



PACKAGING PROJECT

Packaging Technology and Standardized methods for packaging tests

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OUTLINES

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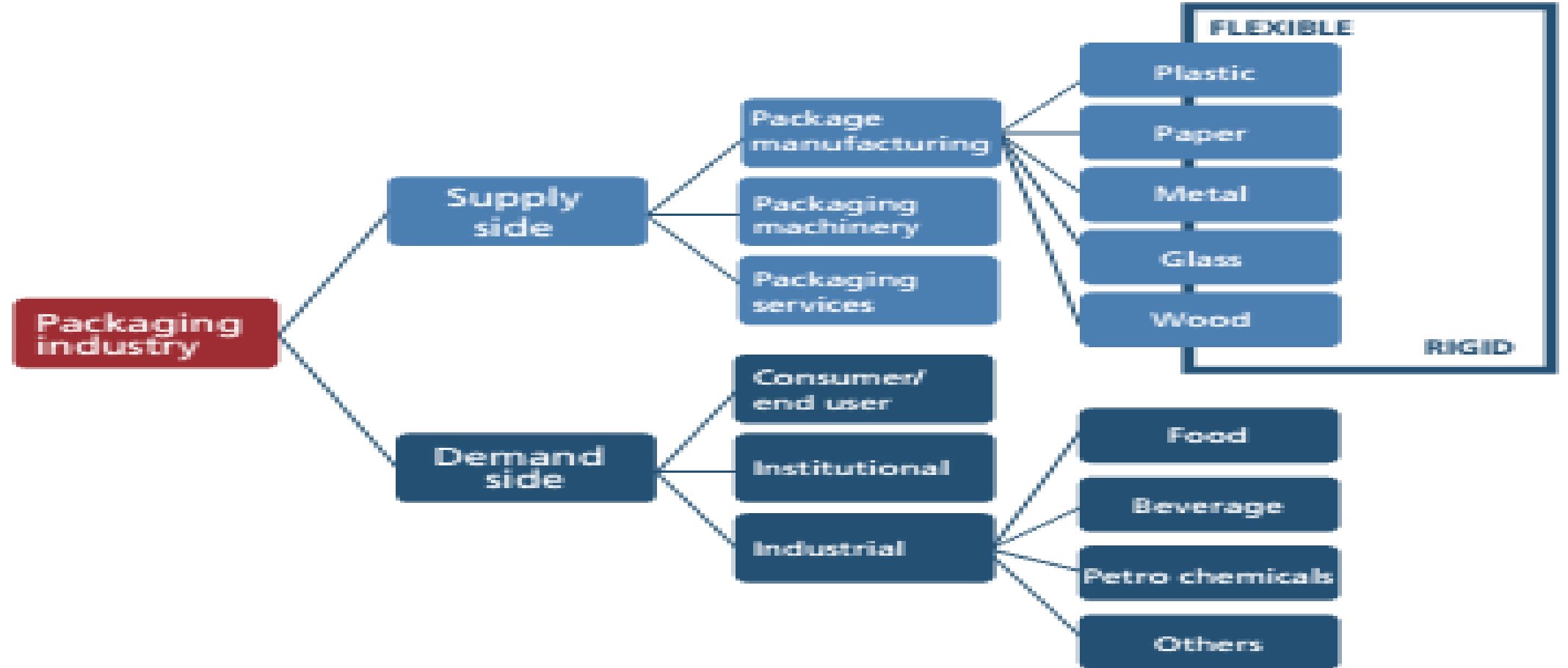
- ➔ **Overview of Global Packaging technologies**
- ➔ **Advanced Packaging Technology**
- ➔ **Standardized methods for packaging tests**
- ➔ **Conclusions and Recommendations**
- ➔ **The Wayforwrd**

1. The Global Packaging Industry

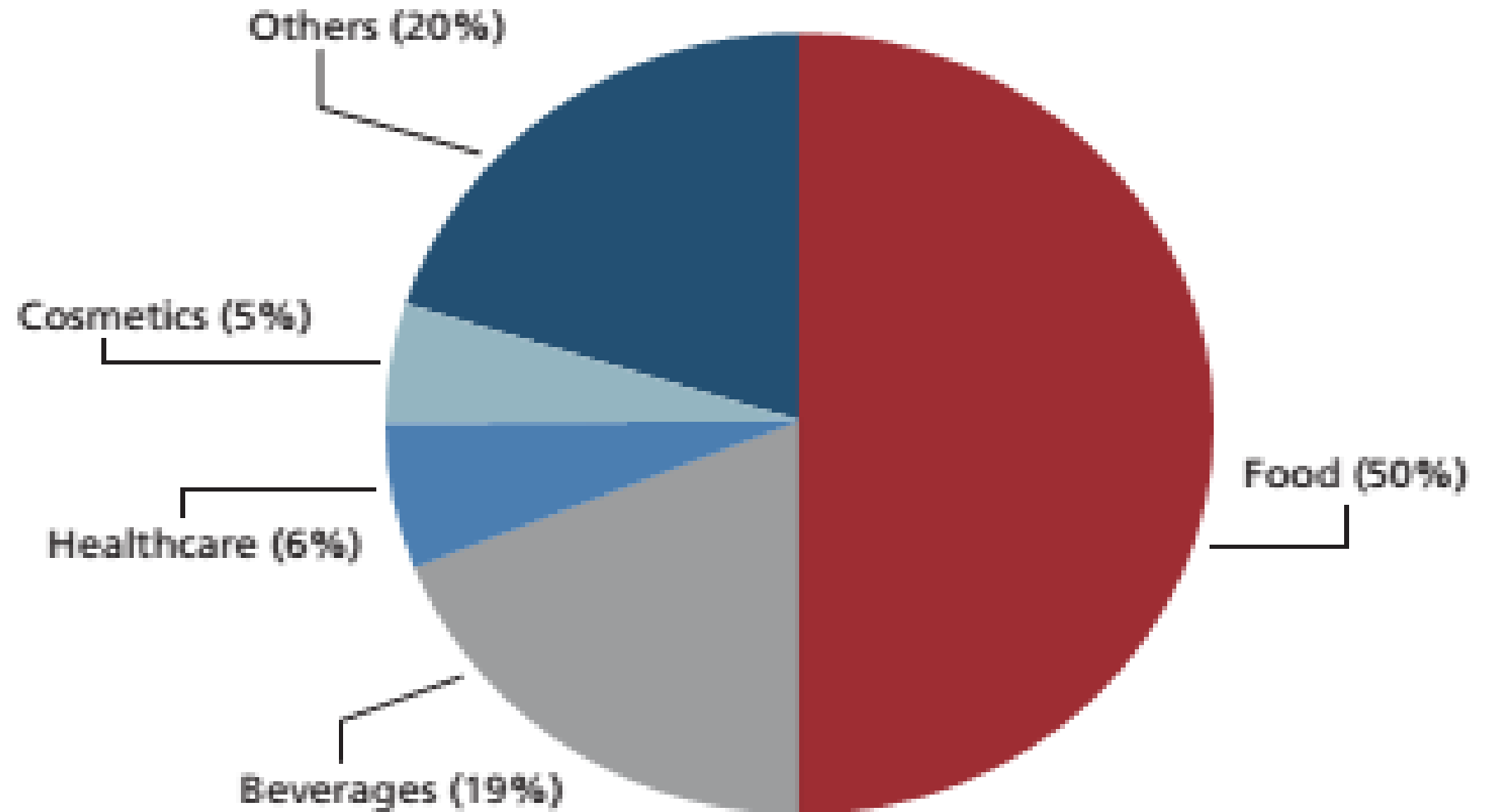
- Packaging manufacturing has globally the greatest share of the total industry (81%),
- Followed by the packaging service (14%)
- Then by packaging machinery (5%).

The Global Packaging Industry

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The Global Consumers of Packaging Industry



MOTI: Prioritized Sectors

- 1. **Agro-processing**
- 2. **Packaging**
- 3. **Biotechnology**
- 4. Chemical & Pharmaceutical products
- 5. Metals and engineering
- 6. Electronic products
- 7. Petro-chemicals
- 8. Textiles and garments
- 9. Leather & leather products



Global Advanced Packaging Market

**Global Advanced
Packaging Market -
Segmented by
Technology and Region -
Growth, Trends and
Forecasts**



Food Packaging Materials

Uses

- ➔ Safe delivery of the foods products
 - ✓ Protect the food against a range of hazards during distribution and storage.
- ➔ **Economic function: optimizing the costs, sales and profits**
- ➔ **Packaging a silent salesperson with many functions**

Food Packaging

- **Packaging** : a socio-scientific discipline which operates in society to ensure delivery of goods to the **ultimate consumer** of those goods in the **best condition** intended for their use.
- **Packaging material:** The most critical inputs
- **Function of Packaging:** Containment, Convenience, Communication & Protection
- **Food packaging** functions as “*Silent salesperson*”
- **Packaging plays a significant role in motivating purchase**

Main Marketing Considerations in Packaging Design and Manufacturing

- **The brand image of Packaging Industry and style of presentation**
- **Flexibility to change the size and design of the Corrugated and printed cardboards**
- **Compatibility with the industrial and service sectors needs**
- **Market intelligence/ activities) for demand based assessment outcomes (4 or more speciation's, A-E)**

Packaging Industries

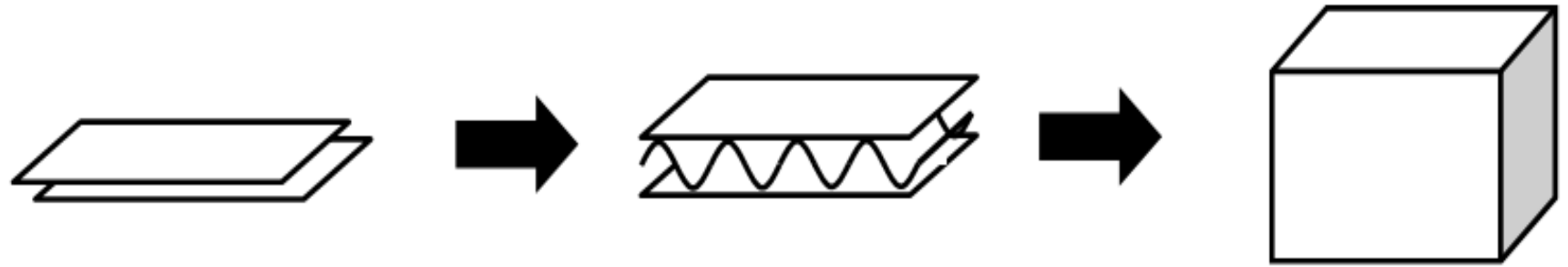
- The critical factors in value additional for integral processes towards **Global Market Export**
- Investment for various packaging materials based International standards
- **Strengthen packaging raw materials and end products testing laboratories**



Advanced Packaging

Technology Laboratories, Inc.

Mapping of existing standards



Paper properties

- Tensile stiffness
- Tensile strength
- Short span compression test (SCT)
- Corrugated medium test (CMT)
- Dimensional stability

Corrugated board properties

- Edge crush test (ECT)
- Flat crush test (FCT)
- Bending stiffness
- Friction
- Printability
- Burst strength
- Warp

Box performance

- Box compression test (BCT)
- Rough handling protocol

Standardized methods

- paper/board level

box level

pallet level

reality



Bending stiffness
(ISO 5628)



Box compression test
(ISO 12048,
ASTM D 642)



Transport test
(ASTM D 4169)

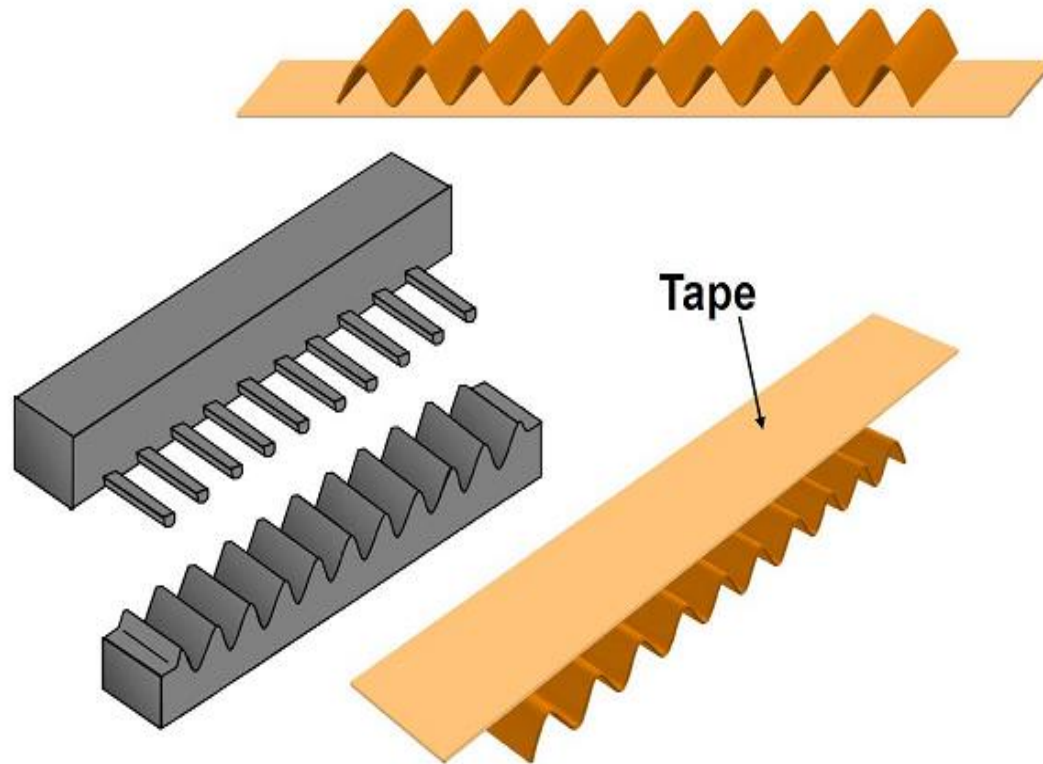


How to reflect real life?

Examples of test methods - paper level

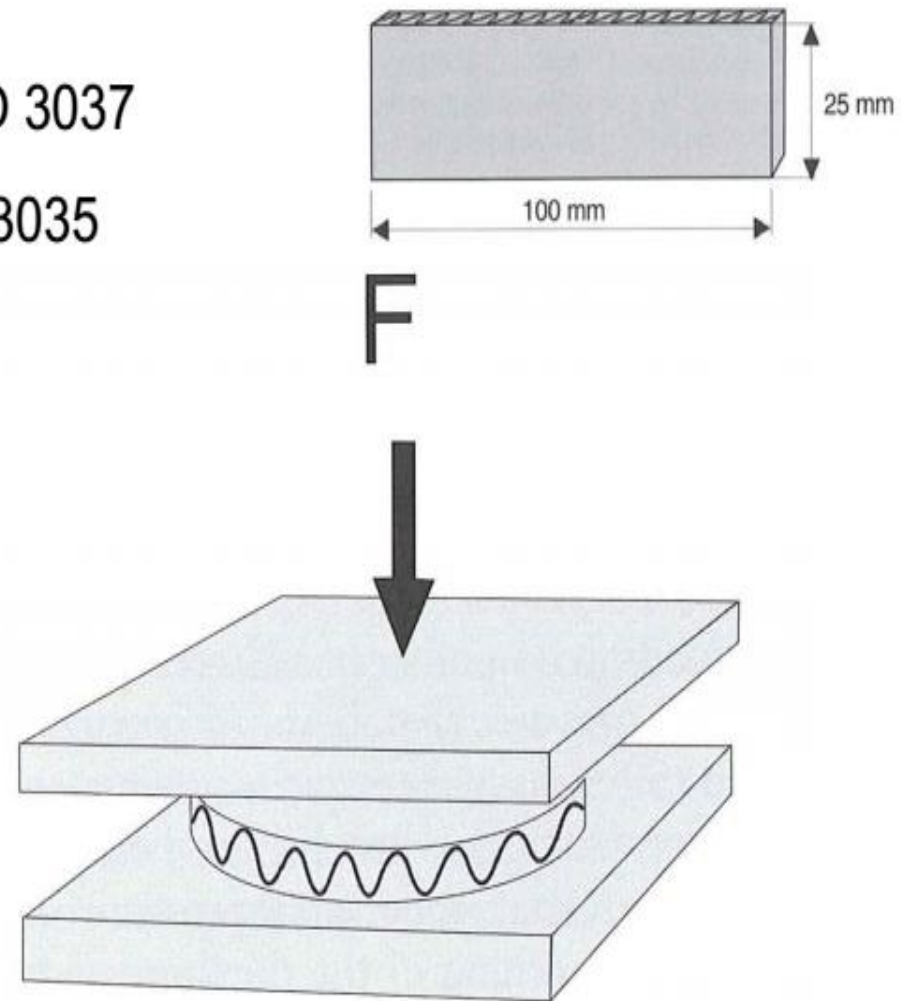
Corrugated Medium Test (CMT)

Corrugating medium - Determination of the flat crush resistance after laboratory fluting – ISO 7263



Examples of test methods – board level (1)

- ECT (Edge Crush Test), ISO 3037
- FCT (Flat Crush Test), ISO 3035



Board level (2)

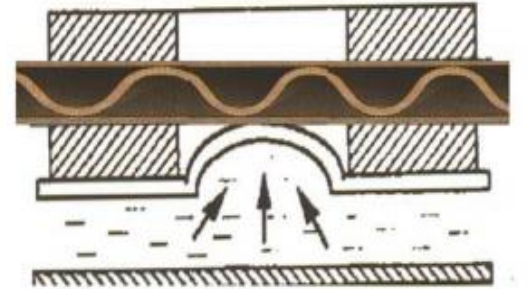
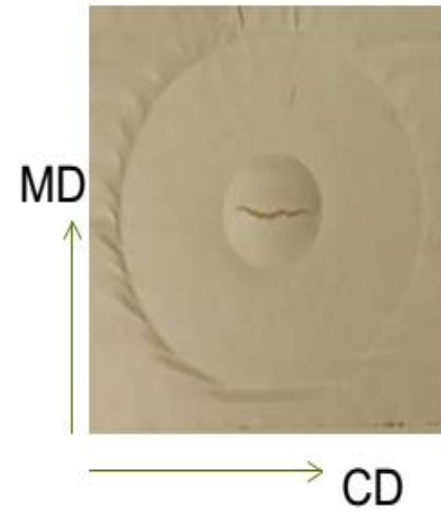
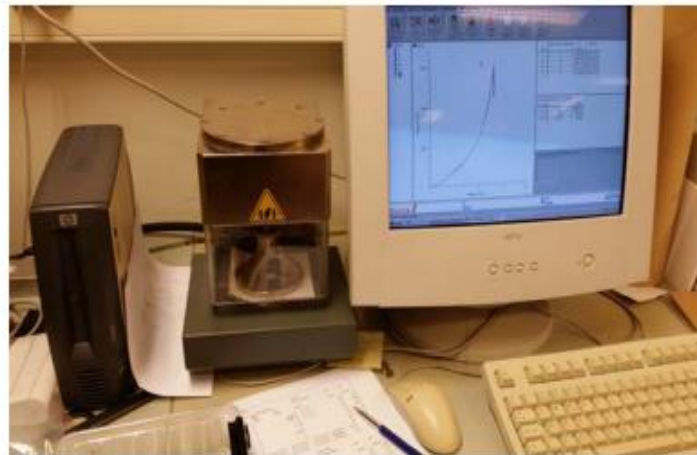
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-Bending stiffness – four point bending (ISO 5628)



Board level (3)

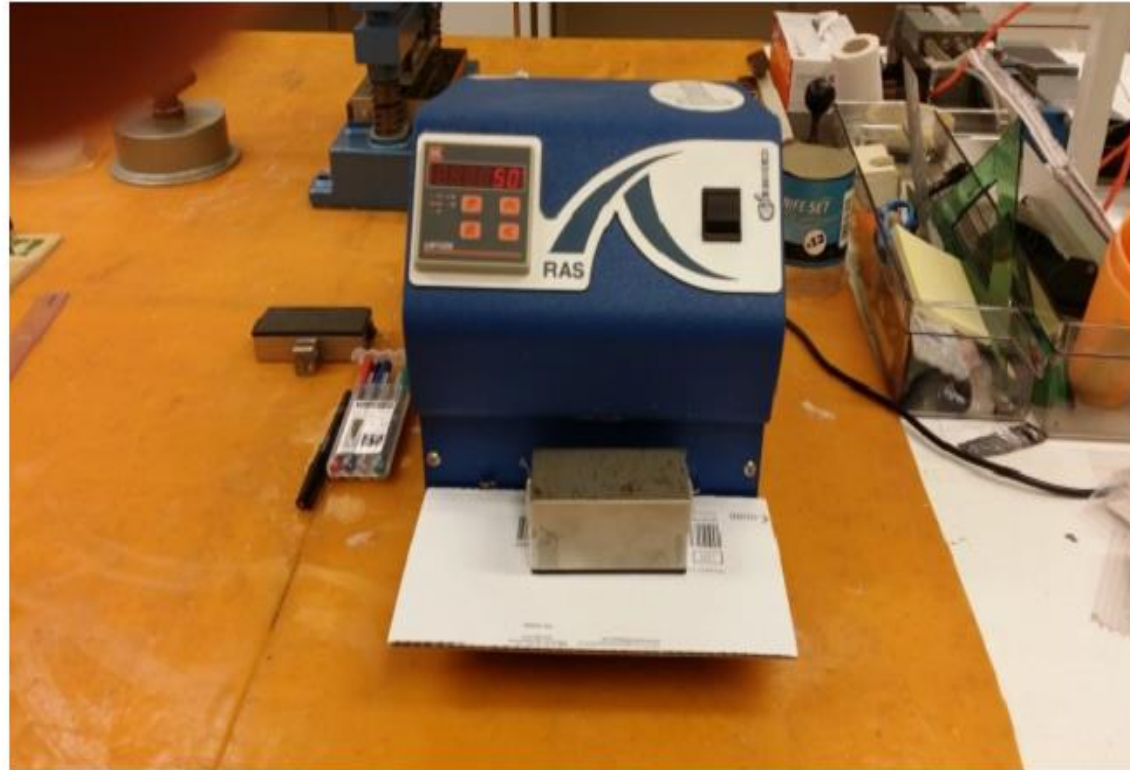
- Burst strength (Mullen) ISO 2759



Board level (4)

- Test of ink rub resistance

- ASTM D 5264-98 (Reapproved 2011) "Standard Practice for Abrasion Resistance of Printed Materials by the Sutherland Rub Tester."
- Friction
- Printability



Some examples of test methods – Box level/Pallet level

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- BCT (Box Compression Test)
- Transport test (e.g. ASTM D 4169)



Cardboard Puncture Resistance Test

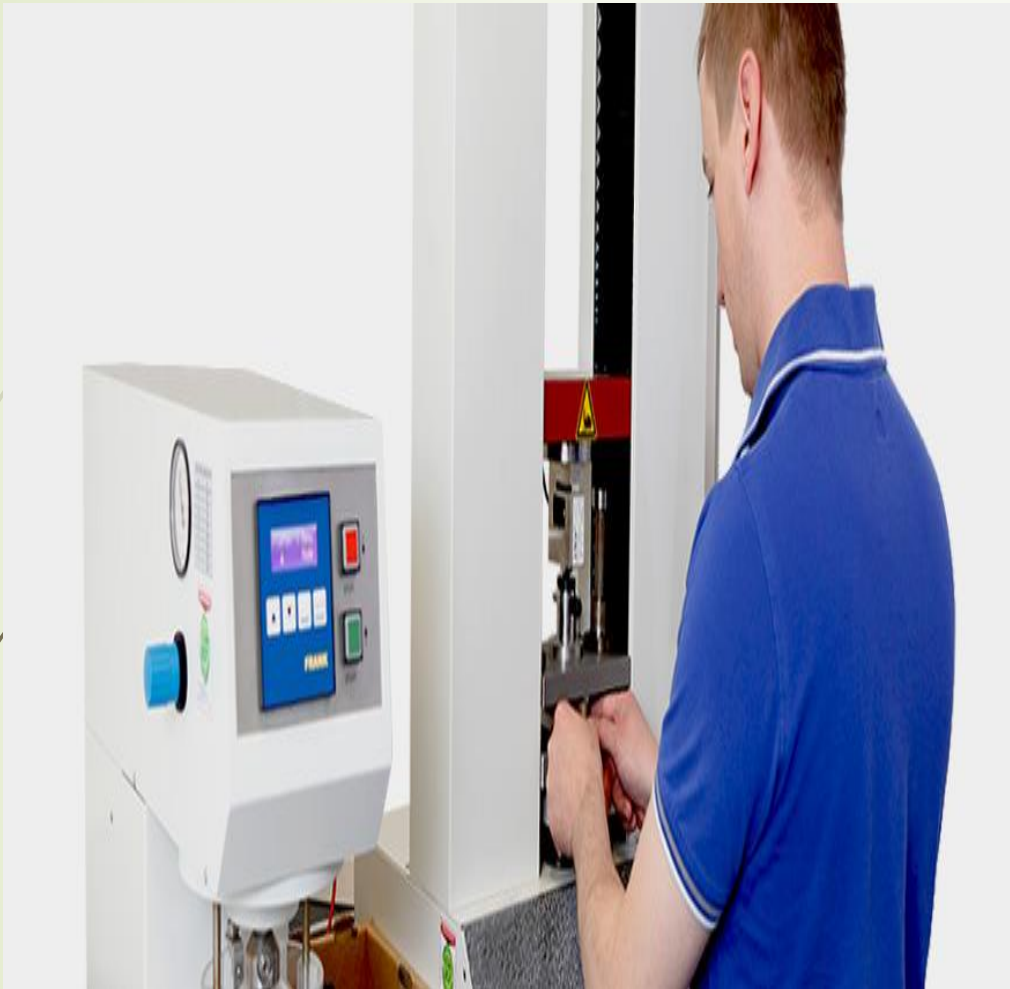
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Cardboard Paperboard Bursting Strength Testing Machine



Packaging tests such as drop test

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Measurement of edge crush resistance

There are **international standards and norms** which test packaging and packaging units. (Testing manuals in English)

Paper, Cardboard Testing Technologies

- Tensile Testers
- RCT Testers
- Box Compression Testers
- Printing Ink Durability Tester
- Elmendorf Tearing Strength Tester
- Burst Strength Testers
- Puncture Tester
- MIT Flex Tester
- Sample Cutters
- Water Absorption Tester
- Package Drop Testers
- Cardboard Spray Tester
- Scott Internal Bond Impact Tester
- Digital Inter-laminar Peeling Tester
- Large-Sized Vibration Teste

- Development of standards and guidelines
 - Effects of vibrations, shocks and creep on stacking strength
 - Effects of design, e.g. perforations
 - Effects of varying climate

Computer aid Design & Implementation

Optimise processes and implement reductions



Corrugated materials

- ▶ Corrugated materials provide eco-friendly packaging solutions, using recyclable materials such as used corrugated cartons.
- ▶ **Cost-Effective and Sustainable**
- ▶ Optimize the entire packaging supply chain with **impactful custom packaging design.**

Packaging Optimization

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- **Detailed list of parameters of quality test for raw materials, end products, water and steam/air quality in Packaging industry are required**
- **Detailed laboratory equipment specification for each identified parameters based on International standards**
- **Quantity, country of origin, test methods, model, year of manufacture,**
- **Quality certification test for their precision and calibrations certificate**
- **Lab reagents/chemicals and reference test standards**

Manufacture of Corrugated Board

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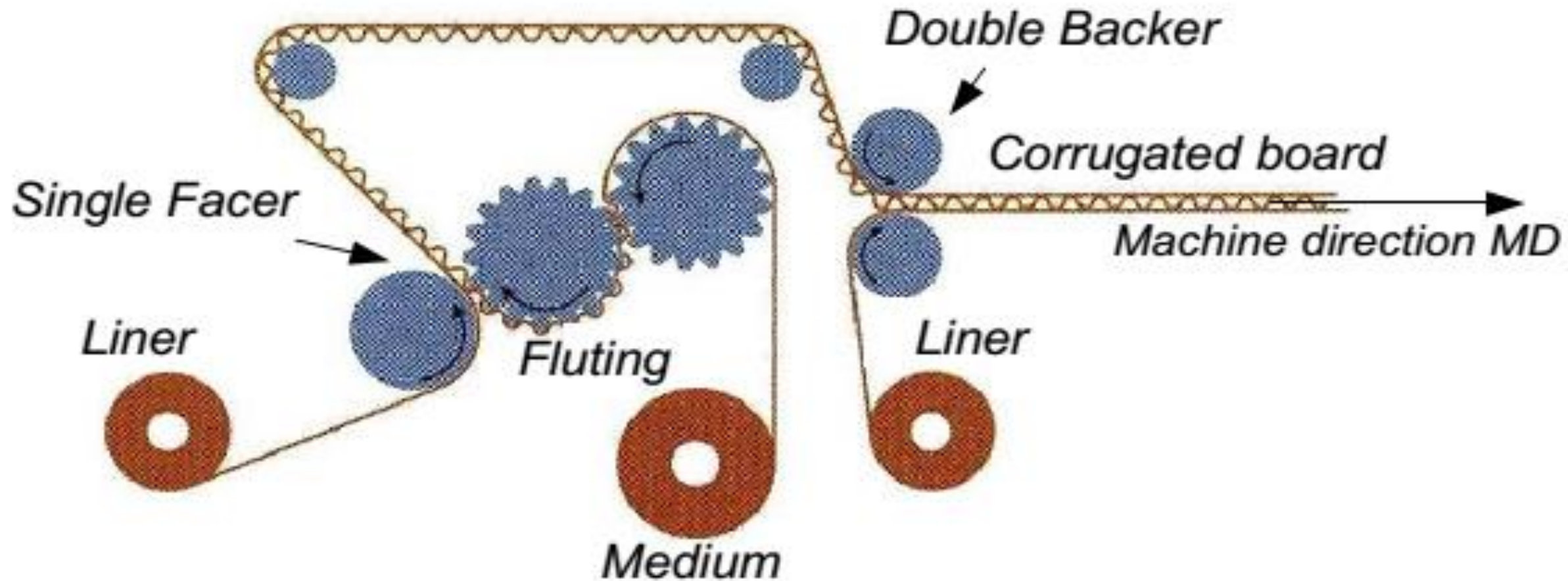


Figure 4. Manufacture of corrugated board.

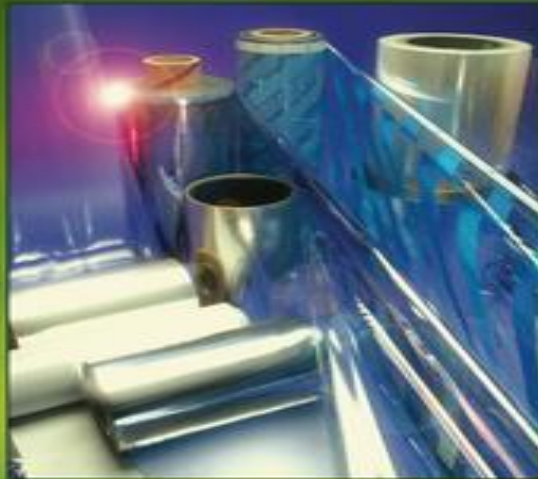
Conclusion

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- ➔ Need to get hold of state-of-the art packaging industries in East Africa
- ➔ **Food Packaging Materials: Testing & Quality Assurance**
- ➔ Capacity building in terms of :
 - ✓ Quality testing of packaging materials (Laboratory, machineries, HR, Implementation strategy)

Food Packaging Materials

Testing &
Quality
Assurance



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Thank you