Enabling the Success of Lubricant Marketers and Formulators

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Agenda

• About Dow
• Dow’s Lubricant Business
• Trends in the Lubricant Market
• Dow’s Portfolio for the Lubricant Market
• Key Take Aways
About Dow
Key facts about The Dow Chemical Company

2014 Sales of $58,167 million

- Agricultural Sciences $7,290
- Infrastructure Solutions $8,429
- Performance Materials & Chemicals $15,114
- Performance Plastics $22,386
- Consumer Solutions $4,639
- Corporate: $309

201 Manufacturing Sites Around the World

Dow at a Glance

- 2014 Adjusted EBITDA of ~$9.3B
- ~53,000 employees
- Manufacturing in 35 countries
- Sales in ~180 countries
New operating segments aligned to Dow’s strategy

Agricultural Sciences
- Crop Protection
- Seeds

Revenue: $7.3B
Adj. EBITDA: $1.0B
- Attractive market fundamentals
- Aggressive growth funding to expand leading innovation pipeline
Monsanto, Syngenta, Bayer, NuFarm, BASF, DuPont, FMC

Consumer Solutions
- Consumer Care
- Dow Automotive Systems
- Dow Electronic Materials

Revenue: $4.6B
Adj. EBITDA: $1.0B
- Leading positions in attractive markets
- Leading technology platform and strong innovation pipeline
Cabot Micro, Croda, DuPont, Sumitomo, Gliant, Stepan, Johnson Controls

Infrastructure Solutions
- Dow Building & Construction
- Dow Coating Materials
- Energy & Water Solutions
- Performance Monomers

Revenue: $8.4B
Adj. EBITDA: $1.2B
- Solid positions in key market segments
- Leading technology platforms
- PDH and productivity drive for acrylic chain
RPM, Valspar, Kemira, Sherwin-Williams, Akzo Nobel, Arkema, Owens Corning, Pall, PPG, Celanese

Performance Materials & Chemicals
- Chlor Alkali and Vinyl
- Chlorinated Organics
- Energy
- Industrial Solutions
- Polyurethanes

Revenue: $15.1B
Adj. EBITDA: $2.2B
- Strong integrated franchise(s)
- Chlorine carve-out
- PDH and Sadara
- Productivity Drive
Stepan, BASF, Huntsman, Eastman, Bayer, Axiall, Mitsui, Hexion

Performance Plastics
- Dow Elastomers
- Dow Electrical and Telecommunications
- Dow Packaging and Specialty Plastics
- Energy
- Hydrocarbons

Revenue: $22.4B
Adj. EBITDA: $4.4B
- Leading Integrated franchise with strong market fundamentals
- Sadara and USGC
- Ethylene cycle
ExxonMobil, Borealis, Braskem, LyondellBasell, INEOS, Westlake, Mitsui, Nova

Foundation of Core Strengths Support the Entire Franchise
- Cost Advantaged Feedstocks in Every Region
- Global Reach — Marketing, Business & Operations
- Scale & Operational Excellence
- Expertise in Science & Technology
- Molecular and Physical Integration
- Strong Brand Value

we listen. we understand. we deliver.
Dow Performance Lubricants
Dow’s versatile portfolio for the lubricant market

...More than just Polyalkylene Glycols

- Combining the power of 4 former Global Business Units
- Focused on markets and holistically serving our customers
- 400 Customers around the world
- 400 Trade products made in multiple facilities around the globe

Global Sales 2014

- Amine
- Oxo Solvents
- Polyalkene Glycols
- Acetone Derivatives
- Organic Specialties
- Surfactants
Dow is close to the markets and customers

- 130 employees at 10 locations
- Multiple pilot plants and research labs
- World market Leader in PAG based Lubricant technology
- High throughput laboratory capabilities
- Broad back integrated technology base
- Specific market-aligned labs, e.g. for Crop Defense, Lubricants, Coatings and Food Processing
Core competencies that enable the success of lubricant formulators and marketers.

**Energy Efficiency** - Ingredients and base stocks that reduce friction, increase system parts durability, and improve both fuel economy and operational reliability.

**Extended Lubricant Performance** - Synthetic, thermo stable, non-varnishing ingredients and base stocks that enable reduced down-time cycles and improve cleanliness.

**Fuel & Lubricant Authentication** - Dyeing and marking technologies that protect authenticity along complex distribution chains by providing robust resistance to removal procedures.

**Food Grade** - Nontoxic, low odor ingredients and base stocks that meet food and beverage processing standards for use where incidental contamination may occur.

**Environmental Acceptability** - Non-irritating, non-sheen biodegradable fluids that provide better environmental profiles for sensitive applications such as marine use.

**Fire Resistance** - High performance fluids that can endure extreme temperatures and enable safe formulations for harsh operating conditions.

**High Purity & Inhibition Properties** - Complete set of low vapor pressure, high purity base stocks. Multi-functional ingredients that serve as detergents, foam control agents, corrosion resistance and anti-oxidants.
Lubricant Trends
Market drives to higher performance

**Industrial**

- Environmentally Acceptable - biodegradable fluids
- Food Compliance - compliant due to increased scrutiny
- Fire Resistance - lubricants for harsh operating environments
- Energy Efficiency - friction modifiers to optimize resource use

**Automotive**

- Durability - increased service intervals
- Fuel Economy - increased mileage per gallon
- Light Weight - change from steel to aluminum
- Demand Growth - emerging geo’s and more 4x4 drive

*we listen. we understand. we deliver.*
Increasing global demand in high performing synthetic lubricants

*e.g. Gear Oils*

- **2008**
  - Conventional: 96%
  - Synthetic: 4%

- **2012**
  - Conventional: 87%
  - Synthetic: 13%

- **2022e**
  - Conventional: 87%
  - Synthetic: 13%

**Source:** Kline Data and internal studies

Conventional: Group I, II, III
Synthetic: Group IV, V
Dow wants complementary collaboration with our key growth partners

- Listen and understand the needs of lubricant formulators and marketers
- Be focused and committed on enabling their success via complementary technologies & ingredients
- Be flexible on the way we collaborate (e.g. open innovation, joint developments etc.)
Dow aligned to lubricant market needs

- ENERGY EFFICIENCY
  UCON™ OSP Technology

- ENVIRONMENTAL ACCEPTABILITY
  UCON™ Trident™

- FOOD GRADES
  UCON™ Hydraulic Fluids

Market

- DECREASED EMISSIONS
- FRAUD PREVENTION
- HIGHER ENVIRONMENTAL STANDARDS
- COST SAVINGS & HIGHER OPERATIONAL RELIABILITY

Dow as a COLLABORATIVE SUPPLIER of ingredients to lubricant formulators & marketers to address market needs

- FUEL & LUBRICANT AUTHENTICATION
  Accutrace™

- FIRE RESISTANCE
  UCON™ PAG Technology

- HIGH PURITY & INHIBITION PROPERTIES
  UCON™ Quenchants
Dow’s technology enables customers success

UCON™ PAG Technology for Turbine Fluids curtails unexpected shutdowns due to varnish reduction. Recognized by General Electric Gas Turbine specification.

UCON™ OSP-based grease technology enables steel manufacturers to save operation costs through decreased maintenance, clean operations and high temperature stability.

Successful field trial with UCON™ PAG based gear oils for over 3 years in a 2MW wind turbine in harsh conditions that are operated by Vattenfall.
Key take aways

• Dow’s newly formed Performance Lubricant Business offers a broad technology portfolio and unique application and R&D capabilities around the globe beyond Polyalkylene Glycols (PAG’s).

• We are dedicated and committed to collaborate openly in multiple ways, like open innovation with lubricant formulators and marketers to enable their success in order to master today’s and tomorrow’s market challenges.
For more information…

Dow Customer Information Group (CIG):
- E-mail: CIGChemicals@dow.com
- Phone: 800-447-4369

- Can provide:
  - MSDS
  - Sales Specifications
  - Certificate of Analysis
  - Process sample requests

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- News Articles
- Presentations
- Case Studies

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Thank You

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Ingredients and base stocks that reduce friction, increase system parts durability, and improve both fuel economy and operational reliability.
Synthetic, thermo stable, non-varnishing ingredients and base stocks that enable reduced down-time cycles and improve cleanliness.
Dyeing and marking technologies that protect authenticity along complex distribution chains by providing robust resistance to removal procedures.
Nontoxic, low odor ingredients and base stocks that meet food and beverage processing standards for use where incidental contamination may occur.
Performance Lubricants

Non-irritating, non-sheen biodegradable fluids that provide better environmental profiles for sensitive applications such as marine use.
High performance fluids that can endure extreme temperatures and enable safe formulations for harsh operating conditions.
Performance Lubricants

Complete set of low vapor pressure, high purity base stocks. Multi-functional ingredients that serve as detergents, foam control agents, corrosion resistance and anti-oxidants.
Enabling the success of lubricant formulators and marketers.

At the intersection of our tribology expertise and proven chemistries is the opportunity to customize solutions that provide superior performance and differentiation for lubricant formulators and marketers.

We strive to make every conversation about how we can keep our customers ahead of the curve in addressing market trends and growing their margins.
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