BASF – Products for packaging applications

Dr. Axel Grimm
BASF Aktiengesellschaft
EUM/MB
Marketing Support Branches and Industries
30 May 2007
At a glance

BASF – The Chemical Company

- The world’s leading chemical company
- Offers intelligent solutions and high-quality products for almost all industries
- Uses new technologies to open up additional market opportunities
- Combines economic success with environmental protection and social responsibility
Providing impulses for innovation: requirements from technology, the market and society

- Society: e.g. sun protection
- Market: e.g. UV absorbers
- Technology: e.g. nanotechnology

Demand → Idea → Implementation

- Research and development: e.g. product properties
- Marketing: e.g. marketing strategies
- Production/technology: e.g. process engineering
World packaging materials consumption, value [%]

- Paper/Cardboard: 36%
- Plastics: 34%
- Glass: 10%
- Metal: 20%

Plastic and Paper are the dominant packaging materials worldwide.

Source: Berndt&Partner, Packaging Magazine
BASF offers a broad product portfolio to the packaging industry

- **Pigments, Dyes, Resins, Waxes, Preparations for Graphic Arts and Plastics**
- **Adhesive Raw Materials** (Dispersions, Resins)
  - **Paper chemicals** (Process Chemicals, Binders, Coatings)
- **Plastics Rigid** (PS/PA and Copolymers, PU+EPS/PS-Foams, Superabsorbents)
- **Chemicals/Additives** (e.g. Monomers, Inorganics, Plasticizers)
  - **Dispersions** (PS- and Acrylic Copolymers)
- **Plastics flexible (PA, PS, PU, Ecoflex, Styroflex, Flexible Films)**

**Light stabilizers** (UV absorbers, HALS)
Competitive edge through differentiation, for brand owners and BASF

Packaging with an increasing importance for the buying decision (Sensorik)
BASF and Packaging
The Packaging Network Team

Cross-business and cross-functional team
1. Light Stabilizers

Success story: Uvinul® 5050 H for Vegetable Boxes and Bottle Crates

Advantages

- No offensive smell
- No processing problems
- No migration at the tool
1. Light Stabilizers

Uvinul® 5050 H for shrink film
2. Pigments and Dyes

Pigments and Dyes for plastic packaging
BASF pigment portfolio
2. Pigments and Dyes

Pigments and Dyes for plastic packaging
Fashion Cosmetics Packaging Kit
2. Pigments and Dyes

Interactive Tool for effect pigment visualization
3. Resins for Printing Inks

**Overview**

- Broad portfolio with good market positions:
  - Waterbased - JONCRYL
  - Radiation curing - LAROMER

- Three main production sites:
  - Heerenveen (NL)
  - Schwarzheide (D)
  - Ludwigshafen (D)
3. Resins for Printing Inks

Market segments

- Printing Inks
  (Image)
  - Pigment Dispersions
  - Packaging
  - Publication
  - Industrial

- Overprint Varnishes
  (Ink protection/esthetics)

- Functional Coatings
  (Substrate enhancement)
We are the #1 global supplier of water-based polymers

Estimated share in Europe is 60%

Water-based represents about 40% of the liquid ink & opv markets

Estimate share in UV resin market is ± 6%
4. Waxes

Luwax® and Poligen®

Printing Inks
Waxes are used in printing inks mainly to improve mechanical resistance (rub fastness).
Trends in paper & board packaging

- Functionality, convenience
- Eco-friendly material & life-cycle
- Shelf ready packaging
- Multi-sensory experience
- Aseptic & hygienic packaging
- Smart packaging
- Traceability
- Brand protection
- Visually appealing
- Global branding
Visible Success: What we add to paper & board

- Visual appeal
- Printability
- Processability
- Tactile experience
- Eco-efficiency
- Global quality standards
- Security
6. Paper Chemicals

BASF product portfolio for paper & board production

Paper making

Paper coating
6. Paper Chemicals

**Luredur®:**
Making strong board more eco-friendly

- Less natural resources: Use of Luredur® technology helps saving energy of 20% during board production.
- Higher productivity: Production increases of more than 10%.
- Higher quality: Luredur® technology makes board even stronger.
7.2 Styroflex®
What’s Styroflex® 2G66?

Thermoplastic Elastomer with unique properties:

- Processability
- Polarity
- Mechanics
- Transparency
- Breathability
7.2 Styroflex®
Recovery Demonstration

Styroflex® Film 50 µm
Additive for improved film mechanics

Additive for:
- PE and PP films

Toughness modifier for:
- Transparency, Polarity Compatibility, Elasticity

Toughness, Processability, Polarity Compatibility, Elasticity

Flexible Film

Styroflex® 2G66

Pure or Via Compounding

Softness, Polarity, Toughness, Elasticity, Surface properties

Compounds, Toys, 2-K, Profiles, Household

Applications: Styroflex® 2G66

7.2 Styroflex®
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Characteristics of Styroflex® - fresh meat film

- Product concept: Coextrusion with EVA as outer layers
- Excellent transparency, high gloss
- Optimal protection due to high toughness and puncture resistance
- No marks on packages due to excellent recovery
- Condensation prevention through use of additives
- Oxygen permeability allows retention of aesthetically attractive red color of the meat
- Utilization of Styroflex® film possible for manual and automatic packaging
- Density advantage compared to plasticized PVC
- No environmental concerns
7.3 Ultramid®
Polyamid 6 in Packaging Applications

- Transparency
- Aroma barrier
- Gas barrier
- Puncture resistance

- Thermoformable
- Chemical resistance
- High heat resistance
7.3 Ultramid®
Polyamid 6 in Packaging Applications
• Ecoflex® is the biodegradable film resin from BASF.

• Ecoflex® can be processed without predrying on existing PE blown film lines and chill roll lines

• Ecoflex® meets the requirements of the European standard for biodegradable polymers, DIN EN 13432.
7.4 Ecoflex® and Ecovio®

**Ecovio®**

- Unique in its variety, tear resistance and environmental compatibility
- Certified globally as 100% biodegradable in compost (European standard EN 13432)
- 45% renewable source and 100% biodegradable in compost
- Suitable for flexible film in combination with Ecoflex® and Ecoflex® Masterbatches
- Suitable for rigid packaging in combination with PLA
BASF Plastics for attractive packaging of cosmetics

BASF Plastics in cosmetics

Exclusive, attractive and seductive, a sensory delight
9.2 Styrene Polymers

BASF Plastics

Unrivaled resistance—greatest transparency

Terlux for exclusive and attractive packaging of cosmetics

- Excellent transparency
- Brilliant surfaces
- High toughness and rigidity
- Outstanding resistance
- Easy to process
- Exceptional depth of color
Polystyrol for variety
  - Excellent transparency
  - High gloss
  - High flowability
  - Resistant to cosmetic ingredients
9.2 Styrene Polymers

BASF Plastics
Good colorability—Numerous possible uses

Terluran® for visual appeal
- High toughness and rigidity
- Scratchproof
- Outstanding surface quality
- Coloring in particularly intense colors
- Easily printable and metalizable
9.2 Styrene Polymers

BASF Plastics
Brilliant surface – Great depth of color

Luran for elegance

- Exclusive and brilliant surface
- Easily printable
- Design variety and color variety
- Resistant to cosmetic ingredients
10. Superabsorbents

Effective Moisture Management in Food Packaging

- Superabsorbent polymers effectively absorb and bind excess fluids in meat – traypads
- Delicate food stays fresh longer and looks more attractive

Benefits of Luquasorb® FP 800
- Good absorption under pressure
- High absorption capacity
- FDA approval for indirect food contact

Luquasorb® FP 800

approved for indirect food contact by the
  •German Federal Agency for Risk Assessment (BfR) and the
  •US Food and Drug Administration (FDA).

The approval includes the use for meat, poultry, fish, vegetables and fruit.
Luquafleece® – the superabsorbent fabric

Luquafleece® is an innovative textile that combines the high absorption capacity of superabsorbent polymers with the handling advantages of a non-woven.

Luquafleece® has the unique ability to absorb enormous amounts of aqueous fluids and vapour.

Luquafleece® is delivered as a roll-good
Transport Packaging

- Luquafleece® is used as a highly absorbent inlay in transport packages that takes up potential leakage of fluids.

- During the transport and storage of potted plants a pre-moistened Luquafleece® ensures the freshness of the plants by constantly releasing humidity.

- During shipment of moisture-sensitive goods in oversea containers Luquafleece® balances humidity levels and reduces the risk of corrosion.
11. Services - Ecoefficiency

Sustainability and Packaging - a life cycle view

- Product
- Choice of packaging
  - material, size, design,…
- Product delivery
- Product use
- Packaging recovery /biodegradation

Eco-efficiency Analysis as helpful instrument

Energy
Material
Emissions
Costs
…
11. Services - Ecoefficiency

Eco-Efficiency Portfolio
Packaging for milk based drinks

Example: Milk based drinks

<table>
<thead>
<tr>
<th></th>
<th>High eco-efficiency</th>
<th>Low eco-efficiency</th>
</tr>
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<tbody>
<tr>
<td>Chemical</td>
<td></td>
<td></td>
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<tr>
<td>Glass bottle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plastic</td>
<td></td>
<td></td>
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<tr>
<td>Composit cartons</td>
<td></td>
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</tbody>
</table>

Customer Benefit:
Packaging and consumption of 500 ml milk based drinks
(Study for Müller-Milch)

Cups made of plastics such as Polystyrene proved to be more eco-efficient than reusable glass jars and laminated carton!
11. Services - Ecoefficiency

Food containers used for meals served off site and in the canteen

**Off site event**

- Portfolio

- Environmental Impact (normalized)
  - Costs (normalized)

**Indoor event**

- Portfolio

- Environmental Impact (normalized)
  - Costs (normalized)

- Service packaging: Polystyrene
- Service packaging: Cardboard
- Re-usable crockery 1% breakage rate
- Re-usable crockery 3% breakage rate
- Re-usable crockery 5% breakage rate
11. Services

BASF Packaging Portal
http://www.packaging.basf.com

BASF - Your partner for packaging solutions

Learn more about products, solutions, and innovations from BASF for the packaging industry. Whether food, beverages, cosmetics, chemicals or pharmaceuticals need to be packed, using paper, cardboard, carton, metal or plastics: BASF creates value for its partners at all levels of the value chain, from raw material suppliers to consumer brands.