



# Gloss and metallic effects in packaging

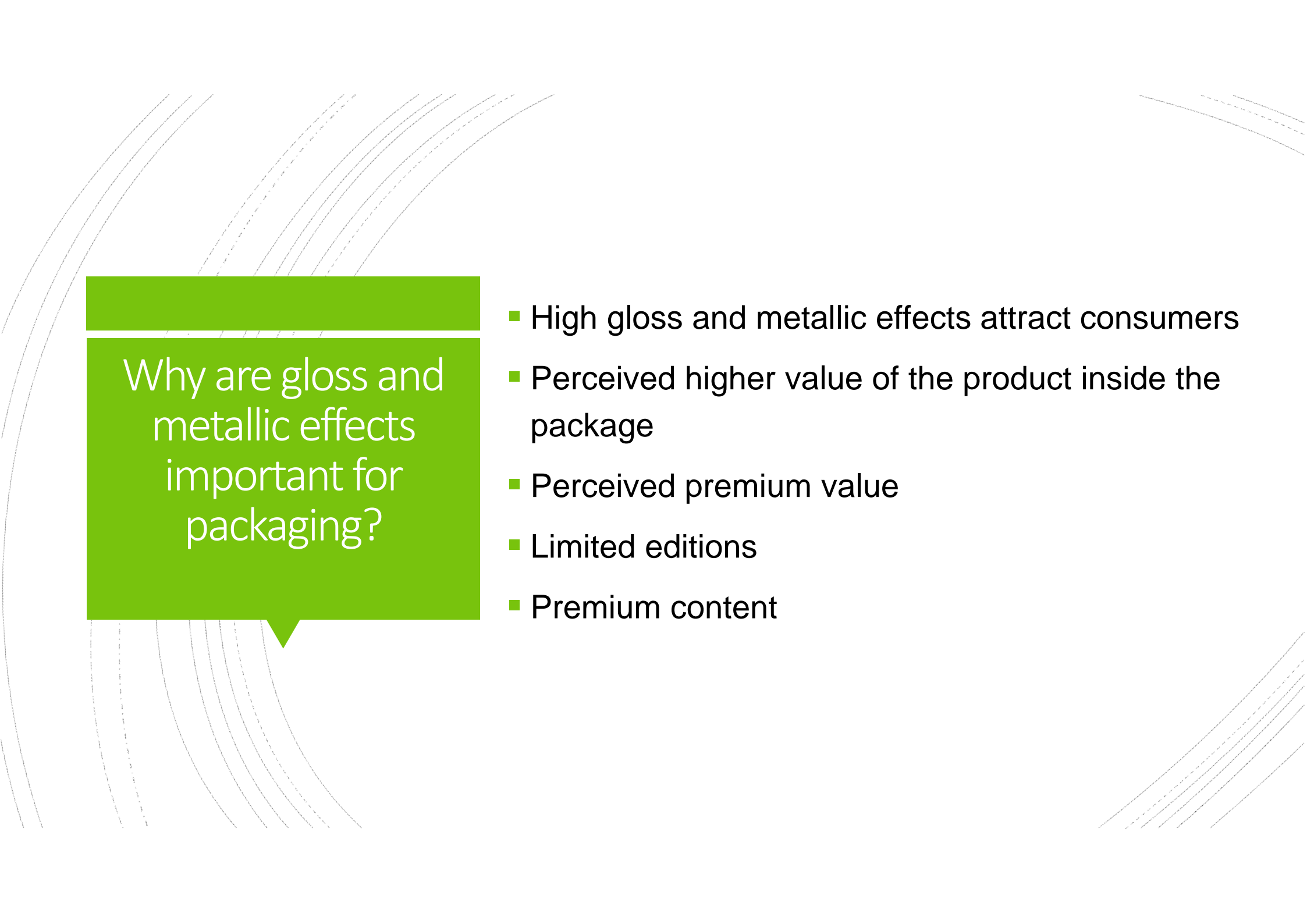
Toronto's Graphic Arts Day

Ryerson University

Martin Habekost, Dr. rer. nat., Associate Professor

# Overview

- Why are gloss and metallic effects important for packaging?
- What can be used to increase gloss or the metallic effect?
- What is actually gloss and how can it be measured?
- Sphere vs. 0/45 (M3)
- Conclusion



## Why are gloss and metallic effects important for packaging?

- High gloss and metallic effects attract consumers
- Perceived higher value of the product inside the package
- Perceived premium value
- Limited editions
- Premium content

What can used to increase gloss or the metallic effect?

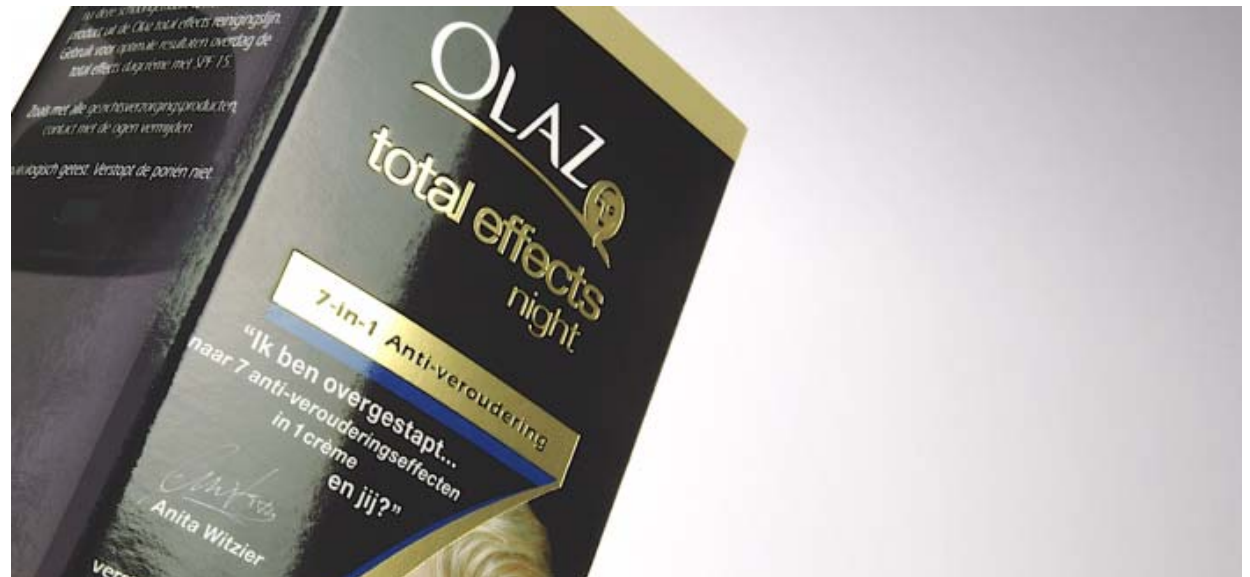
- Sharp contrast (matte/gloss) between background and element(s) that needs to be emphasized
- High gloss UV coating
- PMS colours with metallic pigments
- Foil stamping
- Embossing with foil stamping
- Landa's nano silver (yet to come to market)

# Landa nano silver



[http://www.landanano.com/images/drupa\\_2016/676x473/LAND0638.jpg](http://www.landanano.com/images/drupa_2016/676x473/LAND0638.jpg)

Foil  
stamping/high  
gloss coating



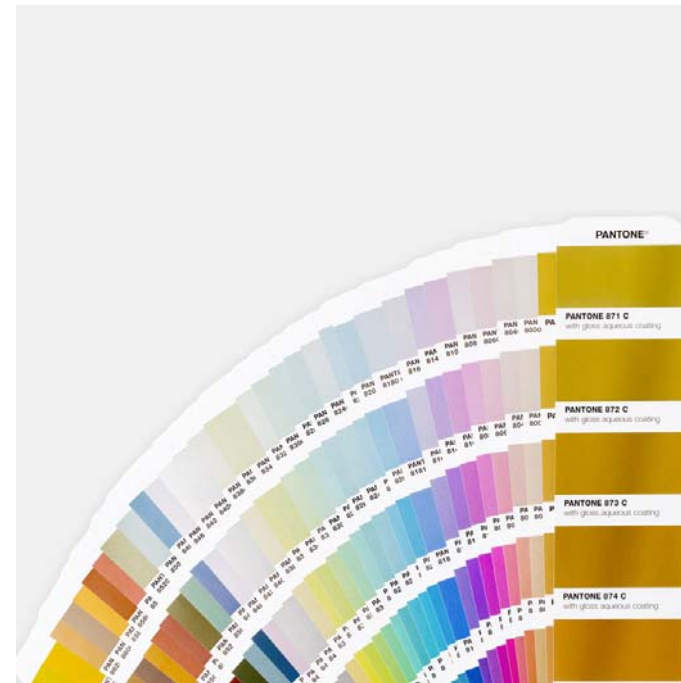
Metallic  
substrate



<http://dieline.typepad.com/.a/6a00d8345250f069e20120a8763843970b-550wi>

# Metallic inks

- Metallic pigments based on aluminum and bronze are used to create effect colours.
- Quite often the prints are water-based coated for protection which removes a lot the metallic effect.



<https://www.pantone.com/images/products/GG1507-pantone-pms-spot-colors-fan-guide-metallic-chips-product-2.jpg>

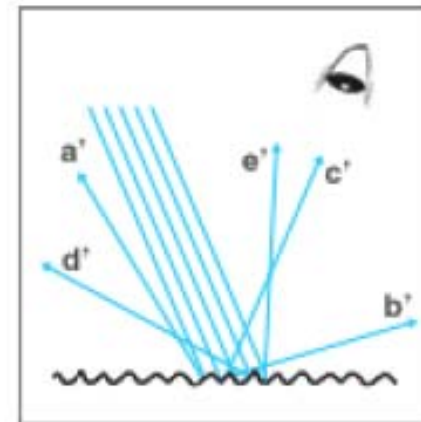
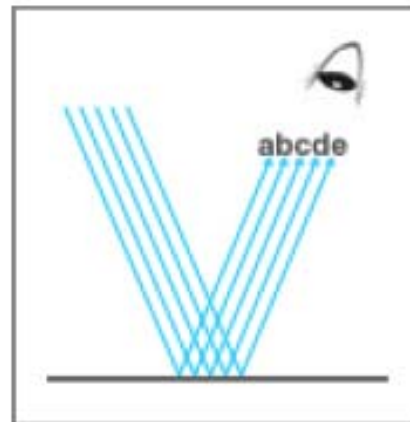
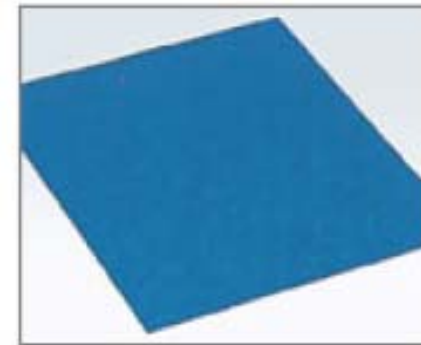
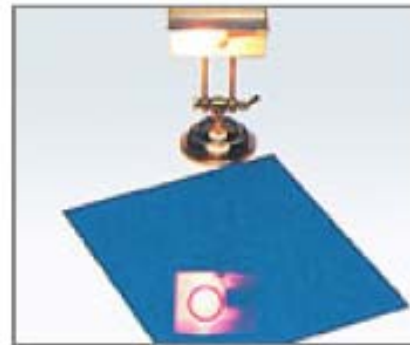
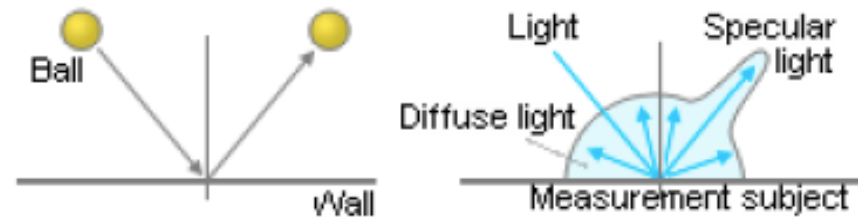
[http://www.pantone.com/images/pages/20283/release\\_GG1207.gif](http://www.pantone.com/images/pages/20283/release_GG1207.gif)



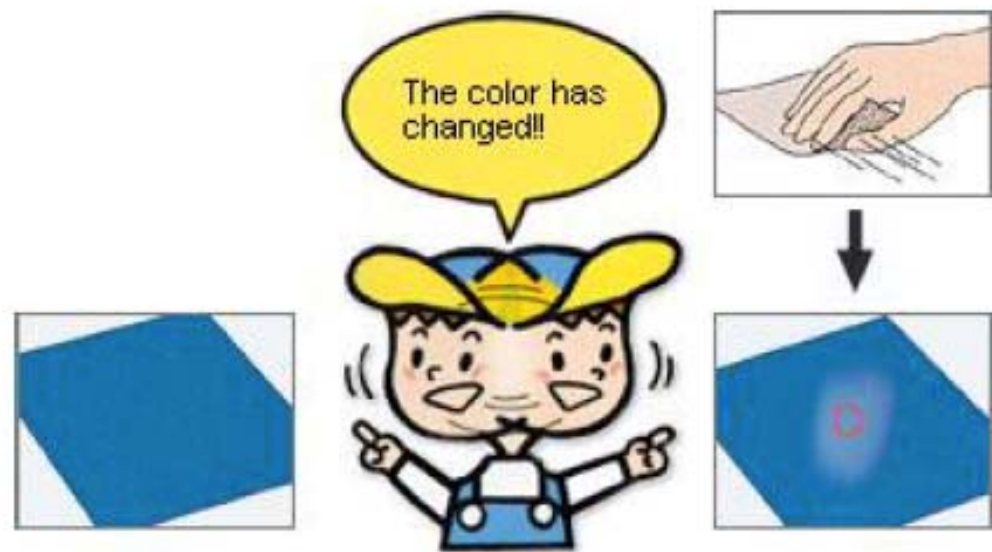
## Metallic digital inks

- [https://www.youtube.com/watch?v=ITwFrH07E\\_Lw](https://www.youtube.com/watch?v=ITwFrH07E_Lw) (Color Logic metallic inkjet inks)
- Gold and Silver are available are also available for toner-based presses (i.e. Xerox, HP Indigo)

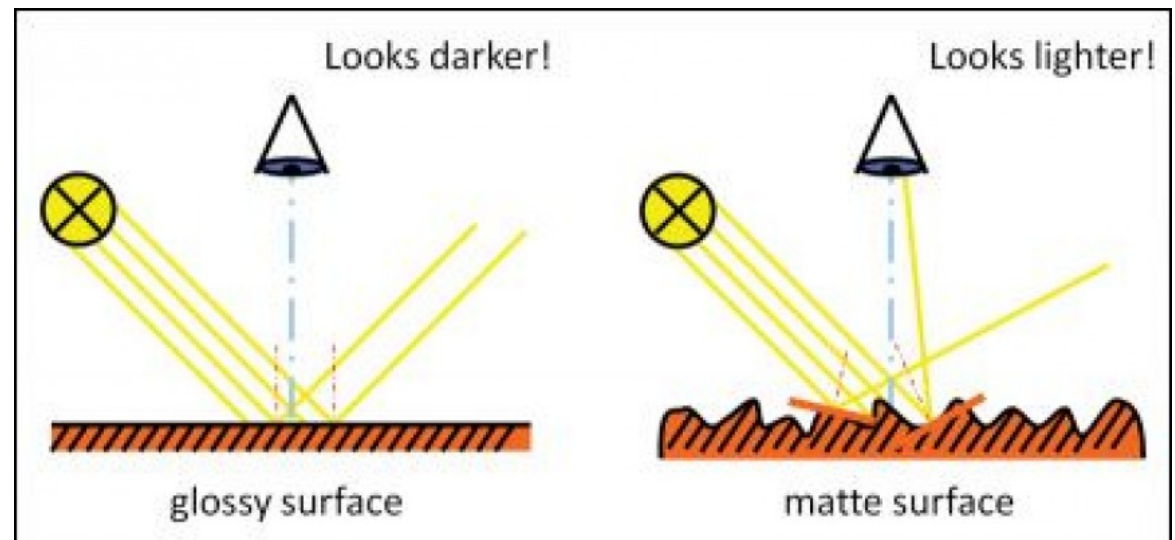
What is actually  
gloss and how can  
it be measured?



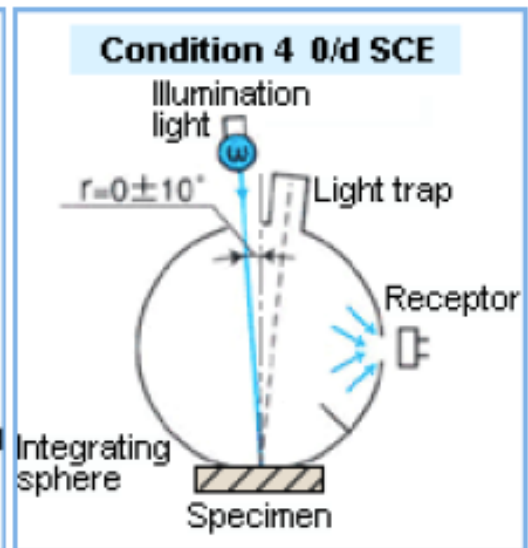
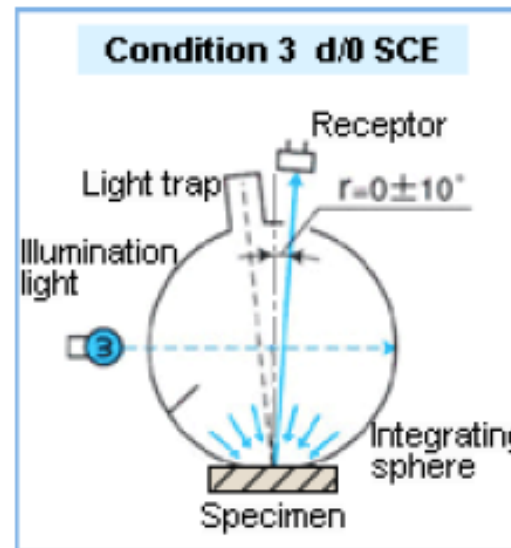
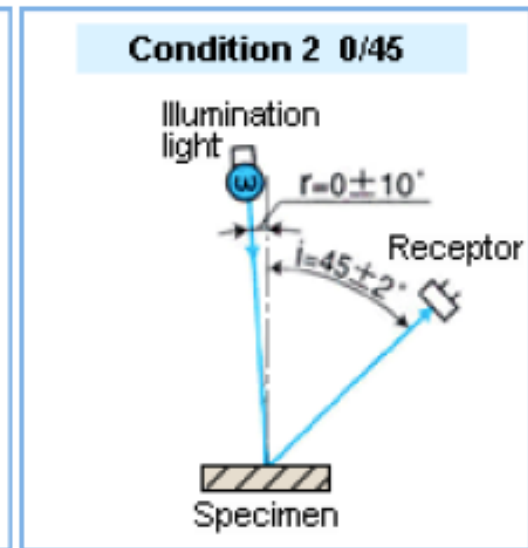
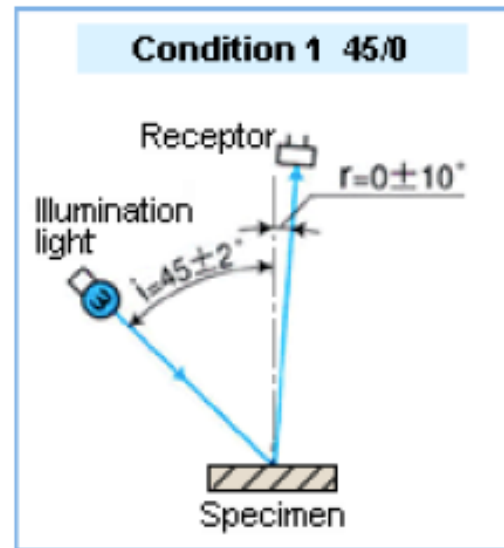
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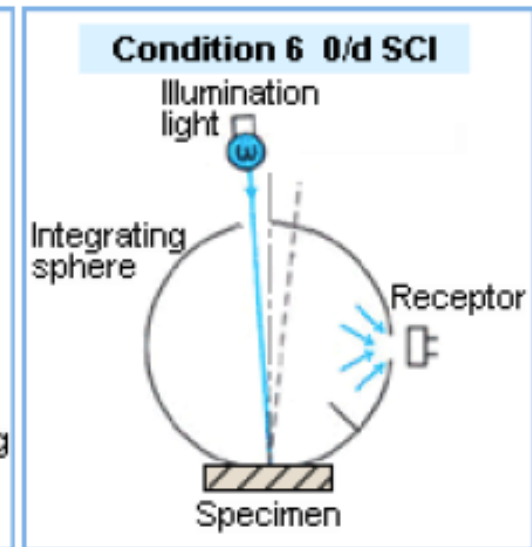
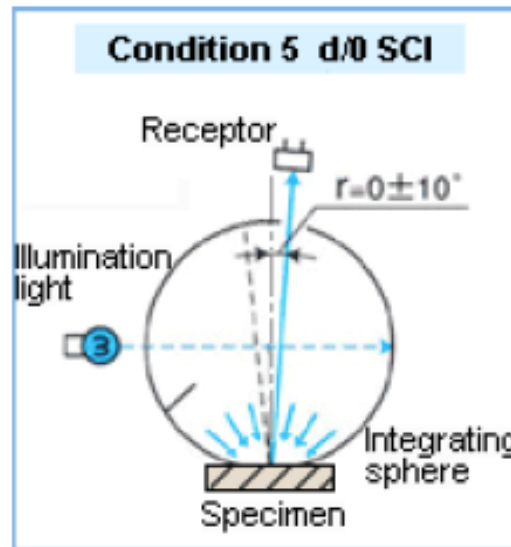
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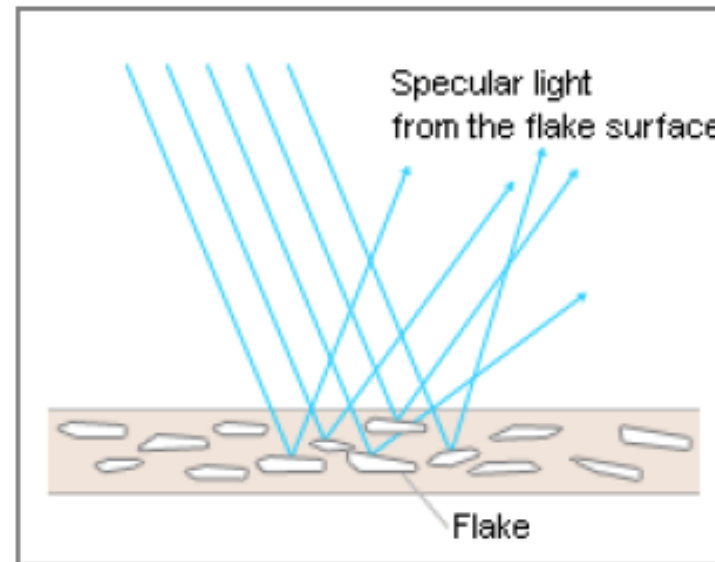
# Sphere vs. 0/45 (M3)



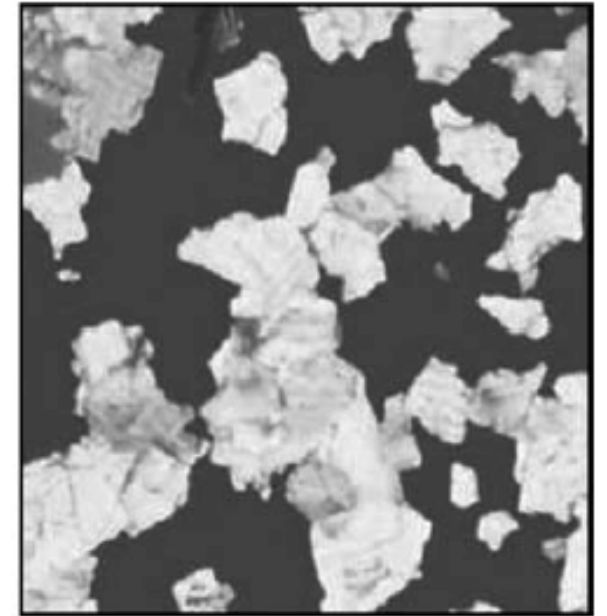
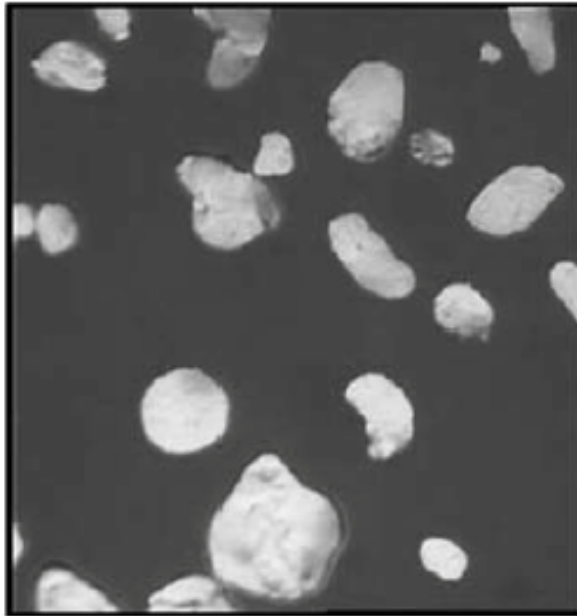
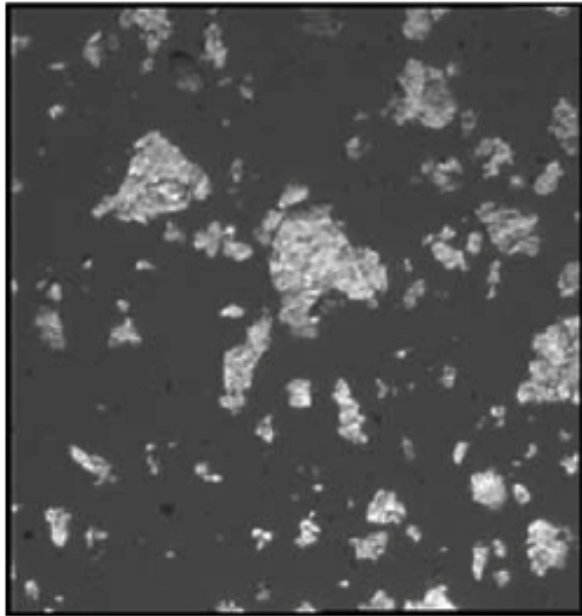
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<https://www.konicaminolta.com/instruments/knowledge/color/part3/03.html>

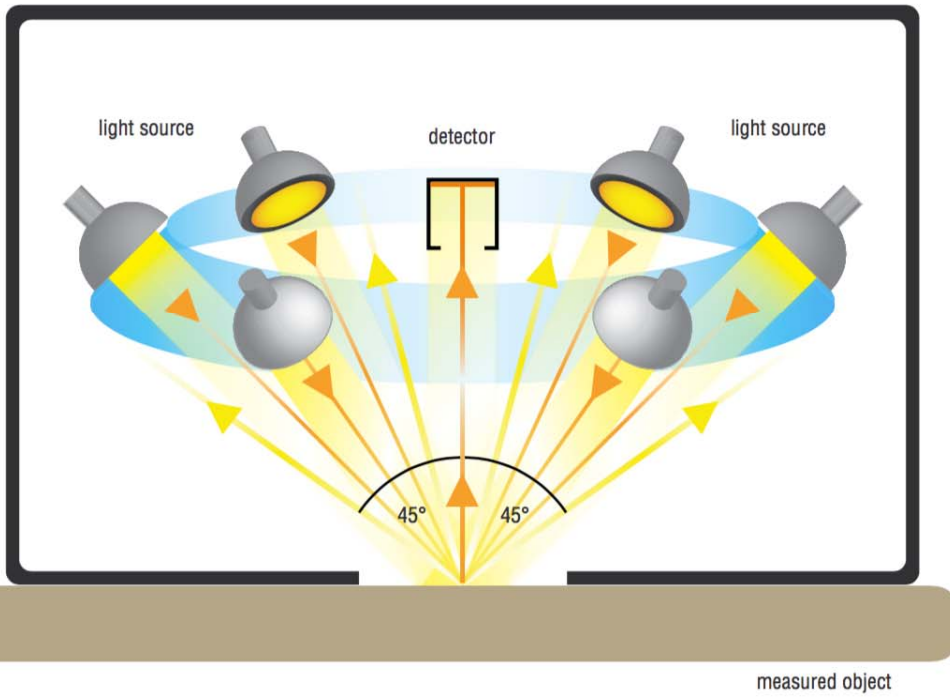


**Metallic flakes: "Cornflakes, silver dollar, vacuum film deposition**

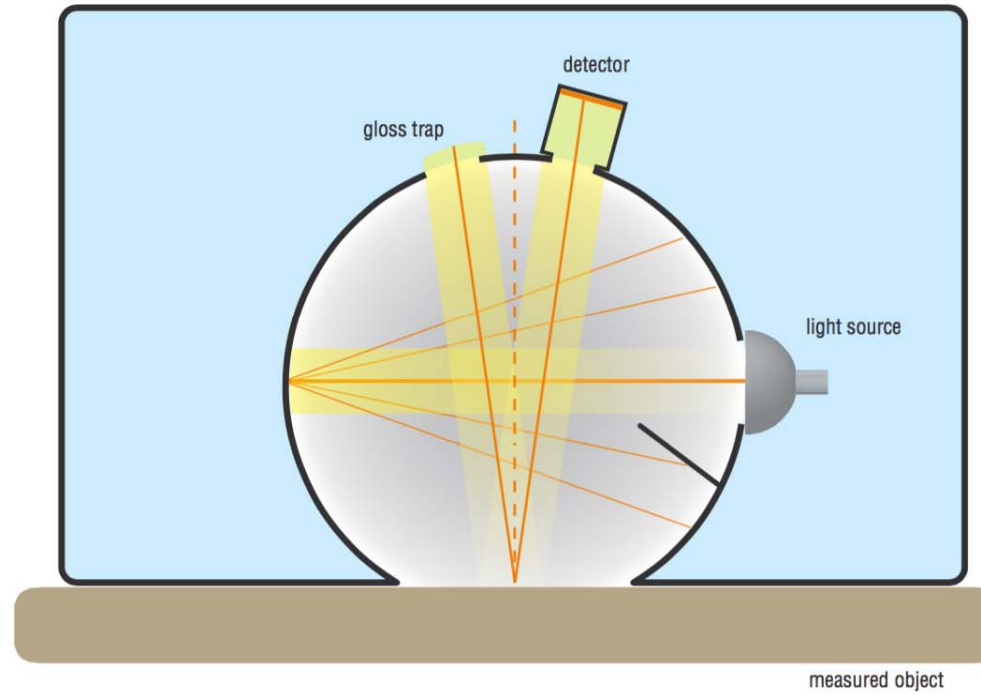
Rich et al, Colour Research and application, Vol. 42, No. 1, Feb 2017



### 45°/0° Spectrophotometer



### Sphere Spectrophotometer



## Sphere vs. 0/45 (M3)

- Metallic inks are mainly measured with a sphere-geometry-based instrument
- In the graphic arts industry measurement instruments with 0°/45° or 45°/0° measurement geometry are used
- Metallic inks can be measured with the M3 measurement condition
- Instruments like X-Rite eXact and Techkon SpectroDens support this measurement mode (just to name a few)

## Sphere vs. 0/45 (M3)

- Research has been done on how metallic prints are perceived by observers
- D. Rich, R. Marcus, V. Lovell and T. Kreutz used a sphere-geometry measurement device.
- Introduction of Specular reflection index (SPI)
  - SPIN = Specular component included
  - SPEX = Specular component excluded

$$SPI = 100 \times \left( \frac{Y_{SPIN} - Y_{SPEX}}{Y_{SPIN}} \right)$$

## Sphere vs. 0/45 (M3)

- I have done studies in 2010, 2016, 2017 in regards to measuring printed metallic inks with various 45/0 instruments.
- The latest studies show that instrument that support the M3 measurement mode can be used to measure metallic inks on press.
- Quite good inter instrument agreeability.

## Conclusion

- There are many different ways on how to create special effect on packaging:
  - Metallic inks (conventional and digital, Landa nano silver)
  - Coatings with contrasting gloss levels
  - Foil stamping combined with embossing

## Conclusion

- Metallic inks can be measured with an instrument that supports the M3 measurement mode
- Gloss can be measured with a gloss meter (usually measured at a 60° angle)



Thank you for your attention!

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