Waterstops

For 60 years, Sika Greenstreak has been the leading source for joint sealing technologies and innovative products for concrete. Offering a variety of solutions across all categories of waterstops, Sika Greenstreak has the knowledge and time tested products to meet the most demanding applications.

- Water/Waste Water Treatment Plants
- Lock and Dam Systems
- Reservoirs and Aqueducts
- Flood Walls
- Retaining Walls
- Foundations
- Tunnels and Culverts
- Bridge Abutments
- Containment Structures and Tanks
- Slabs-on-Ground

When you specify Sika Greenstreak, you are specifying the first name in waterstops and the trusted source for superior technical and customer service.
Choose The Right Waterstop

Waterstop Basic Use

Embedded in concrete, across and/or along the joint, waterstops form a watertight diaphragm that prevents the passage of liquid through the joint.

Suggested Waterstop Design Checklist

- Verify chemical containment requirements, if any
- Verify hydrostatic head pressure requirements
- Determine joint type and joint movement requirements
- Specify material type for best water sealing performance
- Specify profile and size (by product number, if possible)
- Verify joinery details of dissimilar or asymmetric waterstop profiles, if any (consider using one profile throughout to simplify intersections)
- Specify factory fabrications and fittings for transitions and intersections
- Specify appropriate method for securing waterstop in position (see Sika Greenstreak CSI-formatted product specifications for additional guidance)

Selecting A Waterstop Shape

MOVEMENT JOINTS are typically designed to accommodate significant movement due to drying shrinkage, temperature changes, settlement, creep, or live load deflections. The waterstop profile selected must have the ability to accommodate expected joint movement, typically achieved through the use of a centerbulb, tear web, or other suitable waterstop geometry designed to accommodate joint movement. Movement joints typically include contraction joints, expansion joints, and isolation joints. The following profiles are suitable for Movement joints:

- **Ribbed with Centerbulb** shapes are the most versatile type of waterstops available. The centerbulb accommodates lateral, transverse, and shear movement. Larger centerbulbs will accommodate greater movement.

- **Tear Web** shapes accommodate large movements. When joint movement occurs, the tear web ruptures and allows the U-bulb to deform without placing the material in tension.

- **Dumbbell with Centerbulb** shapes accommodate lateral, transverse, and shear movement. Larger centerbulbs will accommodate greater movement. Consider using Ribbed with Centerbulb for better sealing characteristics.

- **Base Seal with Tear Web** shapes accommodate lateral, transverse, and shear movement. Larger tear web bulbs will accommodate greater movement. Base Seal waterstops have some limitations with transitions and intersections.
NONMOVING JOINTS typically have 100% of the bonded steel reinforcement continuous through the joint, and expose the waterstop to negligible or no movement. Flat waterstop profiles without a centerbulb or tear web are suitable for nonmoving joints. Other waterstop materials may be considered for nonmoving joints as well, such as strip-applied or injectable hose waterstops. Examples of waterstop profiles suitable for nonmoving joints are as follows:

- **Flat Ribbed** shapes are preferred for nonmoving joints and provide the best sealing characteristics.

- **Dumbbell** shapes are an alternate profile for nonmoving joints. Consider ribbed shapes for better sealing characteristics.

- **Base Seal** is ideal for slab-on-grade joints or backfilled walls and are easy to form. Base Seal waterstops have some limitations with transitions and intersections.

- **Labyrinth** is primarily used in vertical joints. Labyrinth shapes create a keyed joint and do not require split bulkheads. Labyrinth can be difficult to use in horizontal joints and there are some limitations with transitions and intersections.

- **Split Flange** shapes can simplify forming. The split flange is opened and attached to the bulkhead for placement of the first concrete element. After stripping the bulkhead, the flange is closed and anchored for placement of the adjoining element. Split waterstops are suitable for straight runs only. Transitions and intersections are not practical with these profiles.

- **Waterstops for Retrofit Applications** seal joints where new construction meets an existing structure and can be suitable for moving joints. Systems include stainless steel batten bars and fasteners for anchoring to the existing structure with the aid of an epoxy gel.

- **Strip-applied Waterstops** are adhered along concrete joints or penetrations and encapsulated by a subsequent concrete placement. **Hydrotite** is the state of the art for hydrophilic waterstop and is a high-performance, chloroprene rubber material that expands when exposed to moisture to create a compression seal within and along the joint. For less critical applications, Sika Greenstreak also offers SikaSwell A and Swellstop expanding waterstops.

**Product and Material Options**

Sika Greenstreak has the industry’s most comprehensive collection of waterstop products and solutions to meet the most demanding applications. This catalog is primarily dedicated to PVC (polyvinyl chloride) waterstops, but general information is included for chemical resistant waterstops (TPER, PE, Stainless Steel), strip-applied waterstops (Hydrotite, SikaSwell A, Swellstop, Lockstop) and for SikaFuko Injection Hose Systems. Complete catalogs and technical data for each of these products are available in print or online.
Sika Greenstreak PVC Waterstop

Sika Greenstreak, one of the first manufacturers of polyvinyl chloride (PVC) waterstop, has formulated, compounded and manufactured PVC waterstop for years. Sika Greenstreak has the knowledge, experience and desire to provide the highest quality joint sealing solutions and services available.

PVC is the industry standard for flexible waterstops, which are typically embedded across and along the joint. PVC is the most versatile waterstop material, offering the broadest design selection and is accepted under the ACI 350 "Code Requirements for Environmental Engineering Concrete Structures". It has great inherent elasticity and is resistant to many waterborne chemicals. It will not discolor concrete or produce electrolytic action.

Sika Greenstreak offers the industry’s widest array of PVC waterstop designs, typically ranging in widths from 4” to 12” and thicknesses from 1/8” to 1/2". Depending on size, most waterstop shapes are provided in 50 or 100 ft. coils. Please contact Sika Greenstreak for further information or if you need assistance in selecting a waterstop.

Physical Properties

All Sika Greenstreak PVC waterstops are specially formulated and manufactured to meet or exceed industry standard product specifications.

<table>
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<th>Sika Greenstreak PVC Waterstop Physical Properties</th>
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Sika Greenstreak conducts regular testing of materials. Call Sika Greenstreak for the latest test values.

Independent laboratory tests are available for the following applicable standards:

- Corps of Engineers CRD-C 572-74
- Bureau of Reclamation
- CH2M HILL
- MWH
- Various State Highway and/or Public Works Department Standards

Test results conducted using British Standards are also available. Consult a Sika Greenstreak engineer for more information.

NSF-61 Certified PVC waterstops are also available from Sika Greenstreak for drinking water applications. Please contact a Sika Greenstreak engineer for assistance in ordering or specifying NSF-61 Certified PVC waterstop.

Installation Aids and Fabrications

PVC waterstops must be securely positioned in the forms to prevent deflection or misalignment during concrete placement. This is achieved by tying off the outer edge of the waterstop to adjacent reinforcing steel. Sika Greenstreak offers options to properly anchor PVC waterstop, including:

- **Punched Flanges** - most ribbed shapes can be provided with punched flanges
- **Grommets** - select shapes can be provided with brass grommets
- **Hog Rings and Pliers** - available for field application and suitable for most shapes

Virtually every concrete structure requiring a PVC waterstop is going to encounter a joint that will change direction or intersect with another joint. One of the benefits PVC offers is the ability to heat weld the material to create a continuous sealing diaphragm within the joints of a concrete structure.

Waterstop failures are often the result of improper field fabricated transitions and intersections. To avoid potential problems, Sika Greenstreak strongly recommends factory fabrications and maintains an inventory of the most common fabrications to meet the demands of a construction schedule.

Splicing irons are available in various sizes for field welding lengths of PVC waterstop. More information can be found on page 11.

![Splicing Irons]![Factory Fabrications]
Shapes are drawn to varying scales
Ribbed waterstops provide the best sealing characteristics
Shapes are drawn to varying scales
Sika Greenstreak PVC Waterstop

Consult a Sika Greenstreak applicable standards for the latest test values.

CH2M HILL services available.

Sika Greenstreak concrete or produce electrolytic action. It has great inherent elasticity and is resistant to many waterborne chemicals. It will not discolor "Code Requirements for Environmental services available.

Sika Greenstreak Sika Greenstreak Sika physical properties

■ Effect of Alkali

- Hardness change +/-5 points
- Tensile strength Corps of
- Weight change +0.25% -0.10%
- Elongation 300% min.

Stiffness in flexure ASTM D747 700 psi min.

Ultimate elongation ASTM D638 350% min.

Water absorption ASTM D570 0.15% max.

Property Test Value

- Hardness Shore A15 ASTM D2240 79±3
- Tensile strength ASTM D638 2000 psi min.
- Ultimate elongation ASTM D638 350% min.
- Water absorption ASTM D570 0.15% max.

A Note About Head Pressure Ratings:

Head Pressure Ratings are based on parameters published in the Corps of Engineers document, Waterstops and Other Preformed Joint Materials for Civil Works Structures EM 1110-2-2101, dated 30 September 1995. Sample testing conducted by Sika Greenstreak on select profiles has indicated a conservative tendency in these ratings. That said, the published Head Pressure Ratings should be considered to be ultimate values. An appropriate safety factor should be applied to these values.

Contact a Sika Greenstreak engineer for more information.
Retrofit Waterstop Systems

Retrofit waterstops seal joints where new construction meets an existing structure and can be suitable for working joints. Systems include waterstop profile, stainless steel batten bars and anchor bolts. Epoxy 7300 is sold separately.

Specialty Shapes

These shapes have been developed to meet unique requirements of clients or other specifying groups. Consult a Sika Greenstreak engineer for more information or for special applications.
Fabrications/Splicing Irons

Typical PVC Fabrications

Sika Greenstreak strongly recommends factory fabricated transitions and intersections. Typical fabrications for the most common shapes are inventoried by Sika Greenstreak and available to meet construction schedules. Sika Greenstreak can provide customized fabrications to suit unusual configurations or a convergence of differing profiles.

Splicing Irons For Field Welding

As noted, a quality waterstop installation requires quality welds. Sika Greenstreak Splicing Irons are specifically designed for welding thermoplastic waterstop and are constructed of the highest quality components for superior and long lasting performance. No other means or methods can be used.

Temperature controls are adjustable for various conditions and products. Irons are typically 120V operation, but 240V is available for the 213 and 214 irons.

The 213 and 215 irons have an integral thermometer to display the iron temperature for accurate welding. The splicing iron should be large enough to melt the entire cross-section of the waterstop profile. All irons are supplied with a teflon coated cover necessary for welding. Replacement covers are available for purchase.

Chemical Resistant Waterstop

Sika Greenstreak's companion brand, Westec®, offers waterstop solutions for secondary containment in petrochemical and industrial applications. Westec's Envirostop® TPER (Thermoplastic Elastomeric Rubber) Waterstops resist a wide range of oils, solvents, and aggressive chemicals. Alcohols, ketones, glycols, esters and aqueous solutions of acids, bases, and salts have little effect on Westec TPER Waterstop.

TPER has excellent ozone resistance, low temperature flexibility, excellent high temperature (up to 250° F) performance and is heat weldable. Westec TPER Waterstop can also be defined as a Thermoplastic Vulcanizate, TPV.

Westec's TPER Waterstop is certified to NSF/ANSI Standard 61 for Drinking Water System Components

Contact a Sika Greenstreak engineer or visit www.Chemstop.com for more information.
**Strip-applied Waterstops And Injection Hose Systems**

**Hydrotite** is a world renowned hydrophilic waterstop. Composed of modified chloroprene rubber protected with a special delay coating, **Hydrotite** expands when exposed to water, creating an effective compression seal within joints where limited movement will occur. **Hydrotite** is used extensively in sealing concrete construction joints, pipe penetrations, precast concrete segments, tunnel lining segments and for repair of existing joints or retrofit applications. Several shapes and sizes are available.

**SikaSwell A** (formerly Duroseal Gasket) is a water-swelling acrylate-ester that expands upon contact with water to form a compression seal in nonmoving concrete joints. **SikaSwell A** is available in three sizes and is adhered to varying substrates with **Sika MK Adhesive** or **Quellpaste Type E**.

**Swellstop** is a flexible butyl rubber and swellable clay waterproofing compound that expands upon contact with water to form a compression seal in nonmoving concrete joints. **Swellstop** is available in two sizes and must be used in conjunction with **Swellstop Primer Adhesive** to create a watertight bond.

As with all hydrophilic waterstops, Hydrotite, SikaSwell A and Swellstop are suggested for applications where exposure to moisture is constant.

**Lockstop** is a single component and self-sealing mastic waterstop which bonds to concrete to prevent moisture from penetrating nonmoving joints. **Lockstop** must be used in conjunction with **Lockstop Primer Adhesive** to create a watertight bond.

Most Strip-applied waterstops and Injection Hose Systems are suitable for nonworking joints only.

**Limited Warranty:** Sika Greenstreak warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Technical Data Sheet if used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer’s sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor. NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. Sika Greenstreak SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.

Our most current General Sales Conditions shall apply. Please consult the Product Data Sheet prior to any use and processing.