

Business Line Comfort & Insulation

**Evonik
Nutrition & Care Segment**

February 2016



EVONIK
INDUSTRIES

Evonik Group

22 Business Lines grouped in 3 segments



Nutrition & Care



Sales
€4,924 m



Adj. EBITDA / Margin
€1,435 m / 29.1%

Animal Nutrition

Baby Care

Health Care

Personal Care

Household Care

Comfort & Insulation

Interface & Performance



Resource Efficiency



Sales
€4,279 m



Adj. EBITDA / Margin
€896 m / 20.9%

Silica

Crosslinkers

Oil Additives

Coating & Adhesive Resins

High Performance Polymers

Active Oxygens

Silanes

Coating Additives

Catalysts



Performance Materials



Sales
€3,435 m



Adj. EBITDA / Margin
€309 m / 9.0%

Performance Intermediates

Acrylic Polymers

Acrylic Monomers

Functional Solutions

Agrochemicals & Polymer Additives

CyPlus Technologies

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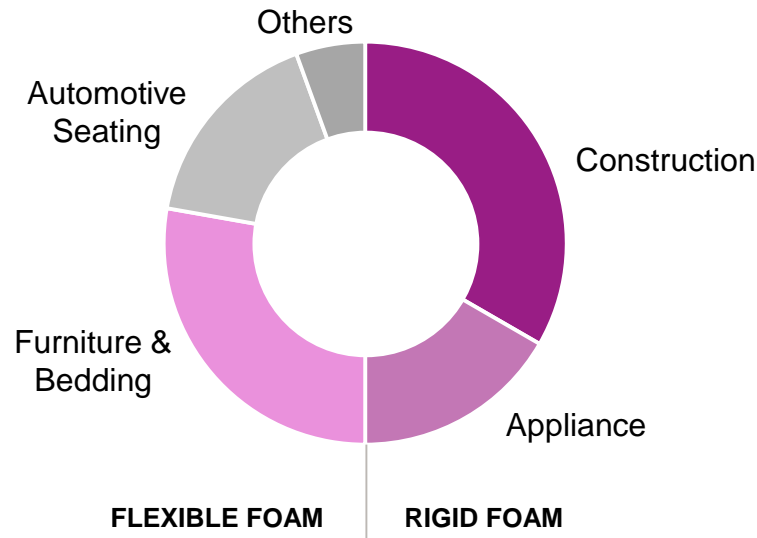
BL Comfort & Insulation is the prime partner for Polyurethane (PU) foam additives



Business Model

- Global strategic partner of key customers with production in all major regions
- Differentiation by quality, product development, application technology and superior logistics

PU Foam end markets

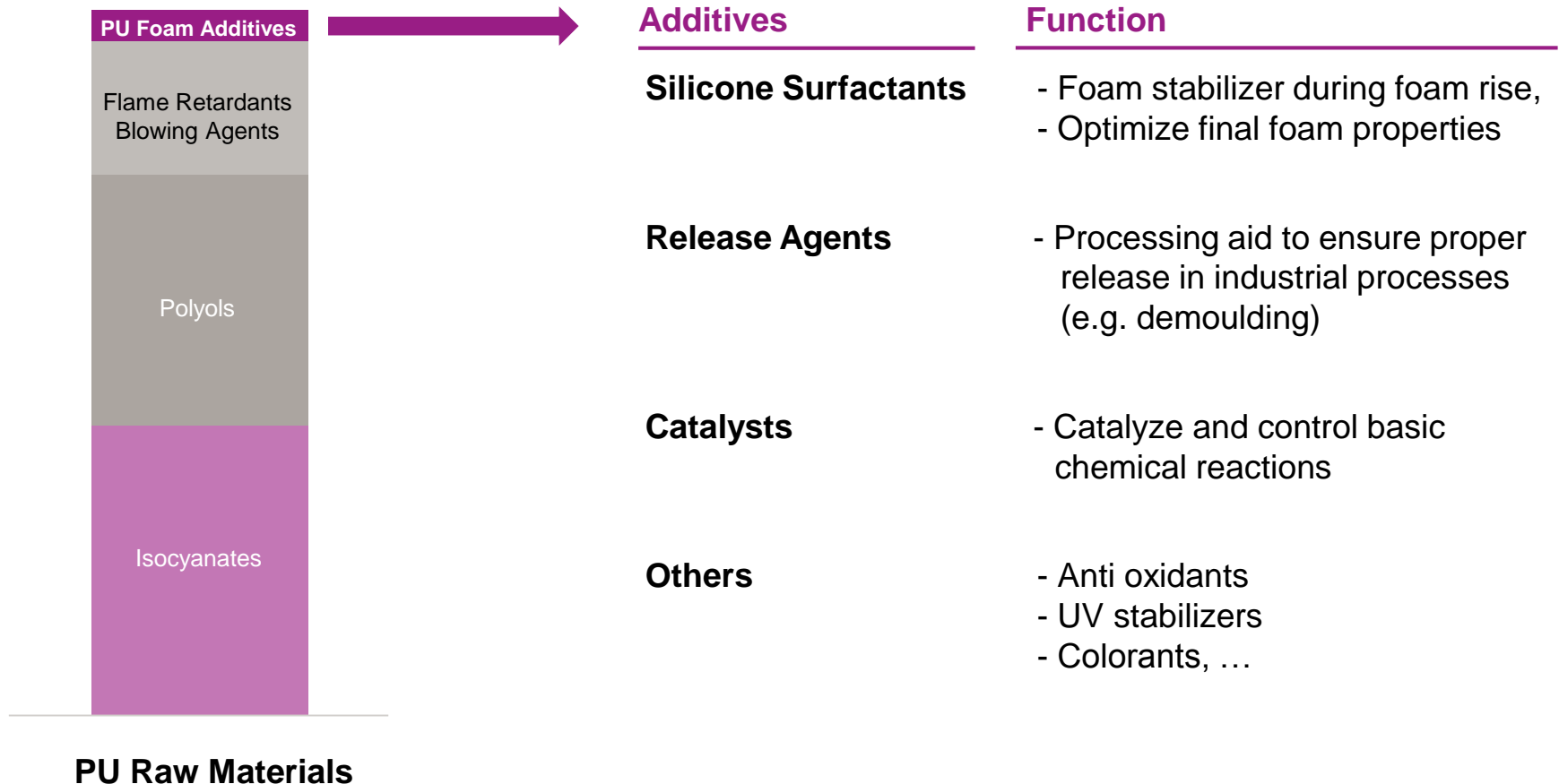


Customers (exemplary)



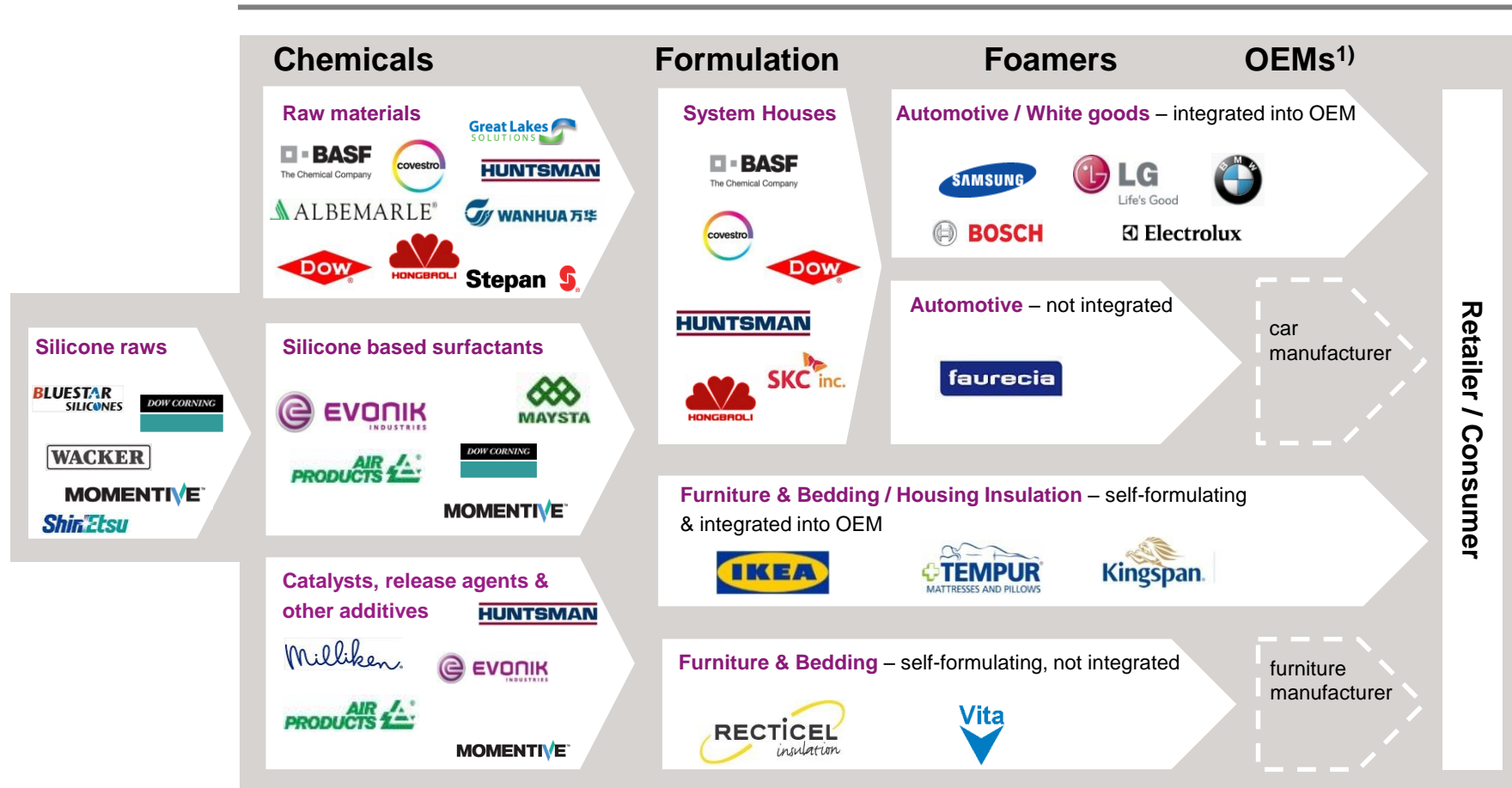
Polyurethane Foam raw materials

Additives with small volumes but decisive impact



Comfort & Insulation is operating within a complex value chain

Supply chain for Polyurethane Foams



1) Direct sales to consumers

Source: BL OU, CS-CO-NBD, annual reports

Business Line at a glance

Leading supplier for polyurethane foam additives worldwide



Top
#1

Supplier for
polyurethane foam
additives worldwide

>600

tailor-made products
for broad spectrum
of applications in
diversified end
markets

>15%

of sales is generated by
products younger than 5 years

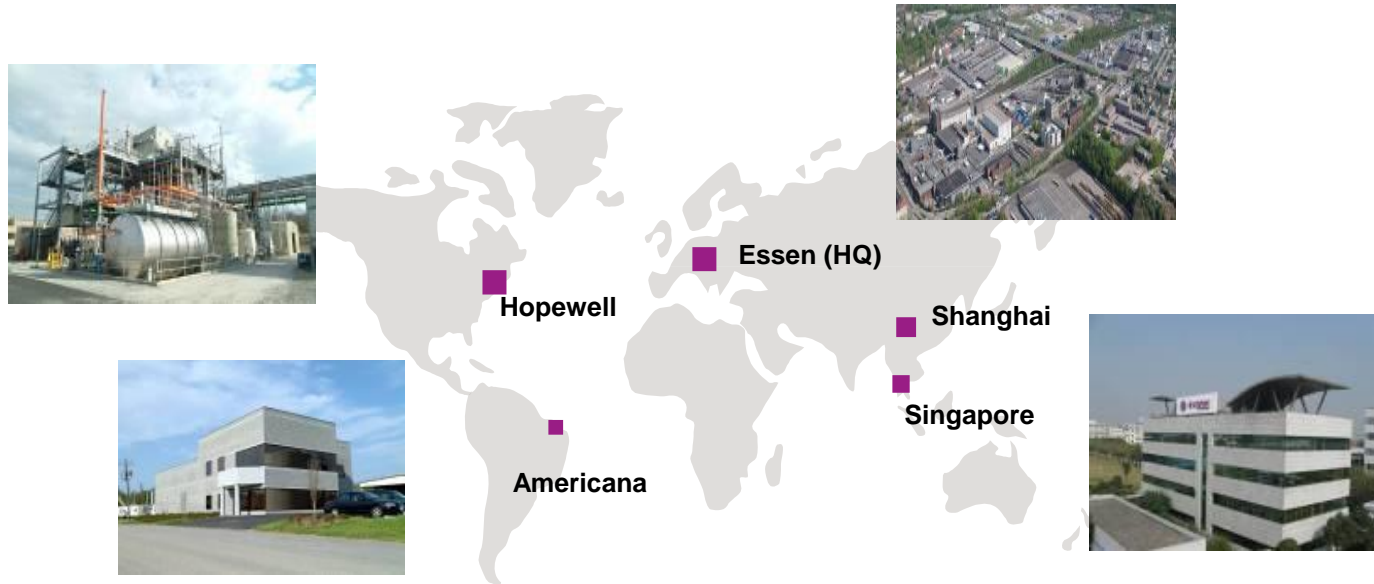
>1,500

direct customers worldwide

Deliveries to more than
120

countries worldwide

Global production & service footprint



| | Customer Service | Technical Service | Training Center | Production | Product Development | R&D |
|-----------|------------------|-------------------|-----------------|------------|---------------------|-----|
| Essen | ● | ● | ● | ● | ● | ● |
| Hopewell | ● | ● | ● | ● | ● | |
| Shanghai | ● | ● | ● | ● | | |
| Singapore | ● | ● | ● | | | |
| Americana | ● | ● | ● | | | |

Shanghai



i

Project Information

- Products Silicone specialties
 - Capacity double our existing local capacity
 - Start-up 2017
-
- Integrated „Verbund“ plant for organomodified silicone specialties serving Asia Pacific
 - Markets: **Appliances, home, construction, automotive**, paints & coatings, agro, textile & industrial applications
 - Products for **Comfort & Insulation**, Interface & Performance, Coating Additives

Growth drivers of our markets and applications

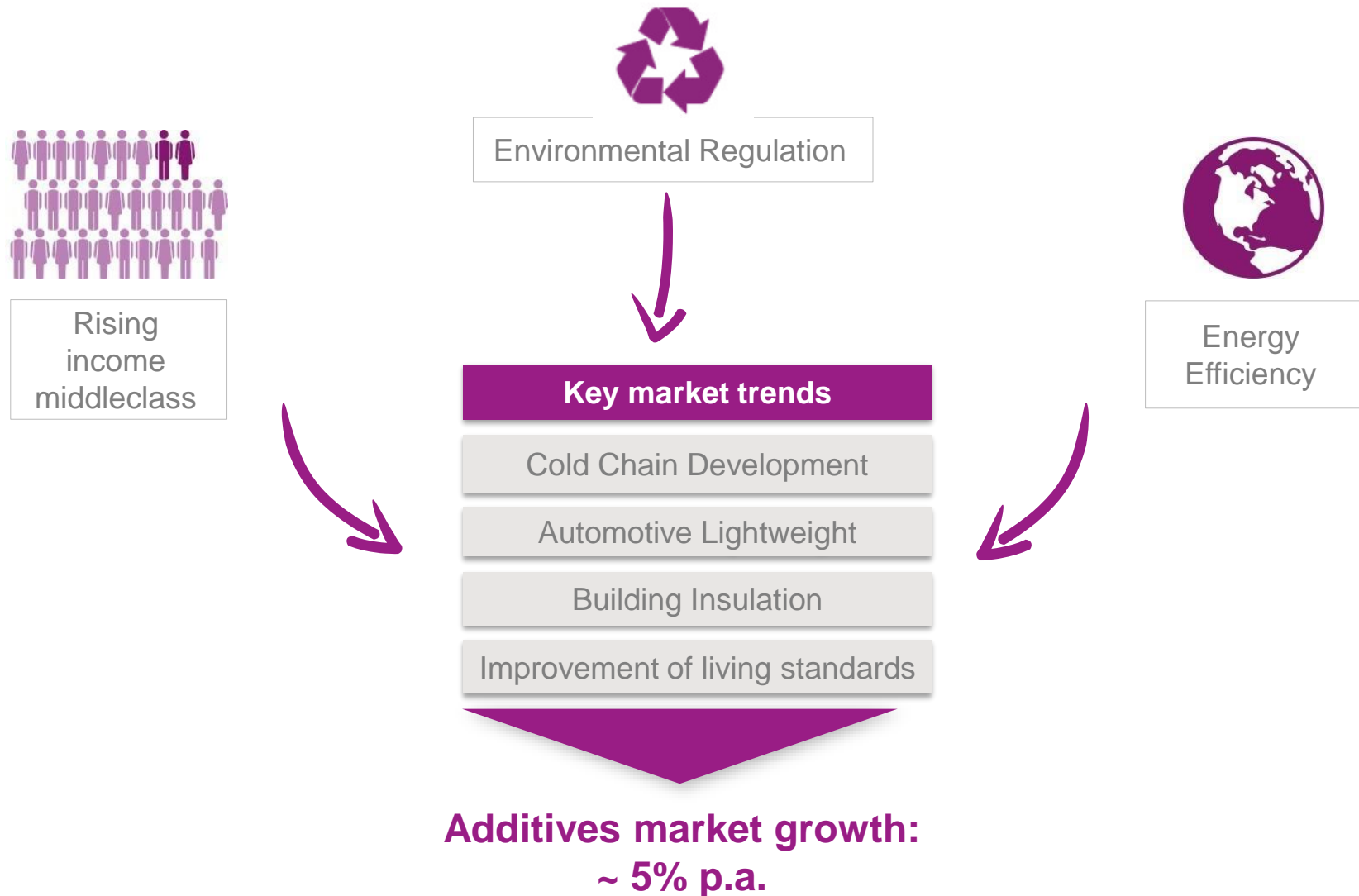


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Market trends drive growth in major applications

| Market trend | End Market | Key application functionalities | Product range |
|---------------------------------|---------------------|--|---|
| Cold Chain Development | Appliance | Lower energy consumption due to excellent cell nucleation, emulsification and surface appearance | Silicone Surfactants TEGOSTAB® |
| Automotive Lightweight | Automotive | Comfort, protection, durability, energy conservation, reduce fogging and meet VOC requirements | Catalysts KOSMOS® TEGOAMIN® |
| Building Insulation | Construction | Energy efficiency management through maximum insulation efficiency, dimensional stability, uniform density, and fine cell structure | Release Agents GORAPUR® |
| Improvement of living standards | Furniture & Bedding | Provide comfort by example regulation temperature and ergonomic demands. Forster the concepts of well being and safety for demanding sleepers. | Other Additives TEGOCOLOR® ORTEGOL® |

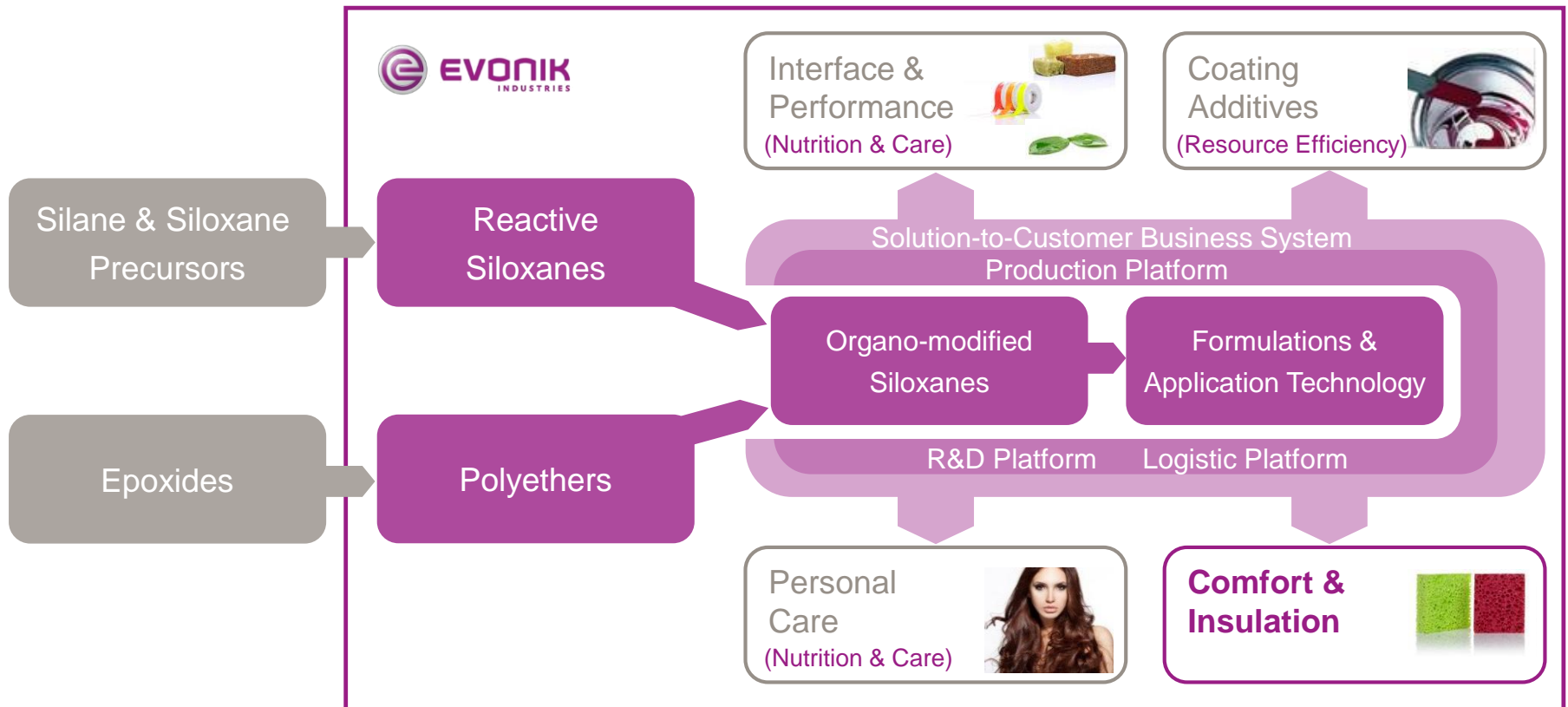


Strong technology base

Capable to produce unique and individual products at attractive economies of scale

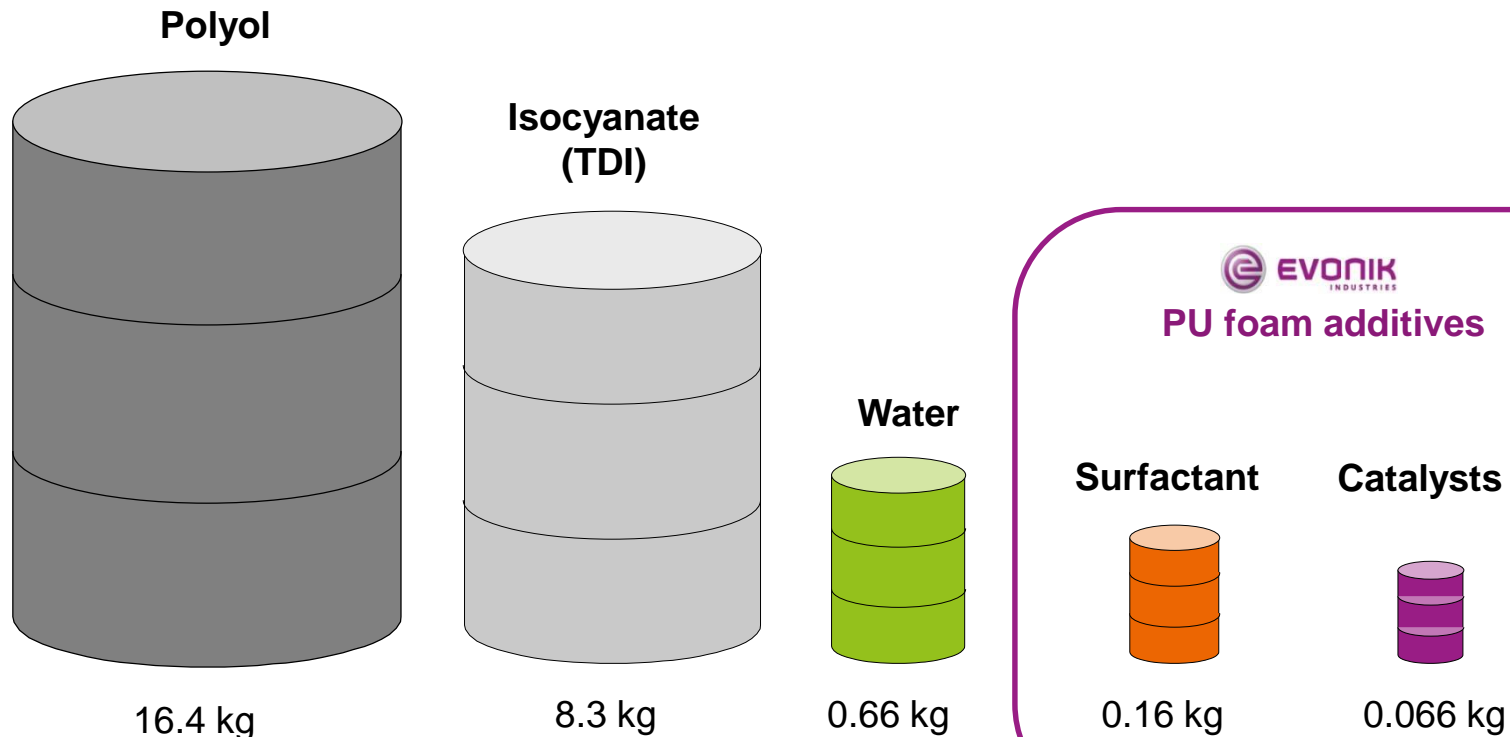


Comfort & Insulation embedded in Evonik's **ORGANO SILICONE PLATFORM** that feeds four Evonik business lines:



Typical Flexible PU Foam Formulation

Quantities being required to produce 1 m³ of flexible foam with a density of 24 kg/m³



Video

Why a silicone surfactant is essential for flexible polyurethane foam



Surfactants are essential for:

- Emulsification of raw materials
- Nucleation Support
- Stabilization

Example Flexible foam: High quality mattresses

It's all about well-being & quality

Over the course of a lifetime, the average person spends around 200,000 hours on mattresses, sofas, and chairs.



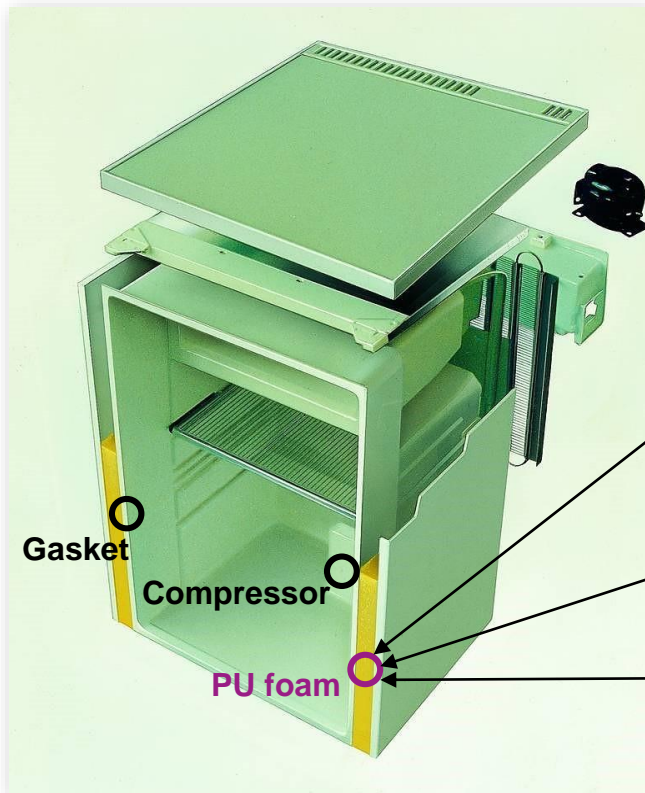
Major product advantages

Our products:

- help ~~to~~ reduce ~~of~~ VOC emissions
- ensure broad range of production techniques and product densities
- provide ideal cellular structure that allows good ventilation and heat transfer
- support highest resilience, durability, strength and comfort for end products

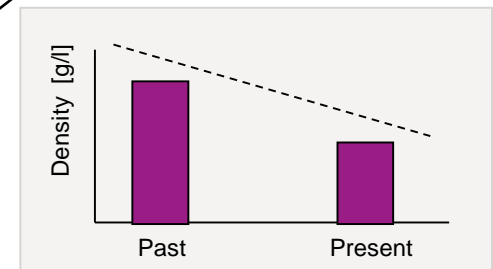
Example Rigid foam: Energy-efficient refrigerator

Energy saving components



Effects

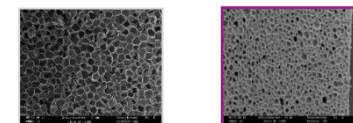
Best Process (density reduction)



Best Surface (void reduction)



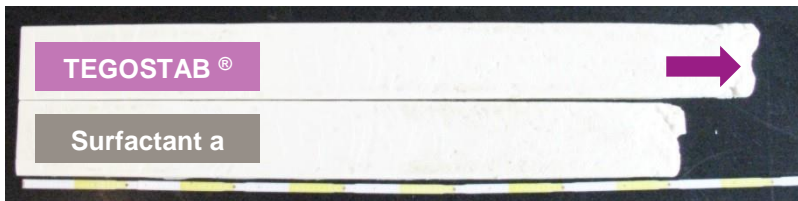
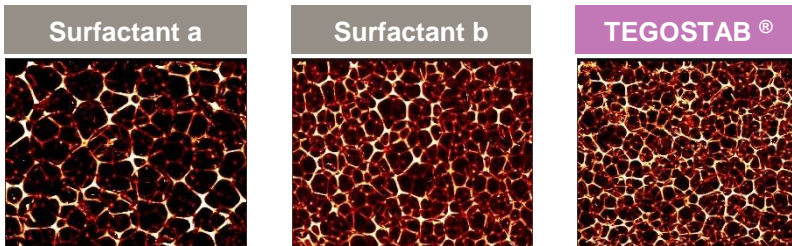
Best Lambda (optimized cell structure)



Because of the introduction of polyurethanes into refrigerators, models designated A++ today are 60% more efficient than refrigerators 15 years ago

Example Rigid foam: Energy-efficient refrigerator

Surfactants make up about 1%
of the entire system



Major product advantages

Our products:

- are helping today's formulators to design tomorrow's appliances
- are a small but powerful tool to improve energy efficiency
- optimize foam processing and final foam insulation properties for our customers
- reduce foam cell size and foam defects
- improve foam flowability

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Summary: Comfort & Insulation has set the course to continue as successful prime partner for PU foam additives



- Leading global position with broad and attractive portfolio of solutions with high value for end customers
- Close strategic customer relations and innovation partnerships
- Tailor-made solutions based on deep understanding of customers' needs
- Strong growth opportunities by addressing current trends in the polyurethane foam industry



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