

Introduction

Appearance Perception

Uniform appearance is an important quality criterion for many products. Gloss effects are based on the interaction of light with the physical properties of the sample surface. The other influencing component is the physiological evaluation scale. The human eye is still the best tool to evaluate gloss differences. However, control by visual analysis is insufficient, because

- evaluation conditions are not clearly defined, and
- people see and judge differently
- In addition, subjective perception of appearance is dependent on personal experience: what is glossy for a paper manufacturer might be dull for an automotive maker. The following criteria are involved in visual evaluation:

Surface Condition

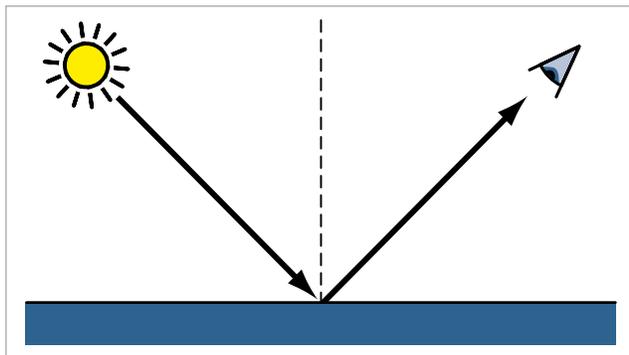
- Material (eg. coating, plastic, metal)
- Structure (eg. smooth, rough, wavy)

Illumination

Prerequisite for appearance evaluation is direct illumination. Diffuse illumination causes diffuse reflection and decreases the gloss impression.

Observer

Eyesight and mood have a decisive role in the visual judgement. Also, it is important what our eye is focused on.

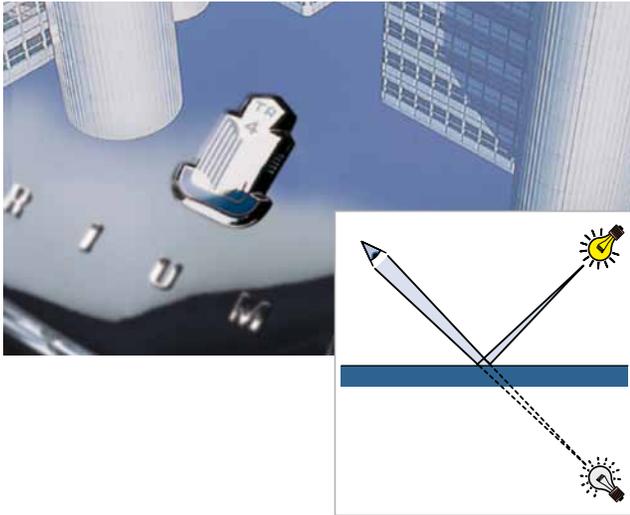


Components of visual evaluation

APPEARANCE

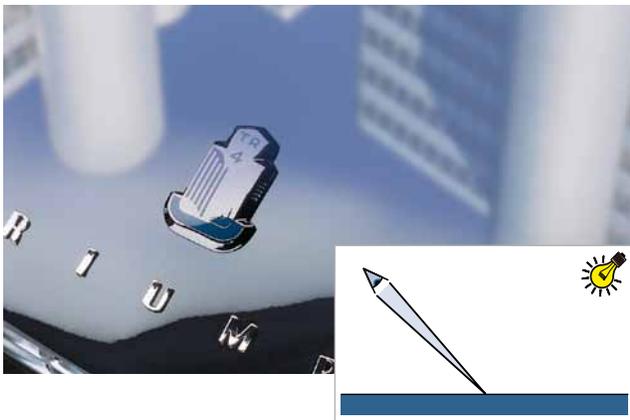
Focus on reflected image

We evaluate a surface by focusing our eye on a reflected image of a light source or on the surface itself. When we focus on the reflected image of a light source, the image forming quality is evaluated – i.e. the capability of a surface to reflect objects. The light source can appear brilliant or dull (gloss). When reflecting an edge the dark area can appear lighter (haze) and the edge can be blurred or distinct (DOI).

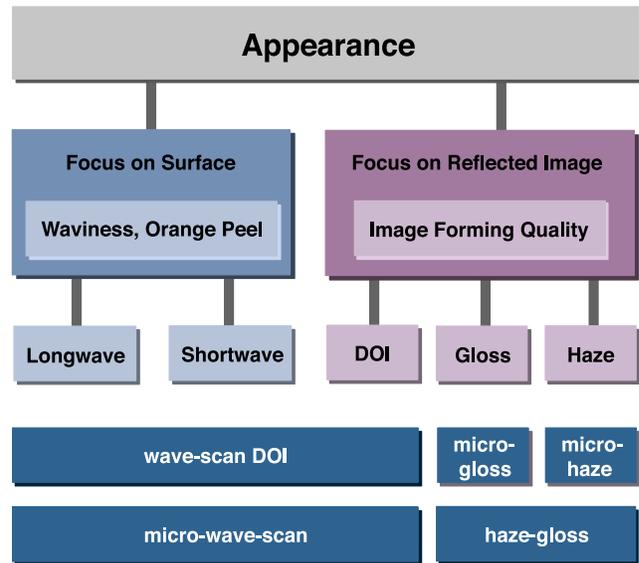


Focus on surface

When we focus on the surface, we gain additional information about structure size and form. We see these structures as a wavy pattern of light and dark areas. This waviness is often referred to as orange peel or flow/leveling defects.



Both evaluation types are individually weighted and contribute to the total appearance perception.



In order to guarantee reliable and practical quality assurance, it is necessary to define appearance with objective, measurable criteria. Accurate characterization of appearance does not only help to control quality, but improves quality and optimizes the manufacturing process.

BYK-Gardner offers a complete system solution to test appearance: from portable instruments such as glossmeters, hazemeters, DOI meters and transparency meters; to benchtop instruments with QC-software.