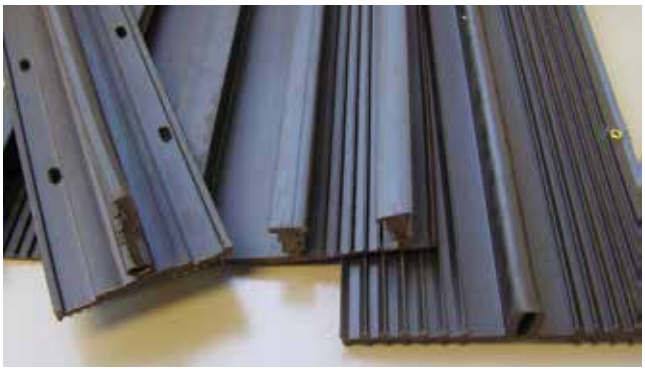
CONCRETE ACCESSORIES
Sika® Westec®
BARRIER TECHNOLOGIES

WATERSTOPS FOR INDUSTRIAL APPLICATIONS

BUILDING TRUST

QUALITY PRODUCTS FOR SECONDARY CONTAINMENT & OPTIMUM PERFORMANCE

SUPERIOR SERVICE



Sika technical engineers are available for design review, chemical testing data, material takeoff and shop drawing assistance.

Industrial applications often have harsh chemical environments in which a traditional flexible PVC waterstop may not be suitable. Sika's Westec® Barrier Technologies specialize in waterstop applications for these unique conditions with a wide range of both traditional and specialty profiles specifically designed for industrial applications.

CHEMICAL RESISTANCE: GENERAL GUIDELINES

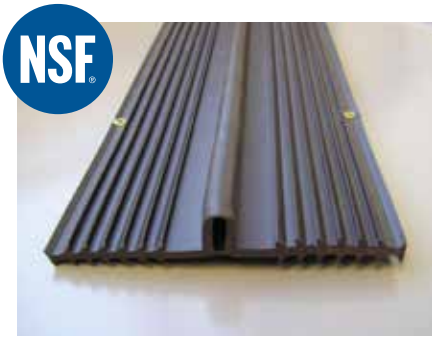
Chemical resistance recommendations are based on short term, secondary containment applications. Typical testing is performed according to ASTM D-471 "Standard Test Method for Rubber Property-Effect of Liquids" with 166-hour (7 day) immersion. Performance data has been collected from a variety of sources including industry reference data, third-party and in-house testing. Consult a Sika Technical Sales Representative for application specific chemical data or further testing.

APPLICATION AREAS

- Ethanol / Biodiesel Plants
- Petrochemical Manufacturing
- Refineries
- Pulp and Paper Mills
- Land, Air and Seaports
- Fuel Storage / Tank Farms
- Pipelines
- Pharmaceutical Plants

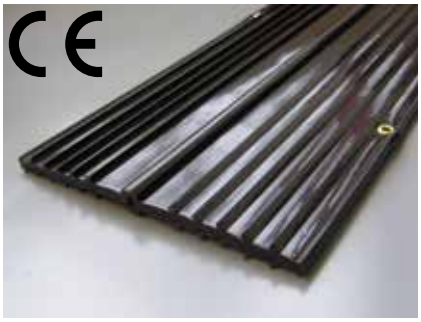
CHEMICAL EXPOSURE	Temperature	TPE-R	PE	Stainless Steel 316	PVC
Rating Key: A = Excellent B = Good C = Conditional X = Do not use					
Ammonia, Anhydrous	23°C (73.4°F)	A	B	A	A
*Antifreeze	100°C (212°F)	A	B	A	A
(50% Ethylene Glycol/50% Water)	125°C (257°F)	B		A	
ASTM Oil #2	100°C (212°F)	B		A	X
Benzene	23°C (73.4°F)	B	B	A	X
Carbon Tetrachloride	23°C (73.4°F)	X	X	B	X
Chlorine (Wet/Dry)	23°C (73.4°F)	A/A	C/C	A/X	X/X
Creosote	23°C (73.4°F)	A		A	X
Cyclohexane	23°C (73.4°F)	X	X	A	X
Diesel Fuel	23°C (73.4°F)	B	B	A	X
Ethanol	23°C (73.4°F)	A	A	A	X
Hydraulic Fluid	23°C (73.4°F)	A	B	A	X
Hydrogen Peroxide	23°C (73.4°F)	A	B	B	A
Isopropyl Alcohols	23°C (73.4°F)	A	A	A	A
Jet Fuel - JP8	23°C (73.4°F)	B	B	A	C
Kerosene	23°C (73.4°F)	B	C	A	C
Methyl Ethyl Ketone	23°C (73.4°F)	B	B	A	X
Nitric Acid- 70%	23°C (73.4°F)	B	X	A	X
Oil, Mineral	23°C (73.4°F)	A	B	A	B/C
Sodium Hydroxide 80% Solution	23°C (73.4°F)	A	C	X	A
Sodium Hypochlorite	23°C (73.4°F)	A	B	B	A
Styrene	23°C (73.4°F)	B	B	A	X
Sulfuric Acid 98%	23°C (73.4°F)	B	C	X	X
Tetrahydrofuran	23°C (73.4°F)	B	X	A	X
Toluene	23°C (73.4°F)	B	B	A	X
Trichloroethylene	23°C (73.4°F)	X	X	A	X
DI Water pH 11	23°C (73.4°F)	A	B	A	A
Xylene	23°C (73.4°F)	B	B	A	X

MATERIAL CHOICES FOR OPTIMUM PERFORMANCE



Envirostop® TPE-R
Thermoplastic Elastomeric Rubber is a fully vulcanized blend of EPDM and Polypropylene, also called a Thermoplastic Vulcanizate or TPV. This gives the waterstop the flexibility and sealing properties of a rubber seal, but allows for heat welding and processing like a plastic. In addition to the favorable physical properties, TPE-R also offers an excellent resistance to a wide range of chemicals. ASTM tests (D-471) show good resistance to oils, fuels, acids, bases and numerous solvents.

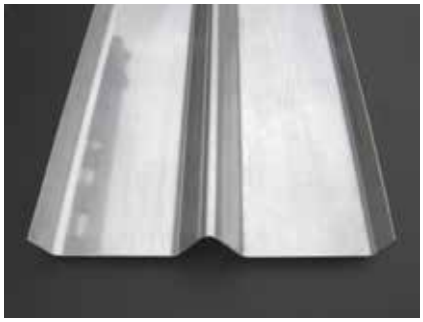
Envirostop® TPE-R
Westec® Envirostop® TPE-R waterstop is certified to NSF/ANSI Standard 61 for drinking water applications. The standard establishes minimum health effects requirements for the chemical contaminants and impurities that may be indirectly imparted to drinking water. Although more commonly known for its use in chemical containment applications, TPE-R waterstop is now widely used for ozone contact structures in the water treatment industry. Envirostop® TPE-R waterstop can be specified for any drinking water containment structure where this certification is required for joint sealing materials.



PE POLYETHYLENE
Polyethylene (VLDPE) is more plastic-like, having increased elastic modulus and hardness than TPE-R. PE also has greater resistance in some applications, and is particularly effective for hydrocarbons such as Benzene, Toluene and Xylene. After exposure (1-4 weeks) to such and subsequent drying, PE waterstop was found to return nearly to its original physical properties.

Westec® PE 050 and 631 waterstop profiles are the first to receive the European Technical Approval for watersealing bands and have been approved for CE marking in the European Union, ETA-04/0044.

GROMMETS
TPE-R and PE 6" and 9" waterstops are pre-punched in the outermost rib with brass grommets providing convenient points on 12" centers to wire the waterstop to reinforcement. Properly securing the waterstop is critical to ensure good consolidation around the ribs and a liquid-tight seal.



SS (STAINLESS STEEL)
Stainless steel is for high temperature environments that exceed 121°C (250°F) or the most severe chemical applications. Sika offers 316 low carbon stainless steel waterstops. However, many applications that have traditionally used SS waterstop can be served with TPE-R, including ozone contact structures.

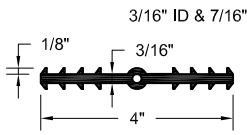
SPLICING AND FABRICATIONS
Sika® Greenstreak® PVC welding equipment and techniques can be used for Westec® TPE-R and PE waterstops, requiring only a higher temperature set at 210°C (410°F). Sika recommends factory-fabricated joints at all intersections and direction changes. They offer a quick and economical alternative to cutting and splicing these critical junctions in the field. Contact a Sika Technical Sales Representative to arrange for a material takeoff and custom shop drawings. Fabrications are available for TPE-R, PE and SS.

PROFILES

Envirostop® TPE-R PROFILES: STANDARD, RETROFIT AND EB CAP

RIBBED CENTERBULB

618



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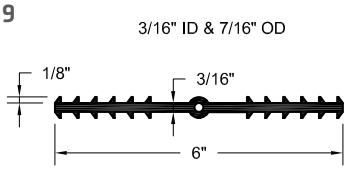

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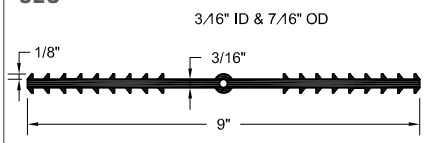

RIBBED TEAR WEB

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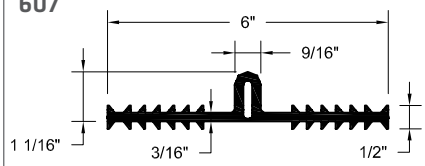

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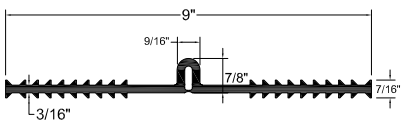

BASE SEAL

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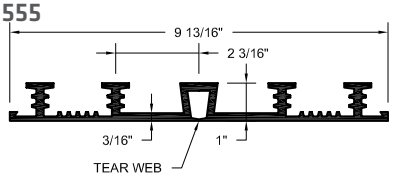

RETROFIT

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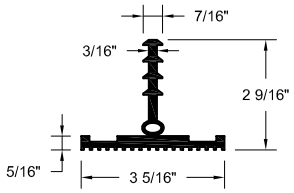

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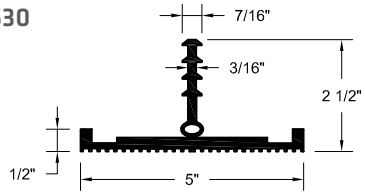

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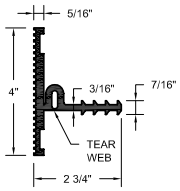

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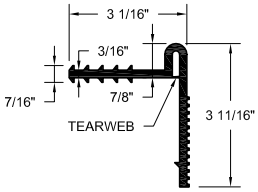

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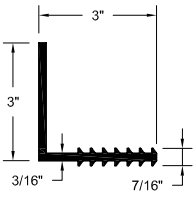

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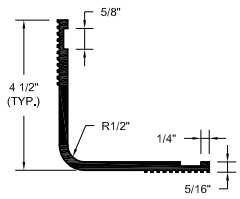

EB CAP

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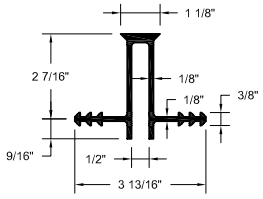

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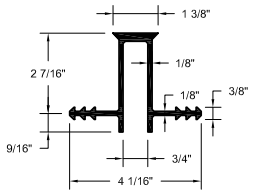

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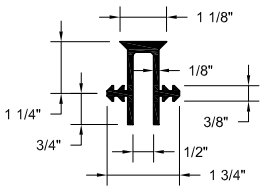

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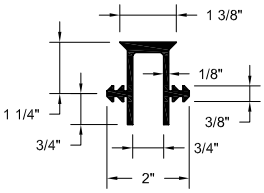

EB CAP RETROFIT

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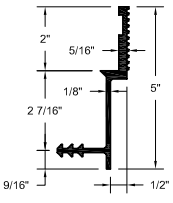

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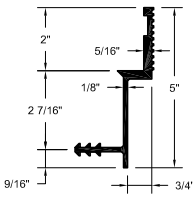

PE PROFILES: STANDARD, RETROFIT AND EB CAP

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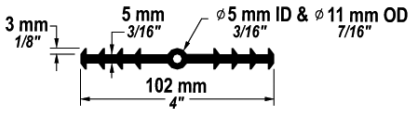

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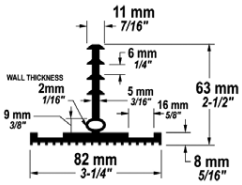

EB CAP RETROFIT

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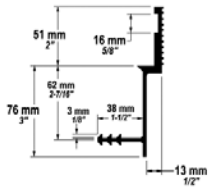

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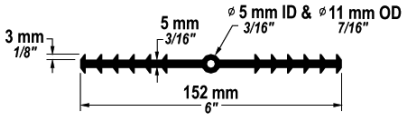

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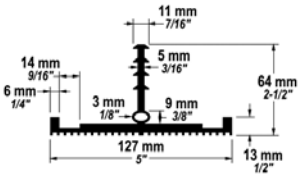

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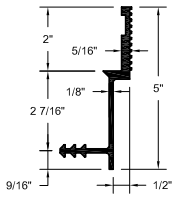

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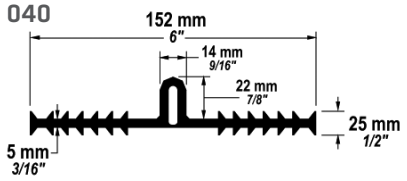

EB CAP

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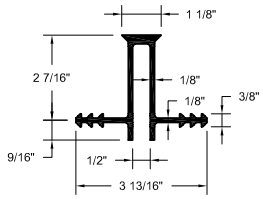

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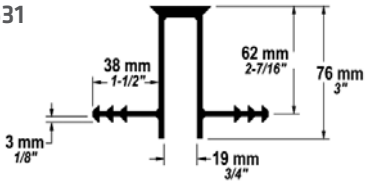

SS PROFILES (STAINLESS STEEL): STANDARD AND RETROFIT

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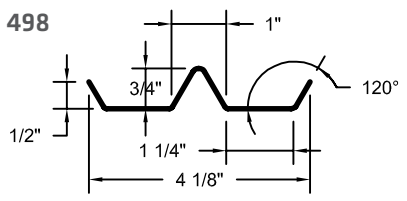

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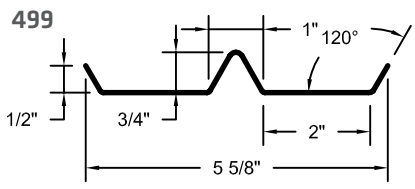

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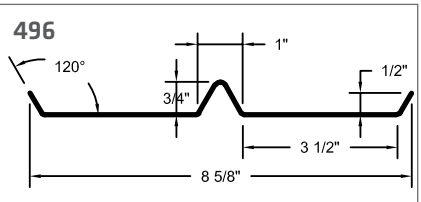

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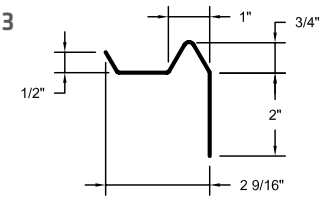

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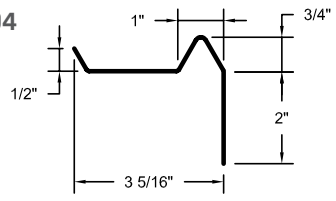

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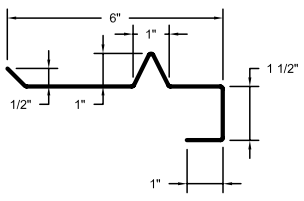
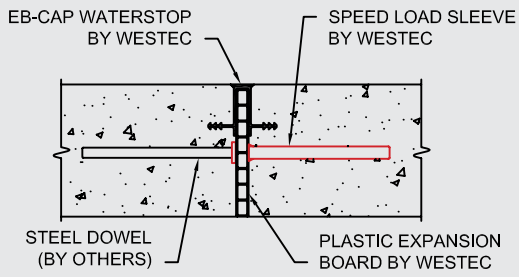
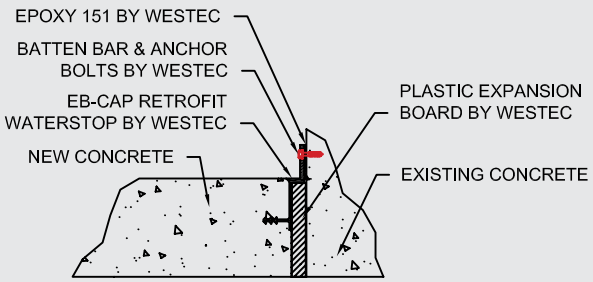


PATENTED EXPANSION BOARD CAP SEAL SYSTEM

CONSTRUCTION DETAILS FOR SPECIAL EB CAP DESIGNS





POLYBOARD

Westec® ¾" HDPE Polyboard is available for 6" and 8" paving applications. The polyboard is designed to work with the EB Cap and EB Cap retrofit profiles and serves as both expansion material and a forming system.

SPEED LOAD

Speed Load sleeves are an excellent addition to the Expansion Board cap seal and Polyboard. Speed Load sleeves align the steel load transfer dowels and are designed specifically for leave-in-place forming systems like the EB Cap System.

Please consult a Sika Technical Sales Representative for your specific project needs.

All Retrofit systems include stainless steel batten bars and tapcons. Westec® 151 Novolac Gel Epoxy creates a fluid tight and chemical resistant seal between the waterstop and existing concrete.

Patent # for EB Cap is 5,378,386

The EB Cap seal system is a complete concrete joint system designed and patented by Westec®. Easy to install, the EB Cap integrates the waterstop, forming system, expansion board, joint seal and load transfer units into a single structure. Just stake down the board, set your screed elevation and that's it. No stripping forms, no messy sealants, no problems!

INSTALLATION BENEFITS:

- No split formwork
- Fewer installation steps
- No poured-in-place sealant required
- No remobilization for saw cutting or sealant
- Convenient strip pouring possible with Speed Loads
- Lower labor and installation costs
- No joint finishing required

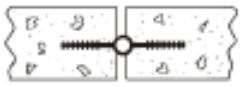
SELECTING THE RIGHT PROFILE

PHYSICAL PROPERTIES OF FINISHED WATERSTOP

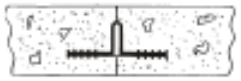
PROPERTY	TEST METHOD	TPE-R	PE	*SS (STAINLESS STEEL)
Tensile Strength	ASTM D 638	2000 psi	2000 psi	75,000 psi
Elongation	ASTM D 638	450%	800%	40%
100% Modulus	ASTM D 638	1000 psi	4200 psi	
Brittle Temperature	ASTM D 746	-56°C (-70°F)		
Hardness	ASTM D 2240	85 Shore A	40 Shore D	95 max. Rockwell B
Yield Strength				25,000 psi

**SS Properties taken from ASTM A240, Table 2*

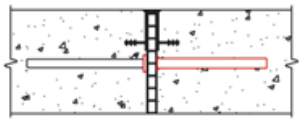
TPE-R and PE waterstops are available in a variety of sizes and profiles to meet the needs of various structures and applications.



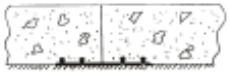
RIBBED WITH CENTERBULB is a very versatile waterstop and a standard for the concrete industry. The centerbulb of the waterstop accommodates vertical and horizontal movement equal to the inside diameter of the centerbulb. This waterstop can be used in control joints and expansion joints, vertical and horizontal applications. TPE-R and PE profiles are available.



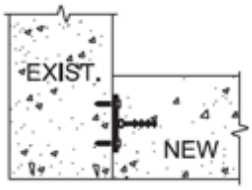
RIBBED WITH TEAR WEB is designed for larger joint movements. The thin web in the U-shaped centerbulb will tear during joint movement and allow for additional expansion or differential settlements. Some fabrications are limited. TPE-R and PE profiles are available.



EB CAP - The patented Expansion Board Cap Seal system was designed to serve as both a waterstop and joint sealant. This unique design allows for one-step placement of your joint sealant and waterstop. No stripping, sawcutting or sealing is required. The result is an easy-to-install, maintenance-free joint. TPER and PE profiles are available.



BASE SEAL is designed for slab on grade joints or backfilled walls and eliminates difficult split forming details. This profile is difficult to join to other waterstops so may not be suitable for containment areas with standard waterstops in other joints. This profile is available only as TPE-R.



RETROFIT - Modern chemical plants and manufacturing facilities are constantly expanding, modifying existing areas for new technologies and products. Structural changes to the concrete areas create the potential for leaks between the new and existing concrete. Traditionally, adding a waterstop to these joints required saw cutting a groove several inches into the existing concrete and grouting in a waterstop. This method is time-consuming, labor-intensive and often requires cutting through the top layer of rebar in the existing concrete. Westec® offers multiple profiles for a variety of situations and applications. TPE-R, PE and SS Retrofit profiles are available.

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