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# Distinctness Of Image

## Tech Talk

The most common description of the appearance of a flooring surface is gloss. However, using only gloss to describe a floor describes only a portion of how it will appear. Two floors may have an equal gloss but a very different appearance. To fully describe a floor, we need to consider more than just gloss.

### What is gloss and how is it measured?

Gloss is a term used to describe the “shine” or light reflection of a flooring surface. Typical gloss meters measure gloss by projecting a beam of light onto the floor and measuring the amount of that light reflected back at the same angle within a  $\pm 0.9$  degree range. Because gloss readings are taken using a range, there will be variations of appearance between samples that give the same gloss reading. We could refine that range and get a better description. That measurement is called Peak Specular Reflectance.

### What is Peak Specular Reflectance (R<sub>Spec</sub>)?

R<sub>Spec</sub> is measured in the same way as gloss but uses a very tight range of  $\pm 0.15$  degrees. Two surfaces may have the same gloss reading but a greatly different R<sub>Spec</sub>. The higher the R<sub>Spec</sub> reading, the more perfectly light is reflected. This reading gives a better indication of the floor appearance but can be further refined.

### What is Distinctness of Image (DOI)?

Distinctness of Image (DOI) is a measure of how crisp and sharply a reflected image appears. For example, the ability to see a bright spot reflected in a floor as compared to being able to clearly see the outline of a light bulb or being able to read text in a reflected sign.

Distinctness of Image is an indication of the perfection of a reflection, and lack of haze or “orange peel” in a surface. The picture above is an example of a floor with a very high Distinctness of Image. In effect, a high DOI measurement tells us that light is perfectly reflected and only small amounts of light are reflected in angles close to perfect (which would cause a fuzzy image). Due to advances in portable meters, DOI is now being used in the field to measure the quality of floor coatings.



The above picture shows two uncoated concrete tiles with similar 60° gloss (42 left and 49 right) but a different DOI (27 left and 75 right). Notice how the reflected lights are clear in the right hand tile and only a blurred image in the left tile.

## Distinctness of Image

### How does DOI affect the use of 3M™ Trizact™ TZ Abrasives and Scotchgard™ Floor Protectors?

One of the major benefits of using 3M™ Trizact™ TZ Abrasives prior to the application of a floor coating is a dramatic increase in DOI. Because Scotchgard™ Stone Floor Protector is applied thin, it does not “orange peel” and is able to maintain the smoothness and DOI of the 3M™ Trizact™ TZ Abrasives prepared flooring, while enhancing the gloss. Floors that have similar traditional gloss readings will have a better perceived appearance with the increased DOI provided by use of 3M™ Trizact™ TZ Abrasives than those without. The following two images demonstrate the enhanced appearance of surfaces with similar gloss and different DOI values.



*The flooring on the left in the above picture was prepared using 3M™ Trizact™ TZ Abrasives and has a 60° gloss of 78 and a DOI of 71. The flooring on the right was not prepared with 3M™ Trizact™ TZ Abrasives and has a 60° gloss of 74 and a DOI of 43.*



*In this image the concrete toward the front has a 60° gloss of 16.3 and a DOI of 80.9 with clearly reflected overhead lighting. The area in the rear has a 60° gloss of 16.4 and a DOI of 27.5 with overhead lighting visible only as a blur.*



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\*Based on 3M internal testing

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