Converting paper and board

Sigrid Gerold on behalf of CEPI and CITPA - 12th EFSA FCM Network meeting

21st & 22nd October 2025

Agenda

1. Basics on Converting
2. Converting processes

Guiding documents

- CEPI/CITPA Food contact guidelines for the compliance of paper and board materials and articles http://www.citpa-europe.org/sites/default/files/Food%20Contact%20Guidelines_2019_final.pdf
- CEPI Guideline on good manufacturing practice for the manufacture of paper and board for food contact https://www.cepi.org/updated-good-manufacturing-practice-gmp-guidelines-for-the-manufacture-of-paper- board-for-food-contact/
- CEPI Eurokraft / EUROSAC Food Contact Guideline https://www.eurosac.org/fileadmin/pdf/pdf_food_contact/2025_Food_Contact_Guideline_EN.pdf
- ECMA Good Manufacturing Practice for Food Safety https://ecma.org/industry-topics/guidelines-and-gmp/ecma-good-manufacturing-practice-for-food-safety/
- FEFCO Good Manufacturing Practice (GMP) standard https://www.fefco.org/sites/default/files/2020-2019/March/FEFCO%20GMP%20FINAL%202020.pdf
- PIJITF GUIDANCE Information and Transparency in the Printed Food Packaging Supply Chain https://www.eupia.org/wp-content/uploads/2025/03/PIJITF-Guidance-on-Information-Flow-and-Transparency-in-the-Supply-Chain_Final-March-2024.pdf
- EDQM Technical guide on documentation supporting compliance and safety of food contact materials and articles – 1st edition, 2024 Documentation supporting the compliance and safety of food contact materials and articles - European Directorate for the Quality of Medicines & HealthCare
- EDQM Paper and board used in food contact materials and articles https://www.edqm.eu/en/paper-and-board-used-in-food-contact-materials-and-articles
- CoE Resolution CM/Res(2020)9 on the safety and quality of materials and articles for contact with food https://rm.coe.int/09000016809fe04a
- EuPIA documents on the use of printing inks on food contact materials and articles https://www.eupia.org/key-topics/food-contact-materials/general-overview-of-fcm/

1.
Basics on Converting

Converting

Transformation of raw paper and board into usable food contact materials and articles (FCM) for packaging

The goals:

1. **Pack and protect the product to ensure safe transport and storage**
2. **Functionality** (e.g. increase moisture resistance, strength)
3. **Food safety** (e.g. application of barrier layers)
4. **Providing Product information**
5. **Ensure visibility on the shelf**

Converting processes are identical for virgin and recycled fibre products.

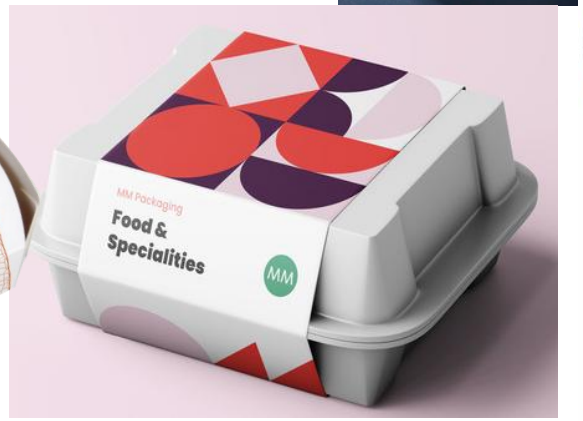
End use applications may differ.

Paper and Board products in contact with food

- Tea & Coffee Filters
- Dry Food Cartons & Boxes
- Bread Wrap
- Flour & Sugar Bags& Sacks
- Fast Food Trays
- Baking Papers
- Corrugated cartonboard
- Butter Wrap
- Fruit & Vegetable Trays
- Sanitary papers & Napkins
- Liquid Food Cartons
- Paper straws…





2. Converting processes on FCM

Converting processes

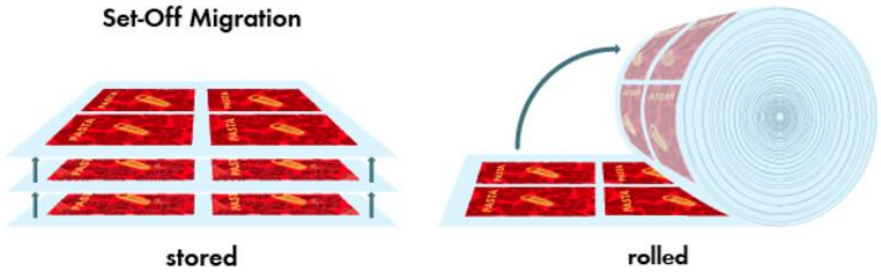
- partially mechanical in nature and
- involve, for instance, combining layers of paper and board with other substrates, changing the physical shape of the product

<u>Key processes:</u>

- Printing, varnishing and Lacquering
- Coating
- Glueing
- Laminating
- Corrugating
- Forming
- Cutting, Creasing, Perforating

Even compliant raw materials can become unsafe if processed in the wrong way

Printing on FC P&B



Offset, Flexo, Gravure, and Digital options

Risk: ink migration into food

- Inks must be formulated for indirect food contact unless there's a functional barrier (EU) 2023/2006
  - **Low migration inks**: Designed to minimize chemical transfer.
  - **UV**-inks: fast drying, but require careful formulation and curing process
  - **Direct Food contact inks** (new on the market / German Ink ordinance)

Inks selected based on supplier **Statement of Composition** (SoC) - Information on migrating substances (intentionally used substances and NIAS which are known to be present) – acc. to *"EuPIA Guidance for Risk Assessment of Non-Intentionally Added Substances (NIAS) and Non-Evaluated or Non-Listed Substances (NLS) in printing inks for food contact materials"*

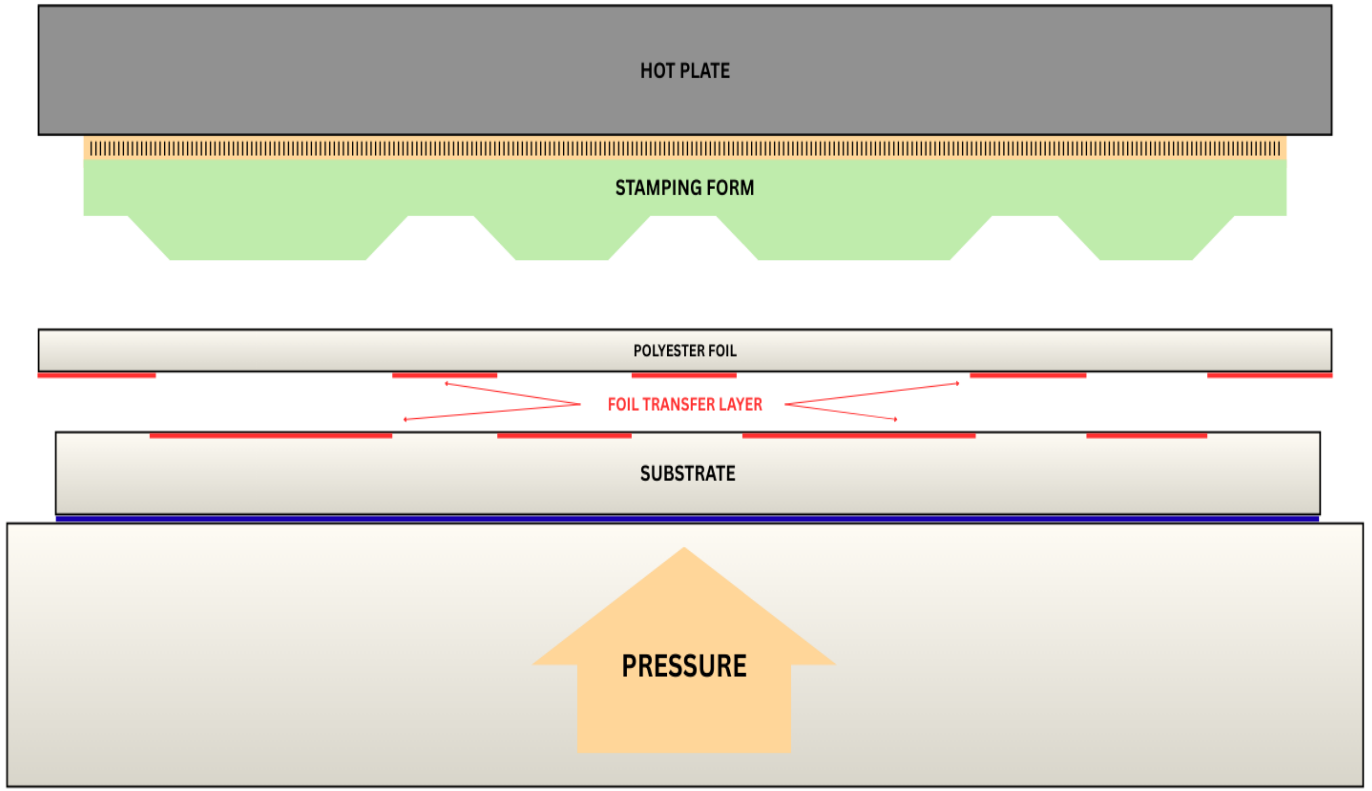
Post-print curing and migration testing to ensure process stability.

Transfer printing

To apply metallic surface effects

Hot Stamping: with adhesive layer

- optical effects, safety features, coding etc.



Cold Transfer: no adhesive layer, but special printing ink applied with rest-stickiness

Varnish and Lacquer on FC paper & board

Varnish is typically applied over the printing ink:

- Varnish effects, including spot, drip off, matt, gloss, effect pigments, UV, and metallic options
- Help to reduce set-off migration from inks to the inside

Lacquer is typically applied to the side that comes into contact with food.

This can result in

- additional barrier properties
- improved technical properties (e.g. sealability).

Varnishes and lacquers are selected based on supplier information (SoC)

Printing inks , Varnishes and Lacquers for food packaging applications

Underlying regulatory documents:

- Industry guidelines (EuPIA)
- Swiss Ordinance 817.023.21
- German Printing Ink regulation (not applicable on lacquers)
- French Decree No. 2020-105 (MOSH/MOAH, not applicable on lacquers)
- BPA according to regulation (EU)2024/3190
- Regulation (EU) 10/2011
- FDA CFR 21 § 175.300 (not applicable on inks)

Additional: EUPIA guidelines

Coating on FC paper & board @ converter

Coating: The application of a layer to the surface of paper **without** using an **adhesive** (e.g. for beverage containers).

Purpose of Coatings

- **Barrier Properties:** protection against moisture, water, oxygen, oil, and grease
- **Enhanced Appearance:** improve gloss, smoothness, and printability
- **Functional Performance:** add properties like adhesion, flexibility, sealability
- **Sustainability:** Coatings add functionality allowing P&B to replace plastics

Examples: Wax coatings, water-based dispersion coatings; PE-extrusion; Al-metallization

Coating is selected based on intended purpose and supplier information (SoC or DoC)

Underlying regulatory documents:

- Regulation (EU) 10/2011
- BPA according to Regulation (EU)2024/3190
- FDA CFR 21 § 175.300: Resinous and polymeric coatings

Destinction between **plastic coated papers** and **papers coated with dispersion coatings** (e.g., containing minerals – already applied on the paper machine.) These latter materials are outside the scope of (EU) 10/2011

Adhesives and Glues on FC paper & board

Adhesive: Can be synthetic (epoxy, acrylic, polyurethane) – strong bonding

Glue: Traditionally made from natural sources (e.g., starch)

Must be food-safe and not compromise the integrity of the applied barrier. Must not be in direct contact with foodstuff

Adhesives are selected based on supplier information (SoC)

underlying regulatory documents :

- Industry guidelines (FEICA)
- FDA CFR 21 § 175.105
- BPA according to Regulation (EU)2024/3190

Additional: Adhesives Industry guidelines (FEICA)

Laminating on FC paper & board

Lamination: Applying a layer of material to the surface of paper **using an adhesive**

Addition of an extra layer to achieve barrier properties (e.g. moisture, grease resistance; migration), enhance durability, ensure sealability, visual appearance

Materials used on paper & board:

- Polyethylene, Polypropylene (ovenable packaging), PET, aluminum foil, metallized foils…
- **+** Adhesive: must not compromise barrier!

⇒ Multilayer / Multimaterial structures (e.g., sacks: several layers of paper combined with PE layer)

Underlying regulatory documents:

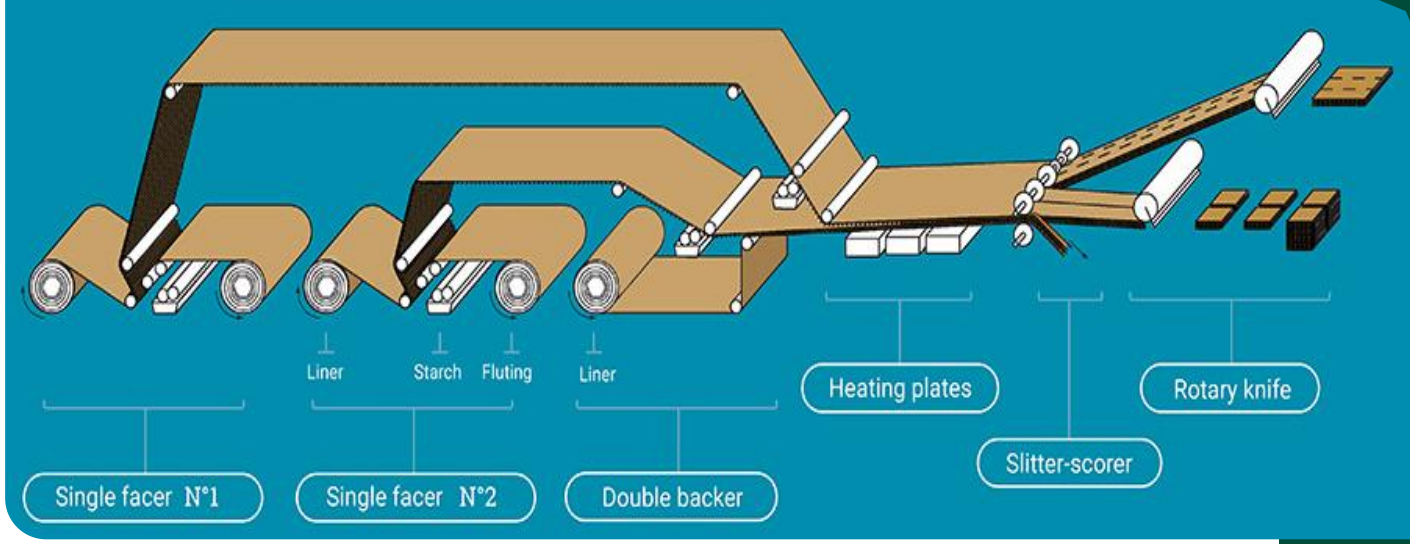
- Regulation (EU) 10/2011
- BPA according to Regulation (EU)2024/3190

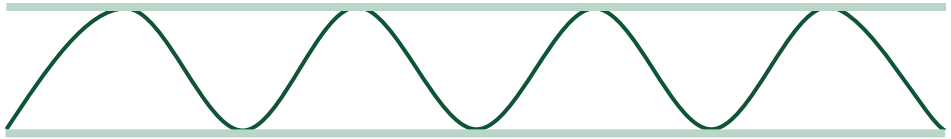
Corrugating

Mostly recycled content with virgin outside layers

3 key stages:

1. Corrugating the flutes and gluing to a single liner
2. Gluing the outside liner to make a rigid board
3. Cutting the board to the desired size





- Min. 3 sheets of paper (containerboard) are unrolled simultaneously on the corrugator:

  the **inner liner,** the outer liner and in the middle, the **fluting**.

- The medium sheet is given a "**wave**".
- **Starch** is applied to the tips of the flutes, the outer liner and the inner liner are glued to the tips of the corrugated medium sheet.
- The Corrugated board comes out of the corrugator as a flat board sheet.

The production of modern corrugated packaging | Fefco

Cutting & Shaping

- Die-cutting
- Slitting
- Perforating
- Creasing and Folding
- Embossing*

The converting processes must not damage the coating or lamination leading to a reduction in barrier properties after the final product is formed (e.g. by creasing at the edges).

Tightness of packaging products highly influenced by packaging design.

* tactile packaging solution, featuring embossing, debossing, and 3D embossing effects that engage the senses

Good Manufacturing Practice

Prevention from contamination during the entire converting process:

- Hazard Analysis and Critical Control Point (HACCP)
- FCM converters are often certified according to Food Safety Management Systems (GFSI recognized standards)

Traceability

- Batch records for each converting step
- Linking the raw materials to finished product
- Testing preparedness for recalls

Any questions?

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