RHOPOINT INSTRUMENTS

RHOPOINT AMERICAS

AESTHETIX

The ultimate surface appearance measurement solution

www.rhopointinstruments.com sales@rhopointinstruments.com

Modular solution:

Surface Brilliance | Texture | Effect Finish
Custom application modules

Choice of deployments:

Laboratory, portable in-field, in-line in production or as part of a Cobot solution

Versatile measurement:

Flat surfaces, curved parts and small surface areas

EXPERTS IN APPEARANCE MEASUREMENT SINCE 1986

Manufactured by Rhopoint Instruments in the United Kingdom

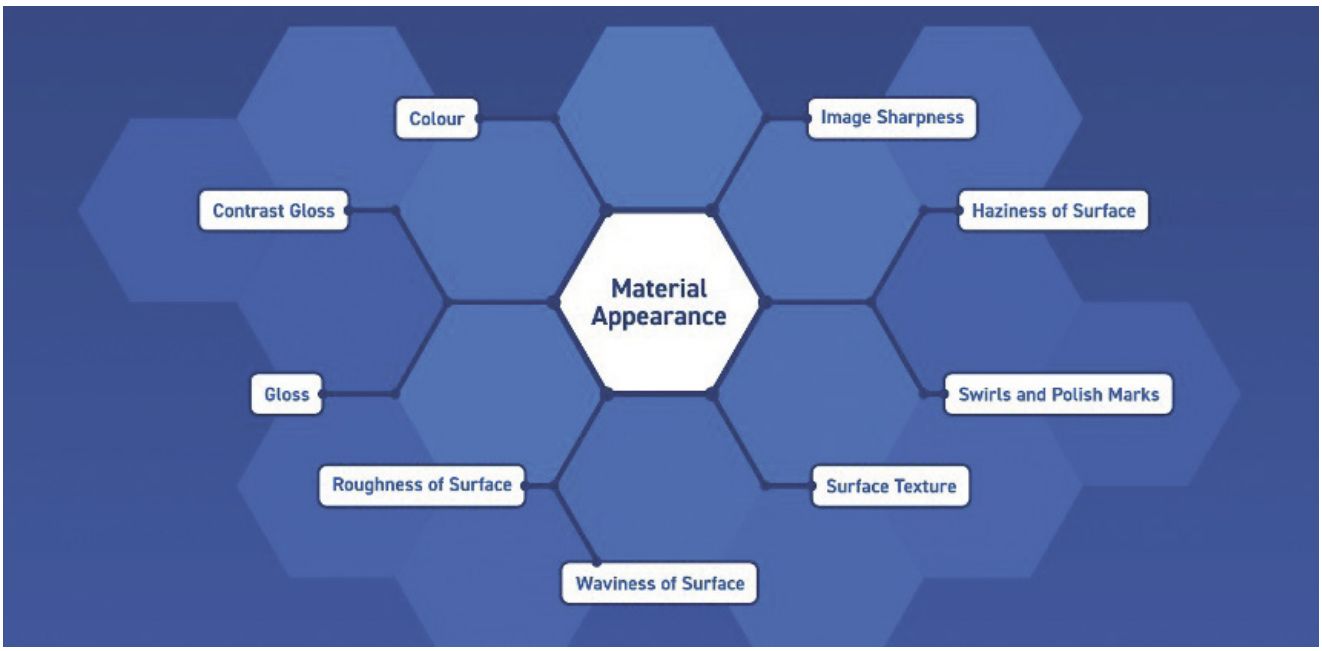
Why is Aesthetix® the ultimate surface appearance measurement solution?

Multiple aspects of surface appearance contribute to how the quality of a surface is perceived. Consumers subconsciously observe the glossiness, colour, translucency and texture of surfaces when judging the aesthetic appeal of a product.

Product aesthetics is a major factor in driving consumer purchase. Designers and manufacturers invest significant resources in optimizing materials and processes for maximum consumer appeal.

Aesthetix® uses cutting-edge measurement technology* to quantify overall surface appearance with the closest correlation to human perception.

Multiple aspects of appearance can be measured with Aesthetix®



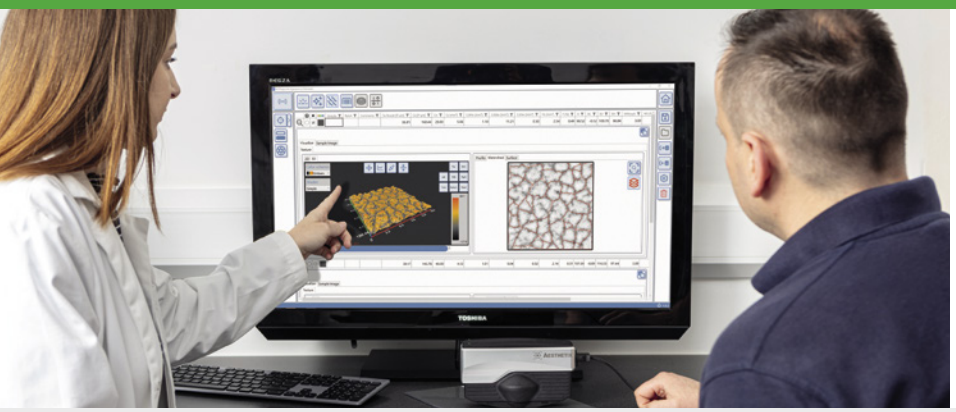
*Measurement technology co-developed with industrial and academic partners.

What is the Rhopoint Aesthetix®?

Aesthetix® is an advanced system that predicts the impact of surface quality on consumer perception using new measurement metrics.

This modular device measures all aspects of surface quality, including glossiness, texture, topography, surface patterns, and visual homogeneity. Adaptable to various workflows, it can measure flat, curved, and small areas with contact or non-contact methods. Aesthetix® can distill complex measurement into easy to understand perception parameters which can be used to set pass/fail tolerances. Enhanced with **Rhopoint Appearance Elements** software, it supports data sharing, storage, analysis and reporting, making it a comprehensive tool for surface quality assessment.

Aesthetix® Implementation



Research and Development

Use Aesthetix® perception metrics to understand what makes a perfect surface finish in the eyes of the consumer.

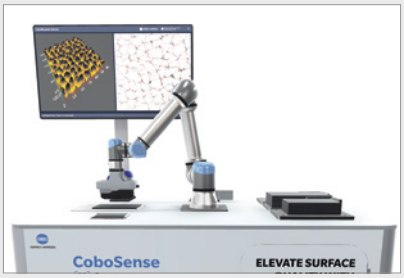
Set new standards with defined pass/fail criteria.

Deploy Aesthetix® technology to suit your workflow

Quality control

A simple QA interface with job based work flow can be employed for routine surface inspection.

Coming soon!



Automation

Designed for automation, the non-contact Aesthetix® sensor can be integrated into a cobot or robot measurement cell.

Portable inspection

Connected to a tablet, the Aesthetix® can be used as a portable off-site measurement tool.

Advanced Data Management

Rhopoint Appearance Elements software is used to analyse measured results by comparing values, images and topographical information against reference standards.

Scalable data management

Rhopoint Appearance Elements provides a structured, fully indexed database for precise process optimisation and future AI-driven decision-making.

Local

A local database stores results, data and images from a single instrument. Data and images can be output for further analysis.

Network

A network database for multiple instruments and locations.

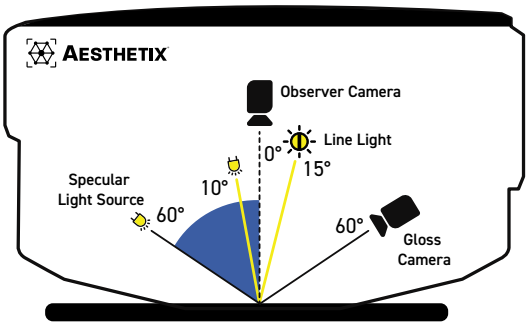
Coming soon!

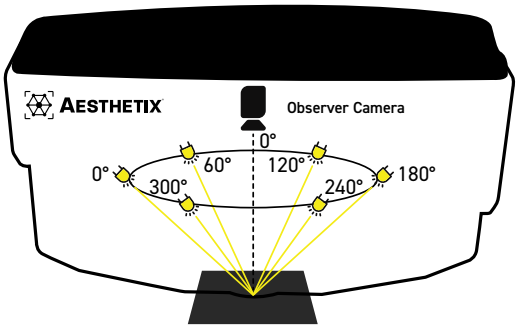
Cloud

Host your database on the Rhopoint cloud or use your organisation's cloud.

Coming soon!

Aesthetix® Technology





Dual camera system: Designed to capture detailed information about the surface and how it interacts with light.

Observer camera: Captures a highly detailed colour-correct image of the surface.

Gloss camera: HDR images are used to characterise multiple aspects of surface glossiness.

Specular light source: Conforming to ISO 2813 and ASTM D523, this is used in the calculations for gloss, visual gloss, DOI, sharpness, haze, visual haze.

6 x 45° ring lights: Used to light the surface for image capture, sparkle analysis and photometric stereo.

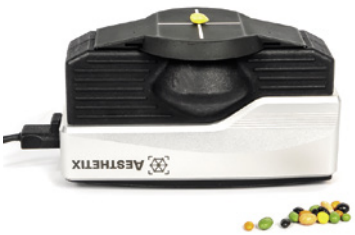
Line light: Used to measure orange peel and surface waviness.

10° spot light: Used in the analysis of scratches, holograms and haze.

Using Aesthetix® technology

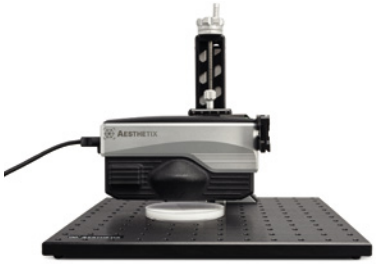
The Aesthetix® instrument vision system comprises of a sensor unit connected via USB 3.0 supporting onsite inspection with a tablet, surface analysis with a laboratory PC and in-line quality control via SPC.

This modular device measures all aspects of surface quality, including glossiness, texture, topography, surface patterns, and visual homogeneity. Adaptable to various workflows, it can measure flat, curved, and small areas with contact or non-contact methods.

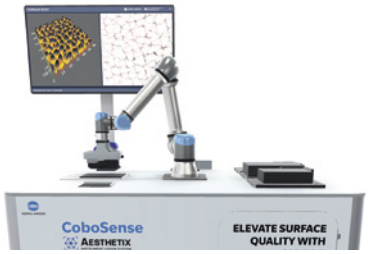


Interchangeable adaptors allow for measurement of flat surfaces, small parts, small areas and curved surfaces.

The instrument is able to accept custom jigs and adaptors for more repeatable measurement of small and complex parts.



For non-contact measurement of delicate surfaces, liquid coatings, gels, creams and pastes, Aesthetix® can be used with a height-adjustable stand.



High-throughput sample analysis can be achieved with Aesthetix® integrated into a laboratory cobot system.

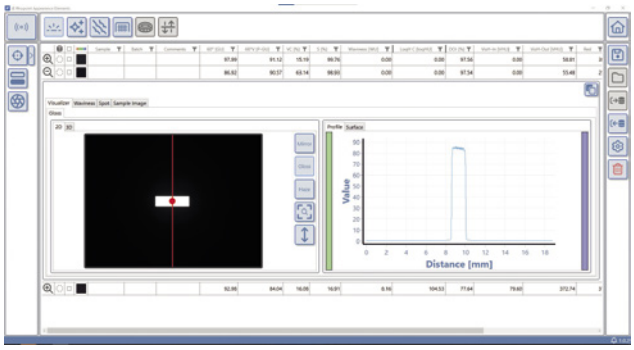
The Aesthetix® can be integrated into a production environment as a non-contact in-line sensor.

Minimum Windows system requirement: OS: Windows 10/11 | Memory: 8 GB | Port: USB 3.0 or Thunderbolt | Screen Resolution: Recommended 1920 x 1080 | Portable inspection: Recommended Windows Surface Pro 9 | 4-5 hours usage per charge | In-line measurement: TCP/IP protocol | Siemens S7

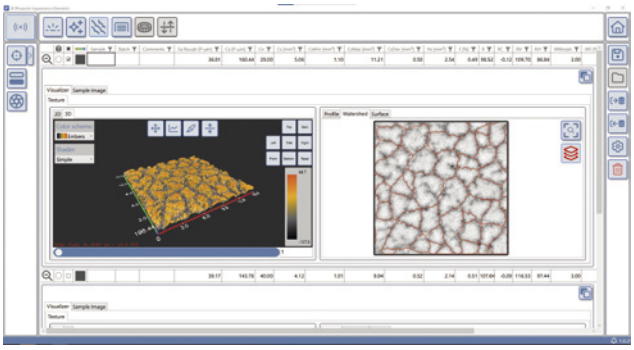
Rhopoint Appearance Elements

RHOPOINT APPEARANCE ELEMENTS

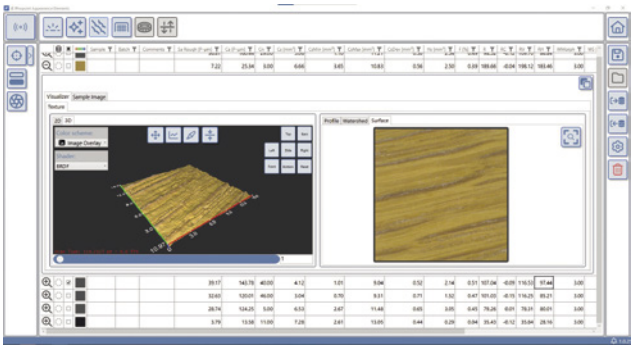
Rhopoint Appearance Elements software is at the heart of the Aesthetix® instrument vision system, capturing images for analysis with cutting-edge algorithms. Measurement images, graphs, and topographical surface maps illustrate the appearance qualities of the surface. Numeric results and images are stored in a local, network or cloud database, ensuring secure, scalable data management.



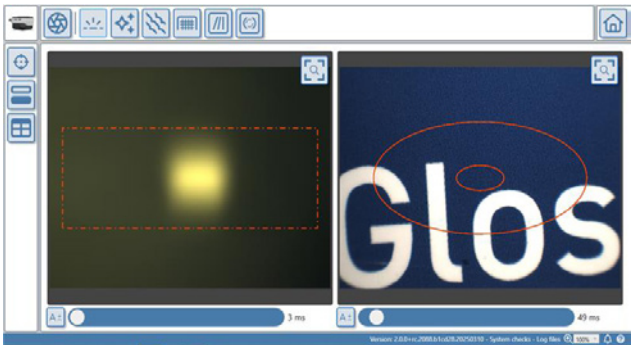
Surface brilliance module showing numeric results, measurement images and graph.



Texture module with numeric results, surface topography and segmented map.



Texture module showing a colour-correct surface image rendered on 3D surface map.



Aesthetix® interactive measurements displays a live view from both cameras, ensuring perfect positioning and alignment on all surfaces.

Coming soon! QA mode

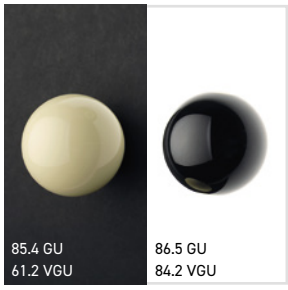
A streamlined QA interface displays specified parameters with pass/fail indicators. Measure within a defined workflow, and upon completion, generate a PDF report.

MODULE Surface Brilliance

A combination of perception metrics that comprehensively describe the reflectivity and visual quality of high-quality, high-gloss surfaces.

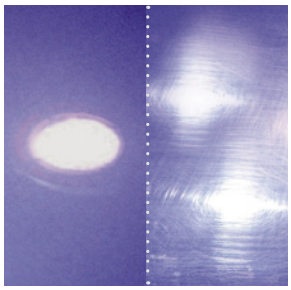
Gloss

Set around the industry standard of 60 degrees, Aesthetix® gives gloss values complying to international standards with camera images to fully describe surface reflectivity.



Visual Gloss

60 degree gloss values often conflict with perception. For example, black materials always appear glossier than white materials with the same gloss value. Aesthetix® NEW visual gloss scale (pGU) aligns with real surface perception.



Haze

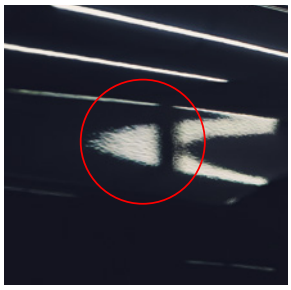
Haze refers to a cloudy or milky appearance on a coated or polished surface. Aesthetix® provides ASTM E430 compatible values and new perception based metrics which predict appearance in different viewing conditions (indoor vs outdoors).

In a car showroom, polishing defects in paintwork are barely visible, but in sources of bright natural light, halos are apparent.

Sharpness/DOI

A NEW sharpness parameter (SU) gives improved sensitivity for ultra-fine texture on the highest quality surfaces, whilst DOI units are compatible with Rhopoint IQ ASTM E430 measurements.

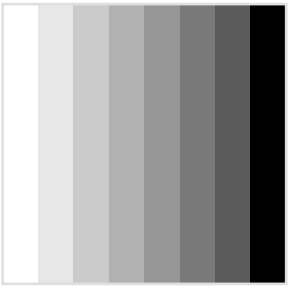
Left - A crisp, sharp reflection is seen in a smooth surface.
Right - Very small surface texturing distorts the reflected image causing it to be blurred and indistinct.



Waviness

Waviness in surface finishes presents as a wavy texture resembling the peel of an orange.

Aesthetix® offers TAMS Waviness, PCI orange peel scale, and tension values to accurately characterise orange peel for various applications.



Luminance

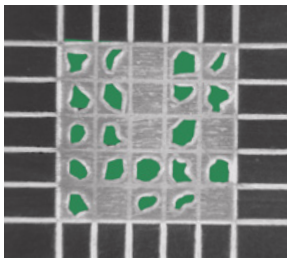
Aesthetix® displays surface average Y value from the CIE 1931 XYZ scale. This represents how light or dark the surface appears, independent of its hue or saturation.

Colour

A colour-accurate image of the surface is captured and the average RGB values are reported in the Rhopoint Appearance Elements software.

MODULE Cross-cut Adhesion

Aesthetix Cross-cut Adhesion Module replaces the subjective analysis of reproducible imaging measurement, increasing the speed and accuracy of a critical test which quantities durability and performance of a coating under various conditions.



Cross-cut class

Cross-cut AE software identifies the amount of coating remaining after testing and classifies according to ASTM D3359 and ISO 2409.

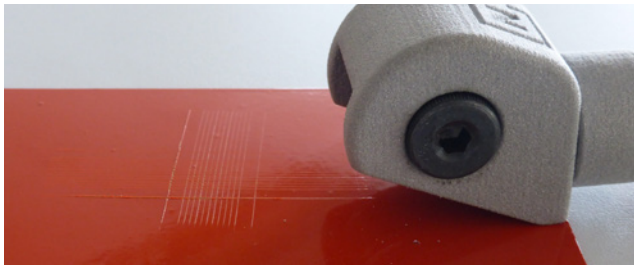
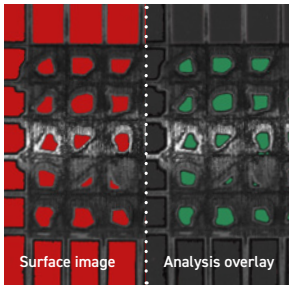
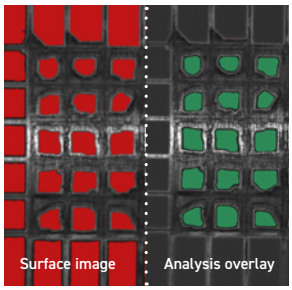


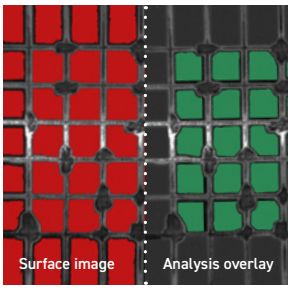
Image courtesy of Neurtek



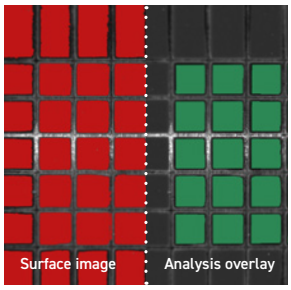
ASTM Class 0,
ISO Class 5, Xcut: 16.5%



ASTM Class 1,
ISO Class 4, Xcut: 35.5%



ASTM Class 2,
ISO Class 3, Xcut: 79.7%

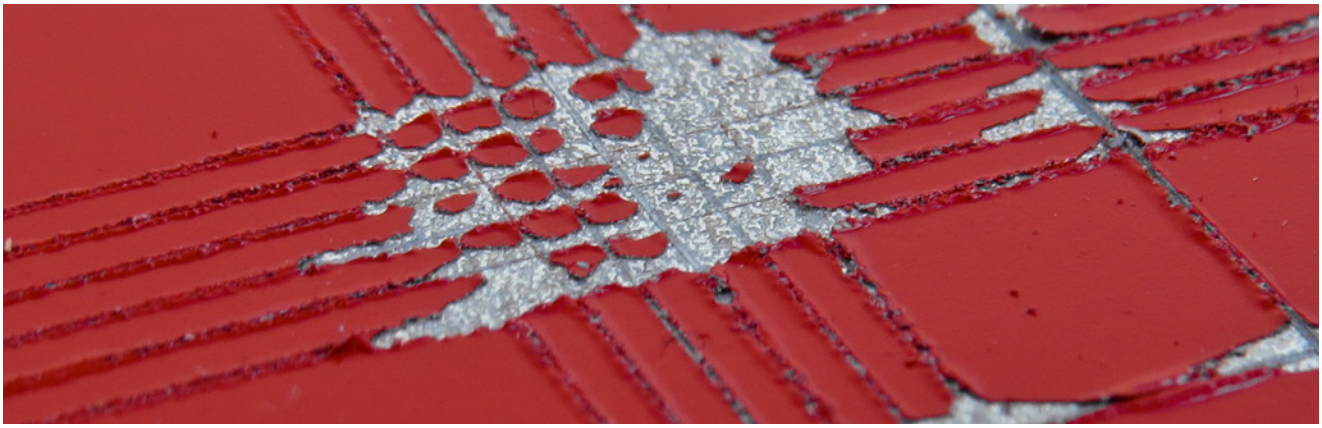


ASTM Class 4,
ISO Class 1, Xcut: 98.5%

Rhopoint recommends the Neurtek NK200 Cross Cut Tester

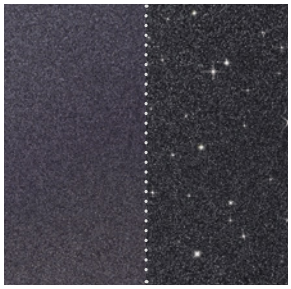
Advantages over visual assessment

- Less time to assess the panels
- Reproducible measurements (subjectivity removed)
- Digital test images are retained as a record of coating adhesion performance



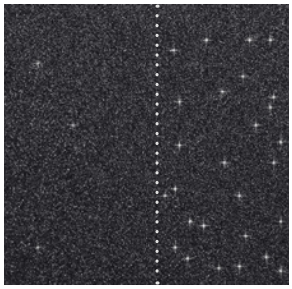
MODULE Effect Finish

Coatings with effect pigments exhibit sparkle and coarseness. Sparkle refers to a visual texture observed when mirror-like elements within a surface reflects light.



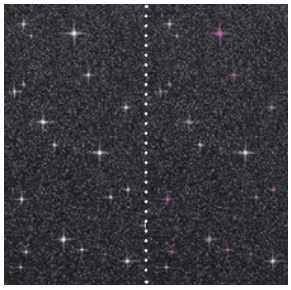
Coarseness

Coarseness describes the non-uniform grainy appearance of a surface when viewed in diffuse lighting conditions. Coarseness tends to increase with pigment loading.



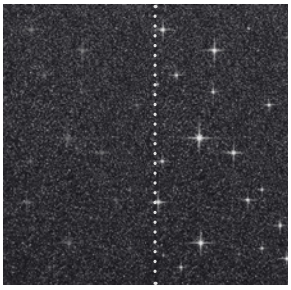
Density

Sparkle density is a measure of the concentration of visible sparkle points on a surface when viewed under directional lighting conditions.



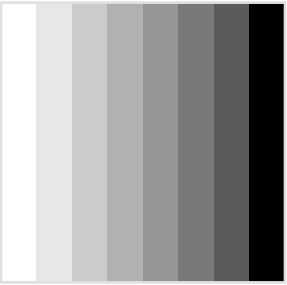
Colour

These values show the average RGB colour of the visible sparkles in the field of measurement.



Visibility

The Aesthetix® reports sparkle visibility; an average intensity value for any sparkling elements which have been identified as visible in the material.



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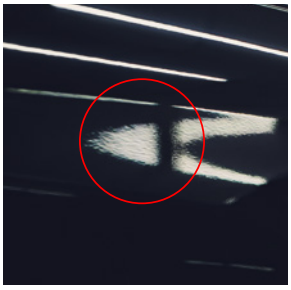

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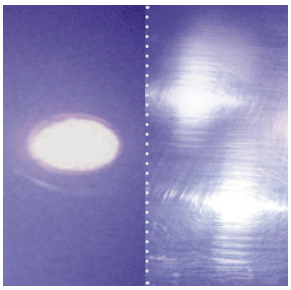

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In a car showroom, polishing defects in paintwork are barely visible, but in sources of bright natural light, halos are apparent.

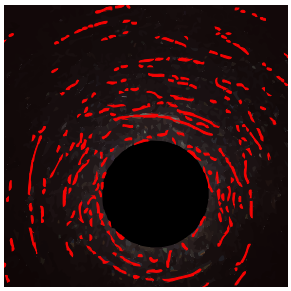
Gloss

Set around the industry standard of 60 degrees, Aesthetix® gives gloss values complying to international standards with camera images to fully describe surface reflectivity.

MODULE Polishing Quality

The Rhopoint Polishing Quality Module is designed to objectively quantify scratches, holograms, and swirls on high-gloss automotive surfaces.

Additionally quantifying gloss, haze, sharpness / DOI for a complete surface characterisation. Ideally suited for manufacturers optimising polishing processes and evaluating spot repairs.



Polishing defects

Swirls, holograms and scratches on a surface are identified, toleranced by length, visibility and quantified.

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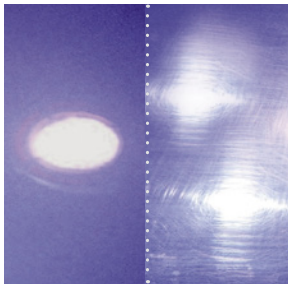

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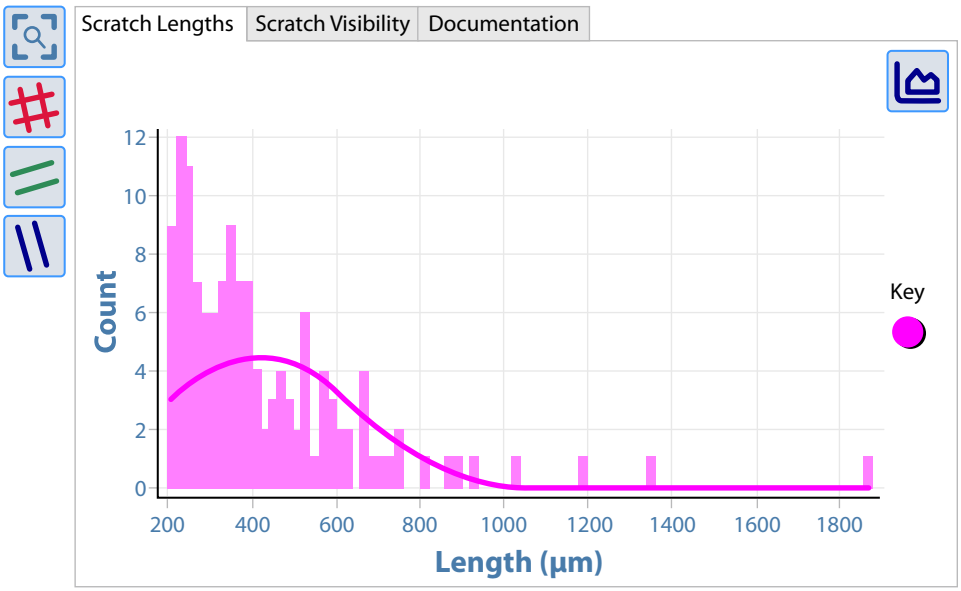
Right - Very small surface texturing distorts the reflected image causing it to be blurred and indistinct.



Rhopoint Appearance Elements Software quantifies the profile of surface scratches

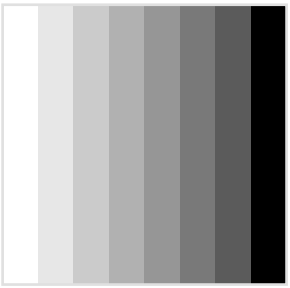
MODULE Texture

Materials with surface texture such as automotive interior plastics, leather and powder coatings need to have uniformity of appearance and pattern to have maximum visual appeal. The Rhopoint Aesthetix® analyses surface texture to help manufacturers create consistent products with optimum visual appearance and tactile qualities.

Ca = 90 µm *Ca = 40 µm*

Cell Amplitude

This is the average amplitude of all cells identified within the texture of a material.
This parameter is used to understand the depth of the surface texture which directly influences visual and tactile perception.



Luminance

Aesthetix® displays surface average Y value from the CIE 1931 XYZ scale. This represents how light or dark the surface appears, independent of its hue or saturation.

Cs = 3.4mm² *Cs = 0.7mm²*

Cell Count and Size

Quantifying cell size and distribution helps in evaluating the uniformity, coarseness and overall appearance of the surface, essential for quality control and ensuring consistency in product manufacturing.

Colour

A colour-accurate image of the surface is captured and the average RGB values are reported in the Rhopoint Appearance Elements software.

Reflectivity

Rhopoint Aesthetix® measures overall surface reflectivity and the contrast between the hills and valleys of the pattern. The degree of reflectivity in leather can affect how it looks under different lighting conditions.

Gloss

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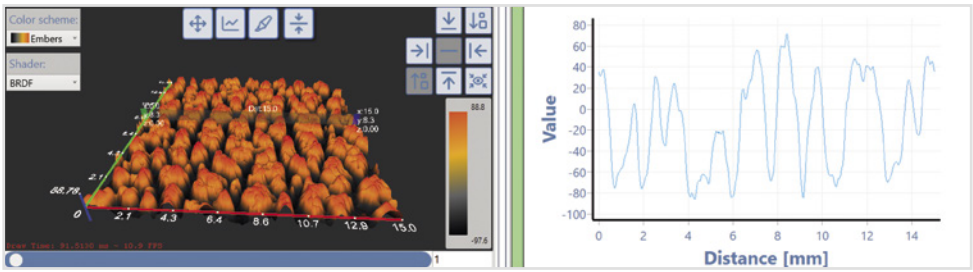

Perceived Roughness

The standard deviation of amplitude for all measured pixels in the 15x15mm field of measurement.

RHOPOINT INSTRUMENTS

RHOPOINT AMERICAS

TRY BEFORE YOU BUY

We offer two options for you to try out the Aesthetix® before buying.

1. **Online demonstration**: Online presentation of the Aesthetix® with your samples measured LIVE on Microsoft Teams. Includes a consultation with an application specialist.

2. **Factory sample testing**: Send in samples of your material for testing and receive a comprehensive test report.

Arrange a demo

Ready to receive a quote? Click here

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