



Paper and synthetic paper face materials

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Content

1. Uncoated, coated and synthetic paper face material
2. Converter and end-user performance requirements
3. Recycled paper face and paper face recycling



- Papers & films
- Adhesives
- Silicones
- Typically large companies

- Lamination
- Roughly dozen suppliers per continent

- Companies specialized in label converting

- All companies with labeling needs
- Mainly packaged goods companies

- Private & industrial usage of labeled products



UNCOATED PAPER

Woodfree, calendared paper without top coat on the base paper

Ink absorption are caused by the gap between fibres and the fibres own absorption

COATED PAPER

Woodfree, calendared surface is coated on the top of the base paper

Ink absorption is caused by the micro porosity in coating layer

SYNTHETIC PAPER

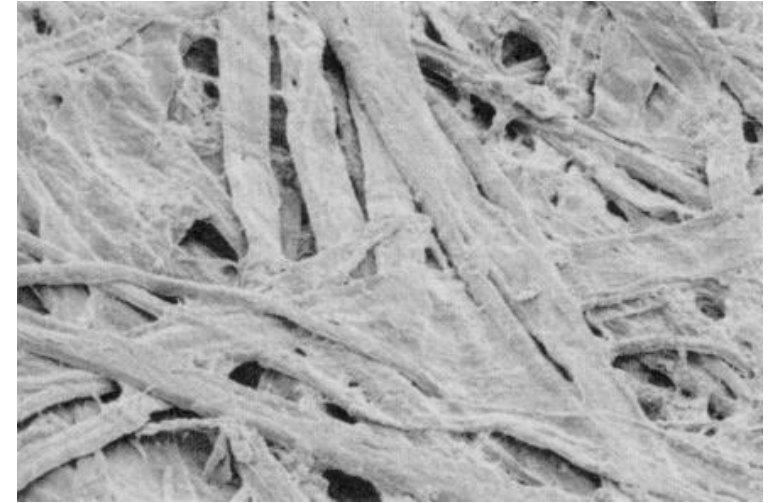
Plastic films coated from both side

Ink absorption is caused by the micro porosity in coating layer

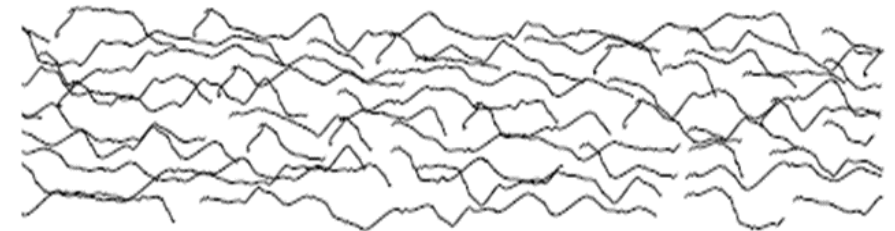


UNCOATED PAPERS

- Higher roughness, more peaks and troughs on the surface than coated paper
- Printing methods: thermal transfer, dry-toner, SOHO printers: monochrome and colour laser, inkjet. Suitable for flexography, offset, letterpress, but due high ink absorption printing quality can be not sufficient
- Typical end use: logistics, distribution and warehouse inventory application, A4 labelling - office documentation and address labels

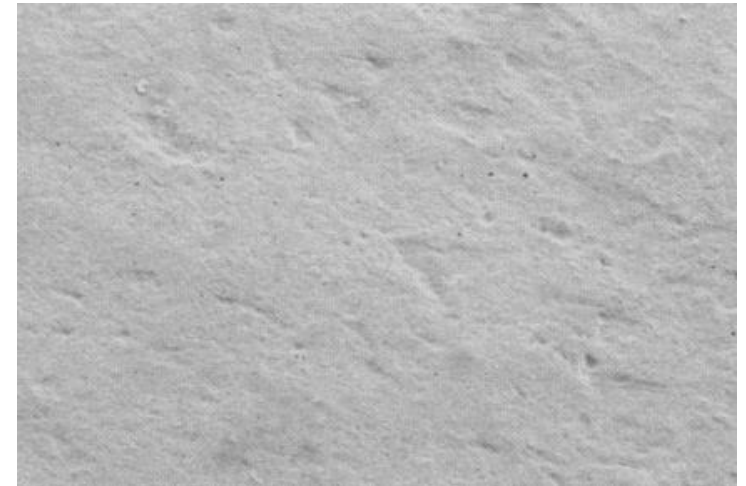


Surface of an uncoated paper

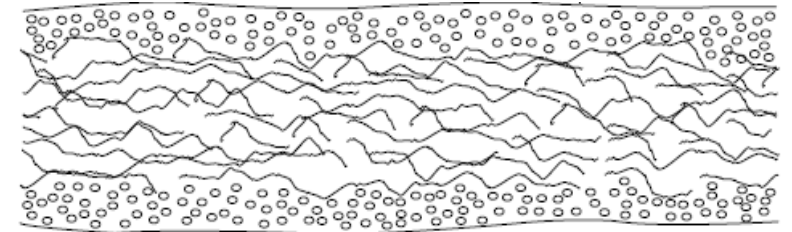


COATED PAPERS

- Smooth, low roughness papers
- Matt or gloss coated
- Printing methods: flexography, offset, rotogravure, screen, cold and hot foil, dry toner. Suitable for thermal transfer. With special designed top coats can be printed on inkjet, UV inkjet, liquid toner.
- Typical end use: Food, Home & Personal Care, Beverage



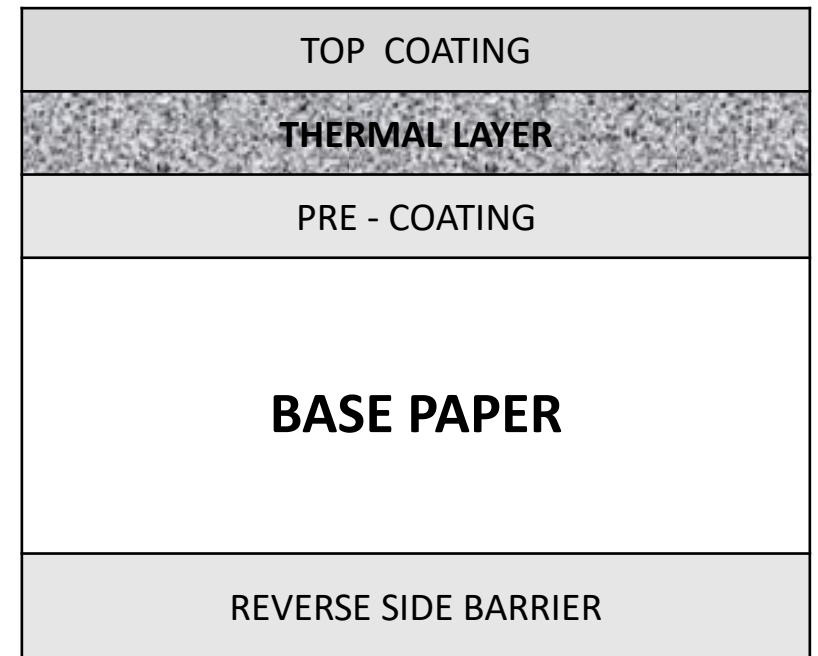
Surface of a coated paper



COATED PAPERS

DIRECT THERMAL PAPERS

- Direct Thermal papers – papers with special coating designed for direct thermal printing
- Production of thermal paper
 - Base paper
 - Pre-coating
 - Thermal layer with three main components: colour former, developer and sensitizer
 - Top coating
 - Reverse side barrier



SYNTHETIC PAPERS

- Flexible
- Resistant to tearing and water
- Resistant to oily substances and a lot of chemical products
- Printing methods: depends on the coating, conventional and digital printing methods can be used
- Typical end use: durables, industrial chemicals



CONVERTER PERFORMANCE REQUIREMENTS

Printing

- Printing requirements depends on the printing method
- Face material properties impacting on printing
 - Optical properties, color consistency
 - Roughness/smoothness of the paper
 - Surface compressibility
 - Absorption properties
 - Surface strength
 - Surface treatment



CONVERTER PERFORMANCE REQUIREMENTS

Printing

WATER AND UV FLEXO

- High smoothness to achieve a good contact between the paper and the printing plate
- Low absorption properties to have good ink hold out

OFFSET

- High surface strength to avoid break of the paper surface by viscous ink & fountain solution
- Optimum absorption properties - too slow and uneven absorption cause mottling

THERMAL TRANSFER

- High smoothness to achieve good and even contact between ink and paper
- High absorption properties to have good enough anchorage of the ink



CONVERTER PERFORMANCE REQUIREMENTS

Printing

LASER

- Optimized electrical, thermal properties and surface chemistry to achieve high enough toner transfer
- High surface porosity to ensure the toner anchorage

INK JET

- Optimized absorption properties to have right density levels of the print
- Optimized surface chemistry to avoid bleeding of the inks

DIGITAL

- Optimized paper properties for particular printing method



CONVERTER PERFORMANCE REQUIREMENTS

Die cutting & matrix stripping

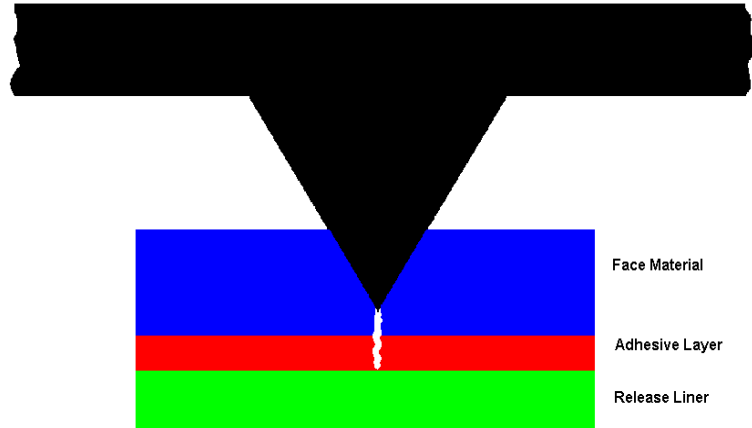
- Laminate properties impacting on die cutting & matrix stripping
 - Face material
 - Type of the face – paper or synthetic paper
 - Strength of the paper
 - Paper formation
 - Coating formulation
 - Liner
 - thickness, variation, density, compressibility
 - Release coating
 - release forces



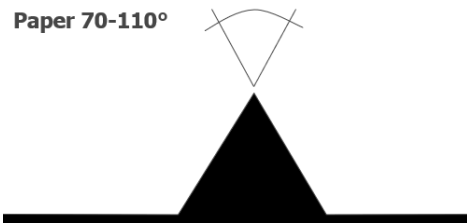
CONVERTER PERFORMANCE REQUIREMENTS

Die Cutting & Matrix Stripping

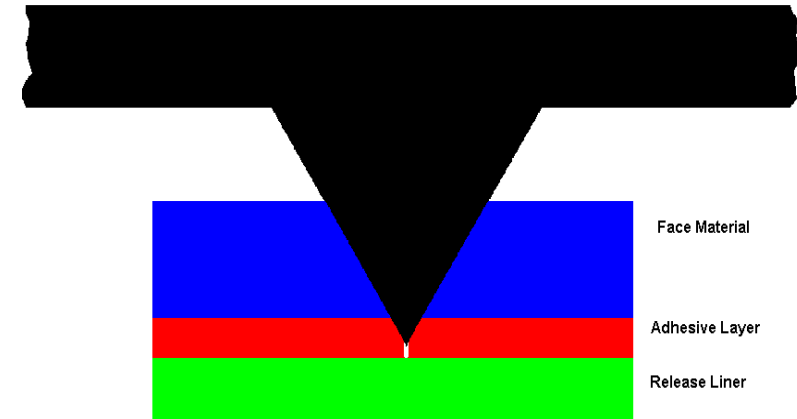
Paper face material



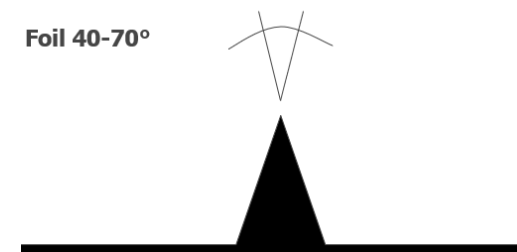
Paper „Break Point” at 60-65% Compression



Synthetic paper face material



Foil „Break Point” at 90-95% Compression



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CONVERTER PERFORMANCE REQUIREMENTS

Die Cutting & Matrix Stripping

Strength of the paper

- High tensile and tear strength in machine and cross directions to avoid matrix breaking

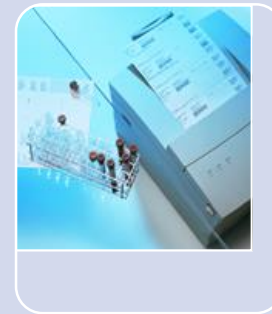
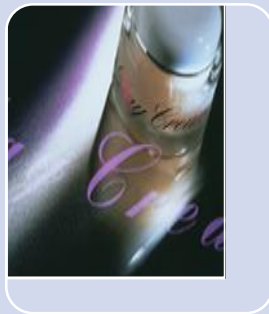
Paper formation

- Even paper formation to minimize die cutting problems (content of long fibres on the backside of face paper)

Coating formulation

- Optimized recipe to minimize wearing of dies

END USER PERFORMANCE REQUIREMENTS



FOOD

LOGISTIC

HOME &
PERSONAL
CARE

BEVERAGE

OFFICE

INDUSTRIAL
CHEMICALS

PHARMA



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END USER PERFORMANCE REQUIREMENTS

Stiffness

- Optimized for labelling process
- Optimized for shape (curved surfaces)

Optical properties

- Optimized brightness, whiteness, opacity to particular application

Stability

- Optimized for particular end use - different environments, UV-light, moisture resistance, chemical resistance



END USER PERFORMANCE REQUIREMENTS

Tear strength

- High tear strength to minimize risk of destroying the label

Internal strength

- High internal strength of the paper to avoid delamination

Safety and regulatory requirements

- Depends on the end – use
- Declaration of Conformity, FDA, BfR, Toy Safety etc.



RECYCLED PAPER FACE AND RECYCLABILITY OF THE PAPER FACE

- Recycled papers – papers contain pulp coming from recycling
 - Different content of the recycled fibres
 - Can be coated or uncoated
 - Often visible impurities on the face material coming from recycling process
- Face paper recyclability
 - Landfilling and waste-to-energy are the typical solutions for label waste,
 - Labels with screenable adhesives are designed to be recyclable in the paper recycling



Thank you



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