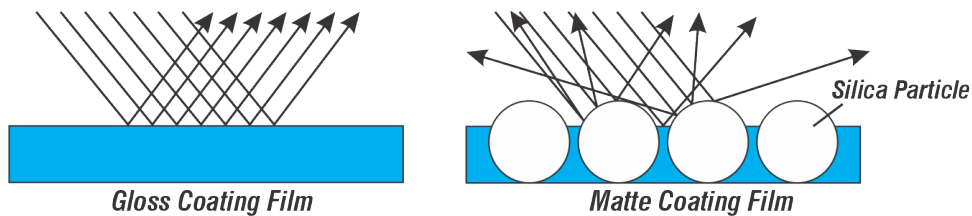


### Waterbased Coating – Matte Coating Burnishing

#### Matte vs Gloss Coating

- Unlike gloss/clear waterbased coatings, matte waterbased coating products contain silica flattening particles that are employed to create a very low visual/measurable gloss level to the dried coating film.
- While gloss coating products produce a very smooth and glass-like film surface with a high degree of clarity to optimize specular reflectance and achieve high results for visual/measurable gloss, the silica particles used in matte coating products produce a very irregular/rough film surface and light interference within the film which increases light refraction, lowers specular reflectance and ultimately lowers the resulting visual/measurable gloss level.
- The degree of 'matte' gloss level that a matte waterbased coating achieves is representative of the size and concentration of silica flattening particles that are contained in the coating-film – more coating-film surface roughness/irregularity creates a lower gloss result.
- The below image demonstrates the light reflective difference between a 'gloss' and 'matte' coating-film surface:



#### Burnishing

- Burnishing is a visual defect in which the matte waterbased coating-film increases in gloss or 'sheen' due to applied friction/abrasion while the dried coating-film remains intact – **burnishing and rub/wear are not the same thing.**
- Due to the inherent irregular/rough surface that a matte coating-film achieves, when abrasion/friction forces are applied to the film surface, the silica flattening particle 'peaks' on the film surface can become sheared resulting in a smoother coating-film surface than was originally established.
- The much smoother or 'polished' coating-film area creates an increase in visual/measurable gloss compared to the surrounding coating areas – the area where the flattening particle 'peaks' are sheared smooth that now has an increase in gloss is defined as a 'burnish'.
- The below image demonstrates a burnished area compared to surrounding areas of a matte coating film:



#### Matte Coating Burnishing Considerations

##### Substrate

- Smooth substrate surfaces can contribute to matte coating burnishing due to a high-degree of surface-to-surface contact – a rough/irregular substrate surface with 'peaks and valleys' can reduce the burnish result.

##### Ink Coverage

- Matte waterbased coating applied over dark ink colors can make the burnish result more visibly evident – more visual contrast.

##### Rub Testing

- When conducting rub testing on printed pieces that use a matte waterbased coating, burnishing will be a consideration in the testing results.
- While the overall matte coating film may exhibit robust characteristics for rub/wear, due to the burnish sensitivity of matte coatings, a visual burnish may be the result.

- Rub test parameters may require adjustment compared to other higher-gloss coating products if burnish resistance is to be part of the overall performance evaluation/criteria.

### Alternatives

- Use of a less-matte (satin-matte) coating product that produces a higher visual/measurable gloss film may be necessary as the reduced concentration of silica flattening particles contained in the dried film can reduce/eliminate the burnish result compared to a more-matte coating product – a higher gloss matte coating will provide less burnish contrast and make the result less apparent.
- 'Burnish-resist' matte waterbased coating products are available, however, this may only improve the overall burnish result and not eliminate it.
- The use of a cross-linker will not benefit the burnishing result – the cross-linker will only benefit the coating itself for rub/wear and not the flattening-particle for shearing/burnishing.