

# Urethane Systems – Our solutions at K 2019

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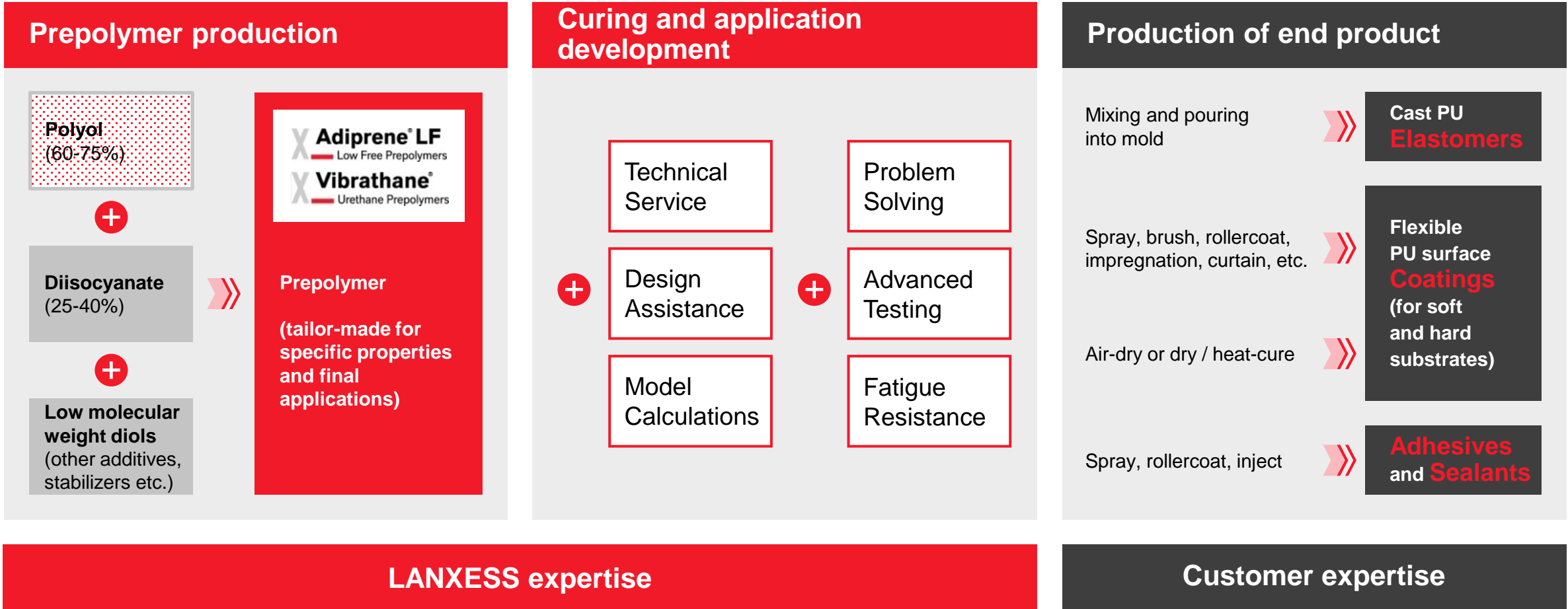
# LANXESS Urethane Systems covers elastomers, coatings, sealants and adhesives



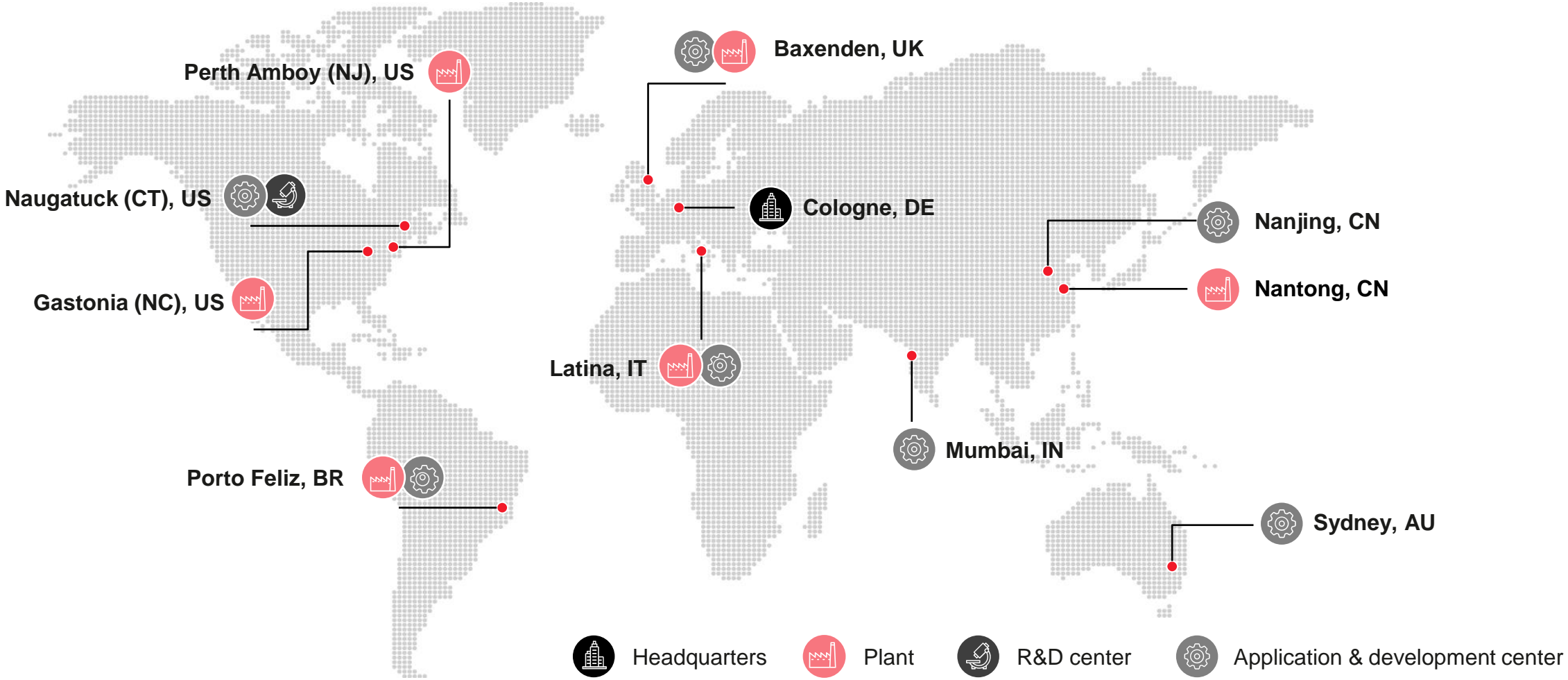
<b>Elastomers</b>	<b>Coatings</b>
<b>Sealants</b>	<b>Adhesives</b>

Late 1950s > 60 years urethane experience K 2019

# A world leader in specialized systems for urethane elastomers, coatings, adhesives and sealants



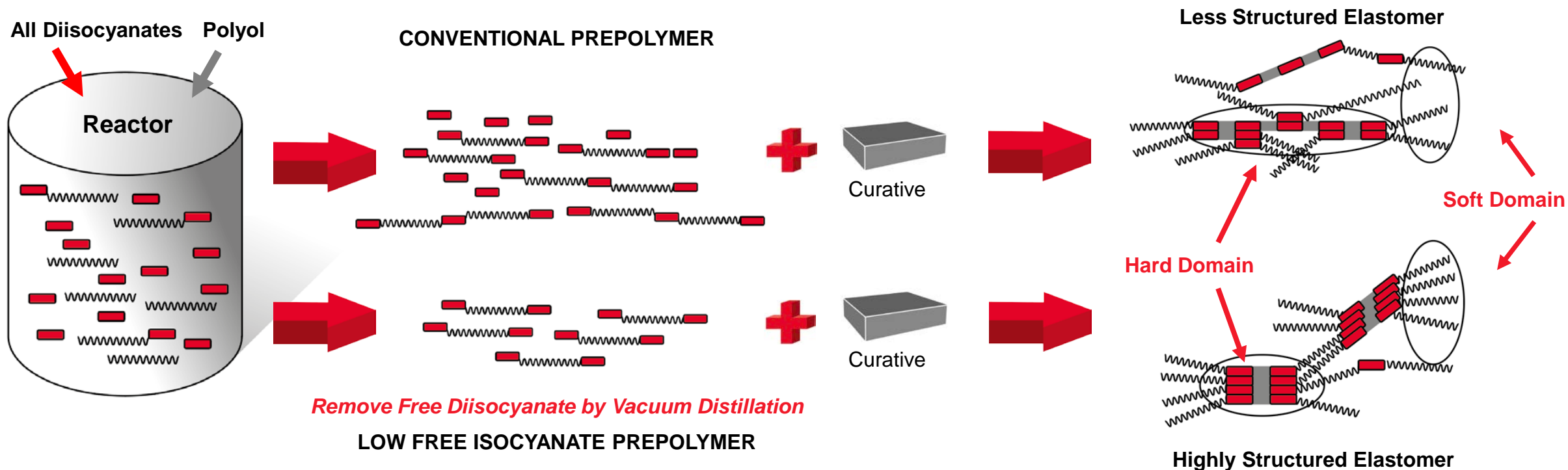
# Global coverage for customers





# Synthesis of low free (LF) isocyanate urethane prepolymers leads to highly structured morphology

## Benefits of LF prepolymers



Low free (LF) prepolymers achieve narrow molecular weight distribution, virtual crosslinking, and more defined phase segregation for **IMPROVED PERFORMANCE**

# Urethane Systems is able to offer materials for a very diverse set of applications



Thickness  
100 mm

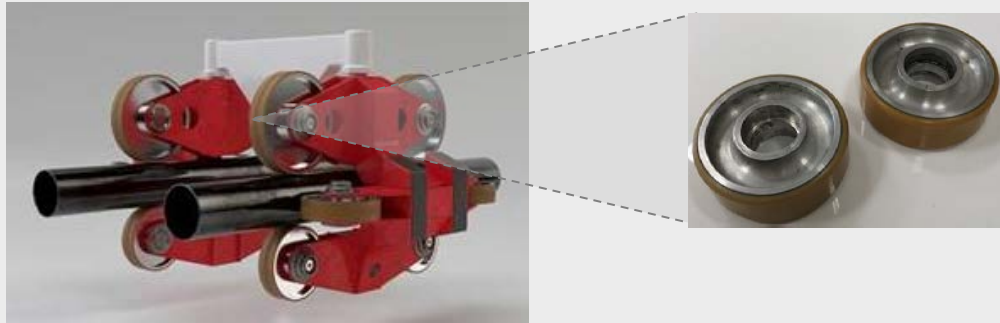


<0.1 mm

<b>Wheels</b> 	<b>Mining</b> 	<b>Subsea Oil &amp; Gas</b> 	<b>Oil Pipelining</b> 	<b>Cosmetics</b> 	<b>Agriculture</b> 	<b>Infrastructure</b> 
<b>Machinery</b> 	<b>Recycling</b> 	<b>Seals</b> 	<b>Paper</b> 	<b>Food</b> 	<b>Belts</b> 	<b>Concrete Molds</b> 
<b>Electronics</b> 	<b>Sports Track</b> 	<b>Abrasives</b> 	<b>Carpet Underlay</b> 	<b>Medical</b> 	<b>Fabric Belts</b> 	<b>Ballistics</b> 
<b>Sealants</b> 	<b>Textiles</b> 	<b>Coil Coatings</b> 	<b>Adhesives</b> 	<b>Construction</b> 	<b>Automotive</b> 	<b>Metal Protection</b> 

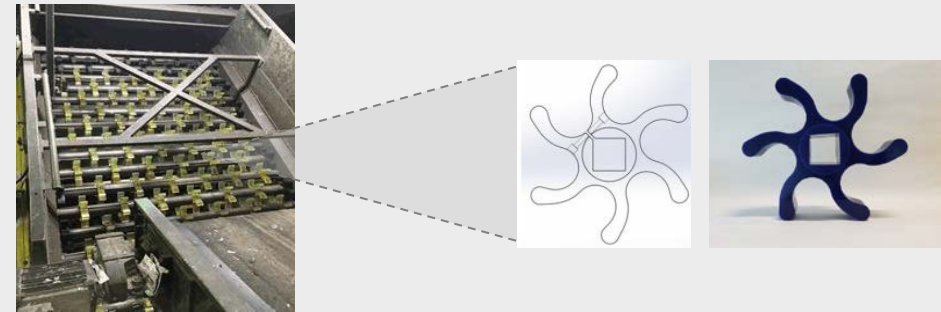
# LF grades serve the most demanding applications – superior hysteresis and abrasion resistance

## Roller coaster – Adiprene LF pPDI



- Material chosen by Urethane Systems technical experts based on customer's high load and/or speed wheel application
- Value proposition
  - **Free pPDI levels <0.1%** for improved **health & safety**
  - **Resistance to hysteresis**, fatigue and wear
  - Can outperform typical urethane elastomers at temperatures as high as 150°C (302°F)
  - Can be **recycled** into thermoplastic polyurethanes (TPUs)

## Star wheel – Adiprene LF TDI



- Both star **design & material** developed by Urethane Systems used in the high impact zone processing up to 50 tons per hour
- Design is licensed to limited number of processors
- Value proposition
  - **Free TDI levels <0.1%** for improved **health & safety**
  - Exceptional **wear resistance** and **cut/tear strength**, capable of **high speeds** & able to withstand **temperature variations**
  - **At least twice the operating lifetime** as compared to rubber



# Adiprene® LF MDI systems also enable superior “design to recycle” profile

## Adiprene® LF @Circular Economy

- Industry norm – cast PU generally **not recycled**
- **Adiprene® LF MDI** systems are designed to be **100% recyclable**
- **Recyclates in the form of granules** can be used in traditional TPU applications
- **Injection molding and extrusion** are possible with recyclates of Adiprene® LF MDI systems
- Value
  - Landfill use is minimized
  - Cost of waste processing is reduced
  - Reuse of scrap reduces overall material costs





# Urethane Systems is the leading innovator for LF PU systems with < 0.1% free isocyanate

Industry leading technical and analytical capabilities to deliver state-of-the-art material solutions



Global manufacturing network ensures consistent products and reliable local supply



Decades of expertise in the design, formulation, and use of urethane systems across a range of applications



Going forward, Urethane Systems plans to supply all Adiprene® LF prepolymers with < 0.1% free isocyanate



**LANXESS**

Energizing Chemistry