



# Tape Solutions for Mass Transit Rail

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**Saint-Gobain Norseal**® Foam Gasketing Tapes are compressible, elastomeric foams designed for forming protective seals against smoke, fire, air and water. Our **Norseal** product series is suitable for a variety of mass transit railcar applications including (but not limited to) thermal insulation, access panel seals, intake gasket, HVAC seals and electronic enclosure gaskets. These foams are tested to industry standards and are verified to meet/exceed most requirements for railcar applications.

## Gasketing Foams and Tapes

**Products:** Silicone Foam Rubbers, Closed-cell Silicone Sponge Rubber, Fire-blocking Polyurethane Foam

**Function:** To provide excellent protection against air, fire, vapor, moisture, dirt and sound by functioning as gaskets

**Features:** Excellent flame resistance, noise damping and thermal insulation. Foams with and without surface texture can be used for different types of handling. Our offerings have been tested in accordance with various European EN 45545 requirements and several North American standards like NFPA 130, FTA Docket 90-A, 49CFR Part 238 that include testing according to ASTM standards ASTM E162, ASTM E662, ASTM C1166, SMP800-C & ASTM E1354.

**Silicone Foam Rubber:** **Norseal** F-12, F-15 and F-20 are soft, light-weight silicone foams that provide excellent flame resistance with low toxicity and smoke generation. Both F-12 and F-20 meet the highest Hazard classification of HL3 per EN 45545-2 thus helping to enhance passenger safety. All three products are ideal for both interior and exterior seals. Low compression set ensures long life seals and reduces overall maintenance costs. **Norseal** F-12 has a modified cell structure and low density for gasketing and thermal insulation application. **Norseal** F-15 is medium-low density silicone designed to deliver environmentally stable, flame-retardant performance for gasketing, insulation and dampening applications, offering non-toxic, low smoke generation and low flame spread. **Norseal** F-20 has a finer closed cell structure with a medium density for excellent sealing attributes. All three products have very good low and high temperature capabilities (-50°C to 200°C). Smooth or textured surfaces can be customized for modifying sealing abilities.

**Silicone Sponge Rubber:** **Norseal** R10400 and **Norseal** R10460 have very good flame resistance with low toxicity and smoke generation meeting an HL2 rating per EN45545-2. Both provide superior resistance to extreme temperatures (-70°C to 260°C) while offering excellent mechanical properties, making them suitable for a variety of interior and exterior sealing applications.

**Fire-Blocking Polyurethane Foam:** **Norseal** FS1000 series is a multi-functional foam tape with intumescent characteristics meeting an HL2 rating per EN45545-2. FS1000 is ideal for modest temperature range of -40°C to 100°C. Its soft nature makes it highly conformable to uneven surfaces. It can be easily compressed with minimal force to create air and water seals. Its intumescent characteristics is demonstrated from a temperature of 200°C (392°F), by forming a fire-resistant char, blocking fire, smoke and hot gasses, thereby ensuring safety to passengers. *Scan QR Code on back to see FS1000 video.*

## Material Selection Guide – European Standards EN 45545-2\*

Material Type	Product Code	Thickness, mm	Density, Kg/m <sup>3</sup>	Hazard Classification**	Requirements Set***	Product Features
Silicone	F-20	0.8 - 12.7	320	HL3	R-22 Interior Seals  R-23 Exterior Seals	Closed-cell foam with medium density
	F-12	1.6 - 25.4	190			Modified cell structure with low density
	F-15	1.6 - 12.7	240	HL2		Smooth surface on both sides; medium-low density
	R10400	1.6 - 12.7	560	HL2		Closed-cell sponge with excellent mechanical properties with low density
	R10460		470			Closed-cell sponge with very low compression set and excellent mechanical properties
Polyurethane	FS1000	6.0	240		Intumescent, airtight, watertight and resilient sealing foam	

\* Contact Customer Care for 3<sup>rd</sup> party test reports.

\*\* HL (Hazard Level) Classification: HL3 fulfills HL1 & HL2, HL2 fulfills HL1.

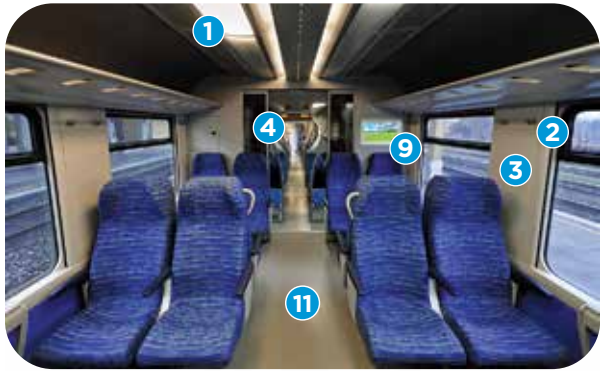
\*\*\* R1, R2, R3, etc. are the material requirements. They will define the specific tests and success/failure criteria of a product for each Hazard Level Classification.

## Material Selection Guide – North American Standards\*

Material Type	Product Code	Thickness	Density	ASTM E162	ASTM E662		ASTM C1166	UL94	SMP 800C	Product Features	Common Applications
		in	lb/ft <sup>3</sup>	Flame Spread Index	Ds 90s	Ds 4min	Flame prop, in				
Silicone	F-20	0.063	20	< 35	22	40	3.1	V-0	Pass	Closed-cell foam with medium density	Window gaskets, door nosings, inter-car diaphragms, lighting seals, access panel seals
		0.5			13	74	1.4				
	F-15	0.125	15	< 35	8	27	1.4	V-0	Pass	Smooth surface on both sides; medium-low density	Window gaskets, door nosings, inter-car diaphragms, lighting seals, access panel seals
	F-12	0.063	12	< 35	26	36	3.6	V-0	Pass	Modified cell structure with low density	Window gaskets, door nosings, inter-car diaphragms, lighting seals, access panel seals
		1.0			11	68	1.5				
	R10400	0.06	35	20	14	42	2.1	V-0	Pass	Closed-cell sponge with excellent mechanical properties	Seat frame covering, thermal and acoustic insulation, HVAC Seals
		0.5		25	8	80	0.9				
	R10460	0.063	29	20	12	42	2.5	HBF	Pass	Closed-cell sponge with very low compression set and excellent mechanical properties	Seat frame covering, thermal and acoustic insulation, HVAC Seals
		0.5		20	34	100	0.9				

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## Mass Transit Rail Applications



- 1 • Lighting Fixture Gaskets
- 2 • Window Gaskets
- 3 • Acoustic Insulation
- 4 • Internal Door Seals
- 5 • HVAC Seals
- 6 • Intake Gasket
- 7 • Access Panel Seals
- 8 • Thermal Insulation
- 9 • Electronic Enclosure Gasket
- 10 • Lighting Seals
- 11 • Floor Panel



# 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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