

## As Close as It Gets

How closely can flexographic printing mirror the high opacity of screen-printed white?

### About the project

Screen printing has long been accepted as the best application for applying a compact high opacity white. It remains the highest quality and most favored method, despite higher running costs.

Flexographic printing has challenges including pinholes, mottling, drying and laydown issues, which can all negatively affect the visual opacity. These challenges can sometimes be addressed with two white applications; this of course comes with a cost implication.

The Apex GTT patented technology has been proven to eliminate aeration in several transfer applications, from a UV offset varnish to many water-based ink applications. This is achieved thanks to applying a smoother, thinner, and more compact layer of ink compared to any alternative anilox technology available today

### The test

Process parameters used for the test:

|                    |                                      |
|--------------------|--------------------------------------|
| <b>Substrate</b>   | 35-micron BOPP                       |
| <b>Ink</b>         | Flint Force UV                       |
| <b>Plate</b>       | Asahi water wash AWP                 |
| <b>Tape</b>        | Lohmann 5.4                          |
| <b>Anilox</b>      | Apex International GTT 2.0 - XL; C21 |
| <b>Press</b>       | MPS                                  |
| <b>Press speed</b> | P80 MPM                              |

The assessment of ink coverage was independently validated by:



Oerlemans Technology Centre



*Figure 1 - Analysis positions*

The test involved analyzing three different samples at 2 positions. Figure 1 shows the corresponding analysis positions, indicated by A and B.

The ink yield was measured at position A and position B, by measuring a cut-out area of 10 x 10cm<sup>2</sup> (0.01m<sup>2</sup>) before and after a wash step.

During the wash step, the ink was washed from the film in a solution of 96% ethanol/4% methanol.

### Test results

The GTT XL = 11 cm<sup>2</sup>/m<sup>2</sup> ink transfer was consistent with both one and two applications of white. The ink coat weight was 28mg with a single application and 56mg with a double application.

The opacity increased from 59.7% to 70%, which is a combination of a good compact laydown and a smooth consistent transfer.

The GTT C21 = 21 cm<sup>3</sup>/m<sup>2</sup> transferred a remarkably high level of opacity from a single white application. The combination of plate and anilox released a more compact and higher quality print.

**Table 1 - Ink yield**

Table 1 demonstrates the ink yield (in mg) per position, per foil, as well as the measured reflection value.

| Sample | Anilox      | Printed weight in mg | Film weight in mg | Ink weight in mg | Ink weight average in mg | Opacity % |
|--------|-------------|----------------------|-------------------|------------------|--------------------------|-----------|
| 1 A    | 1x GTT XL   | 256.4                | 228.0             | 28.4             |                          |           |
|        | 1x GTT XL   | 260.4                | 232.2             | 28.1             |                          |           |
| 1 B    | 1x GTT XL   | 258.1                | 230.4             | 27.7             |                          |           |
|        | 1x GTT XL   | 256.7                | 228.9             | 27.8             | 27                       | 59.7      |
| 2A     | 2x GTT XL   | 287.4                | 231               | 55.5             |                          |           |
|        | 2x GTT XL   | 285.5                | 229.6             | 55.9             |                          |           |
| 2 B    | 2x GTT XL   | 284.9                | 229.6             | 55.3             |                          |           |
|        | 2x GTT XL   | 286.9                | 230.9             | 56               | 56                       | 70.2      |
| 3 A    | 1x GTT C 21 | 298.0                | 231.5             | 66.5             |                          |           |
|        | 1x GTT C 21 | 298.5                | 231.0             | 67.5             |                          |           |
| 3 B    | 1x GTT C 21 | 300.7                | 233.1             | 67.5             | 67                       | 73.9      |

## Conclusion

The GTT C21 resulted in a 73.9% opacity, which required a higher ink usage to achieve. However, despite higher ink usage, the advantages are clear:

1. The opacity rivals the more expensive screen print application.
2. The single white flexographic application instead of double white application results in the following savings:
  - The use of only one printing plate instead of two.
  - Only one layer of mounting tape is required.
  - One less print unit being used (allowing for an extra color or a reduction in set up time).
  - Less white ink as only one unit is needed to be set up.
  - Faster wash up times as only one white unit is needed.

## ADVANTAGES

These cost advantages can be boosted by the possibility of acquiring orders from projects which would have traditionally been carried out by screen or gravure printing processes, both of which are inherently higher value markets.

Find out more about what you can do today about white opacity.

Get in touch with our anilox experts via [www.apexinternational.com](http://www.apexinternational.com) or scan the QR code.

