


# SILICONE TUBING FOR LAB & MEDICAL APPLICATIONS

## POWERED BY HelixiMC™ TECHNOLOGY

MADE IN GERMANY

FREUDENBERG MEDICAL

All HelixMark products are manufactured in clean rooms in compliance with the requirements of the medtech and pharmaceutical industry.

The following criteria apply to all articles of this programme:

- Materials approved in accordance with USP Class VI, ISO 10993-1, FDA 21CFR 177.2600 and EP 3.1.9
- Utilisation of platinum-cured silicone
- Production and packaging in ISO Class 8 clean rooms
- Certified manufacturing in compliance with ISO 13485 quality standards
- Sterilisable in autoclaves, with ethylene oxide and by gamma irradiation
- Supplied with material certificate in every packaging unit
- Seamless batch traceability
- Double packed
- Off-the-shelf availability guarantees short delivery times
- Customer-specific solutions available outside the HelixMark standard product portfolio

# HELIXMARK®
# STANDARD TUBING

HelixMark Standard silicone tubing meets the needs of a broad spectrum of medical and laboratory applications and are universally applicable for the transfer of fluids under standard requirements. Our tubing is individually packed in 15 m coils.

| INNER DIAMETER | OUTER DIAMETER | WALL THICKNESS | ISO FDA USP (EP) |
|---|---|---|---|
| mm | mm | mm | REF |
| 0,31 | 0,64 | 0,17 | **45634140** |
| 0,51 | 0,94 | 0,22 | **49300528** |
| 0,64 | 1,19 | 0,28 | **45634142** |
| 0,76 | 1,65 | 0,45 | **45634143** |
| 1,02 | 2,16 | 0,57 | **45634144** |
| 1,47 | 1,96 | 0,25 | **49300529** |
| 1,58 | 2,41 | 0,42 | **45634146** |
| 1,58 | 3,18 | 0,80 | **45634147** |
| 1,98 | 3,18 | 0,60 | **49300530** |
| 2,64 | 4,88 | 1,12 | **45634149** |
| 3,35 | 4,65 | 0,65 | **45634150** |
| 3,18 | 6,35 | 1,59 | **45634151** |
| 4,78 | 7,95 | 1,59 | **45634152** |
| 4,78 | 9,53 | 2,38 | **45634153** |
| 6,35 | 9,53 | 1,59 | **45634154** |
| 6,35 | 11,13 | 2,39 | **45634155** |
| 6,35 | 12,70 | 3,18 | **45634156** |
| 7,94 | 12,70 | 2,38 | **45634157** |
| 9,53 | 12,70 | 1,59 | **45634158** |
| 9,53 | 14,30 | 2,39 | **45634159** |
| 9,53 | 15,88 | 3,18 | **45634160** |
| 12,70 | 17,48 | 2,39 | **49300531** |
| 12,70 | 19,05 | 3,18 | **45634162** |
| 15,88 | 22,23 | 3,18 | **45634163** |
| 15,88 | 23,83 | 3,98 | **49300532** |
| 19,05 | 25,41 | 3,18 | **45634165** |

The values stated are typical values. 15 m coils. Double bagged and packaged in boxes. Material certification and batch number included in every box.*

**SPECIFICATIONS**

ISO: ISO 10993-1
FDA: FDA 21CFR 177-2600
USP: USP-KLASSE VI
EP: EP 3.1.9

**TYPICAL PROPERTIES AFTER CURING**

| | |
|---|---|
| Specific gravity [g/cm3] | 1.16 |
| Durometer hardness [Shore A points] | 60 |
| Tensile strength [MPa] | 9.8 |
| Tear strength [kN/m2], Die B ASTM D624 | 38 |
| Elongation [%] | 700 |

* Individual measured values may differ from mean values. These values are not to be considered as product specifications. Non-implantable, non-sterile.

# HELIXMARK®
# PERISTALTIC PUMP TUBING

HelixMark peristaltic pump tubing is designed and manufactured for use with peristaltic pumps and other applications with higher effective forces. A special production process designed to meet these requirements ensures that the products provide greater stability and capacity to withstand stresses. The range offers sizes suitable for use with all commonly used pump types. Our tubing is individually packed in 7.5 m coils.

| INNER DIAMETER | OUTER DIAMETER | WALL THICKNESS | FIT PUMP TUBE SIZE | ISO FDA USP (EP) |
|---|---|---|---|---|
| mm | mm | mm | REF | REF |
| 0,51 | 3,71 | 1,60 | #112 | **45635015** |
| 0,79 | 3,99 | 1,60 | #13 | **45635023** |
| 0,99 | 1,60 | 0,31 | | **45635027** |
| 1,50 | 2,52 | 0,51 | | **45635037** |
| 1,60 | 4,80 | 1,60 | #14 | **45635043** |
| 1,60 | 6,38 | 2,39 | #119 | **45635045** |
| 2,01 | 3,02 | 0,51 | | **45635051** |
| 2,52 | 3,53 | 0,51 | | **45635063** |
| 3,00 | 4,01 | 0,51 | | **45635070** |
| 3,18 | 6,38 | 1,60 | #16 | **45635079** |
| 3,18 | 7,95 | 2,39 | #120 | **45635082** |
| 4,01 | 5,44 | 0,72 | | **45635093** |
| 4,78 | 7,98 | 1,60 | #25 | **45635104** |
| 4,78 | 9,55 | 2,39 | #15 | **45635108** |
| 4,78 | 9,86 | 2,54 | #15TW | **45635110** |
| 4,78 | 11,13 | 3,18 | #123 | **45635112** |
| 6,35 | 9,55 | 1,60 | #17 | **45635130** |
| 6,35 | 11,13 | 2,39 | #24 | **45635133** |
| 6,35 | 11,43 | 2,54 | #24TW | **45635136** |
| 6,35 | 12,70 | 3,18 | #26 | **45635139** |
| 6,35 | 13,21 | 3,43 | #26TW | **45635141** |
| 7,95 | 11,15 | 1,60 | #18 | **45635160** |
| 7,95 | 12,73 | 2,39 | #35/121 | **45635163** |
| 7,95 | 15,98 | 4,02 | #185 | **45635166** |
| 9,53 | 14,30 | 2,39 | #36/122 | **45635191** |
| 9,53 | 15,89 | 3,18 | #73 | **45635194** |
| 9,53 | 16,38 | 3,43 | #73TW | **45635197** |
| 9,53 | 19,03 | 4,75 | #70/190 | **45635200** |
| 12,01 | 20,03 | 4,01 | #186 | **45635230** |
| 12,70 | 19,05 | 3,18 | #82 | **45635243** |
| 12,70 | 19,56 | 3,43 | #82TW | **45635245** |
| 12,70 | 22,20 | 4,75 | #88 | **45635248** |
| 15,88 | 22,23 | 3,18 | #184 | **45635262** |
| 15,88 | 25,38 | 4,75 | #189 | **45635270** |
| 16,00 | 24,03 | 4,02 | #187 | **45635288** |
| 19,05 | 28,55 | 4,75 | #191 | **45635310** |
| 25,40 | 34,90 | 4,75 | #92 | **45635420** |
| 25,40 | 35,56 | 5,08 | #92TW | **45635428** |

The values stated are typical values. Typical hardness: 60 Shore A. TW = Thick Wall (stronger wall thickness, variance between identical pump numbers). 7.5 m coils. Double bagged and packaged in boxes. Material certification and batch number included in every box*

**SPECIFICATIONS**
ISO: ISO 10993-1
FDA: FDA 21CFR 177-2600
USP: USP-CLASS VI
EP: EP 3.1.9

* Individual measured values may differ from mean values. These values are not to be considered as product specifications. Non-implantable, non-sterile.

# HELIXMARK®
# BRAIDED REINFORCED TUBING

HelixMark braided reinforced tubing is designed and manufactured especially for applications with higher pressures. Pressure-proof polyester braiding, firmly embedded between two layers of silicone, lends this tubing its particularly durability and resistance to pressure. Our tubing is individually packed in 7.5 m coils.

| INNER DIAMETER | OUTER DIAMETER | MIN BURST | ISO FDA USP (EP) |
|---|---|---|---|
| mm | mm | PSI | **REF** |
| 3,18 | 9,27 | 705 | **45636020** |
| 4,75 | 11,35 | 655 | **45636030** |
| 6,35 | 13,21 | 630 | **45636040** |
| 7,92 | 15,04 | 555 | **45636045** |
| 9,53 | 16,64 | 505 | **45636050** |
| 12,70 | 20,32 | 430 | **45636060** |
| 15,88 | 24,51 | 355 | **45636070** |
| 19,05 | 27,94 | 280 | **45636080** |
| 22,23 | 31,37 | 255 | **45636090** |
| 25,40 | 34,54 | 230 | **45636100** |

The values stated are typical values. Typical hardness: 65 Shore A. 7.5 m coils. Double bagged and packaged in boxes. Material certification and batch number included in every box.*

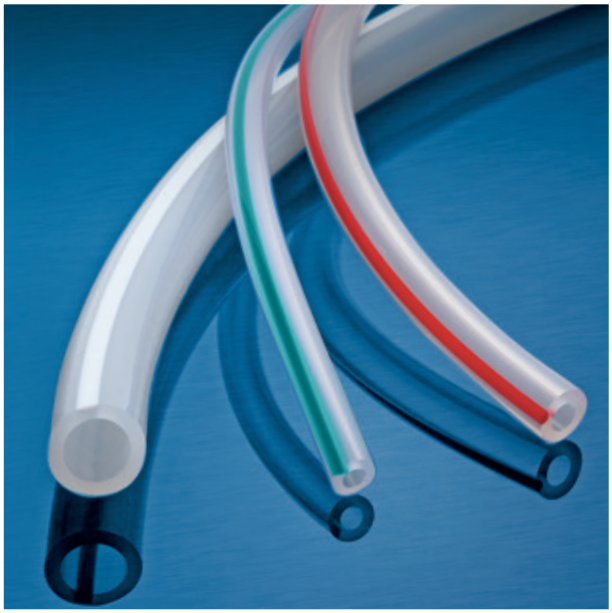
**SPECIFICATIONS**

ISO: ISO 10993-1
FDA: FDA 21CFR 177-2600
USP: USP-CLASS VI
EP: EP 3.1.9

* Individual measured values may differ from mean values. These values are not to be considered as product specifications. Non-implantable, non-sterile.

# HELIXMARK®
# COLOUR-STRIPED TUBING

HelixMark colour-striped tubing helps to maintain a clear overview in complex tubing systems and enables quick and easy identification of individual applications, sizes or functional configurations. The tubing is available with stripes in red, green and white, individually packaged in pre-cut lengths of 15 m.

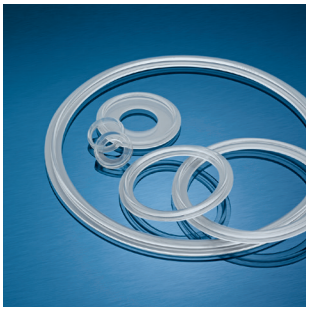


| INNER DIAMETER | OUTER DIAMETER | WALL THICKNESS | RED STRIPE FDA | GREEN STRIPE FDA | WHITE STRIPE FDA |
|---|---|---|---|---|---|
| mm | mm | mm | REF | REF | REF |
| 3,18 | 6,35 | 1,59 | **45630621** | **45630721** | **45630821** |
| 4,78 | 9,53 | 2,38 | **45630623** | **45630723** | **45630823** |
| 6,35 | 12,70 | 3,18 | **45630626** | **45630726** | **45630826** |
| 7,95 | 12,70 | 2,38 | **45630627** | **45630727** | **45630827** |
| 9,53 | 15,88 | 3,18 | **45630630** | **45630730** | **45630830** |
| 12,70 | 19,05 | 3,18 | **45630632** | **45630732** | **45630832** |

The values stated are typical values.
Typical hardness: 60 Shore A.
Please contact Customer Service for details of sizes and tolerances.
Material certification and batch number included in every box. */**

**SPECIFICATIONS**
FDA: FDA 21CFR 177-2600

* Individual measured values may differ from mean values. These values are not to be considered as product specifications. Non-implantable, non-sterile.
** Minimum order quantity required! For more information, please contact your representative.



# HELIXMARK®
# CLAMP GASKETS

HelixMark clamp gaskets ensure reliable sealing of radial plug-in connectors. The gaskets are suitable for all commonly used diameters and sizes and are supplied in packages of 25.

| TYPE | INNER DIAMETER | ISO FDA USP (EP) |
|---|---|---|
| mm | mm | REF |
| Mini | 12,70 | **45639005** |
| Mini | 19,05 | **45639007** |
| Standard | 25,40 | **45639010** |
| Standard | 38,10 | **45639015** |
| Standard | 50,80 | **45639020** |
| Standard | 63,50 | **45639025** |
| Standard | 76,20 | **45639030** |
| Standard | 101,60 | **45639040** |
| Standard | 152,40 | **45639060** |

The values stated are typical values. Typical hardness: 80 Shore A. Packaged in boxes with 25 gaskets per resealable bag. Material certification and batch number included in every box.*/**

**SPECIFICATIONS**
ISO: ISO 10993-1
FDA: FDA 21CFR 177-2600
USP: USP-CLASS VI

# HELIXMARK®
# STOPPERS

HelixMark silicone stoppers enable reliable sealing of glass tubes, vials and flasks. The stoppers are suitable for all commonly used diameters and sizes and are supplied in packages of 12.

| STOPPER SIZE | TOP DIAMETER | BOTTOM DIAMETER | HEIGHT | ISO FDA USP (EP) |
|---|---|---|---|---|
| mm | mm | mm | mm | REF |
| 000 | 13 | 8 | 25 | **45639199** |
| 00 | 15 | 10 | 25 | **45639190** |
| 0 | 17 | 13 | 25 | **45639100** |
| 1 | 19 | 14 | 25 | **45639101** |
| 2 | 20 | 16 | 25 | **45639102** |
| 3 | 24 | 18 | 25 | **45639103** |
| 4 | 26 | 20 | 25 | **45639104** |
| 5 | 27 | 23 | 25 | **45639105** |
| 6 | 32 | 26 | 25 | **45639106** |
| 7 | 37 | 30 | 25 | **45639107** |
| 8 | 41 | 33 | 25 | **45639108** |
| 9 | 45 | 37 | 25 | **45639109** |
| 10 | 50 | 42 | 25 | **45639110** |
| 12 | 64 | 54 | 25 | **45639112** |

The values stated are typical values. Typical hardness: 50 Shore A. Packaged in boxes with 12 gaskets per resealable bag. Material certification and batch number included in every box.*/**

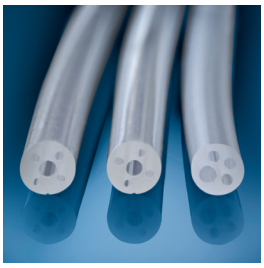
**SPECIFICATIONS**
ISO: ISO 10993-1
FDA: FDA 21CFR 177-2600
USP: USP-CLASS VI
EP: EP 3.1.9

* Individual measured values may differ from mean values. These values are not to be considered as product specifications. Non-implantable, non-sterile.
** Minimum order quantity required! For more information, please contact your representative.

# HELIXMARK®
# CUSTOMER-SPECIFIC SERVICES

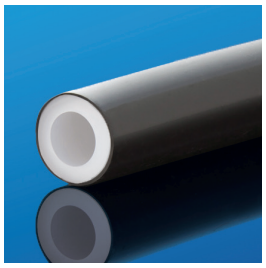
In addition to the products for the general needs of the medtech and pharmaceutical industry shown in our catalogue, we also offer a wide range of options for customer-specific silicone tubing solutions. This allows the configuration of made-to-measure solutions to meet the customer's precise requirements.

For more information please visit www.freudenbergmedical.de
or contact us under info@freudenbergmedical.de



MULTI-LUMEN TUBING

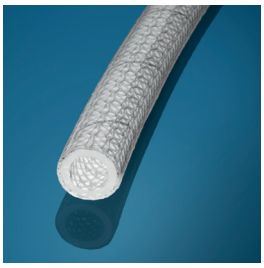
CUSTOMER-SPECIFIC COLOURS



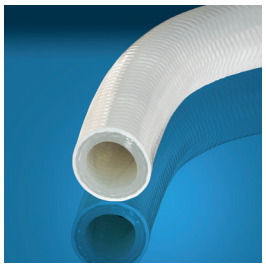
UV-LIGHT SHIELDING TUBING

RADIOPAQUE TUBING

PACKAGING ON SPOOLS



WIRE BRAIDED TUBING



DOUBLE REINFORCED TUBING

TUBING SYSTEMS

BOTTLE CLOSURE SYSTEMS


STOPPERS WITH HOLES


HELIXMICRO™ MICRO TUBING


HELIXTWIST™ MULTI-LUMEN


HELIXIMC™ TECHNOLOGY

ADDITIONAL SERVICES

- Profiles
- Precision cut-to-length
- Tip trimming
- Punching

MISSING SOMETHING?

Please contact us for specific requirements.

Powered by HelixiMC™ Technology, a ground-breaking new technology to continuously measure the inner geometry of silicone tubes.

**Freudenberg Medical manufactures products exclusively for the medtech and pharmaceutical industry. This focus enables us to understand and rapidly and efficiently fulfil our customers' precise requirements. In this, our capabilities as a supplier and partner in the development of products and solutions are distinguished by exceptional flexibility and powers of innovation.**

We are your global partner for the design, development and production of innovative medical and combination products. Our portfolio comprises complex medical components and catheter solutions for minimally invasive surgery. We are a leading manufacturer not only in the field of precision-moulded components and tubing in silicone and thermoplastics, but also in coating technologies and the production of metal hypotubes.

Freudenberg Medical is a part of the Freudenberg Group, a technology group with a tradition reaching back over 165 years and a provider of innovative products for more than 30 market segments around the globe.

In our daily work, both our corporation and individual employees are committed to upholding the values for which we all stand:

- Value for customers
- Innovation
- Leadership
- People
- Responsibility
- Long term orientation

As a development partner, we ensure that every innovation project our customers entrust to us is realised and led to commercial success by our unique combination of technical expertise, a global network, financial stability and enormous flexibility.

# SILICONE CHEMICAL COMPATIBILITIES

- Little or no effect (Volume swell <10%)
- Possible loss of physical properties (Volume swell 10–20%)
- Noticeable change (Volume swell 20–40%)
- Not suitable for service

**Chemical Medium**

- Acetaldehyde
- Acetamide
- Acetic Acid, 25% to 60%
- Acetic Anhydride
- Acetone
- Acetylene
- Acrylonitrile
- Alums
- Aluminum Chloride
- Aluminum Salts
- Aluminum Sulfate
- Ammonia Gas, Cold
- Ammonia Gas, Hot
- Ammonium Hydroxide, Concentrated
- Ammonium Nitrate
- Ammonium Phosphate
- Ammonium Salts
- Ammonium Sulfate
- Amyl Acetate
- Amyl Alcohol
- Amyl Borate
- Amyl Chloride
- Amyl Chloronaphthalene
- Amyl Naphthalene
- Aniline
- Aniline Hydrochloride
- Asphalt
- Barium Chloride
- Barium Hydroxide
- Barium Salts
- Beer
- Beet Sugar Liquors
- Benzaldehyde
- Benzene
- Benzoic Acid
- Bleach Liquor
- Borax
- Boric Acid
- Bromine
- Bromobenzene
- Butane
- Butyl Acetate
- Butyl Alcohol
- Butyraldehyde
- Calcium Bisulfide
- Calcium Chloride
- Calcium Hydroxide
- Calcium Hypochlorite
- Calcium Nitrate
- Calcium Salts
- Cane Sugar Liquors
- Carbitol
- Carbolic Acid
- Carbon Dioxide
- Carbon Monoxide
- Carbon Tetrachloride
- Carbonic Acid
- Castor Oil
- Caustic Soda
- Chlorinated Solvents
- Chlorinated Solvents, Dry
- Chlorinated Solvents, Wet
- Chlorobenzene
- Chlorobromo-methane
- Chloroform
- Chloronaphthalene
- Chlorosulfonic Acid
- Chlorotoluene
- Chrome Plating Solution
- Chromic Acid
- Citric Acid
- Coconut Oil
- Cod Liver Oil
- Copper Salts
- Corn Oil
- Creosote, Coal Tar
- Creosote, Wood
- Cresol
- Cyclohexane
- Detergent Solutions
- Dextrose
- Diacetone Alcohol
- Dichlorobenzene
- Diethyl Ether
- Diethylamine
- Diethylene Glycol
- Dimethyl Formamide
- Dioctyl Phthalate
- Dioxane
- Diphenyl
- Ethers
- Ethanolamine
- Ethers
- Ethyl Acetate
- Ethyl Acetoacetate
- Ethyl Alcohol
- Ethyl Cellulose
- Ethyl Chloride
- Ethylene
- Ethylene Chlorohydrin
- Ethylene Diamine
- Ethylene Dichloride
- Ethylene Glycol
- Ethylene Oxide
- Ethylene Trichloride
- Fatty Acids
- Ferric Chloride
- Ferric Sulfate
- Fluorobenzene
- Formaldehyde
- Formic Acid
- Fuel Oil
- Fumaric Acid
- Gasoline
- Gelatin
- Glucose
- Glycerin
- Glycols
- Green Sulfate Liquor
- Halowax Oil
- Hexaldehyde
- Hexane
- Hydrazine
- Hydrobromic Acid
- Hydrochloric Acid, 3 Molar to 158°F
- Hydrochloric Acid, Hot 37%
- Hydrocyanic Acid
- Hydrofluoric Acid, Concentrated Hot
- Hydrofluorosilicic Acid
- Hydrogen Gas
- Hydrogen Peroxide
- Hydrogen Sulfide, Dry Cold
- Hydrogen Sulfide, Wet Cold
- Isobutyl Alcohol
- Isooctane
- Isopropanol
- Isopropyl Acetate
- Kerosene
- Lactic Acid, Cold
- Lard
- Lead Acetate
- Lead Nitrate
- Linseed Oil
- Lithium Hydroxide
- Lubricating Oils, Petroleum
- Lye
- Magnesium Chloride
- Magnesium Salts
- Magnesium Sulfate
- Manganese Sulfate
- Mercury
- Mesityl Oxide
- Methane
- Methanol
- Methyl Bromide
- Methyl Chloride
- Methylene Di-P-Phenylene Isocyanate
- Methyl Ethyl Ketone
- Methyl Isobutyl Ketone
- Methyl Methacrylate
- Methylene Chloride
- Milk
- Mineral Oils
- Monochlorobenzene
- Naphtha
- Naphthalene
- Natural Gas
- Nickel Chloride
- Nickel Salts
- Nitric Acid, 50–100%
- Nitrobenzene
- Nitroethane
- Nitrogen
- Nitrogen Oxides
- Animal Oil
- Lubricating Oils, Petroleum
- Mineral Oils
- Vegetable Oils
- Oleic Acid
- Oxalic Acid
- Oxygen, Cold
- Ozone
- Paraffins
- Perchloric Acid
- Perchloroethylene
- Petrol
- Phenol
- Phosphoric Acid
- Phthalic Acid
- Picric Acid
- Pinene
- Potassium Carbonate
- Potassium Chlorate
- Potassium Cyanide
- Potassium Dichromate
- Potassium Hydroxide
- Potassium Iodide
- Potassium Nitrate
- Potassium Salts
- Producer Gas
- Propane
- Pyridine
- Pyrrole
- Sea Water
- Sewage
- Silicone Oils
- Silver Nitrate
- Soap Solutions
- Soda Ash
- Sodium Bicarbonate
- Sodium Bisulfate
- Sodium Bisulfide
- Sodium Borate
- Sodium Chloride
- Sodium Cyanide
- Sodium Hydroxide
- Sodium Hypochlorite
- Sodium Nitrate
- Sodium Perborate
- Sodium Peroxide
- Sodium Phosphate, Dibasic
- Sodium Sulfate
- Sodium Sulfide
- Sodium Sulfite
- Sodium Thiosulfate
- Soybean Oil
- Stannic Chloride
- Stannous Chloride
- Stearic Acid
- Stoddard Solvent
- Styrene
- Sulfur Chloride
- Sulfur Dioxide
- Sulfur Hexafluoride
- Sulfur Dioxide
- Sulfur Trioxide
- Sulfuric Acid, Concentrated Room Temp
- Sulfuric Acid, Concentrated to 158°F
- Sulfurous Acid
- Tannic Acid
- Tar, Bituminous
- Tartaric Acid
- Tributyl Mercaptan
- Tin Chloride
- Toluene
- Trichloroethane
- Trichloroethylene
- Tricresyl Phosphate
- Turpentine
- Vegetable Oils
- Vinegar
- Water
- Whiskey
- Wine
- Xylene
- Xylol
- Yeast, Aqueous

**Note:** Volume swell is only one indicator of elastomer fluid compatibility and may be based on the solubility parameter alone. Fluid attack on the backbone of the polymer may show up as change a in physical properties such as Tensile Strength, Elongation at Break, and Hardness. Elevated temperature and extended exposure times may create more aggressive conditions than cited in this guide.

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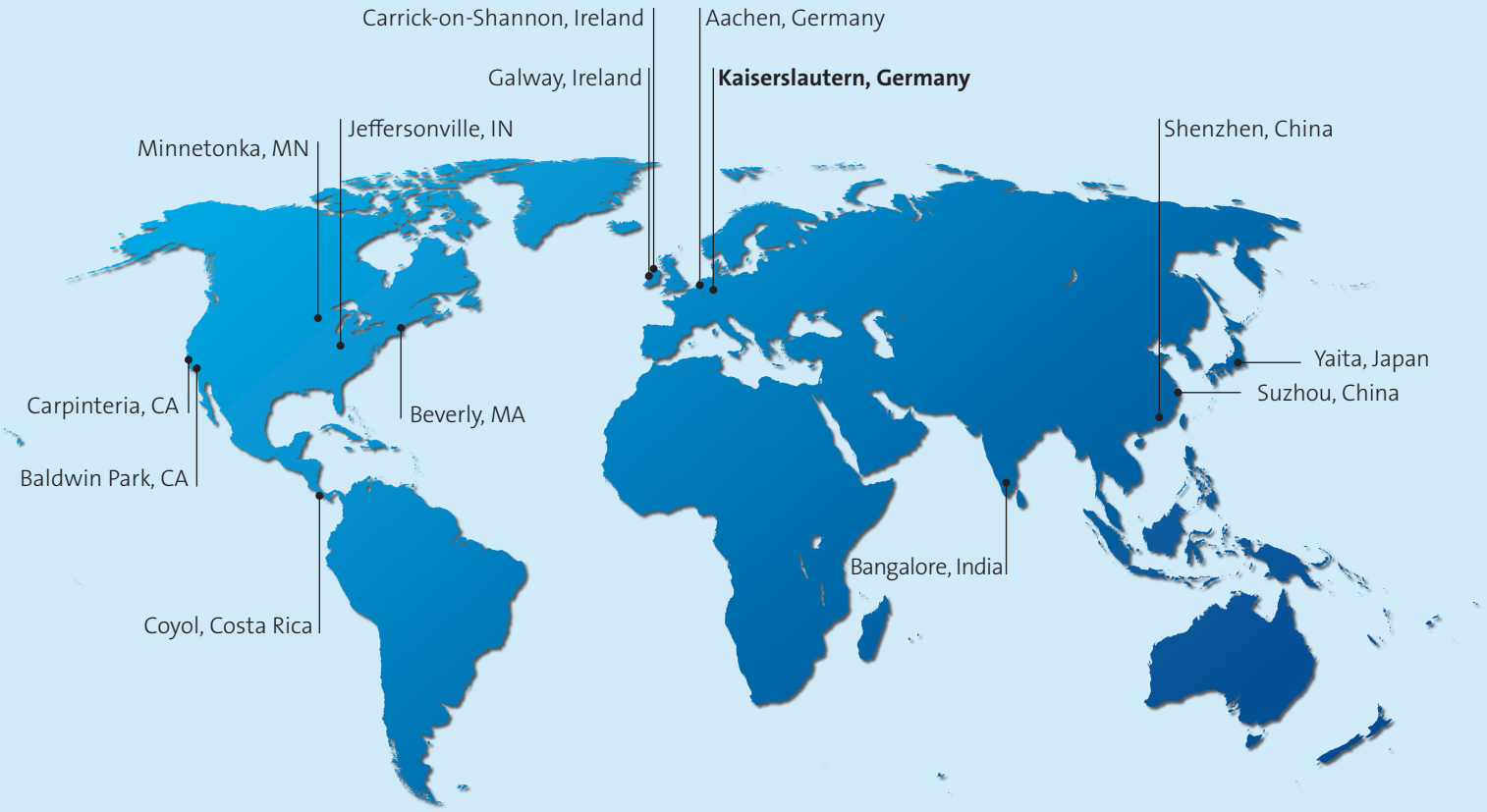
# GLOBAL RESOURCES
# LOCAL SOLUTIONS



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