



# Tape Solutions for LED Lighting



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**Saint-Gobain®** offers a wide range of solutions that address the specific needs of outdoor LED lighting applications, including **Norseal®** Silicone Products. These products are made from high-performance materials with a unique chemical structure which provide high temperature stability and general inertness unavailable in any other elastomer. Offering low outgassing and extended service life, **Norseal** Products are ideal for LED lighting applications on streets and highways and in parks, recreation areas, gas stations and commercial buildings. Traditional gasket materials, like EPDM and neoprene, deteriorate faster with outdoor exposure. The ideal choice for outdoor LED lighting fixtures, **Norseal** Silicone Gaskets are resistant to fungus growth, withstand harsh weather cycles, have excellent thermal stability and can handle long-term UV exposure. With a 10-year minimum shelf life, **Norseal** Silicone Products are designed for the demanding, long-term nature of outdoor LED lighting applications.

## Norseal Silicone Gasketing

**Products:** Silicone Foam Rubber, Silicone Sponge Rubber, Silicone SNS Tapes

**Function:** Fungus resistance and long-term protection against dirt, sunlight, moisture, ozone and UV for outdoor applications

**Features:** Extreme temperature resistance, low compression set, lower material outgassing, UL tested for critical specifications including UL-50 and 50E- recognized weather seal gasket, UL V-0, JMLU2 gasket materials

**Silicone Foam Rubber:** Rubber foams are resistant to environmental conditions, making these products ideal for both interior and exterior seals in LED lighting. Their low compression set minimizes the necessity for periodic replacement. **Norseal** F-12, F-15 and F-20 are soft, lightweight silicone foams with low and medium density. F-12 and F-20 provide excellent flame resistance (UL94 V-0), with low toxicity and smoke generation. F-15 is currently pending UL94 V-0 testing. These silicone foams are non-corrosive in use with metals and in hostile environments, reducing overall maintenance costs. F-12, F-15 and F-20 have outstanding compression set resistance for a long-term, continuous seal, preventing outside elements, such as dust and moisture, from entering the LED electrical lighting component.

**Silicone Sponge Rubber:** Designed for a variety of gasketing, cushioning, insulating and protecting applications over a wide range of temperatures and environments. **Norseal** Silicone Sponge Rubber Products offer superior mechanical strength with key benefits of thermal stability, excellent compression set, ozone and UV resistance and very low outgassing. The combination of these properties make **Norseal** Silicone Sponges the ideal choice in LED applications.

**Norseal R10400** — Flame retardant closed-cell sponge recognized to UL94 V-0. With excellent tensile strength and elongation for high pressure, this product is dependable in LED lighting fixtures. Another key feature is maintaining its resiliency even under extended compression and extreme temperatures.

**ThermaCool® R10404** — Thermally conductive silicone sponge rubber, offering electrical isolation and compression set resistance. The viscoelastic core of R10404 is ideal in LED applications, offering a long life and temperature stability, which are key industry requirements.

**Norseal R10460** — Flame retardant (UL 94 HB/ V-1 for thicknesses > 11.7 mm) and especially resistant to compression set, this closed-cell sponge rubber is flexible with excellent weatherability. Meeting UL 157, R10460 is a recognized weather seal gasket suitable for outdoor LED applications.

**Norseal R10470** — General-purpose UL-recognized silicone weather seal gasket with excellent environmental and weather sealing properties.

**Norseal R10480** — Features an extremely low compression set and recognized to UL 50E. When used as a gasket or seal, this product prevents water from penetrating LED lighting electrical components.

**Silicone SNS Tapes:** **Norseal** Silicone SNS Tapes provide all the benefits of our silicone rubber in an easy-to-apply, pressure-sensitive adhesive tape form. Compressible and flexible, they can conform to irregular surfaces or be formed to produce right angles, making the SNS tape the optimal solution for LED applications where irregular shapes are required. When used in place of expensive die-cut parts, overall cost of the LED lighting structure is reduced. Available with both high and low temperature silicone adhesive and aggressive, strong anchorage acrylic pressure-sensitive adhesive on one side. **Norseal** Silicone SNS Tapes can be supplied with closed-cell sponge backing SNS 100S (R10470M), SNS 200A (R10470M); fiberglass-reinforced closed-cell sponge SNS 300AR (R10450); soft and thin solid silicone SNS 440S, SNS 440A; or flame retardant silicone foam backing SNS 512AF (F-12), SNS 515GF (F-15), SNS 520AF (F-20).

## Material Selection Guide

| Material Type          | Product Code | Density of Silicone Substrate<br>kg/m <sup>3</sup> (lbs./ft <sup>3</sup> )<br>ASTM D-3574 | Temperature Range °C (°F) | UL Approvals   | Color   | Product Features  |
|------------------------|--------------|---|---------------------------|--|---|---|
| Silicone Foam Rubber   | F-12         | 192 (12)  | -60 /+400<br>(-51 /+204)  | 94 V-0 (gray and black)  | Gray (std.);<br>white, black & brown<br>(custom colors)                       | Modified cell foam with low density   |
|                        | F-15         | 240 (15)  | -60 /+400<br>(-51 /+204)  | 94 V-0 pending (gray)  | Gray (std.)   | Modified cell foam with low density   |
|                        | F-20         | 320 (20)  | -60 /+400<br>(-51 /+204)  | 94 V-0 (gray and black)<br>JMLU2 (gray), 50E, 508  | Gray (std.)   | Closed cell foam with medium density  |
| Silicone Sponge Rubber | R10400       | 560 (35)  | -73 /+260<br>(-100 /+500) | 94 V-0   | Gray (std.)   | Closed cell sponge with excellent mechanical properties   |
|                        | R10404*      | 1105 (69)   | -62 /+205<br>(-80 /+400)  | —  | Light green (std.)  | Thermally conductive closed cell sponge, that offers electrical isolation and temperature stability |
|                        | R10460       | 470 (29)  | -73 /+260<br>(-100 /+500) | UL 94 HB/ V-1 for thicknesses > 11.7 mm<br>JMST2 Suitable for use as weather seal gaskets in lighting fixtures | Dark blue (std.)  | Closed cell sponge with very low compression set and excellent mechanical properties                |
|                        | R10470M      | 470 (29) medium<br>692 (43) firm  | -73 /+260<br>(-100 /+500) | JMST2 Suitable for use as weather seal gaskets in lighting fixtures  | Orange-tan (std.);<br>black & gray<br>(custom colors)                         | Closed cell sponge available in medium and firm grades  |
|                        | R10480S      | 332 (21) soft<br>470 (29) medium  | -73 /+260<br>(-100 /+500) | JMLU2 (red), 50E, 508  | Brown (R10480M std.),<br>orange & red (R10480S std.);<br>gray (custom colors) | Closed cell sponge available on soft and medium grades  |
| SNS Tapes              | SNS 100S     | 470 (29)  | -73 /+260<br>(-100 /+500) | JMST2 Suitable for use as weather seal gaskets in lighting fixtures  | Orange-tan (std.);<br>black (custom color)                                    | Silicone sponge R10470M with high temperature silicone adhesive                                     |
|                        | SNS 200A     | 470 (29)  | -28 /+163<br>(-20 /+325)  | —  | Orange-tan (std.)   | Silicone sponge R10470M with aggressive acrylic adhesive  |
|                        | SNS 300AR    | 560 (35)  | -73 /+260<br>(-100 /+500) | —  | Blue (std.)   | Reinforced silicone sponge R10450 with aggressive acrylic adhesive                                  |
|                        | SNS 440S     | 1100 (69)   | -73 /+260<br>(-100 /+500) | —  | Gray (std.)   | Silicone solid Shore A 30 durometer with high temperature silicone adhesive                         |
|                        | SNS 440A     | 1100 (69)   | -28 /+163<br>(-20 /+325)  | —  | Gray (std.)   | Silicone solid Shore A 30 durometer with aggressive acrylic adhesive                                |
|                        | SNS 512AF    | 192 (12)  | -28 /+162<br>(-20 /+325)  | 94 V-0 (for base foam)<br>JMST2 Suitable for use as weather seal gaskets in lighting fixtures                  | Gray (std.);<br>white (custom color)  | F-12 foam with film supported acrylic adhesive  |
|                        | SNS 515GF    | 240 (15)  | -28 /+162<br>(-20 /+325)  | 94 V-0 (for base foam) pending   | Gray (std.)   | F-15 foam with supported acrylic adhesive   |
|                        | SNS 520AF    | 320 (20)  | -28 /+162<br>(-20 /+325)  | 94 V-0 (for base foam)   | Gray (std.);<br>black (custom color)  | F-20 foam with film supported acrylic adhesive  |

\*ThermaCool thermally conductive products are also available as an option for LED lighting applications. Please contact Customer Care for a list of available ThermaCool products.

Because of the softness and the processing of R10480 Soft, we do not recommend die-cutting narrow width gasketing. Contact Application Engineering.

## Key Recommended Properties for LED Lighting

| Product Family           | Properties                        | Test Method  | Typical Value   |
|--------------------------|-----------------------------------|--------------|---|
| Norseal Silicone Foams   | Outgassing %                      | NASA Testing | Less than 2% weight loss (after 24 hrs. at 257°F (125°C) in vacuum) for F-12 and F-20             |
|                          | Compression Set %                 | ASTM D1056   | < 5% for F-12 and F-20  |
|                          | Compression Deflection kPa (psi)  | ASTM D1056   | 20 (3) for F-12; 70 (10) for F-20   |
|                          | Tensile Strength kPa (psi)        | ASTM D412    | 172 (25) for F-12; 207 (30) for F-20  |
| Norseal Silicone Sponges | Outgassing %                      | NASA Testing | Less than 1% weight loss (after 24 hrs. at 257°F (125°C) in vacuum) for all sponge products       |
|                          | Compression Set %                 | ASTM D1056   | 5% for all sponges (15 for R10404 and R10470M)  |
|                          | Water Absorption %                | ASTM D1056   | < 5% for all sponge products  |
|                          | Tensile Strength kPa (psi)        | ASTM D412    | 690 (100) — R10400; 828 (120) — R10404; 518 (75) — R10460; 345 (50) — R10480S; 621 (90) — R10470M |
|                          | Thermal Conductivity average W/mK | ASTM E1530   | 0.11 for all sponge products  |

# Your Partner in Custom Tape Solutions

A custom tape solution can pay for itself many times over thanks to the process and product improvements it can provide. Tape development engineers will work with partners to design an economical but highly effective tape product.

Even with endless permutations of industrial tapes available there is only one company that can deliver a custom-made tape with optimal adhesive, the perfect backing materials, seamless process integration and superb performance.

To learn more about how **Saint-Gobain** can help solve tape and materials engineering challenges, call us or visit us online.

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