



Tro FILMS

Germany

Digital finishing - feasibility study

Part 2: dmax

Feasibility study for digital coating and transfer film finishing of TroFilms' laminating films using dmax print finishing systems

Introduction

Who is TroFilms?



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- **TroFilms GmbH produces lamination films for the graphic industry since 2012**
- **The company coats PP or PET films in different variants and for different requirements**
- **Company headquarters and production is located in Georgensgmünd/Bavaria**
- **The products of the company are used worldwide**

Why did TroFilms initiate this study?

- In the second part of this wide-ranging study, the coatability on TroFilms films in the dmax system is investigated.
- Further tests with other systems and additional films will follow in the coming months. This is necessary because the various manufacturers of digital finishing machines work with their own or bought-in coating materials. These sometimes show significant differences. The chemical structure is comparable, but there are differences in rheology, wetting behavior, adhesion behavior, coating height and also in the type of curing (LED or conventional UV).

- **The study is intended to become a real "tool" that users of dmax technology and later other digital finishing systems will be able to use to adapt any changes to the parameters of the machine configurations and job quantities in advance.**
- **The goal must be to guarantee the status quo of TroFilms products' postpress processability in a reproducible manner.**
- **If necessary, our surfaces must be adapted to the conditions and, if necessary, in the case of films that do not work perfectly, a clear reference must be made in our technical data sheets until the respective film surface is adapted.**

Explanation of the test

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- It was printed on Profisilk from Igepa in a grammage of 170 g/m². The printing was done in 5/5 colors on a HEIDELBERG Speedmaster XL.
- A silk matt primer produced by WEILBURGER Graphics (coating number 350188) was applied inline.
- Subsequently, film lamination was carried out at 40 m/min on a Paperplast machine with a temperature of 110 °C.
- The double-sided lamination was carried out in a thermal process.

Explanation of the test

- The digital finishing was done on a Steinemann dmax.
- The Steinemann machine has a pinholekiller (was inactive), a conventional UV dryer (IST) and a double row print head cascade. In the first row a 2D coating was loaded, in the second row a 3D coating. Both coatings were supplied by ACTEGA Schmid Rhyner AG.
- The machine speeds were always left at 1,000 sheets per hour. The dryer position was always positioned as close as possible to the application unit.
- The test would have produced an even better result with more invested time.

Tested films



Tro PROTECT-X



Tro PureLine



Tro PROTECT
GLOSS



Tro LEATHER



Tro Temptation-X



Tro Wood



Tro Temptation



Tro ROUGH

- All film types were run with the same machine settings.
- For each type of film, a complete production run was performed, i.e. the second side was laminated immediately after the first.
- No film flags were visible at the tear-off edge, nor was any film curling visible at the gripper.
- Flatness and adhesion are perfect.

Steinemann dmax

- The finishing started 2 weeks after the lamination process
- All types of laminating film were processed one after the other.

Test results

1. TroPURELINE



TroPURELINE

1. TroPURELINE



1. TroPURELINE

- The coating was applied with the quantity setting print head row 1 (2D) 4 g/m², print head row 2 (3D) 50 g/m².
- The logos were reduced in size by 2 steps.
- The edge sharpness and gloss are excellent. The coating surfaces are closed with full coating coverage, the screen is reproduced very accurately, but there is a visible linen structure, which becomes more noticeable with low coating coverage in the subject. This does not disturb the overall impression.

2. TroWOOD



TroWOOD

2. TroWOOD



2. TroWOOD

- **The coating was applied with the quantity setting print head row 1 (2D) 4 g/m², print head row 2 (3D) 50 g/m².**
- **The logos were reduced in size by 2 steps.**
- **The edge sharpness and gloss are excellent. The coating surfaces are closed with full coating coverage, the screen is reproduced very accurately, but there is a visible wood structure, which becomes more noticeable with low coating coverage in the subject. This does not disturb the overall impression.**

3. TroLEATHER



TroLEATHER

3. TroLEATHER



3. TroLEATHER

- The coating was applied with the quantity setting print head row 1 (2D) 4 g/m², print head row 2 (3D) 50 g/m².
- The logos were reduced in size by 2 steps.
- The edge sharpness and gloss are excellent. The coating surfaces are closed when the coating is fully applied, the screen is reproduced very accurately, but there is a visible leather structure, which becomes more noticeable when the coating is low in the subject. This does not disturb the overall impression.

4. TroROUGH



TroROUGH

4. TroROUGH



4. TroROUGH

- The coating was applied with the quantity setting print head row 1 (2D) 5 g/m², print head row 2 (3D) 80 g/ m².
- The logos were reduced in size by 3 steps.
- The edge sharpness is poor, the gloss is satisfying. The coating surfaces are closed when the coating is fully applied, the screen is reproduced very accurately, but there is a visible sand structure, which becomes more noticeable when the coating is low in the subject. This disturbs the overall impression a little.

5. TroPROTECT-X



TroPROTECT-X

5. TroPROTECT-X



5. TroPROTECT-X

- The coating was applied with the quantity setting print head row 1 (2D) 15 g/m².
- The logos were reduced in size by 2 steps.
- The edge sharpness and gloss are excellent. The coating surfaces are closed at full coating coverage, the screening is reproduced very accurately.
- The edge sharpness is not realizable when using very small fonts (under 6 pt.) with 2D lacquer.
- With high coating amounts, the 2D varnish tends to pinholes, which could not be eliminated at all.

6. TroPROTECT GLOSS



TroPROTECT

GLOSS

6. TroPROTECT GLOSS



6. TroPROTECT GLOSS

- The coating was applied with the quantity setting print head row 1 (2D) 4 g/m², print head row 2 (3D) 50 g/m².
- The logos were reduced in size by 2 steps.
- The edge sharpness and gloss are excellent.
- The coating surfaces are closed with full coating coverage.

7. TroTEMPTATION-X



7. TroTEMPTATION-X



Temptation

7. TroTEMPTATION-X

- The coating was applied with the quantity setting print head row 1 (2D) 4 g/m², print head row 2 (3D) 50 g/m².
- The logos were reduced in size by 2 steps.
- The edge sharpness and gloss are excellent.
- The coating surfaces are closed with full coating coverage.

8. TroTEMPTATION



8. TroTEMPTATION



8. TroTEMPTATION

- The coating was applied with the quantity setting print head row 1 (2D) 4 g/m², print head row 2 (3D) 50 g/m².
- The logos were reduced in size by 2 steps.
- The edge sharpness and gloss are excellent.
- The coating surfaces are closed when fully coated, the screen is reproduced very accurately.
- No ghost patterns appear on the reverse side.

dmax application quantities at a glance

dmax application quantities at a glance:



| Film quality | Print head row 1 | Print head row 2 |
|------------------|---------------------|---------------------|
| TroPURELINE | 4 g/m ² | 50 g/m ² |
| TroWOOD | 4 g/m ² | 50 g/m ² |
| TroLEATHER | 4 g/m ² | 50 g/m ² |
| TroROUGH | 5 g/m ² | 80 g/m ² |
| TroPROTECT-X | 15 g/m ² | - |
| TroPROTECT GLOSS | 4 g/m ² | 50 g/m ² |
| TroTEMPTATION-X | 4 g/m ² | 50 g/m ² |
| TroTEMPTATION | 4 g/m ² | 50 g/m ² |

Physical assessment

Physical assessment:

- On all films, the wetting, gloss and adhesion of the coating is one hundred percent guaranteed.
- The only film that shows a difference in gloss of the coating is the TroROUGH type. However, this is due to the rough surface, so it has a physical reason (topography of the film surface).

Summary

Summary:

- All tested products are perfectly compatible with the technology of Steinemann dmax.
- There are neither adhesion nor wetting problems, even the finest details are accurately reproduced.
- The same machine setting was used throughout, the production speed was comparable to working on unlaminated or normal matt laminated sheets.
- The amount of varnish was adjusted to the substrate if necessary.
- No changes or corrections of the tested films are necessary.

Summary:

- **However, it is noticeable that the edge sharpness is very difficult to display 1:1 with full data assignment.**
- **All logos had to be scaled down.**
- **This is mainly due to two circumstances: Firstly, the varnishes on the Steinemann dmax must be extremely optimized, as the process itself tends to produce air bubbles/ pinholes. Secondly, in our opinion, the flow distance is too long. If, for example, a pre-curing unit (even closer to the print head) were installed, the pinholes could be eliminated.**

Partners and Acknowledgements

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- **Layout and data preparation:**

**Alexander Dort
Am Altzberg 28
66540 Neunkirchen-Hangard
www.alexanderdort.com**

**Many thanks dear Alex for the effort,
the superb layout and the great realization.**

Partners and Acknowledgements



- **Print:**

**Druckhaus Waiblingen
Remstal-Bote GmbH
Albrecht-Villinger-Straße 10
71332 Waiblingen
www.dhw.de**

Dear team of DHW,

**As always perfectly printed
and everything produced uncomplicated and fast.**

Partners and Acknowledgements



- **Finishing (lamination):**

**LamiFaktur GmbH
Papierveredelung und Dokumentenschutz
Eulerstraße 11
48155 Münster
www.lamifaktur.de**

Dear Mr. Altevolmer and Mrs. Blanke,

A heartfelt thank you for your hospitality and the great cooperation. The job was prepared by you in a great way and executed excellently by your employees. Their know-how has really helped us to move forward.

Partners and Acknowledgements

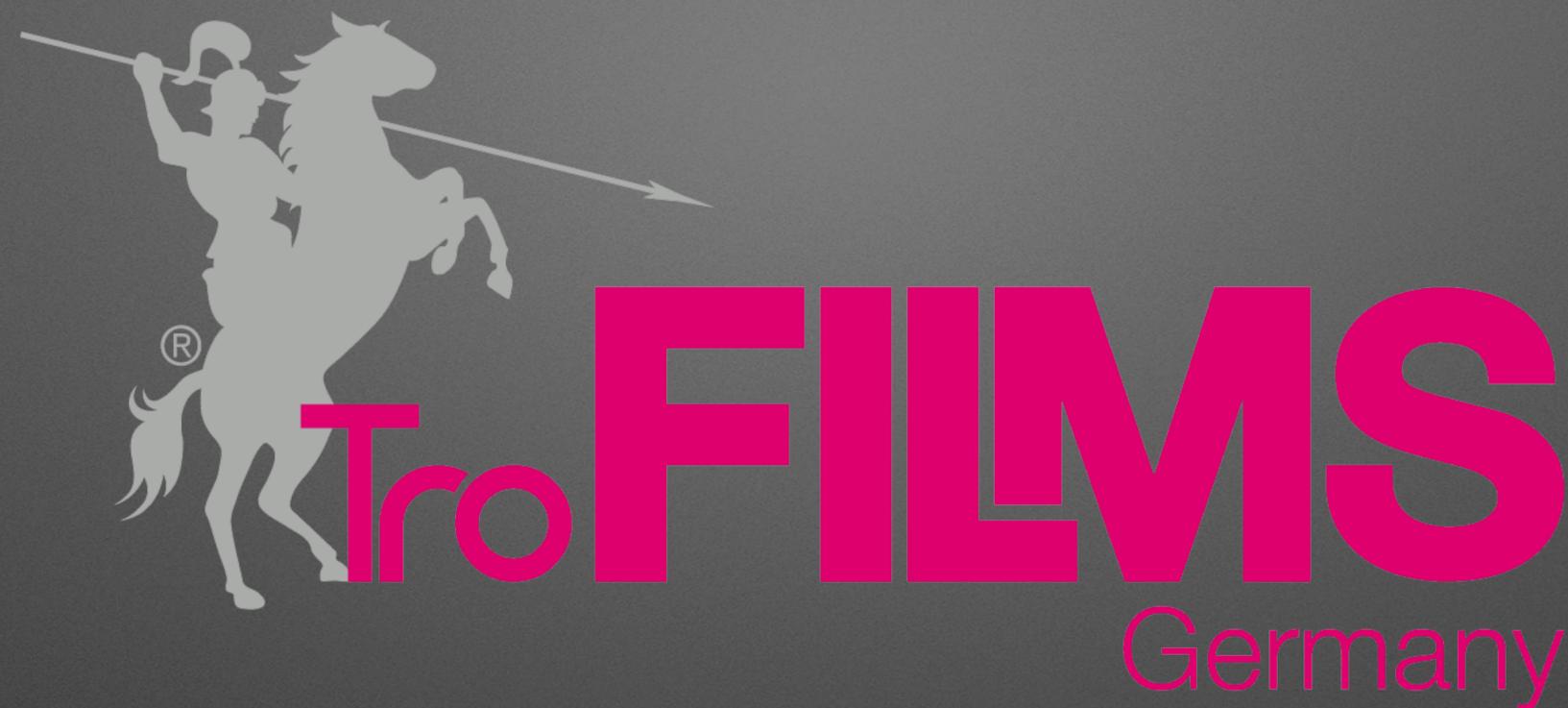


- **Finishing (digital coating):**

**Printlack AG
Hauptstraße 11
2556 Schwadernau/ CH**

Dear Mr. and Mrs. Schüpbach,

Thank you very much for your hospitality and the great cooperation. As always, it was a pleasure for me to visit you in beautiful Switzerland. I would also like to thank the entire Printlack team once again for their great commitment.



Many thanks for your attention!

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