



SANDHYAFLEX

ISO 9001:2015 certified company

Swellable Water Bar

TECHNICAL DATASHEET

SANDHYAFLEX, a trusted name in construction materials since 2015, has established itself as a frontrunner in water bar technology. Their innovative water bars offer a robust and user-friendly solution for water sealing in construction joints.

Overcoming Challenges, Delivering Excellence:

Traditional water sealing methods often involved nailing down materials to shutters, which could lead to punctures and compromised effectiveness. SANDHYAFLEX recognized this challenge and introduced their water bars as a superior alternative.

The Power of Expansion: How SandhyaFlex Works?

SandhyaFlex water bars are designed for ease of use and exceptional performance. Here's how they work:

- **Simple Installation:** The bars are positioned at the center of the construction joint before concrete pouring. No complex procedures are required.
- **Automatic Activation:** Upon exposure to water, the swellable water bar expands within the joint, creating a watertight seal.
- **Adaptable and Durable:** SandhyaFlex bars are flexible, accommodating deflection and movement in the structure. They also boast high chemical resistance, ensuring long-lasting performance.
- **Effective Sealing:** These water bars effectively prevent water ingress, including potable water, hard water, and even saline water.

History of Swellable Water Bars :

- **1940s Early Waterproofing Concepts:** Engineers began developing rubber-based sealing systems for concrete construction joints to prevent water leakage.
- **1950s Rubber Technology Growth:** Advances in synthetic rubber and polymer technology improved water-resistant sealing materials used in dams, tunnels, and basements.

- **1960s Hydrophilic Materials Developed:** Researchers discovered that certain rubber compounds could expand when exposed to water, leading to the development of swellable sealing products.
- **1970s First Swellable Water Bars:** Japan and Europe introduced the first hydrophilic swellable water bars for concrete joint waterproofing in underground structures and water-retaining systems.
- **1980s Commercial Expansion:** Swellable water bars became widely used in tunnels, sewage treatment plants, reservoirs, and foundation construction due to their self-sealing properties.
- **1990s Improved Technology:** Manufacturers developed advanced bentonite-based and rubber-based swellable water bars with better expansion control, durability, and chemical resistance.
- **Modern Era:** Swellable water bars are now globally used in construction projects such as basements, retaining walls, water tanks, tunnels, and precast concrete joints for reliable waterproofing protection.

COLOUR AND ITS APPLICATION:

Colour	Application
Black	Standard construction joints, basements, tunnels, retaining walls
Red	Water-retaining structures, dams, reservoirs, water tanks
Blue	Drinking water structures and potable water applications
Green	Sewage treatment plants, drainage systems, wastewater structures
Yellow	Identification for special-purpose sealing or chemical-resistant applications
Grey	Industrial construction joints and precast concrete segments
Brown	Underground foundation joints and earth-contact structures

For builders, contractors, and infrastructure developers seeking reliable waterproofing solutions and premium construction materials, SANDHYAFLEX stands as a trusted partner. With a strong commitment to quality, durability, and innovation, SANDHYAFLEX offers a comprehensive range of products including PVC Water Stoppers, Swellable Water Bars, Rubber Hoses, and other construction sealing solutions. Their dependable performance, advanced manufacturing standards, and customer-focused approach make them a one-stop destination for modern construction and waterproofing needs..

Materials :

The swellable water bar shall be manufactured from high-quality hydrophilic rubber, bentonite-based compounds, or modified polymer materials designed to expand upon contact with water. The compound may contain synthetic rubber, hydrophilic additives, fillers, plasticizers, stabilizers, and other reinforcing materials to ensure excellent swelling capacity, durability, flexibility, and long-term waterproofing performance.

The material shall possess adequate resistance to water pressure, chemicals, weathering, and ageing so that it meets the performance requirements specified in relevant construction and waterproofing standards.

RAW MATERIALS OF SWELLABLE WATER BAR				
S. No.	Raw Material	Image	Typical Grade / Example	Function / Purpose
1	Hydrophilic Rubber (EPDM / NBR / Special Polymers)		EPDM Rubber NBR Rubber Special Hydrophilic Polymers	<ul style="list-style-type: none"> Main base material Provides elasticity and flexibility Essential for swelling and water sealing
2	Bentonite Clay (Sodium Bentonite)		Sodium Bentonite Powder Granular Bentonite	<ul style="list-style-type: none"> Provides high swelling capacity Ensures self-sealing when in contact with water
3	Plasticizers / Extenders		DOA (Dioctyl Adipate) DOP (Dioctyl Phthalate) Paraffinic Oil	<ul style="list-style-type: none"> Improve flexibility and workability Assist in better mixing Prevent cracking
4	Fillers		Calcium Carbonate (CaCO ₃) Talc Silica	<ul style="list-style-type: none"> Improve dimensional stability Enhance physical properties Reduce production cost
5	Stabilizers		Calcium-Zinc Stabilizer Lead Stabilizer (Older systems) Heat Stabilizer	<ul style="list-style-type: none"> Improve heat and weather resistance Prevent degradation during processing and service life
6	Processing Aids		Stearic Acid Paraffin Wax Processing Aid (Acrylic based)	<ul style="list-style-type: none"> Improve flow and extrusion Reduce friction during processing Improve surface finish
7	Anti-oxidants		Phenolic Anti-oxidant Phosphite Anti-oxidant	<ul style="list-style-type: none"> Prevent ageing and oxidation Improve long-term durability
8	Pigments / Colorants		Carbon Black (Black) Iron Oxide (Red / Yellow) Others (Blue, Green)	<ul style="list-style-type: none"> Provide desired color / identification Improve UV resistance (in some cases)
9	Adhesion Promoters (Optional)		Silane Coupling Agent Resin Based Adhesion Promoter	<ul style="list-style-type: none"> Improve bonding with concrete Enhance sealing performance

RAW MATERIALS → MIXING → EXTRUSION → COOLING → CUTTING → FINISHED SWELLABLE WATER BAR

Swelling Ratio by Volume (%)

$$\text{Swelling Ratio (\%)} = \frac{V_2 - V_1}{V_1} \times 100$$

Where: V_1 = Original volume (before water)

V_2 = Final volume (after soaking)

Example:

A bar size = 20 mm × 10 mm × 100 mm

Original volume:

$$V_1 = 20 \times 10 \times 100 = 20,000 \text{ mm}^3$$

Size becomes 28 mm × 14 mm × 100 mm (After soaking 7 days in water)

Final volume:

$$V_2 = 34 \times 208 \times 100 = 68000 \text{ mm}^3$$

$$\text{Swelling Ratio} = (68000 - 20,000) \div 20,000 \times 100 = 240\%$$

Packing standard of Swellable Water Bar

S No	Dimension	Weight/mtr	Each Roll	Packing in Total Box
1	20x5mm	140 gram	25 Mtr	25Mtr x6 Nos=150Mtr
2	20x10mm	280 gram	20 Mtr	20 Mtrx5 Nos=100 Mtr
3	20x20mm	560 gram	25 Mtr	25 Mtr x 2 Nos=50 Mtr
4	25 x20mm	700 gram	25 Mtr	25 Mtr x2 Nos=50 Mtr
5	25 x25mm	875 gram	25 Mtr	25 Mtr x2 Nos=50 Mtr

Color Black

S No	Dimension	Weight/mtr	Each Roll	Packing in Total Box	Weight Kg/Pkd	Lenght	Width	Thickness	CBM
1	20x5mm	140 gram	25 Mtr	25Mtr x6 Nos=150Mtr	21 kg/pkd	0.450	0.45	0.125	0.025
2	20x10mm	280 gram	20 Mtr	20 Mtrx5 Nos=100 Mtr	28/pkd	0.450	0.45	0.125	0.025
3	20x20mm	560 gram	25 Mtr	25 Mtr x 2 Nos=50 Mtr	28/pkd	0.45	0.45	0.15	0.030
4	25 x20mm	700 gram	25 Mtr	25 Mtr x2 Nos=50 Mtr	35/pkd	0.45	0.45	0.15	0.030
5	25 x25mm	875 gram	25 Mtr	25 Mtr x 2 Nos=50 Mtr	43.7/pkd	0.45	0.45	0.15	0.030

Colour in Red:

S No	Dimension	Weight/mtr	Each Roll	Packing in Total Box	Weight Kg/Pkd	Length	Width	Thickness	CBM
1	20x5mm	140 gram	25 Mtr	25Mtr x6 Nos=150Mtr	21 kg/pkd	0.450	0.45	0.125	0.025
2	20x10mm	280 gram	20 Mtr	20 Mtrx5 Nos=100 Mtr	28/pkd	0.450	0.45	0.125	0.025
3	20x20mm	560 gram	25 Mtr	25 Mtr x 2 Nos=50 Mtr	28/pkd	0.45	0.45	0.15	0.030
4	25 x20mm	700 gram	25 Mtr	25 Mtr x2 Nos=50 Mtr	35/pkd	0.45	0.45	0.15	0.030
5	25 x25mm	875 gram	25 Mtr	25 Mtr x 2 Nos=50 Mtr	43.7/pkd	0.45	0.45	0.15	0.030

**HYDROPHILLIC SWELLABLE BAR OF POLYMER / BENTONITE BASE WITH
SPECIFICATIONS**

1	HYDROPHILLIC SWELL BAR POLYMER BASE SIZE: 20 X 5 MM (PACKING 150 MTR EACH BOX)	39259090
2	HYDROPHILLIC SWELL BAR BENTONITE BASE SIZE: 20 X 5 MM (PACKING 150 MTR EACH BOX)	39259090
3	HYDROPHILLIC SWELL BAR POLYMER BASE SIZE: 20 X 10 MM (PACKING 100 MTR EACH BOX)	39259090
4	HYDROPHILLIC SWELL BAR BENTONITE BASE SIZE: 20 X 10 MM (PACKING 100 MTR EACH BOX)	39259090
5	HYDROPHILLIC SWELL BAR POLYMER BASE SIZE: 20 X 20 MM (PACKING 100 MTR EACH BOX)	39259090
6	HYDROPHILLIC SWELL BAR BENTONITE BASE SIZE: 20 X 20 MM (PACKING 100 MTR EACH BOX)	39259090
7	HYDROPHILLIC SWELL BAR POLYMER BASE SIZE: 25 X 20MM (PACKING 50 MTR EACH BOX)	39259090
8	HYDROPHILLIC SWELL BAR BENTONITE BASE SIZE: 25 X 20 MM (PACKING 50 MTR EACH BOX)	39259090
9	HYDROPHILLIC SWELL BAR POLYMER BASE SIZE: 25 X 25MM (PACKING 50 MTR EACH BOX)	39259090
10	HYDROPHILLIC SWELL BAR BENTONITE BASE SIZE: 25 X 25 MM (PACKING 50 MTR EACH BOX)	39259090

Polymer Base Swell Bar

A Polymer Base Swell Bar is a hydrophilic waterproofing strip manufactured from special rubber and polymer compounds that expand when exposed to water, creating a durable and flexible watertight seal in concrete construction joints.

Bentonite Base Swell Bar

A Bentonite Base Swell Bar is a waterproof sealing strip made from sodium bentonite clay combined with rubber or polymer binders, designed to swell upon contact with water and block leakage through concrete joints and gaps.

S. No.	PRODUCT DESCRIPTION	BASE TYPE	SIZE (WIDTH x THICKNESS)	CROSS-SECTION (Original → After Swelling)	PACKING	HSN CODE
1	HYDROPHILIC SWELL BAR SIZE: 20 X 5 MM	POLYMER BASE	20 x 5 mm		150 MTR EACH BOX	39259090
2	HYDROPHILIC SWELL BAR SIZE: 20 X 5 MM	BENTONITE BASE	20 x 5 mm		150 MTR EACH BOX	39259090
3	HYDROPHILIC SWELL BAR SIZE: 20 X 10 MM	POLYMER BASE	20 x 10 mm		100 MTR EACH BOX	39259090
4	HYDROPHILIC SWELL BAR SIZE: 20 X 10 MM	BENTONITE BASE	20 x 10 mm		100 MTR EACH BOX	39259090
5	HYDROPHILIC SWELL BAR SIZE: 20 X 20 MM	POLYMER BASE	20 x 20 mm		100 MTR EACH BOX	39259090
6	HYDROPHILIC SWELL BAR SIZE: 20 X 20 MM	BENTONITE BASE	20 x 20 mm		100 MTR EACH BOX	39259090
7	HYDROPHILIC SWELL BAR SIZE: 25 X 20 MM	POLYMER BASE	25 x 20 mm		50 MTR EACH BOX	39259090
8	HYDROPHILIC SWELL BAR SIZE: 25 X 20 MM	BENTONITE BASE	25 x 20 mm		50 MTR EACH BOX	39259090
9	HYDROPHILIC SWELL BAR SIZE: 25 X 25 MM	POLYMER BASE	25 x 25 mm		50 MTR EACH BOX	39259090
10	HYDROPHILIC SWELL BAR SIZE: 25 X 25 MM	BENTONITE BASE	25 x 25 mm		50 MTR EACH BOX	39259090



HIGH SWELLING
CAPACITY



EXCELLENT WATER
SEALING



CHEMICAL &
CORROSION RESISTANT



DURABLE &
LONG LASTING



EASY TO INSTALL
& USE

ILLUSTRATIONS OF THE SWELLABLE WATER BAR

PHYSICAL AND CHEMICAL PROPERTIES

S. No.	Property / Test	Specification Clause No.	Permissible Limits as per Specification	Relevant Code / Test Method	Results
1	Shape	Clause 5.1	Rectangle	Visual Inspection	Rectangle
2	Colour	Clause 5.2	Black	Visual Inspection	Black
3	Dimensions	Clause 5.3	20 × 10 mm / 20 × 15 mm / 25 × 25 mm	Dimensional Verification	As Required
4	Coating	Clause 5.4	Talcum Treated	Visual Inspection	Talcum Treated
5	Toxicity	Clause 5.5	Non-Toxic	Material Compliance Test	Non-Toxic
6	Hardness Test (Before Ageing)	Clause 6.1	50 ± 5 Shore A	IS : 3400 (Part II)	52 Shore A
7	Tensile Strength	Clause 6.2	30.0 kg/cm ² (Min)	IS : 3400 (Part I)	32.0 kg/cm ²
8	Elongation at Break	Clause 6.3	200% (Min)	IS : 3400 (Part I)	220%
9	Water Absorption	Clause 6.4	10.0% (Max)	IS : 3400 (Part VI)	4.2%
10	Specific Gravity	Clause 6.5	1.35 – 1.40 g/cm ³	IS : 3400 (Part VI)	1.36 g/cm ³
11	Tensile Strength	Clause 6.6	3 kg/cm ²	IS : 3400 (Part I)	Conforms
12	Elongation	Clause 6.7	150%	IS : 3400 (Part I)	Conforms
13	Hardness	Clause 6.8	35 ± 5 Shore A	IS : 3400 (Part II)	Conforms
14	Swelling Ratio (24 Hours)	Clause 6.9	100%	Laboratory Swelling Test	Conforms
15	Swelling Ratio (After 7 Days)	Clause 6.10	300%	Laboratory Swelling Test	Conforms

The above tests are carried out on specially moulded test pieces as per IS:3400 Specification and found satisfactory

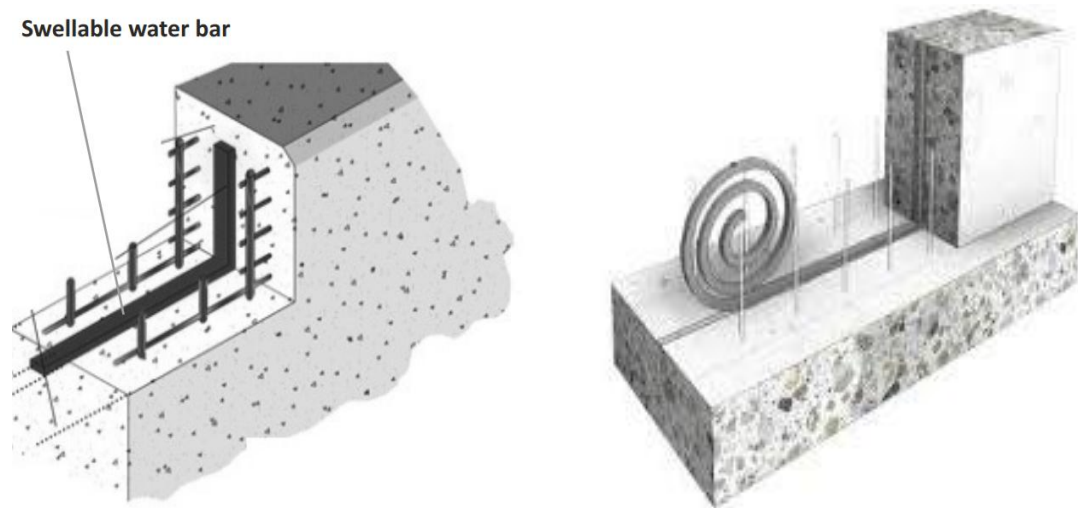


FIG. 1 SWELLABLE WATER BARS

APPLICATIONS BY COUNTRIES :

India:

- Widely used in basements, tunnels, retaining walls, and water tanks in residential and infrastructure projects.
- Increasing demand in metro rail, sewage treatment plants (STPs), and smart city developments.
- Commonly applied in dams, irrigation canals, and underground concrete joints for waterproof sealing.

China:

- High demand driven by rapid urbanization and mega infrastructure projects.
- Extensively used in tunnels, subways, bridges, and high-rise construction.
- Major application in water-retaining structures and industrial construction joints.

United States:

- Used in commercial buildings, wastewater treatment plants, and underground utility structures.
- Widely adopted in foundation waterproofing and expansion joint sealing systems.
- Increasing use in highway tunnels, reservoirs, and flood-control infrastructure projects.

Europe:

- Strong usage in underground transportation systems and precast concrete structures.
- Preferred for waterproofing in sewage systems, marine structures, and water treatment facilities.
- Advanced polymer-based swell bars are increasingly used due to strict durability standards.

Middle East:

- Extensively used in desalination plants, basements, and large-scale infrastructure projects.
- High demand in underground waterproofing due to harsh climatic conditions and groundwater exposure.
- Common in tunnels, water reservoirs, and commercial construction projects.

Africa:

- Used in dams, water storage tanks, and irrigation infrastructure projects.
- Important for waterproofing foundations and underground concrete structures.
- Growing adoption in humanitarian and rural water infrastructure developments due to easy installation and durability.

Get in touch:

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