EMSEAL®
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THERMAFLEX™

Watertight Parking-Deck and Stadium Expansion Joint Systems

TECH DATA

Product Description

- THERMAFLEX consists of extruded thermo-plastic Santoprene® rubber sealing glands with punched flanges embedded in a high-strength, flexible, impact-absorbing elasto-meric concrete nosing.
- The thermo-plastic Santoprene® sealing glands are heat-weldable making transitions through changes in direction and plane not only practical but watertight.
- The elastomeric concrete is two-part polyurethane reinforced with silica sand and fiberglass.
- The silica sand and fiberglass aggre-gate provides compressive strength while preserving flexibility.
- The system is mounted in blockouts on each side of the joint-gap.
- The sealing gland is placed in the joint-gap and the blockouts are filled with the elastomeric concrete which encapsulates the flanges.
- The nosing material flows through holes punched in the flanges thereby forming a row of "pillars" for secure fastening and load bearing.
- The system becomes integral with the deck as nosing material devel-ops a bond to the concrete.

Uses, Applications

- **Parking Decks:** Watertight, vehicular-traffic-durable seal in structural and perimeter expansion joints in cast-in-place, precast, and post-tensioned parking structures.

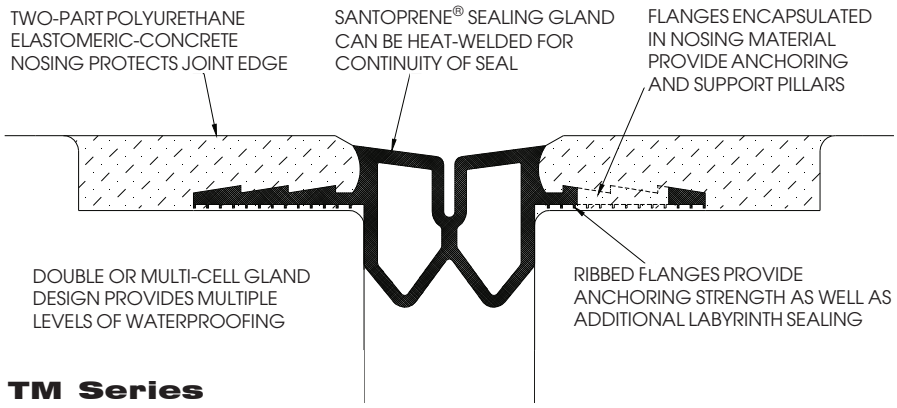
- THERMAFLEX TM-series glands are uniquely suited to sealing precast decks where differential vertical deflection is common.

- **Stadiums:** concourses, treads/risers, helixes and pedestrian walkways.

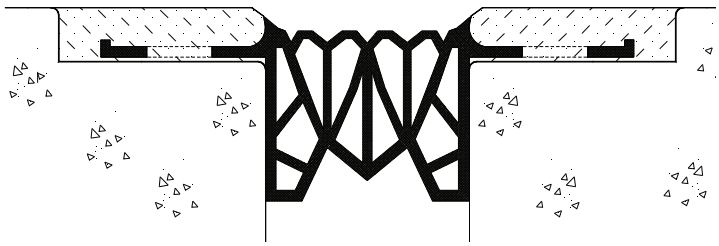
- **Plaza Decks:** See EMSEAL's plaza-deck-specific product "MIGUTAN" first.

- Other conditions--consult EMSEAL.

SYSTEM FEATURES



TM Series



TCR Series

ADVANTAGES

- Watertight, ADA compliant
- Flanges, nosing material and concrete combine to form an integral system that ensures integrity of seal
- Available multi-cell sealing-gland designs provide multi-barrier sealing
- Exceptionally durable under vehicular traffic in extreme weather conditions
- Heat-weldable Santoprene® thermoplastic rubber membrane permits continuous lengths and a continuous seal through transitions and terminations
- Tees, crosses, directional changes, column details, terminations, and changes in plane are available as factory-fabricated items
- Material lengths may be supplied for exact length of joint
- Differential vertical deflection, lateral movement, and seismic shock are accommodated by the flexibility of the seal
- Accepts traffic in as little as 3 hours at 75°F or higher tempera-tures--thereby facilitating lane-by-lane retrofits with minimal parking revenue loss
- The elastomeric concrete provides a durable impact-absorbing nosing that:
  - mixes rapidly
  - flows readily to fill voids and irregularities
  - has excellent adhesion to concrete and metal
  - does not require use of heat during installation or curing
  - has strength and impact absorption properties
  - has excellent low temperature flexibility
  - compatible with traffic-bearing deck coatings facilitating total protection of the deck and continuity of appearance

EMSEAL JOINT SYSTEMS, LTD 25 Bridle Lane, Westborough, MA 01581
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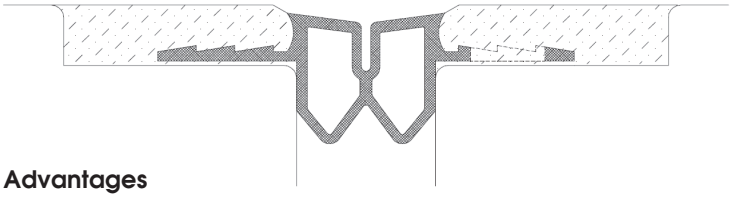
Available Models

System of Choice: TM Series

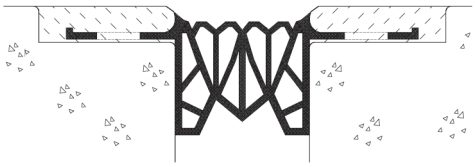


Advantages

- Latest in gland design evolution.
- Greater movement rangethan multi-cell glands for comparable joint sizes while retaining sealing redundancy.
- Handles vertical differential deflection movement typical of precast-tee construction by "hinging" on reinforced center--consult EMSEAL for limits.
- Finite Element Analysis (FEA)-developed section having generous movement cabability and low-stress allows use of a higher durometer grade of Santoprene than is typically used in multi-cell glands. This results in enhanced abrasion, flex-fatigue, and point-load resistances.
- Primary and secondary barriers provide double-barrier sealing.
- Uncomplicated internal geometry facilitates properly welded transitions and terminations.

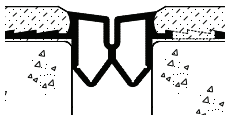
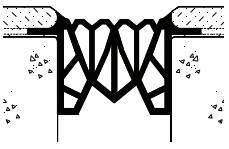
NOTE: For a complete discussion of sealing-gland design and the advantages of double-barrier seals, see "TECH NOTES", January 1995.

Large Joints: TCR Series



Integral gland system provides internal system support for larger joint gaps. Available in a wide range of sizes

Table 1: Selection Guide

	Model No.	Total Movement	Maximum Joint-Gap Size	Minimum Joint-Gap Size	Installation Width* min.	Installation Width* preferred	Installation Width* max.	Blockout Dimensions (each side of joint-gap)
	**TM 1.5**	2 1/2" (63mm)	3" (75mm)	1/2" (12mm)	1 (25mm)	1 1/4" (30mm)	2" (50mm)	3/4" x 3" (20 x 75mm)
	TM 2.5	3 1/4" (80mm)	4" (100mm)	3/4" (20mm)	1 1/4" (30mm)	2 1/4" (55mm)	2 3/4" (70mm)	3/4" x 3" (20 x 75mm)
	**TCR 300**	1 7/8" (47mm)	3" (75mm)	1 1/8" (27mm)	1 7/8" (47mm)	2 1/8" (53mm)	2 3/4" (70mm)	3/4" x 3 1/2" (20 x 90mm)
	TCR 400	2 3/8" (60mm)	4" (100mm)	1 5/8" (40mm)	2 1/4" (57mm)	2 3/4" (70mm)	3 3/4" (95mm)	3/4" x 3 1/2" (20 x 90mm)
	TCR 500	3" (75mm)	5" (125mm)	2" (50mm)	3" (75mm)	3 1/2" (90mm)	4 3/4" (120mm)	3/4" x 3 1/2" (20 x 90mm)
	TCR 600	2 3/4" (70mm)	6" (150mm)	3 1/4" (80mm)	4 1/2" (115mm)	4 3/4" (120mm)	5 1/2" (140mm)	3/4" x 3 1/2" (20 x 90mm)

*Installation at other than preferred joint-gap width may require special handling.

Limitations

- System will not perform where there is unsound substrate or improper blockout preparation.
- The joint-gap and the blockout area must be perfectly clean and dry.
- Minimum substrate temperature for installation is 45°F (7°C).

Fire-Rated

- All EMSEAL deck joint systems are available with UL fire rating where necessary. Contact EMSEAL.

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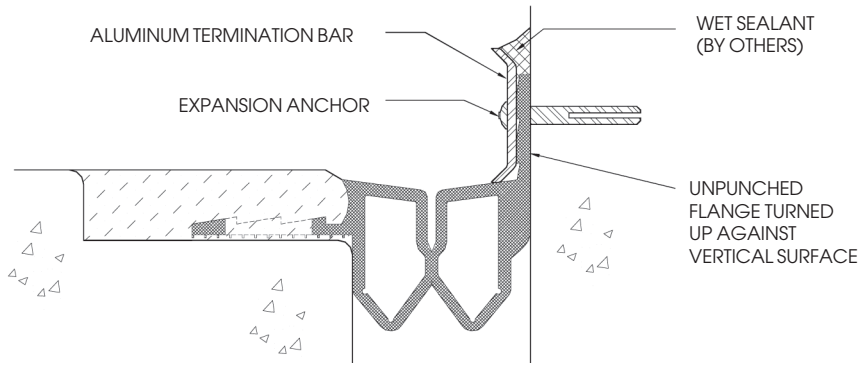
Watertight Transitions & Terminations

With the evolution of extruded expansion joint seals from thermo-set rubbers (neoprene and EPDM) to heat-weldable thermo-plastic rubber (Santoprene®) watertightness through virtually any transition or termination is both possible and practical.

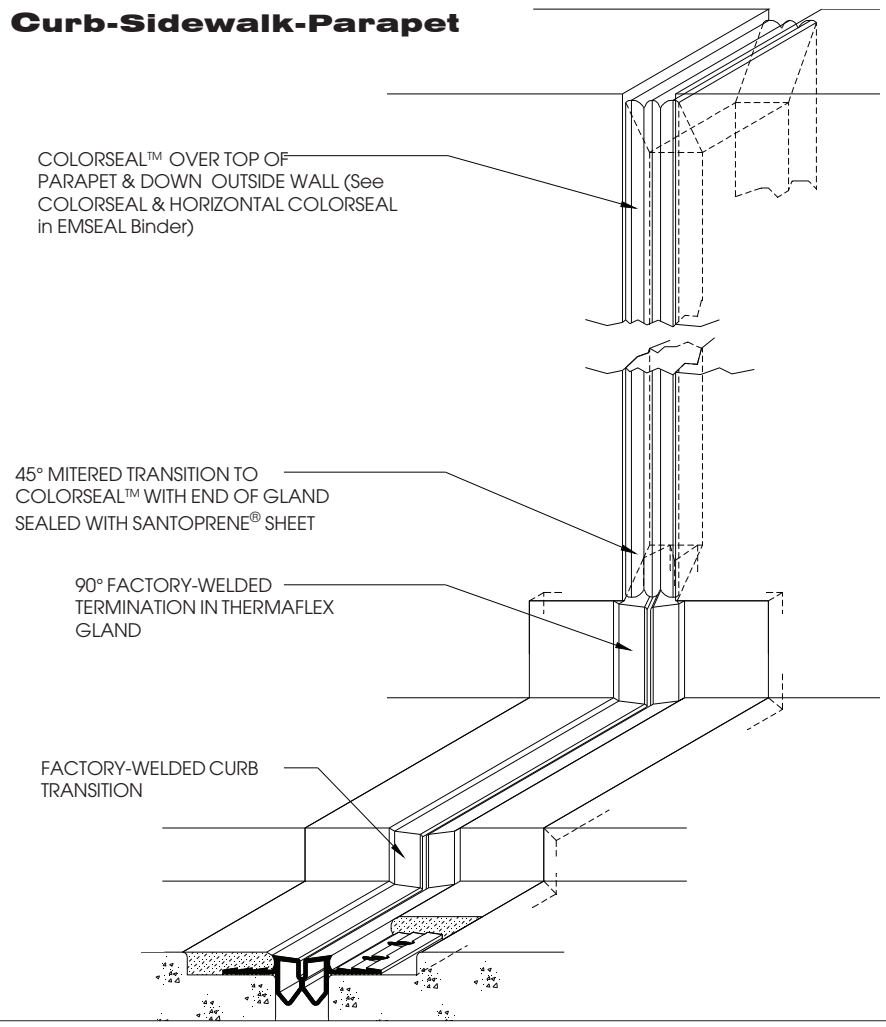
Shown are some of the many standard and custom transition and termination fabrications EMSEAL offers for waterproofing joints where they intersect walls, curbs, columns, etc.

Contact EMSEAL for details specific to your project.

Deck-To-Wall/Column



Curb-Sidewalk-Parapet



Supply--Total System Approach Includes Training, Equipment, & Pre-Measured Components

A principle component of the THERMAFLEX systems is the incorporation in manufacture and supply of installation quality assurance measures. In addition to on-site, hands-on technical training of applicators, EMSEAL provides on each project a mixer kit which includes items needed for proper mixing and placement of the nosing material. Among these items are:

- Dual-rotation mixer to properly mix nosing materials
- Pre-measured sand and aggregate
- Scale and measuring pails to properly proportion liquids.
- Drum taps for efficient and mess-free metering of liquids
- Sloped lid of mixer crate for use as barrel-buck for tidy dispensing of liquids

Installation

- Remove all unsound concrete in or around the blockouts. The horizontal blockout base must be level and all major spalls must be repaired. Proper preparation geometry and suitable patching materials compatible with the nosing must be used.
- The blockout must be perfectly clean and dry prior to installation.
- Apply primer on concrete allowing 30 minutes to dry.
- Thoroughly solvent-clean sealing gland and position in joint-gap.
- Apply 1/8" (TM series) or 1/4" (TCR series) foam form-tape to edge of gland to provide correct screed level for nosing material.
- Mask-off deck and top surface of sealing gland.
- Mix nosing ingredients according to the supplied instructions.
- Pour nosing material into the blockouts, force material under flanges ensuring they are firmly embedded and that there are no air pockets or unfilled voids under the flanges.
- Trowel smooth.
- Remove masking and form tape.
- Substrate temperature must not drop below 45°F (7°C) for at least 4-hours after pouring of nosing material.

NOTE: Install in accordance with detailed install Data which accompany each order. These are also available separately from EMSEAL.

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Maintenance

In the event of damage to the nosing, the damaged section can be removed and replaced with freshly mixed material. Since the product develops good adhesion to itself, the newly applied section becomes an integral part of the nosing section. The contact surface of the cutout must be free of loose debris, dust, dirt, moisture, and other contaminants.

Should the sealing gland be damaged replacement sections or patches can, in many cases, be field welded into position.

For general maintenance guidelines, request document "Maintenance Summary" from EMSEAL.

Warranty

Standard or project-specific warranties are available from EMSEAL on request.

Availability & Price

EMSEAL products are available throughout the United States and Canada. Prices are available from local representatives or direct from the manufacturer. The EMSEAL product range is continually being updated. Accordingly, we reserve the right to modify or withdraw any product without prior notice.

Typical Physical Properties

Santoprene® Sealing Glands

Property	121-67 (TCR Series)	121-73 (TM Series)	Test Method
Tensile Strength (psi/Mpa)	1000/6.9	1200/8.3	ASTM D 412
Ultimate Elongation (%)	440	440	ASTM D 412
Hardness (Shore A)	67 ± 3 Shore A	73 ± 3 Shore A	ASTM D 2240
Ozone Resistance	No Cracks	No Cracks	ASTM D 1170
Low Temperature Recovery (%)	100	100	50% Deflection 22 hours @ -22°F (-29°C)
Fluid resistance - 10% Hydrochloric Acid	1% weight change	1% weight change	ASTM D 471
Fluid resistance - 50% Sodium Hydroxide	1% weight change	1% weight change	ASTM D 471
Fluid resistance - 15% Sodium Chloride	1% weight change	1% weight change	ASTM D 471
Fluid resistance - 50% Ethylene Glycol	1% weight change	1% weight change	ASTM D 471

Elastomeric Concrete Nosing

Test procedures, where modified from ASTM standards or are unique to elastomeric

Test		Test Method	Test Data
Original Properties (after conditioning at 100°F (37 C) for 7 days)	Tensile Strength, psi (MPa) Elongation, % Hardness, Durometer D	Note 1 Note 1 ASTM D 2240	600 (4.14) Min. 25 Min. 50 Shore D Max.
Compression Properties	Compressive stress, psi (MPa) 5% Deflection	ASTM D 695 (Note 2)	800 (5.52) Min.
	Resilience, % 5% Deflection	Note 3	95 Min.
Impact Properties	Ball Drop, ft.-lb. (Joule) @ 20°F (-29°C)	Note 4	>10 (13.56) (No cracks)
Adhesion Properties	Dry Bond Strength to Concrete, pli (KN/M)	Note 5 (Dry)	400 (70.05) Min.
	Wet Bond Strength to Concrete, pli (KN/M)	Note 5	250 (43.78) Min.

Test		Test Method	Test Data
Original Properties (after conditioning at 100°F (37°C) for 7 days)	Tensile Strength, psi (MPa) Tensile Stress, psi (MPa) Elongation, % Hardness, Durometer D	ASTM D 638 ASTM D 638 ASTM D 638 ASTM D 2240	1500 (10.34) Min. 500 (3.45) Min. 25 Min. 90 +/- 3 A
Tensile Properties After Oven Aging (7 days @ 158°F (70°C))	Tensile Strength, psi (MPa) Tensile Stress, psi (MPa) Elongation, % Hardness, Durometer D	ASTM D 638 ASTM D 638 ASTM D 638 ASTM D 2240	1500 (10.34) Min. 500 (3.45) Min. 200 Min. 90 +/- 3 A

Note 1. Test specimens are six inch (15.24cm) dumbbells (with one inch (2.54cm) bench marks) cut from cast film approximately 80 mils (.204cm) thick.

Note 2. Test specimen is a cast two inch (5.08cm) cube. (Machine crosshead speed is 0.05 inch (.127cm) per minute.) Compressive strength is maximum load carried by the specimen divided by original cross-sectional area. (A compress-ometer is used to make the measurement.)

Note 3. Test specimen is a cast two inch (5.08cm) cube. Specimen compressed to desired amount. (Machine crosshead speed is 0.05 inch (.127cm) per minute .) Five minutes after load is removed the specimen thickness is measured. Percent recovery is determined as follows:

$$\frac{\text{\% Deflection + final thickness - initial thickness}}{\text{Deflection}}$$

Note 4. Test specimen is a cast disk 2.50 inches (6.35cm) in diameter and 0.375 inches (.953cm) thick. Specimens are conditioned four hours at test temperatures. A one-pound (454g) steel ball is dropped onto the center of the specimen through a plastic guiding tube from an initial height of five feet (1.52M). The drop height is increased by one-half foot (.152M) intervals until specimen cracks. (Drop is made within ten seconds after removal of specimen from the exposure condition.) Average of four test specimens.

Note 5. Material is cast against a mortar-briquette half (briquette conforms to ASTM C190). Briquette is sawed in half so that cut surface area equals approximately one square inch (6.45sq.cm). Surface is sandblasted (36 mesh). Briquette is placed in mold and Delcrete™ is cast against it. Specimen is submerged in water (seven days @ RT). Using the Riehle Briquette Tester, specimen failure is considered to occur at either the bond interface or within one of the two materials.

Printed wth soy-based inks on acid free, 100% recycled, chlorine-free paper.

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