car parts. A value of >1.0 indicates parts are not similar and if viewed together will detract from overall visual quality perception of the customer.

Rhopoint TAMS™ allows for a more data driven assessment and approval process that is less reliant on subjectivity and judgements of a limited number of experienced assessors.

Colour Viewing Cabinets

The ultimate aim of measuring and qualifying colour or surface parameters is to improve visual quality indicators, and the visual assessment of the customer.

Konica Minolta Sensing supply colour viewing cabinets from Just Normlicht. Solutions include everything from small light boxes up to far larger assessment systems. Products are available with customisable LED lighting, traditional fluorescent tubes and hybrid systems with both technologies.

An LED viewing cabinet can be programmed with custom illuminants to allow users to replicate real world viewing environments and quickly switch between a range of conditions. Just Normlicht cabinets provide a consistent area for specifying, approving, viewing and discussing the surface characteristics and colour of products.