Value growth in Human Nutrition & Health

Rick Greubel
President Human Nutrition & Health

US Field Trip
September 4, 2014
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
Human Nutrition and Health (HNH): who we are

Dietary Supplements
- Drivers are multivitamins, Omega-3’s, vitamin D & E and multi-level marketing products
- Strategic position in Vitamin C enhanced with pending acquisition
- i-Health - leading consumer brands demonstrating healthy growth

Food & Beverage
- Premix nutritional solutions, Omega-3’s and natural colors and ingredients

Infant Nutrition
- Life’s DHA/ARA and premix growth in Asia and LATAM
Fundamental drivers for long term growth of micronutrients

Global aging
- Rising cost of healthcare
- Preventive health and wellness via nutrition

Health claims
- Regulators and skeptical consumers
- Quality science key to build and protect consumer brands

Transparency
- Consumers seek to know & understand
- Quality & Quality image is key to integrity of brands and companies

Urbanization
- Consumption of processed foods

![World market size 2013](source: Euromonitor 2013, DSM estimates)
HNH sales growth driven by multiple factors

- **In forward integrated solutions through premix**
  - Fully customized
  - Focus on complete solutions

- **High growth economies**
  - Staple foods applications for base of pyramid
  - Growth in Asia and LATAM DS driven by preventative care & aging population
  - Acquisitions/venturing provide portfolio synergy opportunities
  - Strategic position in Chinese Vitamin C

- **Innovation sales outpaces overall growth**
  - New differentiated forms
  - Focus on new natural ingredients
  - Eye, heart & bone health increasing importance
  - B2C marketing
Current business conditions in HNH

**Food & Beverages markets**

- Western Food & Beverages markets showed - in general- sluggish growth
- DSM’s global and regional ‘A-label’ customers are addressing these conditions by launching new products, promotional campaigns and by speeding-up innovations
- Demand for premixes remains healthy
- Emerging economies will also drive good growth rates for F&B, tapping into the increased need for good and save quality processed food & beverages

**Infant Nutrition**

- After-effects of false botulism scare, affecting China and South East Asian markets
- New China regulation negatively impacted some of our customers
- Chinese INF market has settled with market growth in mid single digit range, lower than the past few years growth level
- Despite near-term challenges in the market, the fundamentals of the infant nutrition market remain sound
Current business conditions in HNH

**US Omega-3 Dietary Supplements**

- The US fish-oil based Omega-3 market was impacted by increased fish oil costs, leading to sharp increases of retail prices. This was combined with multiple negative media events.
- DSM has taken the lead in an Omega-3 Dietary Supplements industry coalition to drive growth in the category.
- Dietary supplement markets outside the US have not been impacted and continue to show good growth.

**Multivitamins**

- US Vitamins markets have weakened as reaction to negative publications in H2 2013.
- Recent scientific publications and media has been positive.
- Vitamin D & E bucking the trend supported by aggressive DSM advocacy and communications initiatives.
- Continued strong growth in DSM B2B business i-health.
- DSM is taking the lead in a multivitamins industry coalition similar to the efforts in Omega-3 markets.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Jan - Aug, 2014 (YTD) vs. 2013</th>
<th>August ’14 vs August ’13</th>
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<tbody>
<tr>
<td>Vitamin A</td>
<td>-6%</td>
<td>-7%</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>-2%</td>
<td>+6%</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>+5%</td>
<td>+7%</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>+5%</td>
<td>+8%</td>
</tr>
<tr>
<td>Multivitamins</td>
<td>-2%</td>
<td>+1.5%</td>
</tr>
<tr>
<td>Omega-3</td>
<td>-11%</td>
<td>-3%</td>
</tr>
</tbody>
</table>

* Source: IRI (August 2014)
Vitamins: bringing balance to the public landscape

- Promote the body of credible **SCIENCE** while aggressively challenging the coverage of questionable science

- Create a **CONNECTION** to the products for **PEOPLE**

- Demonstrate the **VALUE** of the category to **SOCIETY**

- Galvanize credible and **ENGAGING VOICES** to educate and gain **TRUST** with consumers and the media on the essentiality of vitamins and minerals
DSM’s differentiation along multiple dimensions
HNH sales growth driven by business model and innovation

Growth supported by multiple factors

- Focus on premix solutions
- High growth economies
- Acquisitions provide portfolio synergy opportunities
- Innovation sales outpaces overall growth
  - New differentiated forms
  - Focus on new natural ingredients
Business model unique in industry

FROM

Actives

Active Ingredients

TO

Forms

Premix

Solutions

Access &
insights

GLOBAL PRODUCTS

“what to deliver”

high quality

differentiated

price competitive

GLOBAL PRODUCER

“how to deliver it”

product ownership

asset footprint/Eos

consistency/reputation

LOCAL SOLUTIONS PROVIDER

+ +

unique fit & value

de-complexing (for customer)

easy to do business with

LOCAL SOLUTIONS

customer ownership

access & insights

agility & trust
Customer solutions – adding layers of stickiness

Adding layers of stickiness

Customer solutions

Local Support & Service
- Nutritional Science & Advocacy
- Regulatory
- Order – delivery
- Forward solutions into packaged consumer goods

Global Products
- Tailored (application)
- Novel
- Branded

Local Premix
- Tailored (mix)
- De-complexing
- Fast

Local (and global) Customer Relationships

Global Products

Local Premix

Local Forward Solutions

Local Premix
Our integrated marketing approach

Segments

Health Benefits

Products

Quali®-Blends or Straights

How our Customers are organized?

What drives Consumers?
Health benefit platforms drive growth
Health benefit platforms drive growth
Premixes business model is core growth driver

Completely Custom
- Our premixes are always one-of-a-kind, developed using a comprehensive selection of vitamins, minerals, amino acids, nucleotides, nutraceuticals and other functional ingredients to target your product needs

Solution Focused
- Going beyond blending, we offer advanced R&D resources, expanded access to ingredients and consumer insights to help uncover insights and streamline product development

Proven Expertise & Leadership
- Developed more than *85,000+ custom nutrient premix formula’s for the food, beverage and pharmaceutical markets
- Shaping, advocating and leading the industry by building sound scientific evidence for the role of micronutrients in health and nutrition
Any Nutrient

We offer the deepest portfolio of proprietary nutritional ingredients with added ability to source over 1,400 functional ingredients

- Source only the highest quality raw materials worldwide
- Strong position and relationship with global and niche suppliers in the vitamin, mineral, amino acid, nucleotide, nutraceutical and botanical markets
- Vendor qualification process is second-to-none
- Proven experience to source the right market form, customized for your product
- Extensive market knowledge in the nutrient industry
Any Application

In any supermarket around the world, you will find top-selling products fortified by Fortitech Premixes including:

- Infant Food/Formula
- Cereals
- Sports Drinks
- Nutrition Bars
- Supplements
- Beverages
- Diet Products
- Snack Foods
- Yogurt
- Peanut Butter
- Stick Packs
- Ice Cream

- Waters
- Flour
- Confections
- Baked Goods
- Margarines/Spreads
- Medical Foods
- Noodles
- Dairy Products
- Sachets
- Rice
- Beverage Shots
Any Target

We are a strategic partner and valued consultant at every phase of the product development cycle, offering insight through experience and value through efficiencies

- Expertise to meet specific criteria for fortification while addressing key issues of flavor, texture, bioavailability, cost, shelf-life, marketability and more
- Develop specific premixes to help differentiate your product on store shelves and connect with consumers
- Our innovation centers and R&D resources offer the ability to streamline your product development time to get your product to market faster without compromising quality
- Reduce testing, purchasing, inventory, labor, and equipment costs
- Design innovative premixes to target specific health conditions, lifestyles, specific consumer groups or age demographics.
Anywhere in the World

The only business with a growing global footprint with state-of-the-art facilities dedicated to custom nutrient premixes

- Twelve state-of-the-art facilities on four continents means distribution to any country in the world

- All business units deliver manufacturing, R&D, laboratory and administrative capabilities

- Six strategically located nutrition innovation centers designed to bring insights and streamline the product development process
Examples of forward solutions

US: Power caps

Brazil: Macroblends & Canning

New Zealand: Nutritionals & dairy powder blends

South Africa: Tablets
Combining innovation and business model = growth
Successful Brands = Pillars of Growth

**#1 Probiotic in US.** Offers a full line of Digestive, Kids and Health & Wellness Products

- U.S. $ Share: 14.5%
- Recent sales growth: >10%
- U.S. Brand Rank: #1

**Leader in Menopause Category** with a full range of products that offer multiple symptom benefits

- U.S. $ Share: 55.5%
- Recent sales growth: >10%
- U.S. Brand Rank: #1 & #2

**Leader in Women’s Health** with a full line of Pain Relief, Diagnostic and Preventative products

- U.S. $ Share: 35.8%
- Recent sales growth: >10%
- U.S. Brand Rank: #1

Source: Nielsen data
Unique nutrition franchise set for driving growth

- Broadest range of active nutritional ingredients
- Fully leveraged across the value chain
- Global premix network, moving into complete solutions
- Innovation partner of choice for the dietary supplement, food & beverage and infant nutrition segments
- Regional innovation centers providing differentiation and customer solutions
- Leading industry coalitions to address challenges and create category growth with consumers
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DSM Food Specialties

- Leading positions in food enzymes, yeast extracts, cultures and food preservation products
- Over 1500 employees worldwide

- Manufacturing locations in Europe, North America, Asia, Australia
- Local production and blending
- R&D Centre's in Netherlands, US, China
- Local application facilities
The food industry is core to DSM

Positioned in a very attractive segment

- Specialized end markets
- Knowledge intensive
- Application driven
- Differentiation and innovation in food led by ingredients suppliers
- High entry barriers in bio-ingredients market
Megatrends drive growth at DSM Food Specialties

- Increasing raw material prices
- Need for increased sustainability of solutions
- Substitution of chemicals
- Higher energy cost
- Urbanization in high growth regions
- Increased food prices and growing demand
DSM Food Specialties has a broad technology range

In house bio-processes
- Fermentation processes
  - Anti-infectives
  - Several vitamins
  - Enzymes for Food, Feed
  - Enzymes for Pharma
  - Cultures
- Biocatalysis
  - Vitamins
  - Semi-synthetic antibiotics
  - APIs and building blocks
- Biopharmaceuticals

Bio-based market positions
- Enzymes
- Cultures
- Yeast extracts
- Pharma
- Biologics

Development
- Advanced bioenergy
- Bio chemicals
- Renewable raw materials for polymers
DSM Food Specialties offer unique solutions

Key segments for DSM
- Dairy, Baking, Beverages, Oil-degumming, Soups and Sauces

Improve products
- Enhance taste
- Improve look, texture and quality
- Prolong shelf-life
- Healthier products

Facilitate production
- Speed up reaction
- Require less raw materials
- Reduce waste and energy consumption
- Save cost in a sustainable way
Enzymes are specific and predictable proteins

Sustainable solutions with low energy use

- Enzymes exist in nature (building blocks for life), or can be synthesized
- Proteins, natural biocatalysts for all biological reactions
- Speed up chemical reactions (up to millions of times faster)
- Small amounts are able to convert enormous amounts of matter
- Active at mild conditions in contrast to many chemical processes

An enzyme is a large protein (schematic picture)
Cultures are live bacteria used in food

- Use of cultures has a very long history

- To initiate fermentation processes needed for production of fermented dairy and meat products

- Cultures substantially contribute to making food products tastier, healthier, safer and more convenient

- Have significant impact on the quality of end product

- Key success factors
  - Mastering sophisticated manufacturing requirements
  - In-depth understanding microbial technology
  - Economies of scale
  - Customer application insights
Fast growing market in enzymes and cultures

2013 Global Cultures market € 1.0bn, CAGR 6%

- Dairy
- Meat
- Wine
- Others

Market drivers
- Healthy dairy products
- Globalization/fast industrialization of fermented milk products
- Ongoing expansion to new application areas

2013 Global Enzymes market € 2.7bn, CAGR ~5%

- Food & Beverages
- Household cleaning
- Feed
- Bio ethanol
- Others

Market drivers
- Need for natural sustainable solutions
- Increasing raw material prices
- Increasing demand for processed food
- Demand for cellulosic ethanol

Europe/North America are leading markets, fastest growth in High Growth Economies
Broad enzyme portfolio

- Driving market expansion
- Product range extension beyond traditional bread
- Broadest dairy ingredients portfolio
- Global leader in lactase solution
- Best-selling breakthrough innovations in beer stabilization
- Pioneering enzymatic oil de-gumming
... with the best selling products in its segment

- **Panamore®**
  - Cost efficiency,
  - emulsifier replacement,
  - longer shelf life

- **Maxilact®**
  - The leading lactose solution, improved digestibility, clean taste, sweetness without calories

- **Brewers Clarex®**
  - Prime solution for de-hazing, barley brewing, reduced energy usage

- **Purifine®**
  - Reduction in chemical use, yield increase, decreased water usage, improved oil quality & stability
Majority of industry revenue covered by patents

Knowledge intensity anchored with IP and long term experience

Very intensive patent activities on
- Molecules,
- Manufacturing processes,
- Applications

- Typically >10% of revenues invested in R&D

Vast majority of DSM products and technologies are covered by IP

- In recent years, number of patent filings has increased strongly
- Strong position in application patents
- Recent acquisitions have extended IP position further

Total industry: ~40 000 published patents related to Food & Beverage enzymes
Innovation at DFS

Over 400 of our scientist are committed each day to find new science-based innovations, building on more than a hundred years’ experience in enzyme and fermentation technology.

### Consumer needs
- Taste
- Convenience
- Health & Vitality
- Food Safety
- Natural
- Sustainability

### Innovation program
- Bio-based solutions for prolonged shelf life
- Bio-based solutions for natural taste enhancement
- New enzymes for sustainable process improvement & conversion of bio-based raw materials
Full capabilities throughout the development

Biotechnology expertise combined in DSM biotech Center

- **Biochemistry & Application & formulation**
  from product to application, QA/QC

- **Down Stream Processing**
  from raw to refined product

- **Fermentation**
  from sugar to raw product

- **Genetics**
  from genes to strain

- **Analysis, BioIT and Modeling**
  Identification & quantification
Outstanding abilities to scale up new products

Controlled development and scale up

- Through own proprietary versatile expression system (PlugBug™)
- Maximizing research & production efficiency by limiting the number of well known production micro-organisms
- Full IP positions on genome sequence (e.g. Aspergillus niger)

DSM’s proprietary PlugBug™ Concept

Slide 15
Unmatched position in yeast/fermentation technology

- Platform development for bio-based chemicals (e.g. bio-succinic acid)
- Yeast development towards alternative raw materials (e.g. C5/C6 yeast for cellulosic ethanol)
- Cost effective enzyme manufacturing at commercial scale (e.g. lactase, chymosin)
- Yeast based taste enhancers (e.g. natural/authentic)
- Very broad and deep knowledge, More than 100 years development in yeast
- World class position in yeast strain development and fermentation technology
How we help our customers
Application specialists at work

- Dedicated application specialists and sensory experts
- Regional application labs China, the Netherlands, USA
- Food Innovation Center
- Laboratory, kitchen & sensory analysis facilities
- Pilot plant applications
Our global production assets

- **German Town**: Direct set culture production
- **Seclin**: Enzyme production
- **Delft**: Research & Development Application
- **Waukesha**: Lipase production Development & application
- **La Ferté**: Surface & ripening culture production Development & application
- **South Bend**: Standardization of enzymes
- **Moorebank**: Direct set culture production
Our innovative solutions
Maxilact®

The freedom to enjoy dairy

Lactose free is one of the fastest growing segments in dairy, driven by increasing awareness of lactose intolerance and health & wellness trend.

Maxilact® breaks down lactose in dairy products, making them suitable for lactose intolerant consumers.

DSM was the first company to commercialize lactase and has been innovating ever since to meet today’s and tomorrow’s lactase needs.
In the mozzarella production there are a range of factors in process efficiency, production quality and application functionality and look and feel that are crucial to address for cheese producers.

Maxiren XDS plays on three key factors:
- extend product shelf-life
- Maintain functionality
- Reduce losses for shredding partners
Squeezing the best out of fruit juice & more

- Increased extraction yield
- Citrus juicy bits pulp retention
- Protein plus & Probiotic plus juices
- Improved filtration
- De-pectinization
- Prevent haze formation in concentrates
- Color retention (browning prevention)
- Color extraction
- Antioxidant extraction
- Viscosity reduction
- Waste valorisation
- More sustainable production process
- Sugar inversion : prevention of crystalization
- Lower caloric juices
Enzymatic oil de-gumming increases yield

High performance enzymatic food solution

- Treatment of crop based oil (palm, soyabean, rapeseed etc.) into mainly eatable oils and biodiesel

- Alternative is chemical de-gumming

- Enzymatic process gives higher yield (3-4%) through better separation and inclusion of the gums (phospholipids) in the oil

Increased yields with Purifine®
Brewers Clarex®
Acrylamide is formed during high temperature food processing.

PreventASe® is suitable in a wide variety of food applications where acrylamide levels could give rise to concerns (such as baked goods, snacks and biscuits).
Multirome®

Do more with less
We make it happen

Rich complex taste
No yeasty aroma

Umami impact and lingering effect

Low cost in use - 1/3 of basic YE

Sustainable - 81% lower carbon footprint than basic YE
DSM’s Savory profile

- Leading supplier of yeast extract based taste components to the culinary industry
- Complete culinary market
  - Soups, ready to eat meals, sauces and snacks
- Natural solutions for every taste direction
  - Standard Yeast Extracts, Process Flavors & High nucleotide Yeast Extracts
- Building taste: unique block-by-block approach
- Salt reduction
DSM’s food & crop protection profile

- Innovative food preservation and packaging solutions that provide improved protection

RETAIN

- color
- taste
- flavor

FIGHT

- bacteria
- molds
- yeasts
Delvo®Cid+ is a natural preservation solution preventing yeast and mold growth in food and beverages.

Improved taste, shelf life, safety with a natural ingredient.
Zivion™ M is a unique bio-fungicide that prevents dry bubble disease in mushroom production. It helps farmers increase yields and maximize profitability in a highly competitive industry.
Package™ natural cheese ripening

Market challenge

- Coating
  - ✓ Moisture loss
  - ✓ Rind /crust forming

- Film ripening
  - ✓ Flat taste

Naturally ripened with Package™

- Yield - Reduced moisture loss & no cutting loss
- Sustainability - reduced carbon footprint
- No dry outer layer
- No quality deviation from natural ripened cheese with coating
DSM’s fermentative Stevia

**Health**

Stevia, non-artificial, high intensity sweetener - answer to consumer demand for a non-artificially derived sweet taste without the calories.

**Sustainability**

DSM helps the food industry with better tasting stevia extracts that are affordable and sustainable.

**Quality**

A consistent supply of steviol glycosides at large quantities with a fully controlled supply chain.

The next big innovation to come
Advantages of making Stevia by fermentation

- Fermentative stevia is the same product as plant-extracted stevia only higher purity and better taste.
- DSM produces it using its fermentation expertise thus solving today’s constraints for stevia

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Stevia today</th>
<th>DSM ‘s fermentative Stevia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>Higher cost in use</td>
<td>Lower cost in use</td>
</tr>
<tr>
<td>Supply Chain</td>
<td>Complex &amp; difficult to quality control, long forecasting cycles</td>
<td>Consistent, scalable and simplified B2B supply chain from DSM</td>
</tr>
<tr>
<td>Taste</td>
<td>Cannot isolate best molecules in high quantities</td>
<td>Production of best tasting molecules (Reb A, Reb-D)</td>
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Wrap up

- Megatrends support need for tailored biotech solutions that are offered by DSM’s Food Specialties business
- The markets are fast growing and has high entry barriers
- DSM Food Specialties has a strong position in the food market through:
  - very strong track record
  - broad combination of solutions for our customer needs
  - IP position and unique technologies
  - application insights and customer intimacy
  - strong innovation pipeline
- DSM Food Specialties expects further profitable growth through continued market penetration, innovation and geographical expansion
DSM Food Specialties movie
BRIGHT SCIENCE. BRIGHTER LIVING.™
Nutritional Lipids

Gertjan de Koning, VP Nutritional Lipids

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Important to ‘re-balance’

Hunter/Gatherer

Agriculture

1900
initial industrialized food system

1970
completely industrialized food system = complete imbalance

Ω3

Ω6
Overwhelming scientific evidence

OMEGA-3
SCIENTIFIC PAPERS

1979  2013

MEDIA STORIES
INTAKE
RECOMMENDATIONS

16,000
1,650
34

25,000
Estimated average daily intake Omega-3

Zone of Consensus for Nutritional Intake Recommendations

mg/day

Estimated average daily intake Omega-3

Bulgaria
China
Romania
Hungary
Columbia
Brazil
Argentina
Poland
South Africa
Czech
Republic
Austria
Germany
Ireland
Italy
Switzerland
UK
USA
Greece
Australia
Israel
Russia
France
Denmark
Sweden
Chile
UAE
Canada
New Zealand
Jamaica
Spain
Portugal
Korea
Finland
Norway
Malaysia
Japan
Iceland
Global Omega-3 Market

2013 Global Omega-3 Ingredient Revenues by Source

- Flax Oil
- Fish Oil
- Other Marine Oils (including Krill, Mussel, Squid)
- Algal Oil

2013 Global Omega-3 Ingredient Revenues by Application

- Dietary Supplements Standard
- Dietary Supplements Concentrates
- Active Pharmaceutical Ingredient
- Food & Beverage
- Infant Formula & Growing-Up Milks
DSM world leader in Nutritional Lipids

- Combination of Martek (leader in algae-based and infant formula segment) and ONC (leader in fish-oil based and dietary supplements segment) created a strong leader in nutritional lipids

- Strong synergies with the ‘existing’ DSM activities:
  - From US-centered to truly global reach: from maturing US-market to emerging growth markets
  - Synergistic health benefits with other DSM nutritional ingredients
  - Access to global Food & Beverage infrastructure and customer base
  - Excellent fit with DSM’s trusted
Our Playbook: Complete Customer Solutions

Health Benefit
- Heart & Overall Wellness
- Brain & Eye
- Brain & Eye

Source
- Vegetarian
- Fish
- Kosher, Halal

Forms
- Concentrates, Standard Oils
- Powder, Liquid, Emulsion

Cost in Use/Dosing
- EPA/DHA
- High DHA
- Varying concentrations

MEG-3
- Life's

Drug
- DHA

Combinations
- TG’s, EE’s
- Kosher, Halal
Differentiation through sourcing

- DSM can source crude fish oil that is aqua feed grade
- DSM can source crude fish oil from other regions than Peru/Chile
Differentiation through production technology

**DSM Confident in a Healthy Future for the Omega-3 Market**

*DSM’s decision to invest $30 million in its omega-3 production facility in Nova Scotia demonstrates market leadership and confidence in the long-term potential of this market, as well as commitment to the community.*
Differentiation through product innovation

Dare to Differentiate
Omega-3 concentrate, from algae

life’sOMEGA™ 60
Introducing high potency algal DHA and EPA

DSM.com/Omega-3  Visit Booth 23024
Years of strong market growth reversed as of 2013

- The US fish oil based Omega 3 market was impacted by increased fish oil costs, leading to sharp increases of retail prices.
- This, combined with multiple negative media events lead to a volume decline of 10% in 2013.
So what can we do about the decline?

We are not the first industry to face this situation, others have successfully reversed declines due to negative media attention.
DSM initiated an industry coalition

- Call for action started February supported by convincing DSM commitment
- Teamed up with industry association GOED as ‘neutral’ party
- Now over 30 members and growing, with well-functioning structure
- Working with specialists agencies coordinated by industry team
- Selected target group and campaign theme based on consumer research
- Campaign designed and roll-out in full swing
Digital campaign

- Completed in June
- Touched 20 million consumers
- Important insights on what messages resonate

↓

- Multi-media execution starts mid September and runs for 6 weeks in test market
- National roll-out using learnings from test market
Target Audience

Adults Ages 45 - 64

AWARENESS

Print

Outdoor

Digital

Television

POS

Sponsorships / PR

SALES

Walmart TV

ENGAGEMENT

Website

Facebook

Facebook
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Human milk represents the nutritional gold standard for infant nutrition and DSM strongly supports and follows the WHO recommendation that infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and long-term health. Thereafter, older infants and young children should receive nutritionally adequate and safe complementary foods, while continuing to breastfeed for up to two years or more. DSM believes that breastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants and is also an integral part of the reproductive process with important implications for the health of mothers. For many reasons, however, not every infant will be fed breast milk exclusively for 6 months. Indeed, some mothers choose not to breastfeed; some mothers may breastfeed only part of the time and a small percentage perhaps cannot breastfeed their babies. Infant formula, although it can never equal breast milk, is formulated in an attempt to ensure that the most nutritionally complete substitute possible is made available for babies who are not breastfed. Breast milk should be the nutritional gold standard by which formula milk should be assessed. The industry’s goal over the years has been to continually improve the quality and safety of infant formula. We believe that components like DHA and ARA, as well as other infant nutrition innovations, help achieve this goal.

Infant Nutrition (INF) Industry Fundamentals

- For today’s discussion, INF refers to infant formula products for babies aged 0 -12 months
  - Growing demand for INF line extensions in toddler/children’s products
- Growth drivers of the INF market
  - Global economic prosperity
  - Population trends
- The industry has grown ~5% CAGR in recent years
  - Focus on China and emerging markets for growth
- Premium and super-premium products, containing optional ingredients, have outperformed standard products
  - These are key segments for DHA/ARA and other optional ingredients
- Quality and regulatory standards continue to become more stringent and impactful
Global Infant Nutrition Market

**INF Volume by Region**

- EMEA: 30%
- APAC: 22%
- North America: 12%
- Latin America: 7%
- China: 29%

**INF Manufacturers by Volume**

- Nestle: 20%
- Danone: 14%
- Mead Johnson: 13%
- Abbott: 9%
- Beingmate: 3%
- Mengniu: 2%
- Perrigo: 1%
- Others: 38%

- Top 15 countries >70% of global volume
- US and China ~40% of global volume
- Top 20 companies >75% of global volume
- Top 4 companies ~50% of global volume

Source: Euromonitor, 2014

0-12 month infant formulas
DHA and ARA Primer

Docosahexaenoic Acid (DHA) 22:6 n3
- Important component of all cell membranes
  - Abundant in neural, retinal and cardiovascular conducting tissue
- Important in infant development and maintains cardiovascular, visual and neural function throughout the lifespan
- Crosses the placenta as a key nutrient for the fetus preferentially compared to other fatty acids
- Always found in human milk

Arachidonic Acid (ARA) 20:4 n6
- Essential for growth
- Precursor of immune regulators and cell regulation molecules
- Crosses the placenta as a key nutrient for the fetus
- Always found in human milk
Clinical Rationale for DHA/ARA in INF

- DHA/ARA, naturally found in breast milk, are found in great concentrations in the brain and eyes

- Infants have a limited capacity to synthesize DHA and ARA. Supplementation achieves tissue levels that are necessary to support health and development and thus complements breastfeeding

- Early research success led to comprehensive clinical trials which demonstrated improved cognitive and visual development

- Studies continue to support the importance of DHA/ARA in infant health and development

- DHA and ARA must be provided together to achieve optimal benefits
Commercial History of DHA/ARA in INF

- The core nutritional content of infant formula is highly regulated
  - Infants and young children have specific nutritional needs, which vary depending on their age and phase of development. As infants are a particularly vulnerable group, it is essential that foods for infants are governed by strictest standards and that these standards are subject to regular evidence-based review
  - The addition of optional ingredients which provide a definitive clinical benefit are important differentials; DHA/ARA being good examples
  - Consumer demand for the developmental benefits of DHA/ARA supports their continued addition to an increasing percentage of infant formulas globally

- DSM was the early champion of the clinical benefits of DHA/ARA
  - DSM initiated and supported much of the early research in this area, and continues to be active in both pre-clinical and clinical research focused and DHA and/or ARA benefits
  - DSM developed and maintains a significant global patent portfolio which covers the production and composition of both *life’s*DHA and *life’s*ARA
  - DSM’s IP, combined with over 20 years of excellent quality and service, has positioned DSM as the market-leader for DHA/ARA for use in infant formula

- DHA/ARA supplemented infant formulas are now highly penetrated in many key markets, but incremental growth opportunities remain
  - Growth will be driven by population trends, socioeconomic development, further premiumization of the segment, and greater penetration into developing INF markets
Robust Microbial DHA & ARA Patent Portfolio

- DSM’s has an extensive microbial ARA and DHA patent portfolio.

  - This includes patents directed to, among other things, ARA and DHA oil composition as well as processes for making those oils

  - The existing portfolio will provide a competitive advantage to DSM’s INF business through 2023-2030

  - DSM continues research and development in the field of microbial oils, and files new patents accordingly
Recent Events Impacting DSM INF Business

- Highly publicized infant formula recalls in 2013 due to the botulism scare have adversely impacted some customers supplying to the Chinese and APAC INF markets.
- Implementation of new China regulations/audits may have caused short-term disruption to multinationals; some small INF companies have not yet had import licenses renewed.
- Growth expectations for the Chinese INF market have been reduced to a lower level than in the past few years. This has led to industry-wide destocking.

Key DHA/ARA customer global sales growth from public filings. Sales for customers infant segment, pediatric nutrition segment or nutrition segment as available.
Why Customers Choose and Stay with DSM for Infant Nutrition Ingredients

- Global leadership
- Safety & Quality
- Traceability
- Portfolio Breadth
- Global Service & Support
  - Technical, Quality & Product Formulation
  - Marketing and PR
  - Public Affairs & Regulatory Expertise
  - Innovation and New Product Development
- Security of Supply
- Sustainability

Customers know that DSM is a partner and solution provider, not just a supplier
Global Leadership with life’sDHA & life’sARA

- High quality, consistent, vegetarian sources of DHA & ARA
- Safety - made in the U.S. in FDA inspected cGMP facilities
  - >110 million babies raised on life’sDHA and/or life’sARA with no adverse events
- Sustainable source of DHA and ARA
- Over 20 years of proven supply and service history as the market leader
Full Portfolio for Infant Nutrition

Nutritional Lipids
- life's DHA
- life's ARA
- MEG-3

Custom Nutrient Premixes
- fortitech premixes

Vitamins
- Wide range of Fat-soluble and Water-soluble Vitamins in various forms
- Quali-C, Quali-E

Carotenoids
- Caro Care
- FloraGLO
- Optisharp

Uniquely positioned in three main steps of the value chain: the production of pure active ingredients, their incorporation into sophisticated forms, and the provision of tailored premixes.
### Innovative & Science-based Solutions

<table>
<thead>
<tr>
<th>Growth &amp; Development</th>
<th>Brain Development</th>
<th>Immunity</th>
<th>Healthy Bones</th>
<th>Eye Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamins and minerals support energy metabolism, while nucleotides support the growth and repair of body tissue.</td>
<td>Vitamins, minerals, trace elements and long-chain polyunsaturated fatty acids (LC-PUFAs) are essential for neurological development.</td>
<td>To combat infection, we supply a range of micronutrients that support the body’s immune response.</td>
<td>Calcium and vitamins B6, C, D and K help to build and maintain adequate bone mass during early childhood.</td>
<td>Carotenoids, which are present in breast milk, help to protect the retina from oxidative damage. Lutein, DHA and ARA are essential for maintaining eye health.</td>
</tr>
<tr>
<td>- Vitamins</td>
<td>- Vitamins</td>
<td>- Vitamins</td>
<td>- Vitamins</td>
<td>- Vitamins</td>
</tr>
<tr>
<td>- DHA &amp; ARA</td>
<td>- DHA &amp; ARA</td>
<td>- DHA &amp; ARA</td>
<td>- Oat beta-glucan</td>
<td>- DHA &amp; ARA</td>
</tr>
<tr>
<td>- Nucleotides</td>
<td>- Lutein</td>
<td>- Nucleotides</td>
<td>- Lutein</td>
<td>- Lutein</td>
</tr>
<tr>
<td>- Choline</td>
<td>- Choline</td>
<td>- Choline</td>
<td>- Choline</td>
<td>- Choline</td>
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<tr>
<td>- Taurine</td>
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<td>- Taurine</td>
<td>- Taurine</td>
</tr>
</tbody>
</table>
Wrap-Up

- The INF industry will continue to be led by a small number of multinational manufacturers
  - Companies with which DSM has substantial and long-standing relationships
- Life’sDHA and/or life’sARA are currently used by over 100 INF companies
  - DSM is the primary global supplier for most major multinationals
  - Many customers are in multi-year license and supply agreements
  - Products from these companies can be found in over 85 countries
- Despite some near-term challenges in the market, especially the destocking in Asia, the fundamentals of the infant nutrition market remain sound
  - Urbanization, a growing middle class, birth rates and the continued success of premium products support market optimism

DSM is well-positioned to continue as a leading supplier and partner to the INF industry
BRIGHT SCIENCE. BRIGHTER LIVING.™
DSM Engineering Plastics
Richard Pieters, President DSM Engineering Plastics Americas
US Field Trip
September 4, 2014
Safe harbor statement

This presentation may contain forward-looking statements with respect to DSM’s future (financial) performance and position. Such statements are based on current expectations, estimates and projections of DSM and information currently available to the company. DSM cautions readers that such statements involve certain risks and uncertainties that are difficult to predict and therefore it should be understood that many factors can cause actual performance and position to differ materially from these statements. DSM has no obligation to update the statements contained in this presentation, unless required by law.

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
Agenda

- DSM Strategy
- Who are we?
- Growth
- Automotive
- Electronics
- Polymers for Flexible Packaging
- Investments
Performance Materials: differentiated growth strategy

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

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

- **Restructure**
  - Composite resins
  - Dyneema® Life Protection

- DSM Engineering Plastics

- DSM’s capabilities to extract value
  - BG DRF
  - BG DEP
  - BG Dyneema
  - EBAs

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

- Low
  - High

Page 3
Who are we?

- DSM Engineering Plastics (DEP) Americas has 350 employees with 3 manufacturing operations and 1 HQ / Commercial Operations / R&T Centre in the Detroit Area

- Part of Global Engineering Thermoplastics Business Group with footprints in Europe, Asia and the Americas, strong focus on Semi Crystalline products

- Value creator over supply chains starting at OEMs and extending till molders. Add value at every step of the chain

- Proud supplier to serve worlds most prestigious companies on the globe

- Ambitious; expanding in new markets with new (bio) polymers and compounds determined to be the supplier of choice

- Totally committed to sustainability & innovation with new products, in-depth application know-how and R&D investments

Leading supplier of Engineering Thermoplastics
Growth DEP Americas

- Innovation pull new applications in all segments
- Growth: beyond typical 2 times GDP growth
- Automotive - DEP outpaced market by penetrating applications
- Electronics sales in Asia (excluded in numbers) - specification done in North America
- The investment in a new Polyamide 6 polymer plant in the US will support strong position in Food packaging and balanced portfolio

Significant organic growth accelerated by investments
Business Dimensions & Growth

**Markets**
1. Automotive
2. Electronic
3. Film and Extrusion
4. Electrical
5. General Industries

**Products**
1. Akulon/Novamid PA6 (co) polymers
2. Akulon/Novamid PA6 Compounds
3. Stanyl, Stanyl ForTii PA4.6
4. Arnitel, Arnite PET/PBT/TPC
5. EcoPaXX PA4.10

**Regions**
1. DEPEU
2. DEPAP
3. DEPAM

Understand Industry and Segment drivers

Translate drivers to opportunities for our products

Business is executed in the regions
Automotive - Global trends support DSM

- Growing demand of vehicles especially in high growth economies; upgrade of fleets

- Climate change, emission reduction and efficient use of energy is key to OEMs

- Demand for more functionalities and safety features increase the electrification and weight of cars
Overview of key drivers

Market definition:
Powertrain & Air/Turbo Management, Interior, Exterior, Auto E&E, Chassis & Brake System

Key drivers for market growth
- Light Vehicle Growth
- Emission Reduction and Fuel Consumption Legislation
- Safety Legislation
- Consumer quest for more Comfort
- Improved Eco Footprints

Specific growth drivers for DEP
- Metal-to-plastic conversion
- Interpolymer conversion (downsizing: PA6 to HPM; LCA: biobased plastics)

Strong growth opportunity for DEP

Global light vehicle sales forecast
Outlook remains optimistic for auto industry

- 83 million sales in 2013 (+4.5%); over 86 million in 2014 (+2.5%)
- Global light vehicle sales to reach 100 million by 2019

Total sales 2006-13:
577 million vehicles
Total sales 2014-21:
772 million vehicles
Main differentiators in automotive

- Long historical relationships at engineering, purchasing and managerial levels at many locations of the top-5 Tier-1s
- Proven track record over 15 years, approved in 350 commercial parts worldwide
- Global grades, global specs, local supply and agile global network
Cars*: lighter, more powerful and safer

Cars became fatter due to additional features and increase of safety standards

Cars became smaller due to light-weighting driven by fuel economy

Cars became more powerful due to increase of use of turbo’s

Weight development (kg):

<table>
<thead>
<tr>
<th>Year</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>805</td>
</tr>
<tr>
<td>1983</td>
<td>985</td>
</tr>
<tr>
<td>1991</td>
<td>1,380</td>
</tr>
<tr>
<td>1997</td>
<td>1,477</td>
</tr>
<tr>
<td>2003</td>
<td>1,590</td>
</tr>
<tr>
<td>2008</td>
<td>1,399</td>
</tr>
<tr>
<td>2013</td>
<td>1,105</td>
</tr>
</tbody>
</table>

Engine power development (kg):

<table>
<thead>
<tr>
<th>Model</th>
<th>Engine Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golf I</td>
<td>37</td>
</tr>
<tr>
<td>Golf II</td>
<td>40</td>
</tr>
<tr>
<td>Golf III</td>
<td>40</td>
</tr>
<tr>
<td>Golf IV</td>
<td>55</td>
</tr>
<tr>
<td>Golf V</td>
<td>55</td>
</tr>
<tr>
<td>Golf VI</td>
<td>59</td>
</tr>
<tr>
<td>Golf VII</td>
<td>63</td>
</tr>
</tbody>
</table>

1 Maximum curb weight
2 Engine power of the smallest model

SOURCE: VW

* Medium Compact Example
**Tightening of CO₂ regulation**

**CO₂ requirement in different regions**

![Graph showing CO₂ requirement over time in different regions]

**More stringent in future:**

- **2020:** CO₂ to 95 g/km in Europe
- **2025:** New WLTP test standard
  - Will boost metal-to-plastic conversion further

**Major driver for weight reduction, leading to technology shifts and inter-material substitution**

*Source: Argon National Lab*
Differentiation driven by application know-how
With OEMs and Tier 1-system suppliers

Industry Definition
Automotive Industry includes Passenger Car and Light Trucks, produced globally

Development time and cycle time
Developments typically done with OEM or Tier 1 and require 2-4 years, after which ongoing sales to Tiers 1, 2, 3 for 3-8 years, with next generation specification likely for incumbent suppliers

Value chain

<table>
<thead>
<tr>
<th>DSM Engineering Plastics</th>
<th>Part producer / molder</th>
<th>System supplier</th>
<th>OEM</th>
</tr>
</thead>
</table>

Key success factors

- Leadership position, global footprint, design expertise, differentiated products
- Low cost operation, quality consistency, areas of specialization
- Leadership position, cost efficiency, innovative system design, global footprint
- Economy of scale, cost efficiency, local legislation requirements, capture emerging market growth

Key trends

- Footprint globalization, metal replacement (high strength/ stiffness and high T)
- New processing technologies (ATC, multi material, thin wall, high precision, etc.)
- Consolidation, increasing design authority, driving system innovation to OEM
- Weight reduction, powertrain efficiency, driver comfort & safety improvements
**Example Safety Systems: 10% CAGR growth**

**Market definition:**
Housing of the airbag for frontal airbags (driver side, passenger side and knee airbags)

**Key drivers for market growth (x% CAGR)**

<table>
<thead>
<tr>
<th>Key drivers for market growth</th>
<th>(4%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth car production</td>
<td></td>
</tr>
<tr>
<td>Increased use of airbags</td>
<td></td>
</tr>
<tr>
<td>Additional airbags (knee airbag, side curtain airbag)</td>
<td>(1%)</td>
</tr>
</tbody>
</table>

**Specific growth drivers for DEP**

| Metal replacement | (5%) |
| Material supplier consolidation (favoring strong established global players) |

**Substitution trends**

| Metal to plastic |
| Higher Heat resistant plastics |
| Higher Impact/Stiffness mat |
| Lighter Materials |

Driven by increase of safety standards and metal to plastic substitution
Established leadership: Akulon PA6 Airbag housing

Airbag in in Akulon PA6, reducing weight with 20-50% (metal replacement)

Safety systems need to be predictable, reliable and 100% dependable

Extreme proven track record, used in over 120 million vehicles
Reduces weight, cost and CO₂ emission
Electronics - Global trends

Connectivity with faster data transfer and cloud computing

Quest for greater functionality and performance - miniaturization

Reduction of the environmental impact on e-waste - less hazardous circumstances
New developments providing growth opportunities

Key drivers for market growth

- Cloud computing
- Increased focus on sustainability
- Increased mobility
- Broader penetration of solid state lighting
- Design, Ease of use, Thinnovation
- Massive increase of Smartphone
- High data rates, content explosion
- Decrease of desktop demand

Specific growth drivers for DEP

- Miniaturization
- Thinnovation
- More data transfer
- More sustainability
- Higher data rates
- Smaller and less connectors/application

Substitution trends

- Interpolymer conversion (more data transfer: PA66/PBT to HPM; halogen-free)
- PA replacement by Polyesters due to higher speed

Overall plastic demand is increasing due to mobile and server applications; Desktop market is shrinking.
Main differentiators for DSM in electronics

| Strong application and CAE design support to speed up time to market for our customers |
| Proven track record over 20 years at all connector manufacturers, ODMs as system providers and OEMs across the world |
| Demonstrated capability to solve failure issues in the validation phase via design, tooling or material advice in every region of interest |
| Strong reputation as innovation leader, enabling improved designs for our customers |
Electronics is an industry with fast cycle times

**Development time and cycle time**
Driven by OEM, ODMs and Tier 1s, cycles are 6-12 months, product live times differ by segment, less than a year for a smartphone, up to 10 years and above for a server or washing machine.

<table>
<thead>
<tr>
<th>Value chain</th>
<th>Engineering Plastics Suppliers</th>
<th>Part Producers (Molders, Connector or Cable Assembly)</th>
<th>System Supplier</th>
<th>OEM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key success factors</strong></td>
<td>Customer intimacy &amp; relation, speed, application expertise, product innovation and performance, sustainability</td>
<td>Total cost, quality, reliability, flexibility, innovation</td>
<td>Total cost, innovation, flexibility, quality, reliability</td>
<td>Design, performance, reliability, brand, innovation</td>
</tr>
<tr>
<td><strong>Key trends</strong></td>
<td>Flow, performance, eco footprint, halogen free, electrical parameters relevant for high speed and product safety</td>
<td>New processing technologies (e.g. ceramic painting, thin wall molding, Silver printing,..)</td>
<td>Own branding, innovation leadership, consolidation</td>
<td>Appearance and design, high speed, wireless, miniaturization, power reduction, recycling, footprint</td>
</tr>
</tbody>
</table>
Fast upcoming technology: Cloud Computing
Servers driven by cloud computing

Global - Electronics - PMC Servers

Key drivers for market growth (x% CAGR)

- Growth of Cloud computing (20%)
- Strong growth of data content by facebook, google, Amazon, SAP, Microsoft, Youtube,.. (>100%/y)
- Growth server production (4.3%)

Specific growth drivers for DEP

- Explosive growth of server memory
- Worldwide server farms consumer 30b watts energy
- 88-92% of this energy is lost in standby
- Power reduction drives advanced designs with high flow, low warpage & reflow

Substitution trends

- Interpolymer (LCP to HTPA), halogen containing to halogen free, low flow to high flow
Server farms consume more power than most cities

Worldwide, server farms use about 30 billion watts of electricity per year.

Yearly electricity demand equals the output of 30 nuclear plants.

In Silicon Valley, many data centers appear on the state government’s Toxic Air Contaminant Inventory.

Only 6-12% of this electricity is used for computation, the rest is used to keep servers idling.

Data centers in the United States account for one-quarter to one-third of that load.

Reducing power consumption is a clear need in developing the next generation servers.

Proven solutions for next generation DDR4 housing

Stanyl®ForTii™ and Stanyl®

Stanyl®ForTii™ and Stanyl® are the only halogen free, high temperature polyamides that supports customers in meeting stringent requirements of reflow soldering.
## Trends support business opportunities DEP

### Overall trends in electronics

- **Market trends**
  - Cloud Computing
  - Increased mobility
  - Connected Home and Cars
  - High data rates, content explosion
  - Digital Health
  - Green Design

- **Technological trends**
  - Further Integration and Miniaturization
  - Further roll out of lead free
  - Low temp soldering
  - Optical vs Cu interconnects
  - Vapor phase soldering
  - Power/Energy reduction
  - Wireless
  - 3D ICs

### Impact on Existing Segments

**Connectors**
- Low warpage, high flow & mechanics
- Less plastics, halogen free, $\varepsilon_r, \tan \delta$
- Less desktops, more servers & mobile
- Reflow soldering, standardization

**Wires and Cables**
- PVC alternatives halogen free
- Wireless & integration replaces cables
- Power reduction reduces cable weight

**Lighting**
- Growth of (O)LEDs
- Ongoing cost pressure
- Big changes in supply chain landscape

### Impact on Potential New Segments

- Growth of Antennas
- Replacement of PC/ABS in Enclosures
- Material solutions for wearables
- Plastics substrates for flexible displays
Global trends in flexible food packaging

- Global population growth and lifestyle change lead to increased consumption of processed and prepared food.

- Industry looks for smart packaging which contribute to reduced food waste by extending the shelf life.

- Need to reduce environmental impact of packaging via recycling and bio-based solutions.
Better barrier & breathable properties and multi-layer

**Market trends**

- **Reduce food waste**
  - From land to retail
  - Shelf life improvement
  - Consumer awareness

- **Shelf life extension**
  Smart packaging solutions for shelf life extension; Shelf life sensors

- **Demographic changes**
  - Convenience food
  - Smaller household size
  - Lifestyle on the go

- **Sustainability & Regulations**
  - Recycle/Green material
  - Tax Brand owner’s waste

- **Pouch Packaging & Fresh produce protection**
  - Packaging for ready to cook/eat concepts\(^1\);
  - Replacement of cans and bottles\(^2\)

- **Increasing regulations**
  - On packaging waste reductions, recycling, and lower CO\(_2\) footprint

**Technology trends**

- **Better Barrier & breathable**
  - Oxygen barrier, breathable solution; better puncture resistance, moist/fog control

- **Multi-layer structures**
  - Multi layer/functional concepts for e.g. re-closable, retorting, ready-to-cook

- **Recyclability**
  - New performance materials driven by monolayer film concept; Alu. replacement

**In favor of PA growth**

- 1 these are mainly the fresh concepts
- 2 is in favor of PA, the pouch growth
Longer shelf life with oxygen barrier (Akulon®/Novamid™)

The oxygen barrier film for food packaging slows down the oxidation process and helps to prevent microbial infection.
Cut foot waste with multi-layer film (Akulon®/Novamid™)

The barrier film is puncture resistant which prevents the package from damage.
Higher value & lower eco-impact with Arnitel® Eco

“Thanks to environmentally friendly Arnitel Eco our panliners not only help to improve food quality and yield, they also prevent food from baking or burning to the pot or pan, thus saving cooking and clean-up time, and leaving no food residue or waste.”

Michael Schmal
President M&Q Packaging Corporation

A bio-based material with up to 50% reduction in carbon footprint
From one extreme to the other with Arnitel® Eco

A bio-based material with excellent performance from -40°C to +205°C, therefore equally ideal for shock freezing and for the oven
### Industry Definition
Flexible food packaging includes films and pouches for consumer food packaging. 80% is used for food packaging and 20% for industrial/medical packaging.

### Development time and cycle time
Developments are mainly initiated by retailers & brand owners. Converters/film producers are their main innovation/development partners. All raw material suppliers initiated programs to understand the packaging needs across the whole value chain.

### Value chain

<table>
<thead>
<tr>
<th>Value chain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEP</strong></td>
</tr>
<tr>
<td><strong>Converter/film producer</strong></td>
</tr>
<tr>
<td><strong>Brand owners</strong></td>
</tr>
<tr>
<td><strong>Retailers</strong></td>
</tr>
</tbody>
</table>

#### Key success factors
- **DEP**: Leadership position in food packaging, strong R&D capabilities. High service level. Understanding value chain needs
- **Converter/film producer**: Low cost operation, quality consistency, constant drive for innovation to protect margins; strong partnerships with BO and retailers
- **Brand owners**: Drive for innovation, cost efficiency, in depth consumer & retailer understanding, strong brand names supported by A&P
- **Retailers**: Cost, efficiency, volume driven sales, high turnover speed /shelf, strong retailer brand name, loyalty, promotions

#### Key trends
- **DEP**: Demand for innovative high performance food packaging, cost down, more sustainable
- **Converter/film producer**: New processing technologies
- **Brand owners**: More need for faster innovation, sustainability, unpredictable legal implications for food packaging (waste reduction, food & plastic)
- **Retailers**: Strong growth of Private label, growing demand for convenience/fresh food, complex handling, strong growth of online retailing

### Move towards newer generation products needed to protect margins

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Page 30
Market trends and innovation opportunities

Trends in flexible food packaging

Current Trends
- Easy Open
- Fresh Taste with less Food Waste
- Reduce Packaging

Innovation Now & For the Future
- Single Serve
- Microwaveable
- Cook-In
- Longer Shelf Life
- Reduce Food Waste
- Reduce Packaging
Customer collaborative innovations within DSM

**DSM Nutritional Products, DSM Resins & Functional Materials and DSM Engineering Plastics work with Bemis on “next generation” Food Packaging, like the BR retort soup pouch**

- Bemis brings total film manufacturing capability
- DSM brings food knowledge, film additives and film knowledge including printing inks, breathable or barrier polymers, oxygen scavenger technology

**DSM Nutritional Products and DSM Engineering Plastics work with Viskase on “next generation” hot dog casing packages**

- Viskase wants to replace cellulosic casings due to cost & availability
- DSM brings fermented food knowledge & favor additives, film additives and film knowledge with breathable &/or barrier polymers
USAlon; enabling global leadership

Demand PA (volume)

- 33% Europe
- 24% Americas
- 22% China
- 21% Rest of Asia

<table>
<thead>
<tr>
<th>2014 Supply</th>
<th>2016 Supply:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Netherlands</td>
<td>Netherlands</td>
</tr>
<tr>
<td>- China</td>
<td>China</td>
</tr>
<tr>
<td>- Taiwan</td>
<td>Taiwan</td>
</tr>
<tr>
<td></td>
<td><strong>USA (USAlon)</strong></td>
</tr>
</tbody>
</table>

- Akulon PA6 High Viscous are critical building blocks for packaging
- Worldscale plant - shortlist locations
- Global products for extrusion; capability to supply regionally;
- Complimentary with Novamid Acquisition 2010 / Arnitel
- Start Q4 2014 - shipments Q3 2016
Wrap-up

- DSM Engineering Plastics is a high growth company in diverse and attractive markets
- Strong presence in industries with good growth potential due to megatrends
- Global footprint and capabilities established and growing
- Expansion in polymers for flexible packaging will drive growth in Americas
- Investments supported by DSM in recent years enable growth far beyond GDP with differentiated products in several industries
- Innovation in all end markets will support further growth
DSM Resins & Functional Materials

Rob Crowell, President Functional Materials

US Field Trip
September 4, 2014
Safe harbor statement

This presentation may contain forward-looking statements with respect to DSM’s future (financial) performance and position. Such statements are based on current expectations, estimates and projections of DSM and information currently available to the company. DSM cautions readers that such statements involve certain risks and uncertainties that are difficult to predict and therefore it should be understood that many factors can cause actual performance and position to differ materially from these statements. DSM has no obligation to update the statements contained in this presentation, unless required by law.

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

- High Performance Plastics
- Biomedical
- Functional materials
- Dyneema® Fiber Solutions
- Specialty Coating resins
- Powder Coating resins
- Solar
- DSM Resins & Functional Materials

**Market growth**

- >2x GDP
- ~2x GDP
- <2x GDP

**DSM’s capabilities to extract value**

- 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>Market Position</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>
<td></td>
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<tr>
<td>Powder Coating Resins</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>
<td></td>
<td></td>
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<tr>
<td>Stereolithography</td>
<td></td>
<td></td>
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</tbody>
</table>
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

<table>
<thead>
<tr>
<th>DSM global trend</th>
<th>Shift to sustainable coatings systems &amp; materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global shifts</td>
<td>Solvent free Waterborne</td>
</tr>
<tr>
<td>Health and wellness</td>
<td>Bio-based Renewable</td>
</tr>
<tr>
<td>Climate and energy</td>
<td>New applications</td>
</tr>
</tbody>
</table>

#### 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
Global shift to sustainable coatings

Shift to more sustainable coatings

<table>
<thead>
<tr>
<th>Resin Technology</th>
<th>Global annual growth rate (%)</th>
</tr>
</thead>
<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>
</tr>
</tbody>
</table>

Driven by legislation and growing consumer awareness

DSM focus on sustainable coatings

% of supply sustainable coating systems

- UV curing, Powder & Waterborne
- DSM Supply
- Global Supply

2010 2015 2020
Well distributed in regulated markets

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

**Trends**
Increased sustainability awareness, faster and cost effective production of end product

**Application**
Paint for industrial wood coatings (MDF) for furniture (bathroom, office) and kitchen cabinets etc. NO compromises on performance (same or even better)

**Main Features**
Solvent free coating, highly efficient use of paint, low application energy, efficient and cost effective production of end product

- 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 thermosets 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

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**Exploring new business model with 3D Printing**
Wrap-up

• 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.
US Field trip

Exton, Pennsylvania

September 4, 2014
DSM Biomedical

Christophe Dardel, President DSM Biomedical

US Field Trip
September 4, 2014
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Performance Materials: differentiated growth strategy

- **Accelerate**
  - Functional materials
  - Solar
  - Biomedical
  - Dyneema® Fiber
  - Solutions

- **Strengthen**
  - High Performance Plastics
  - PA6 compounds
  - PA6 film & extrusion
  - Specialty Coating resins
  - Powder Coating resins

- **Restructure**
  - Composite resins
  - Dyneema® Life Protection

DSM’s capabilities to extract value

- BG DRF
- BG DEP
- BG Dyneema
- DSM Biomedical

GDP growth categories:
- >2x GDP
- ~2x GDP
- <2x GDP
**What are Biomedical Materials?**

<table>
<thead>
<tr>
<th>Biocompatible material is ...</th>
<th>For example...</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ ...a synthetic or natural material used to replace part of a living system or to function in intimate contact with living tissue</td>
<td>✓ ...artificial hips, vascular stents, artificial pacemakers, and catheters are all medical devices made from different biocompatible materials</td>
</tr>
</tbody>
</table>

✓ ... are classically not made by living organisms but have composition and properties similar to and compatible with those made by living organisms

✓ ...calcium hydroxy-apatite coating found on many artificial hips is used as a bone replacement that allows for easier attachment of the implant to the living bone.

“We propose to consider materials for medical applications within and outside of the human body, both of natural and synthetic origin.”
Our vision

“To be the leading development partner, trusted by the medical industry to shape the future of biomaterials and regenerative medical devices that improve and brighten patients’ lives throughout the world”
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>Start of DSM Dyneema’s medical R&amp;D efforts</td>
</tr>
<tr>
<td>2002</td>
<td>Official launch of Dyneema Purity® orthopedic sutures</td>
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<tr>
<td>2004</td>
<td>Biomedical EBA launched</td>
</tr>
<tr>
<td>2006</td>
<td>PTG Acquisition</td>
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<tr>
<td></td>
<td>First cardiovascular &amp; ophthalmic drug delivery development agreements</td>
</tr>
<tr>
<td></td>
<td>First sales of Dyneema Purity® fiber in cardiovascular and spinal applications</td>
</tr>
<tr>
<td>2008</td>
<td>DSM targets EBA sales in 2020 &gt; €1bn</td>
</tr>
<tr>
<td></td>
<td>Expanded portfolio for ophthalmic applications</td>
</tr>
<tr>
<td>2010</td>
<td>Kensey Nash Acquisition</td>
</tr>
<tr>
<td></td>
<td>US Dyneema Purity® fiber plant</td>
</tr>
<tr>
<td>2012</td>
<td>510(k) clearance from the FDA for PRP Device</td>
</tr>
<tr>
<td>2014</td>
<td>In-house medical coating service plant</td>
</tr>
</tbody>
</table>

**Medical Coatings R&D efforts started in DSM Desotech**

- First sales of Dyneema Purity® fiber for knee ligament fixation
- Start of UH and drug delivery activities
- BMM Public Private Partnership funded by Dutch government

**Biomedical EBA launched**

- Medivas technology acquisition for Drug Delivery
- Bionate® II PCU Antimicrobial Coatings
- Next generation UH product
- VitroStealth® non-biofouling coatings

**PTG Acquisition**

- Actamax DSM-DuPont JV
- HQ move to US

**DSM targets EBA sales in 2020 > €1bn**

- Expanded portfolio for ophthalmic applications

**Kensey Nash Acquisition**

- US Dyneema Purity® fiber plant

**UHMWPE membrane technology**
Responding to today’s trends and challenges

Global sustainability
• Committed to finding effective, sustainable solutions to medical issues facing the world

Active lifestyle
• Helping medical device manufacturers and clinicians meet the challenges in medicine - with biomedical materials that are the industry standard in strength and biostability

Healthcare costs
• Designing innovative biomedical materials that enable medical device manufacturers to make more minimally invasive devices which speed recovery, shorten hospital stays and minimize reoperation

Aging population
• Contributing to treatments that help people lead longer, healthier and more active lives
From repair to healing

Evolution in Medical Devices

Supportive Care
Mechanical Replacement
Natural Materials
Engineered Tissue
Cell Based
2013 Medical Devices Market: ~ USD 180bn*

The material solutions market is estimated at USD 30-50bn with CAGR > 2 times GDP

* Source HRI 2013
Our business model

We provide products and technologies to our customers and strategic partners (medical device and pharmaceutical companies) who utilize their expertise and well established distribution networks in a wide variety of market segments.

Our business growth initiatives are guided by four basic strategies:

1. Invest in our core technologies
2. Develop new proprietary biomedical material products
3. Establish new partnerships and customers
4. Manufacture biomedical materials and products for our customers
**Value chain strategy**

**Strategy:** Capitalize on material technology & capabilities to create/extract more value further down in the *Value Chain* without selling & distributing.

- **Materials**
  - Biomedical materials
- **Device & Assembly**
  - Medical device development
  - Medical device manufacturing / assembly
- **Sales and distribution**
- **Implant surgery**

**Increasing value share**

- **Material** (2-5% Value Share)
- **Component** (5-15% Value Share)
- **Device** (15-30% Value Share)
The clinical segments we serve

- Cardiovascular
- Dental
- Diabetes management
- Diagnostic
- General surgery
- Neurologic
- Ophthalmic
- Orthopedic
- Pain management
- Plastic & Reconstructive surgery
- Sports medicine
- Urinary
- Vascular
- Women’s health

DSM
Bright Science. Brighter Living.
Broadest portfolio of biomedical materials

- **Biomedical Polyurethanes**: Hydrophilic & Non-biofouling
- **Coatings**: Slow, sustained release
- **Drug delivery**: Extracellular Matrices
- **Mechanical Devices**: Innovative devices and tooling
- **Natural Materials**: Ceramics, Minerals & Collagen
- **Polymers & Metals**: PLA, PEEK, Polyurethane & Metal Implants
- **Silicone hydrogels**
- **Biomedical Polyethylenes**

Making medical products longer-lasting, more effective, less invasive and more productive
Our technologies, materials and capabilities

Committed to the long-term improvement of people’s lives through innovation

Work together providing the most advanced and trusted solutions to the medical industry
Synthetic Resorbable Materials

- **Variety of Resorbable Materials**
  - PLA, PGA, Polycarbonates (e.g. TMC), ...
  - Polycaprolactones

- **Multiple Configurations**
  - Proprietary High Strength technology
  - Solid, Porous

- **Composites**
  - Ceramics Combinations
    - B-TCP
    - HA
    - Bioactive Glass
Applications for Synthetic Resorbable Materials

Markets
- CMF
- Trauma
- Sports Medicine
- Dental
- Spine
- Extremities
- Cardiovascular

Applications
- Dental Membranes
- Trauma plates
- Micro Fixation devices: e.g. anchors, pins, screws etc.
- Spinal Fusion devices
- Stents and Shunts
- Meniscus repair device
- Joint applications
- CMF devices for reconstructive surgery
- Vascular Closure Devices

DSM
Bright Science. Brighter Living.
Specialty Materials

Collagen
Fibrous, Fibrillar & Soluble Collagen
Ceramic Compounding

Biostable Polyurethanes
Thermoplastic Pellets, Sheets, Rods & Tubes

Silicone Hydrogels

UHMWPE Fiber
Spools & Non-Woven Matts
Dyneema Purity®

Stabilizers for UHMWPE (HALS)

Polyesteramide (PEA) Polymers
Particles, Rods, Films, Coatings
Biologics / Drug Compounding

Ceramics
Powders, Granules, 3D Shapes, Settable Cements

Part of a comprehensive established DSM organization committed to the long-term improvement of people’s lives through innovation.
Our Specialty Materials: from repair to healing

Evolution in Medical Devices

Complexity - from repair to healing

Supportive Care

Biomedical Polyurethanes

Drug Delivery

Natural Materials

Coatings

Mechanical Replacement

Biomedical Polyethylene

Mechanical Devices

Engineered Tissue

Silicone Hydrogels

Cell Based

ECM's

Bio Commercialization

Polymers & Metals

Our Specialty Materials: from repair to healing
Biostable polyurethanes

Bionate® and Bionate® II
Thermoplastic Polycarbonate-urethane

BioSpan®
Segmented Polyurethane

CarboSil®
Thermoplastic Silicone-Polycarbonate-urethane

Elasthane™
Thermoplastic Polyether-urethane

PurSil®
Thermoplastic Silicone-Polyether-urethane

All polymer families have extensive FDA Master Files
Applications for polyurethanes

**Markets**
- Cardiovascular
- Diabetes management
- Diagnostic
- Neurologic
- Orthopedic
- Vascular
- Women’s Health

**Applications**
- Articulating joint implants
- Artificial hearts
- Balloons
- Cardiac rhythm management
- Cardiovascular electrostimulation
- Continuous glucose monitoring
- Drug eluting stents
- Gynecological surgery (C-section, hysterectomy)
- Neurostimulation
- Orthopedic implants
- Pacemaker leads
- Reproductive health devices
- Spinal implants
- Total disc replacement devices
- Ventricular assist devices
Manufacture & Assembly
Clean rooms: 15 class 100,000 suites
25,000 sq-ft
cGMP & ISO 13485 certified

Packaging & Sterilization
Tray, Pouch, Box, Layout, IFU’s, Labels
Gamma, E-Beam, ETO

Research & Development
Fully Equipped Pilot Manufacturing, Cell Culture & Analytical Materials Characterization Laboratories

Device Testing
Mechanical, Chemical, Microbiological & Invivo/Invitro

Regulatory & Clinical
510k, PMA, CE Mark, IDE, Biocompatibility
US & OUS Clinical Trials

Tool Shop
EDM, CNC, Milling, Grinding, Mold design & Fabrication
14 Full Time Toolmakers

Capabilities & expertise

Part of a comprehensive established DSM organization committed to the long-term improvement of people’s lives through innovation

dsm
Regulatory filing and support

- Regulatory strategy consultation
  - Experienced clinical and regulatory affairs staff

- US and international regulatory filing
  - Proven track record of obtaining US and foreign regulatory approvals

- Clinical evaluation reports per ISO 14155

- Clinical investigation plan development and trial management
  - Large and small-scale clinical trials with leading medical institutions throughout the world
Who are we Trusted by?
DSM cell therapy development services

- Design, develop, and manufacture systems to isolate and concentrate autologous cells at the point of care
- Manage the regulatory filings and/or approvals (e.g. PMA, IDE, 510K)
- Partner with leaders in industry

<table>
<thead>
<tr>
<th>DSM</th>
<th>Competition</th>
<th>Benefit for physician</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance</strong></td>
<td>Consistent high platelet recovery and concentration</td>
<td>Variable results in PRP concentration</td>
</tr>
<tr>
<td><strong>Processing time</strong></td>
<td>2.5 minutes</td>
<td>15 - 30 minutes</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>Small and portable @ only 4 lbs.</td>
<td>24 - 68 lbs.</td>
</tr>
<tr>
<td><strong>Procedure</strong></td>
<td>3-step automated process</td>
<td>Multiple steps; cumbersome process</td>
</tr>
</tbody>
</table>

“This products give us more non-operative tools to personalize the approach for the individual patient based on their level of activity, degree of injury and treatment preference,” Peter Vitanzo, MD, Sports Medicine Specialist at the Rothman Institute in Philadelphia

DSM offers a repeatable model to be used in other cell therapies
DSM as Business Partner

Strong Reputation
- Large player with 100+ years of history, committed to further grow its position in the medical material field
- Supplier of materials & technologies, partnering with most large medical device companies today
- Science-based company with highest quality standards and OEM capability for medical device companies

One Stop Shop
- Broad portfolio of biocompatible materials with strong track record and FDA master files in place
- Wide range of capabilities ranging from design to manufacturing and from testing to packaging

Global Reach
- Worldwide, millions of patients have material from DSM in their body in all kind of medical devices
- DSM has teams to support you in US, EU and Asia

“DSM is helping medical device manufacturers provide better, safer and cost effective products to improve patient care”