

# Silicone Materials for LED

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# The New Momentive

**HEXION™**  
Specialty Chemicals



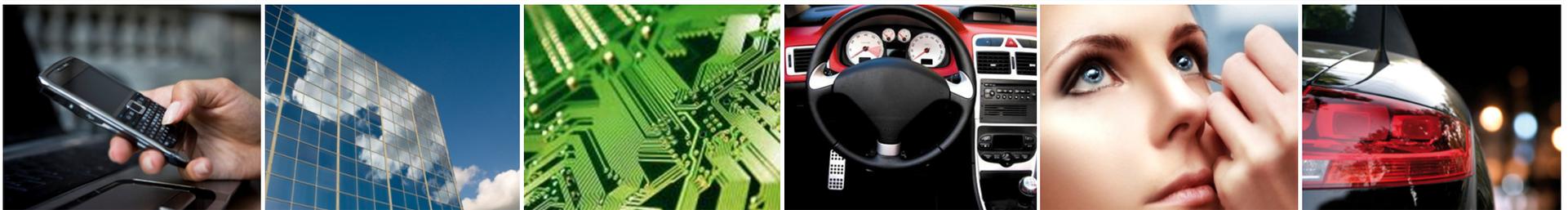
  
**MOMENTIVE**  
performance materials  
The science behind the solutions.

**MOMENTIVE™**

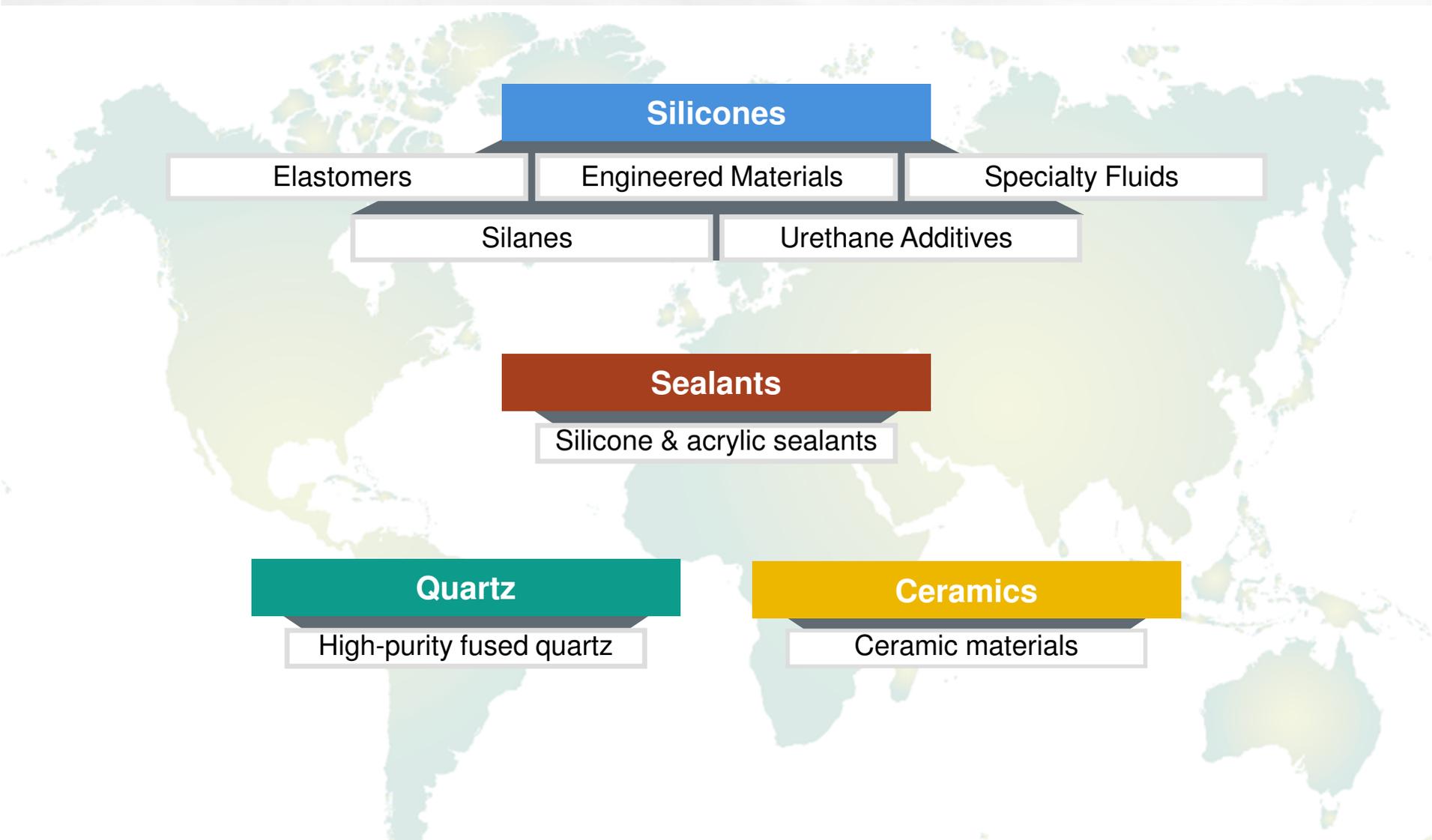
**Transformational Combination Forges An Industry Leader**

## Momentive at a Glance

- **20,000** customers
- **117** production facilities around the world
- **10,000** Momentive associates
  
- Balanced geographic portfolio
- Sales of over **\$7.4 billion**
- Pro forma Adjusted EBITDA **\$1.2 Billion**
- Ability to serve global customers in all major regions worldwide
- New Product Development opportunities across a range of technologies in shared end use markets
  - Automotive, construction, electronics, energy among others



# Global Leader In Silicones & Advanced Materials



**Silicones**

Elastomers

Engineered Materials

Specialty Fluids

Silanes

Urethane Additives

**Sealants**

Silicone & acrylic sealants

**Quartz**

High-purity fused quartz

**Ceramics**

Ceramic materials

# 70+ Years of Silicone Innovations & Market 'Firsts'



**1940**

**First** 'direct process' for making methylchlorosilanes... key building block for all silicone products today

**1950's**

**First** silane coupling agents for fiberglass and composites

**1962**

**First** non-hydrolyzable silicone surfactant for polyurethane foams

**1964**

**First** construction sealant that hardens at room temperature

**1969**

**First** man walks on the moon in silicone bootsoles **enabled by GE Silicones**

**1974**

**First** true structural silicone glazing for architectural applications



**1986**

**First** commercialized silicone for 2-in-1 shampoo and conditioner

**1996**

**First** silicone polyethers introduced for textile treatment, laundry softeners and personal care

**2001**

**First** successful one-part addition cure technology for adhesives and pharmaceutical tubing

**2004**

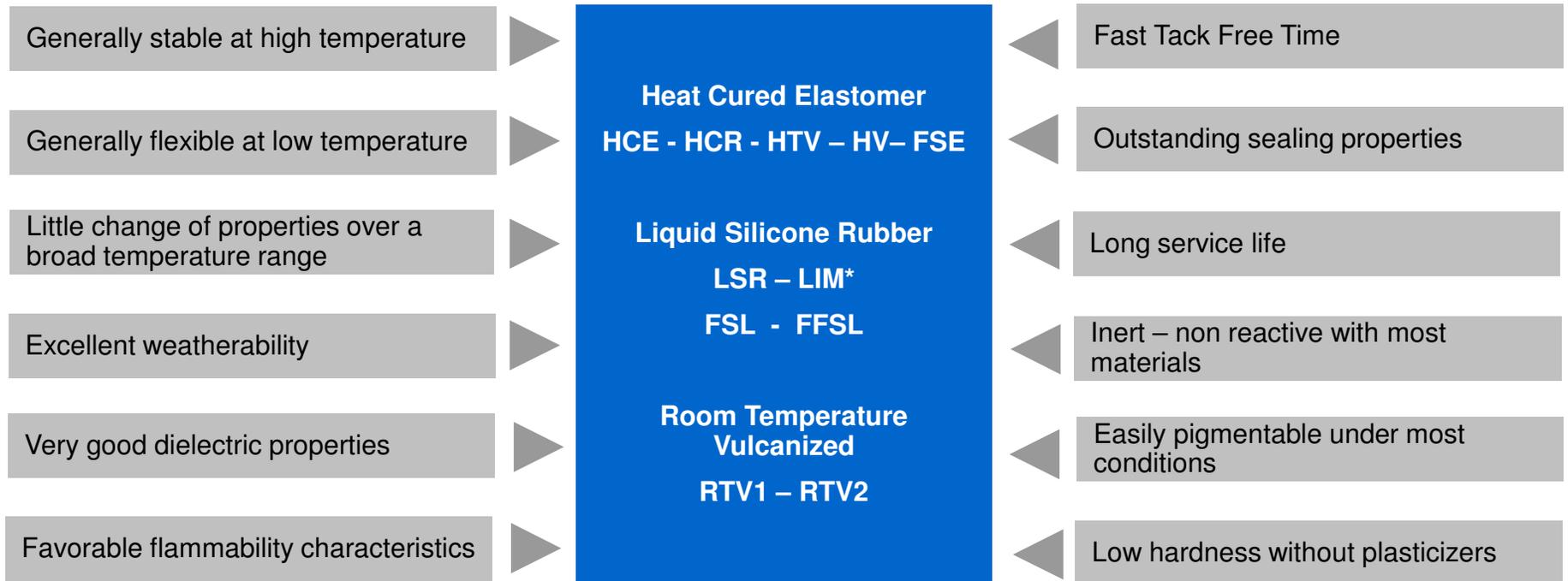
**First** introduction of NXT\* sulfur silane for next generation automobile tires

**2008**

**First** use of Silwet\* hydrolytically stable super-spreader silicones for in-can pesticides

\*NXT and Silwet are trademarks of Momentive Performance Materials Inc.  
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# Why Silicone Elastomer?



# Silicone Materials for LED Light Applications

## Ultra Clear LSR

Transparent silicone elastomers intended to mold LED lenses:

- Injection moldable (LSR)
- High transparency
- UV and heat (150 C) stable
- Advantages over thermoplastics

## Globe Cap Adhesives

RTV1 adhesives to bond globe caps in LED lamps:

- Fast tack free time
- Low volatiles
- Strong adhesion
- Neutral materials

## InvisiSil\* Encapsulants

Transparent RTV2 for LED chip encapsulation:

- Fast cure (Heat)
- Resistance to yellowing
- High refractive index
- No delamination

## Thermally Conductive Materials

Gels, greases and compounds For heat dissipation:

- Good thermal conductivity
- RT or heat cured
- No bleed (grease)
- Soft TIM (stress relief)

