# Elkem Silicones & Foster Corp Healthcare Product and Technology Overview

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# Agenda

- ❑ Introductions
- ❑ Elkem Overview
- ❑ Silbione Brand
- ❑ Silbione Portfolio
- ❑ Silicone Healthcare applications
- ❑ Q &A

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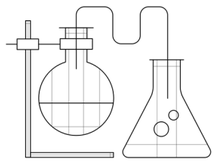
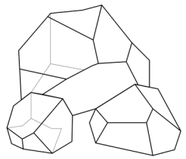
# We are Elkem

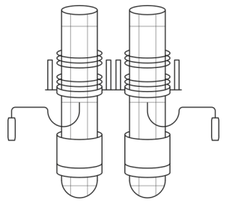
## Advanced material solutions shaping a better and more sustainable future



Silicones



Silicon Products



Carbon Solutions

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# Our history... from local Pioneers to worldwide leaders serving the silicone industry & its customers

## 1944 - 1954
The Founding Years

In 1944, Rhône-Poulenc processed a trial batch of silicones using an organic silicate method.

Xinghuo Silicones plant was built in **1968.**

## 1955 – 1968
Internationalization and Expansion

First international expansion, with the creation of **Siliconas Hispana in Barcelona.**

At Xinghuo plant, the 10,000 ton project construction starts in **1987**.

## 1970 – 1991
A Major Player

In **1970**, with its plant in Saint-Fons, France became the fourth-biggest silicone producing country in the world.

End of **1991,** Xinghuo became the most advanced silicone production unit in China.

## 1993 – 1999
A Global Company

Rhône-Poulenc entered the Chinese market setting up a production site in Shanghai in **1995**.

Xinghuo Silicones joined China National Bluestar Corporation in **1996**.

## 2000 – 2010
A New Century and New Growth

> Bluestar Silicones International, was established on February 1, **2007**, following the acquisition by China National Bluestar Corporation.

> In **2009**, Bluestar Jiangxi Xinghuo Silicones started the construction of the new monomer production unit and a downstream production unit.

## 2011 - 2018
IPO and strengthen leading position worldwide

> In **2011**, the Bluestar Group acquired Elkem and strengthened its position in the silicon value chain.

> In **2017**, Bluestar Silicones and Bluestar Jiangxi Xinghuo Silicones entered Elkem and integrated as Elkem Silicones Division of Elkem.

## 2019 – Today
Expanding through acquisition and transformation

> In **2019** and **2020**, Elkem acquired Basel Chemie, and Polysil in Asia.

> In **2021**, Elkem acquired new plant in France. These 3 acquisitions strengthen Elkem's position and growth in specialised silicones.

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# About Elkem Silicones

- **Global Manufacturer** of silicone products across many industries
- **Vertically integrated** supply chain connecting North America, Europe and Asia
- Provider of wide variety of medical materials in accordance with industry **ISO standards**
- **Innovating culture** to bring about step change technologies through **agile R&D network**
- **Dedicated sales and technical teams** providing expertise and support with a *personal touch*

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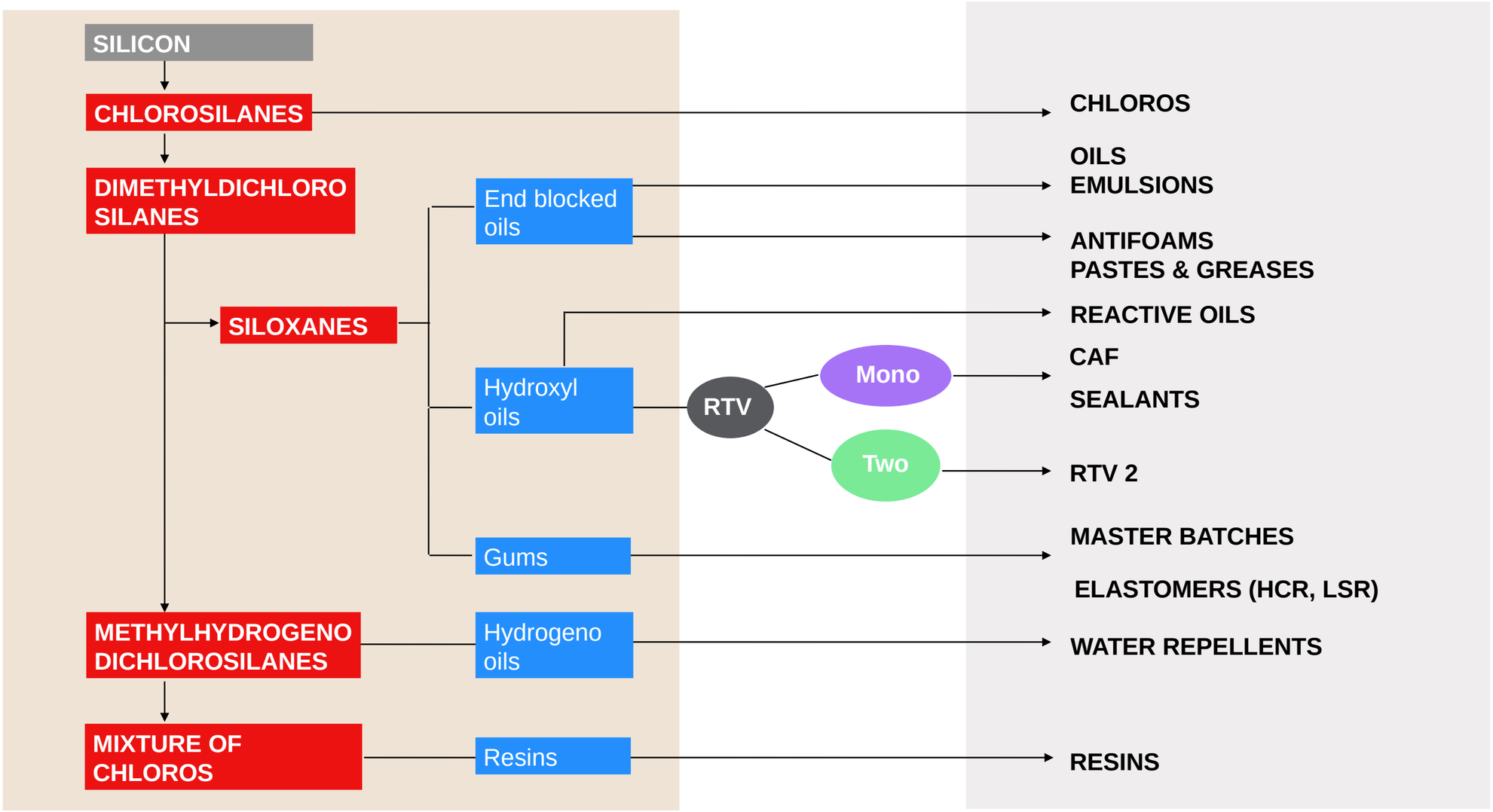
# We offer a complete range of silicone technologies

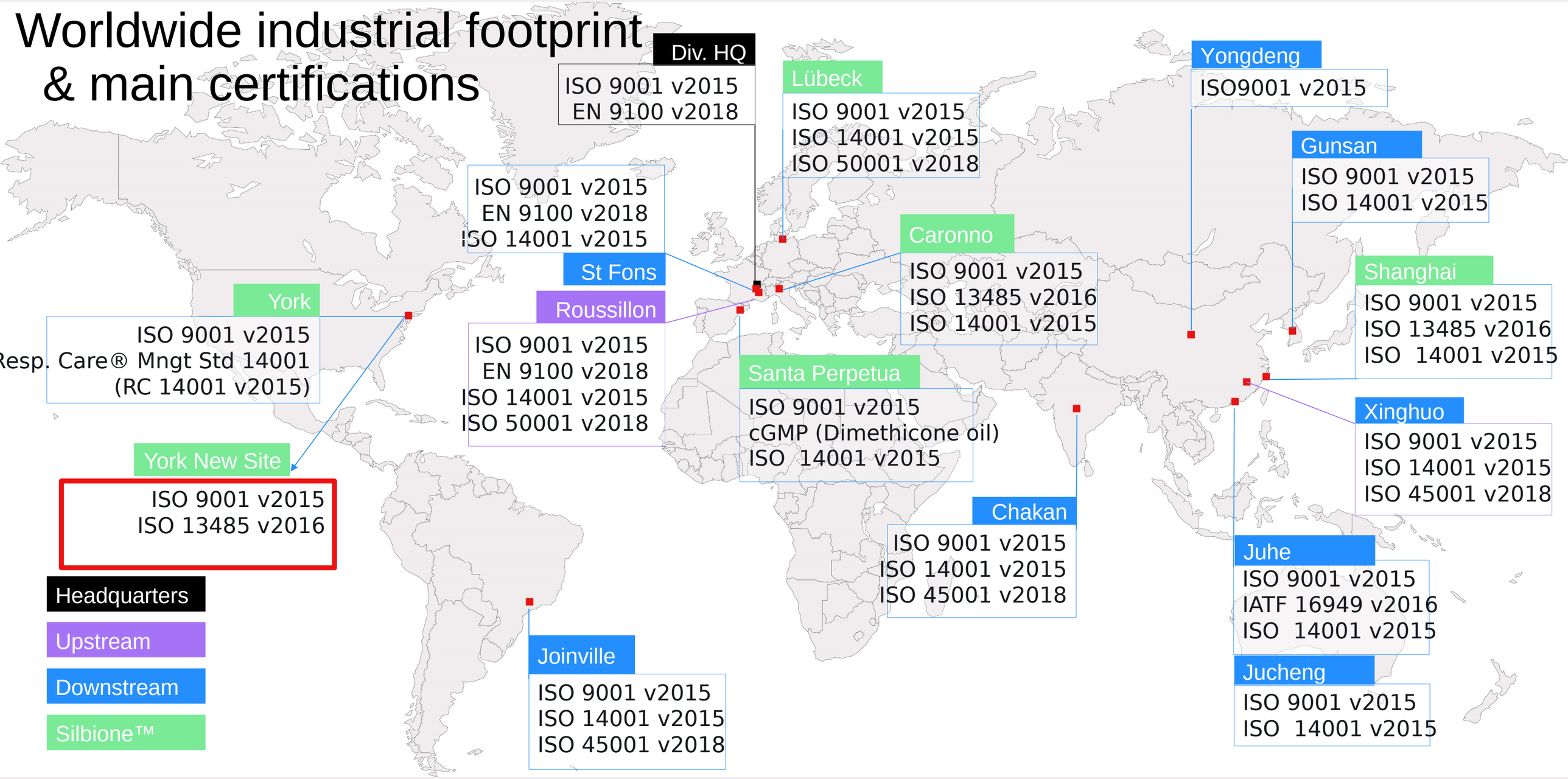
More than 2000 products from intermediates, basics to specialties with applications in diverse industries & markets




Intermediates and basics

Specialties & customized products

# Worldwide industrial footprint & main certifications



# Healthcare Focus - Silbione™ Brand

Designed specifically for the healthcare market, our Silbione™ brand means the products are produced in a clean environment and backed by biocompatibility testing. Whether for short-term or long-term applications, Silbione™ brand silicones are designed to meet the needs of the MedTech and Pharma markets*.

***DMF and MAF files available for relevant materials**

| Less than 30 Day Exposure | Greater than 29 Day Exposure |
|---|---|
| Silbione™ brand materials have been tested according to ISO 10993/USP Class VI for:<br>▪ 1-week implant<br>▪ 28 Day implant<br>▪ USP Intracutaneous Reactivity<br>▪ USP Acute Systemic Toxicity<br>▪ Cytotoxicity<br>▪ Skin Sensitization | Silbione™ Biomedical brand materials have been tested according to, or are substantially equivalent to materials that have been tested according to ISO 10993/USP Class VI for:<br>▪ 12-week implant<br>▪ Hemolysis<br>▪ USP Intracutaneous Reactivity<br>▪ USP Acute Systemic Toxicity<br>▪ Cytotoxicity<br>▪ Mutagenicity<br>▪ Pyrogenicity<br>▪ Skin Sensitization<br>▪ Tissue Irritation |

Comprehensive Silbione™ Silicone Portfolio:

- Liquid Silicone Rubbers (LSR)
- High Consistency Rubbers (HCR)
- Dispersions
- Fluids
- Adhesives
- Gels





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# Materials and Technologies

# Silbione® LSRs and HCRs

* Shore A
** 30 days and more inside the body
*** less than 29 days inside the body

| *LSR Series* | Characteristics | Durometer Range* | A:B Ratio | Long Term Implant Grade** | Medical Grade*** |
|---|---|---|---|---|---|
| Silbione™ Biomedical LSR **M3 Series** | High performance Efficient processing | 1 - 70 | 1:1 | ♦ | |
| Silbione™ Biomedical LSR **M1 Series** | Low consistency | 25-40 | 10:1 | ♦ | |
| Silbione™ LSR **43 Series** | High performance Efficient processing | 1-70 | 1:1 | | ♦ |
| Silbione™ LSR **41 Series** | Low consistency | 25-40 | 10:1 | | ♦ |
| Silbione™ LSR **47 Series** | Self-Lubricating | 45-65 | 1:1 | | ♦ |
| *HCR Series* | | | | | |
| Silbione™ Biomedical HCRA **M5 Series** | Extrusion, molding Polyaddition | 20-80 | 1:1 | ♦ | |
| Silbione™ HCRA **45 Series** | Extrusion, molding Polyaddition | 20-80 | 1:1 | | ♦ |
| Silbione™ HCRA **42 Series** | Extrusion, molding Polyaddition | 50-65 | 1:1 | | ♦ |
| Silbione™ HCRU **44 Series** | Peroxide cure | 48-70 | 1 part + catalyst | | ♦ |

***See appendix for materials' physical properties (slide #44)***

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# Silbione® LSRs (<29 day implant)

| | CTM | LSR 4301 | LSR 4305 | LSR 4310 | LSR 4325 | LSR 4330 | LSR 4340 | LSR 4350 | LSR 4360 | LSR 4365 | LSR 4370 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Appearance | TP 038 | clear | clear | clear | clear | clear | clear | clear | clear | clear | clear |
| Mix Ratio | - | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 |
| Extrusion Rate, g/min | TP 001 | Viscosity55k cps | Viscosity 60K cps | 275 | 135 | 100 | 90 | 85 | 95 | 70 | 76 |
| Specific Gravity, g/cm | TP 013 | 1.07 | 1.07 | 1.09 | 1.11 | 1.11 | 1.12 | 1.12 | 1.12 | 1.14 | 1.14 |
| Hardness, Shore A | D 2240 | 1 | 5 | 10 | 23 | 30 | 40 | 50 | 60 | 65 | 70 |
| Tensile Strength, psi (N/mm2) | D 412 | 270 (1.9) | 480 (3.3) | 850 (5.8) | 1250 (8.6) | 1340 (9.2) | 1250 (8.6) | 1225 (8.4) | 1275 (8.8) | 1270 (8.8) | 1290 (8.9) |
| Elongation, % | D 412 | 1100 | 1050 | 1020 | 970 | 800 | 660 | 600 | 480 | 470 | 475 |
| Tear Strength, Ppi (N/mm) | D 624, Die B | 45 (7.8) | 65 (11.5) | 115 (20) | 180 (32) | 185 (32) | 230 (40) | 270 (47) | 240 (42) | 250 (43) | 225 |
| Modulus,100%, psi (N/mm2) | D 412 | 12 | 19 | 32 | 59 (0.4) | 83 (0.6) | 157 (1.1) | 277 (1.9) | 380 (2.6) | 443 (3.1) | 455 (3.1) |

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# Silbione Adhesives

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MED ADH 4100 | | x | ▲ | + | ▲ | x | | 9 | 820 (5.7) | 1090 | 85 (14.9) | 1,09 | Clear | 24 | x | | x |
| MED ADH 4200 | | x | ▲ | + | ■ | x (Tin-free) | | 7 | 475 (3.28) | 375 | 50 (8.7) | 1,05 | Clear | 18 | x | x | |
| MED ADH2 4213 | | x | ▲ | + | ▲ | | x | 120 | 700 (4.8) | 450 | 90 (15.8) | 1,06 | Clear | 12 | x | x | |
| MED ADH2 4213 SLC | | x | ▲ | + | ▲ | | x | 720 | 700 (4.8) | 450 | 90 (15.8) | 1,06 | Clear | 12 | x | x | |
| MED ADH2 4213 QC | | x | ▲ | + | ▲ | | x | 10 | 700 (4.8) | 450 | 90 (15.8) | 1,06 | Clear | 12 | x | x | |
| MED ADH 4300 | | x | ▲ | + | ▲ | x | | 8 | 700 (5.4) | 650 | 70 (12.3) | 1,08 | Clear | 24 | x | | x |

# Silbione® Self-Bleeding LSRs

Applications:
- Molded medical applications
- General molded parts where high slip is required
- Needleless valves

Features:
- Internal lubricating oil for non-stick surfaces
- High tear strength
- Delayed bleed to prevent mold fouling
- Excellent mold release for shorter cycle times
- Rapid cure at elevated temperatures

| | CTM | LSR 4745 | LSR 4755 | LSR 4765 |
|---|---|---|---|---|
| Appearance | TP 038 | Slight Haze | Slight Haze | Slight Haze |
| Mix Ratio | - | 1:1 | 1:1 | 1:1 |
| Extrusion Rate, g/min | TP 001 | 120 | 120 | 120 |
| Specific Gravity, g/cm | TP 013 | 1.10 | 1.12 | 1.12 |
| Hardness, Shore A | D 2240 | 45 | 55 | 65 |
| Tensile Strength, psi (N/mm2) | D 412 | 1240 (8.6) | 1140 (7.9) | 1130 (7.8) |
| Elongation, % | D 412 | 635 | 450 | 465 |
| Tear Strength, Ppi (N/mm) | D 624, Die B | 255 (44) | 250 (44) | 230 (40) |

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# Silbione® HCRs

| | High Performance | | | | | General Purpose | |
|---|---|---|---|---|---|---|---|
| | HCRA 4120 | HCRA 4130 | HCRA 4150 | HCRA 4165 | HCRA 4170 | HCRA 4250 | HCRA 4265 |
| Appearance | clear | clear | clear | clear | clear | Hazy | Hazy |
| Mix Ratio | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 |
| Specific Gravity | 1.12 | 1.12 | 1.15 | 1.18 | 1.17 | 1.13 | 1.16 |
| Hardness, Shore A | 25 | 29 | 50 | 65 | 70 | 50 | 65 |
| Tensile Strength, psi (Mpa) | 1430 (9.9) | 1500 (10.3) | 1600 (11) | 1480 (10.2) | 1300 (8.9) | 1005 | 1275 |
| Elongation, % | 1260 | 1100 | 700 | 740 | 550 | 523 | 600 |
| Tear Strength, ppi (kN/m) | 220 (38) | 220 (38) | 230 (40) | 240 (42) | 225 (39) | 137 | 150 |
| Toom Temperature Pot Life | ≥4hr | ≥4hr | ≥4hr | ≥4hr | ≥4hr | >4hr | >4hr |

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# Silbione RTVs

| | Mix Ratio | Hardness | Tensile, psi (MPa) | Elongation, % | Tear Strength, ppi (kN/m) | Pot Life (min) | Mixed Viscosity (cps) |
|---|---|---|---|---|---|---|---|
| Silbione RTV 4510 | 1:1 | 11 Sh00 | N/A | N/A | N/A | 60 | 1200 |
| Silbione RTV 4528 | 1:1 | 28 Sh00 | 215 (1.5) | 800 | 11 (2) | 60 | 4000 |
| Silbione RTV 4545 | 1:1 | 45 Sh00 | 450 (2.9) | 800 | 50 (8.7) | 40 | 1900 |
| Silbione RTV 4545 QC | 1:1 | 45 Sh00 | 450 (2.9) | 800 | 50 (8.7) | 5 | 1900 |
| Silbione RTV 4410 | 1:1 | 10 ShA | 430 (2.9) | 800 | 80 (14) | 60 | 1650 |
| Silbione RTV 4410 QC | 1:1 | 10 ShA | 400 (2.7) | 700 | 80 (14) | 10 | 2500 |
| Silbione RTV 4420 | 1:1 | 20 ShA | 580 (4.0) | 550 | 85 (15) | 60 | 4000 |
| Silbione RTV 4420QC | 1:1 | 20 ShA | 508 (3.5) | 500 | 85 (15) | 3 | 7000 |
| Silbione RTV 4044 | 1:1 | 40 ShA | 809 | 370 | 114 | 120 | 40000 |
| Silbione RTV 4040 | | | | | | | |
| w/ Cata 4040 | 10:1 | 40 ShA | 920 (6.3) | 920 | 120 (21) | 120 | 40000 |
| w/ Cata 4020HT | 10:1 | 22 ShA | 801 (5.5) | 801 | 116 (20) | 105 | 40000 |
| w/ Cata 4020 | 10:1 | 25 ShA | 645 (4.4) | 407 | 75 (13) | 120 | 40000 |

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# Silbione® Lubricants & Specialty Fluids

| | Viscosity A/B, cps | Specific Gravity | Volatile Content | Appearance |
|---|---|---|---|---|
| Silbione MDM 350 | 254 (1.75) | 0.95 | 0.05 | Clear |
| Silbione MDM 1000 | 450 (3.1) | 0.98 | 0.03 | Clear |
| Silbione MDM 12500 | 750 (5.1) | 0.98 | 0.70 | Clear |

Typical Applications:

MDM Fluids: Lubrication or Hydrophobic Coatings of medical devices; mold release and anti-adherence agents for plastics and metal castings

| | Appearance | Viscosity A/B @25°C | Refractive Index @25°C | Flash Point | Silicones Content | Specific Gravity @25°C (kg/m$^3$) | Cytotoxicity |
|---|---|---|---|---|---|---|---|
| Silbione RTV Lubricant | Clear, slightly hazy fluid | 30 | 1.408 | 58°C | 30 | 20 | Non toxic (thin film) |

Typical Applications:

RTV Lubricant: supplied as a one component system and is an excellent lubricant for cutting edges. It can be used on razor blades, scalpels, hypodermic needles and other applications where a partially cured cohesive silicone coating is required. For most applications, the resultant coating is more durable than simple polydimethylsiloxane.

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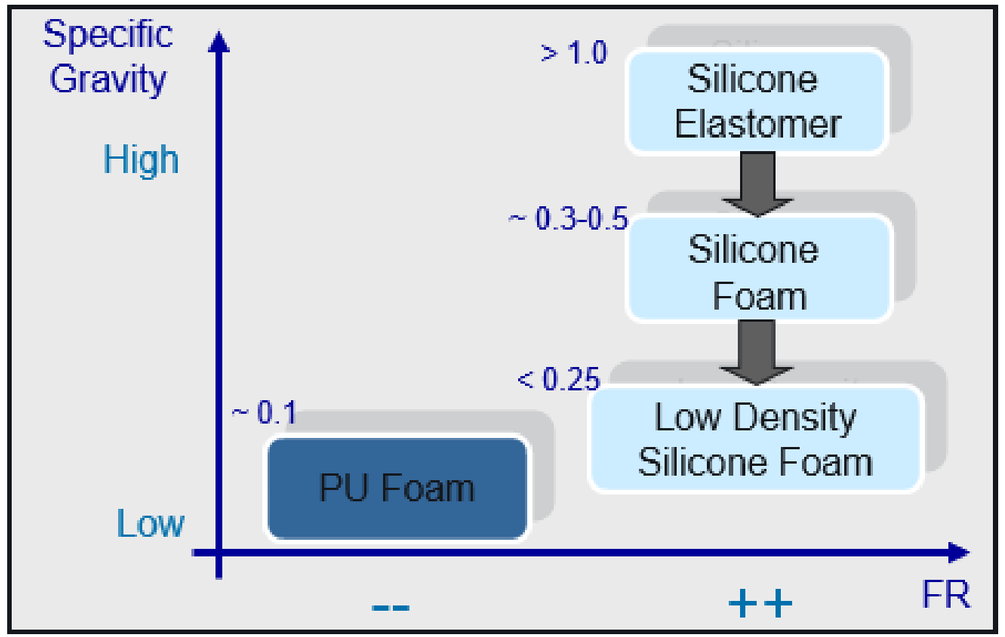
# Silbione® RT Foams

| | Mix Ratio | Viscosity A/B (cps) | Hardness | Pot Life (min) | Cure Time (min) | Demolding Time (min) | Density (g/mL) |
|---|---|---|---|---|---|---|---|
| Silbione RT Foam 4230 | 1:1 | 17000/15000 | 30 Sh00 | 3 | 10 | 20 | 0.18 |
| Silbione RT Foam 4241 | 1:1 | 15000/15000 | 40 Sh00 | 5 | 15 | 30 | 0.24 |

Honored as Frost & Sullivan's Product Differentiation Award 2012 for its patented technology that uniquely offers low density, open cell silicone foam for flexible, breathable and durable healthcare applications.

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# Silbione® Soft Skin Adhesives

| | General Purpose Skin Adhesion | | | | Advanced Woundcare | | |
|---|---|---|---|---|---|---|---|
| | RT Gel 4317 | RT Gel 4717 | RT Gel 4645 | RT Gel 4642 | HC2 2011 | HC2 2031 | HC2 2022 |
| Appearance | clear | clear | clear | clear | clear | clear | clear |
| Mix Ratio | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 |
| Viscosity (mPa.s) | 3000 | 55000 | 10000 | 13000 | 3000 | 55000 | 13000 |
| Working Time (min.) | >60 | >120 | >90 | >120 | >60 | >120 | >120 |
| Penetration (mm/10) | 170 | 170 | 210 | 155 | 170 | 170 | 155 |
| Peel Adhesion (N/cm) | 0.5 | 0.8 | 0.9 | 1 | 0.5 | 0.8 | 1 |
| Bioburden Testing | No | No | No | No | Yes | Yes | Yes |
| Controlled Environment Manufacturing | No | No | No | No | Yes | Yes | Yes |

**Silbione® HC2, performances designed for advanced Wound Care**

- Optimized for coating process
- Wide choice of skin adhesion
- Manufactured in ISO 8 clean room
- Guaranteed microbial safety

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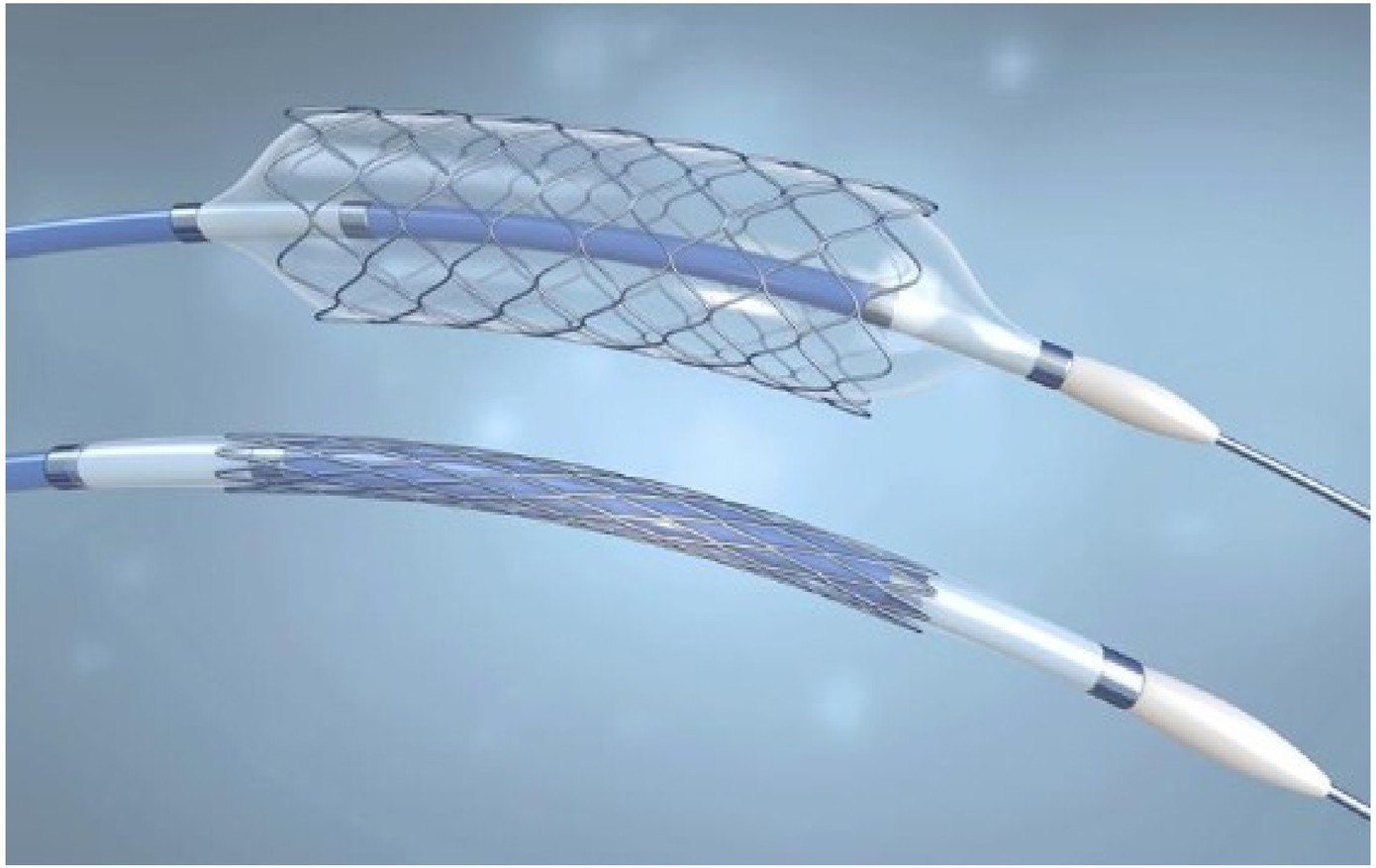
# Silbione® materials uses - *minimally invasive technologies*

**Silbione LSR 4325**

- Optimized for applications involving balloons
- Easy processing and convenient 1:1 mix ratio
- Excellent mold release for shorter cycle times
- Superior clarity
- High performance physicals – high tear and elongation; can be molded into thin-walled parts



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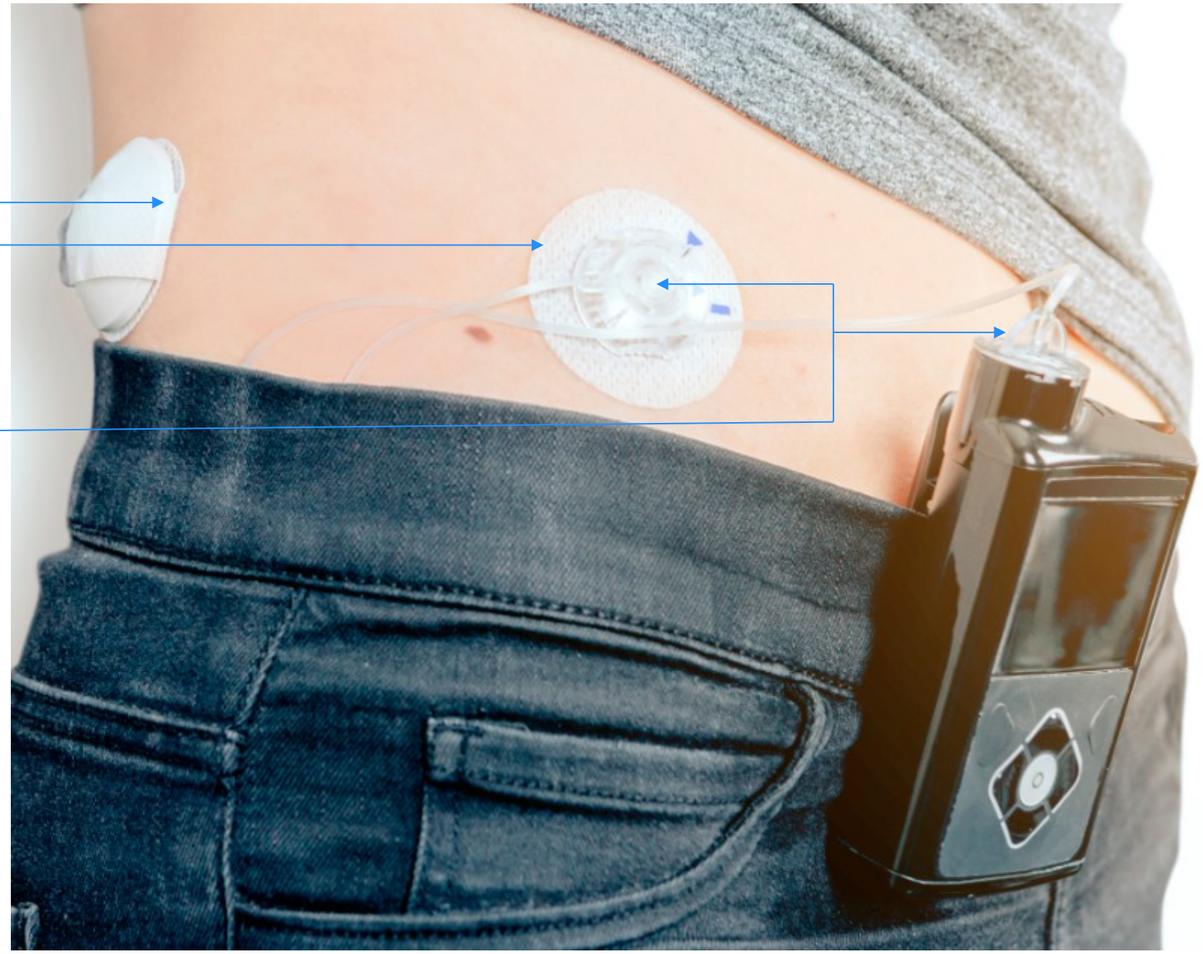
# Silbione® materials uses - *diabetes*

**Silicone soft skin adhesives (SSA)**

- RT Gel 4743
- RT Gel 4642 HV
- RT Gel 4642
- RT Gel 4645
- Rt Gel 4717
- RT Gel 4317

**LSRs and HCRs**

- Inside the device (tubing, reservoirs and seals)
- Strain reliefs:  the port into the body and leaving the device



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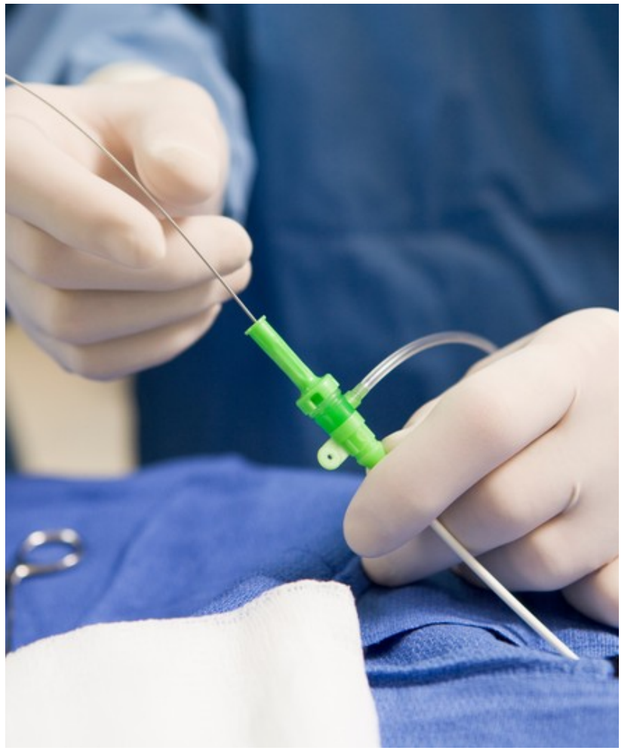
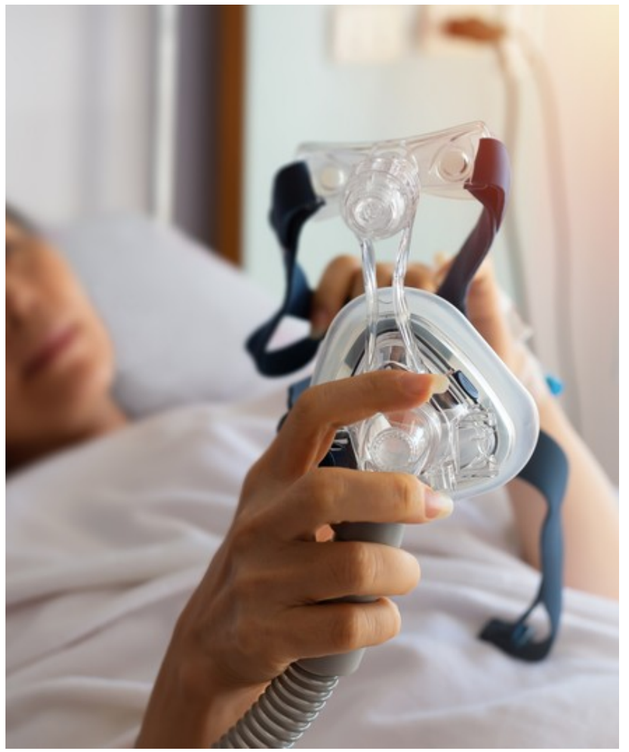
# Additional application examples

Gastric bands



Valves and septa



Sleep apnea and breathing masks

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# Q & A

- Ideal Account size for Foster?
- Point of sale reports?
- Internal support on regulatory and biocompatibility
- Expected margins
- Sales rep compensation
- Sales reporting process/CRM Software
- Current key accounts
- Warehouse locations
- Customization capabilities,  blending, pigmenting, etc

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# Thank you

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Delivering your potential