DSM Resins & Functional Materials

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US Field Trip
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Safe harbor statement

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A more comprehensive discussion of the risk factors affecting DSM’s business can be found in the company’s latest Annual Report, which can be found on the company's corporate website, www.dsm.com
Performance Materials: differentiated growth strategy

- **Strengthen**
  - PA6 compounds
  - PA6 film & extrusion
  - Specialty Coating resins

- **Restructure**
  - Composite resins

- **Accelerate**
  - High Performance Plastics
  - Solar
  - Functional materials

- **DSM’s capabilities to extract value**
  - Powder Coating resins
  - Dyneema® Life Protection
  - DSM Resins & Functional Materials

- **Market growth**
  - >2x GDP
  - ~2x GDP
  - <2x GDP

- **BG DRF**
- **BG DEP**
- **BG Dyneema**
- **DSM Biomedical**
DSM Resins & Functional Materials (DRF)

- A global player in the development, manufacturing, marketing and sales of high-quality resins solutions for paints, coatings, composites, 3D printing resins and optical fiber coatings

- Our mission: We generate value for our customers by working with them to provide more sustainable materials to meet regulatory needs and better respond to end-user demands through continuous innovation

Our businesses:
- UV curable resins
- Powder Coating Resins
- Specialty Coating Resins
- Functional Materials
  - Fiber optical coatings
  - Somos / Stereolithography
Overview of our markets, regions and products

2013 Sales by End Market

- Building & Construction
- Automotive & transport
- Electrics & Electronics
- Packaging & graphic arts
- Telecom
- Other

2013 Sales by Region

- Europe
- North America
- China
- Rest of Asia
- Rest of World

2013 Sales by Product

- Waterborne
- UV curable
- Powder
- Optical fiber
- Stereolithography
- Other

Market Position Coating Resins & Functional Materials

<table>
<thead>
<tr>
<th>Product</th>
<th>Top position</th>
<th>Top 2-3 position</th>
<th>Niche player</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water-based Coating Resins</td>
<td></td>
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<td></td>
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<tr>
<td>Powder Coating Resins</td>
<td></td>
<td></td>
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<tr>
<td>UV-Curing Coating Resins</td>
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<tr>
<td>Optical Fiber Coating Resins</td>
<td></td>
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<tr>
<td>Stereolithography</td>
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Strategic Progress in DSM Resins & Functional Materials

• Cost reductions & efficiency improvements
  ✓ By restructuring and margin management activities significantly improved financial performance in Powder and Specialty Coating resins

• Growth through sustainable innovations
  ✓ By introducing “Supercoating” for Fiber Optic Materials to ensure continued market leadership in segment
  ✓ Moved away from solvent borne coatings to waterborne systems in portfolio: from 50% of portfolio in 2000 to less than 20% expected in 2015

• Strong sales growth and presence in High Growth Economies
  ✓ Established “Waterbased China platform” to develop sustainability awareness in industrial coating market in China
  ✓ Acquisition of AGI in UV curable resins (Taiwan-China)
Megatrends drive our key end-markets

**DSM global trend**

**Global shifts**

**Building and Construction (45% of 2013 sales)**
- Legislation to decrease environmental impact
- Shift to bio-based preference (sustainability)
- Shift away from solvent borne materials

**Telecom and E&E (16% of 2013 sales)**
- Rapid growth in mobile devices, servers & infrastructure
- More comfort and customization
- Emergence of 3D printing for additive manufacturing
- Safer materials, recycling

**Food Packaging / Graphic Arts (14% of 2013 sales)**
- Increasing consumption of processed and packed food
- Strong, safe and smart packaging (reduction of food waste)
- Recycling and recyclable materials

**Automotive (5% of 2013 sales)**
- Lower emissions during manufacturing
- Light weight to safe fuels

**General Industries (20% of 2013 sales)**
- Lower emissions
- Safety and protection in industrial applications

**Shift to sustainable coatings systems & materials**

- Solvent free
- Waterborne
- Bio-based
- Renewable
- New applications
Global shift to sustainable coatings

Shift to more sustainable coatings

<table>
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<tr>
<th>Resin Technology</th>
<th>Global annual growth rate (%)</th>
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<tbody>
<tr>
<td>Solvent-borne</td>
<td>~ -1%</td>
</tr>
<tr>
<td>Waterborne</td>
<td>~5%</td>
</tr>
<tr>
<td>Powder</td>
<td>~3.5%</td>
</tr>
<tr>
<td>UV curing</td>
<td>~6%</td>
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Driven by legislation and growing consumer awareness

DSM focus on sustainable coatings

<table>
<thead>
<tr>
<th>Year</th>
<th>Global Supply</th>
<th>DSM Supply</th>
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<tbody>
<tr>
<td>2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
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<tr>
<td>2020</td>
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Legend: UV curing, Powder & Waterborne
Well distributed in regulated markets

North America:
- California regulated
- LEED
- BioBased preference program

Latin America:
- No legislation

Europe:
- Legislation most advanced
- NGO labeling

Russia:
- No Regulation

India:
- No Regulation

China:
- WB platform: base for lobbying

To drive a sustainable economy, legislation is needed
Legislation is intensifying in the world and driving markets to sustainable coatings systems

Significant growth opportunity for DSM in non-regulated, high growth economies
Our market positions

- DSM only active in small, higher value-add part of the coating industry, based on current technological competences
- DSM is a niche player in most attractive areas (green). Commodities (grey) requiring backward integration into monomers
- Although being a niche player, DSM is sizeable enough and well positioned to leverage its competences

Focus on sustainable technologies in attractive growth market segments
Our businesses: UV Curable Resins (AGI)

- DSM-AGI (51% DSM controlled JV acquired in 2011)
- Offers a broad range of environmentally-friendly UV (ultraviolet) curable resins used in coatings and inks for wood, flooring, plastic and graphic arts applications
- Top customers: DIC, ECI, Xtreme, Renner, Heyo
- Main competition: Allnex, Sartomer
- Strategic Direction:
  - Growth in specialty UV curable coating technologies
  - Backward integration for Functional Materials
Our businesses: Powder Coating Compounds

- Powder coating products for metal with development focused on sustainable differentiated technologies that cure at lower temperatures, efficiency improvements, reduction of energy consumption and, most importantly, new substrates (wood)
- Manufacturing in the US at Augusta, Georgia
- Large customers: Valspar, Jotun, Axalta, Akzo, PPG
- Main competition: Allnex, Arkema
- Strategic Direction:
  - Growth in specialties such as Ultra for wood substrates
## Sustainable innovation: Powder coated wood

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<tr>
<th><strong>Trends</strong></th>
<th>Increased sustainability awareness, faster and cost effective production of end product</th>
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<tbody>
<tr>
<td><strong>Application</strong></td>
<td>Paint for industrial wood coatings (MDF) for furniture (bathroom, office) and kitchen cabinets etc. NO compromises on performance (same or even better)</td>
</tr>
<tr>
<td><strong>Main Features</strong></td>
<td>Solvent free coating, highly efficient use of paint, low application energy, efficient and cost effective production of end product</td>
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- ✓ Health benefits (safe ingredients, zero VOC)
- ✓ Improved comfort and well-being (no odor, no hazardous compounds upon application)
- ✓ Better working conditions

- ✓ GHG emission reduction: up to 400% versus standard solvent borne technology
- ✓ Safe ingredients
- ✓ Efficient use of raw materials (little to no waste)

**Developing most sustainable technology for coating wood**
Our businesses: Specialty Resins (SR)

- SR (Specialty Resins) offers the widest portfolio of water-based coating resin technologies for application in Coatings, Adhesives & Graphic Arts
- Global footprint including manufacturing in the US
  - Wilmington, Massachusetts (incl R&D)
  - Frankfort, Indiana
  - East Providence, Rhode Island
- Large customers: Akzo, PPG, Teknos, Sherwin Williams and Sun
- Main competition: BASF, Arkema, Allnex, Nuplex, Dow, Bayer
- Strategic Direction:
  - Global growth in waterborne specialties/replacement of less sustainable technologies
Bio-based waterborne coatings: DECOVERY®

Trends
Increased sustainability awareness: from general interest to preference for buying ‘green’. From fossil-based to bio-based

Application
Paint for professionals and DIY (suitable for high gloss to flat) for interior and exterior

Main Features
Natural biobased materials (DECOVERY® paint resins) opening a new era of high performance sustainable paint production without impacting the environment at any stage of its use

- Health benefits (safe ingredients, zero VOC)
- Improved comfort and well-being (low odor)
- Better working conditions

- GHG emission reduction: up to 50% versus standard technology
- Safe ingredients
- Renewable resources: based on novel biobased building blocks (50% renewable resources)

Setting up a Bio-based value chain
Setting up a new value chain

- First success secured with positive feedback of leading carpet Producers based on trial results on first prototype carpet production machines

1. Niaga’s carpet fiber binding technology, combined with DSM’s engineered polyester lamination adhesives technology enable the carpet industry to manufacture fully recyclable carpet systems

2. Mission is to make carpet waste obsolete (addressing major land-fill issue in the US)

Entering new innovative business model with carpet recycling
Our businesses: Functional Materials (optical fiber)

- DSM sets the standard for optical fiber protection and performance worldwide helping to ensure greater signal reliability and field performance within optical fiber networks.
- Global market share >70% with extensive intellectual property portfolio.
- Headquarters and R&D in Illinois with manufacturing in North Carolina, the Netherlands and Japan.
- Main competition: Momentive and Phichem (locally in China).
- Strategic Direction:
  - Growth in attractive and important Chinese growth market.
  - Continuing development of wide effective area optical fiber coatings in the West driven by higher and growing bandwidth requirements.
Our businesses: Functional Materials (Somos)

- DSM also uses its strong technology base in UV curable thermostats to develop and market stereolithography materials used in 3D printing
- Large customers: Materialise, Formula 1 (multiple), Epoch Angel
- Main competition: 3D Systems
- Strategic Direction:
  ✓ Growth globally with continuing development in new 3D printing technologies
Sustainable innovation: Additive Manufacturing

What is additive manufacturing/3D printing?

- “Process of computer-controlled joining materials to make objects from 3D model data, usually layer upon layer, as opposed to subtractive manufacturing methodologies, such as traditional machining”
- Additive manufacturing (AM) enables an unprecedented level of design freedom

Speeding up development and moving down the value chain

- Total markets for 3D printers, printable materials, and printed parts expected to reach US$12 billion in 2025
- Positive government climate as 3D initiative creates new local jobs
- Opportunity to speed up adoption rate and expand the market with right partnerships and new business models
- Goal is to expand our materials offering to enable new printer technologies and capture value down the chain in end part applications

Exploring new business model with 3D Printing
DSM Resins & Functional Materials (DRF) has shifted its portfolio successfully toward specialty, value-added technologies.

We see further opportunity with the clear shift from solvent-borne technologies to sustainable solvent-free products and low emission resins.

Innovation in DRF is focused on more sustainable, high quality resins technologies and solutions in response to global challenges such as climate change, energy efficiency and the need to address health and improve well-being:

- This approach has led to a strong increase in ECO+ products, with higher growth rates, high value creation / margins and lower environmental impact.
- The demand is highest in Europe and the US where awareness continues to rise about the negative effects of solvent-borne systems.
- We will capitalize on our innovation pipeline with ability to move the needle for DSM Resins & Functional Materials in the short term with low temperature curing powder coatings, biobased paint resins and carpet recycling.