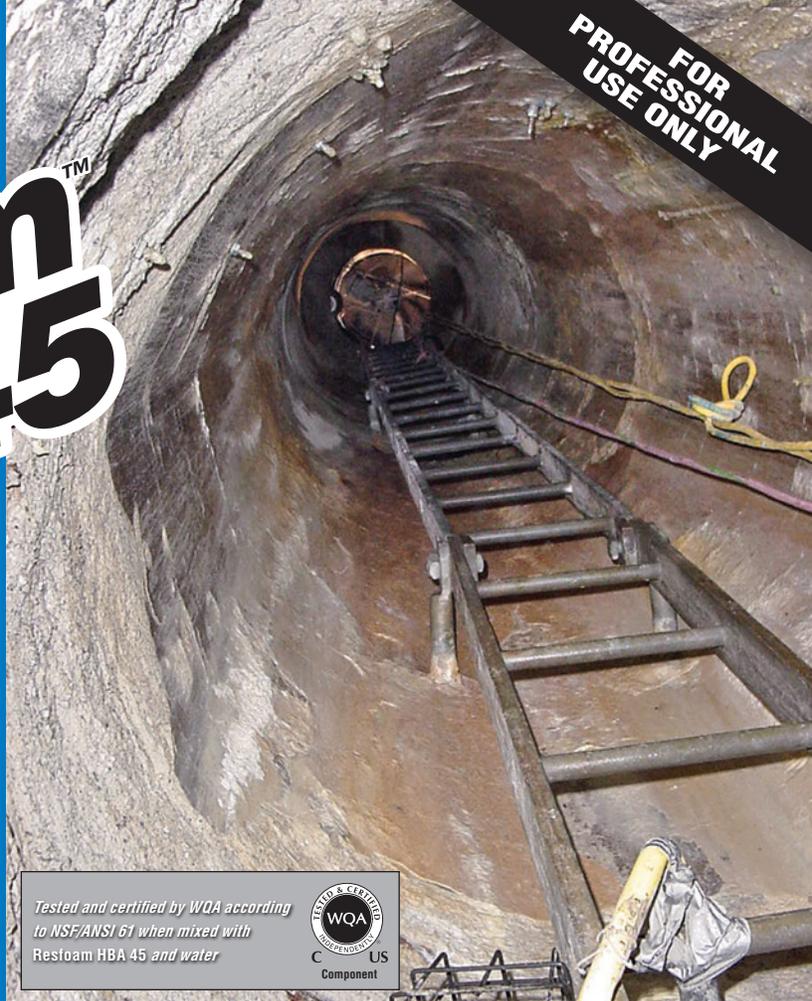




# Resfoam HB 45™

## Flexible, Hydrophobic Polyurethane Grout



FOR PROFESSIONAL USE ONLY

Tested and certified by WQA according to NSF/ANSI 61 when mixed with Resfoam HBA 45 and water



### DESCRIPTION

*Resfoam HB 45* is a low-viscosity, flexible, hydrophobic polyurethane grout used to stop water infiltration in concrete structures. *Resfoam HB 45* is a solvent-free, MDI-based polymer system that reacts with water. Use *Resfoam HB 45* together with *Resfoam HBA 45* accelerator to adjust the reaction profile for a specific application. In a free-rise circumstance, *Resfoam HB 45* will expand up to 750% of its liquid volume. Upon application, *Resfoam HB 45* reacts to form a closed-cell polyurethane grout that will not shrink, and provides an elastomeric waterproof barrier sealing infiltration points against water intrusion. *Resfoam HB 45* is nontoxic and has good chemical resistance. *Resfoam HB 45* is also available in a dual-cartridge format (*Resfoam HB 45C*) with the accelerator already portioned in the Part B cartridge.

### FEATURES AND BENEFITS

- Single-component with accelerator
- Forms a closed-cell, nonshrinking flexible foam
- 100%-solids
- Low in viscosity to penetrate deeply into fine cracks
- Certified by the Water Quality Association (WQA) for NSF/ANSI 61 projects
- Controllable reaction times
- Expands up to 750% of its original volume
- Also available in a dual-cartridge format (as *Resfoam HB 45C*)

### INDUSTRY STANDARDS AND APPROVALS

- Certified by the WQA for contact with potable water in NSF/ANSI 61 areas

### WHERE TO USE

*Resfoam HB 45* is used for stopping water infiltration primarily in concrete, masonry or brick structures. Use *Resfoam HB 45* to stop water infiltration

through wet cracks, dry cracks, water leaks, honeycombed concrete, expansion joints, beam joints, pipe penetrations and more. Repair methods include joint sealing, curtain injection and crack sealing in the following applications:

- Municipal and utility water-treatment facilities
- Mining, pedestrian and automotive tunnels
- Concrete dams, canals and powerhouses
- Foundations
- Parking garages
- Concrete construction joints
- Waste and stormwater systems
- Elevator pits
- Underground vaults

Consult MAPEI's Technical Services Department for installation recommendations regarding substrates and conditions not listed.

### MIXING

Before product use, take appropriate safety precautions. Refer to the Safety Data Sheet for details.

- For proper reaction times, *Resfoam HB 45* must be mixed with *Resfoam HBA 45* accelerator between 1% and 10% by weight.
- Validation of the pre-blend of *Resfoam HB 45* and *Resfoam HBA 45* is required to verify the proper mixing ratio for achieving the desired reaction times for a project. Pre-blend tests should be conducted until desired reaction times are met. Note that the pre-blend should not be pumped, but rather mixed by hand in a small container.
- *Resfoam HB 45C* cartridges must be shaken vigorously before use.

### Pre-blend design:

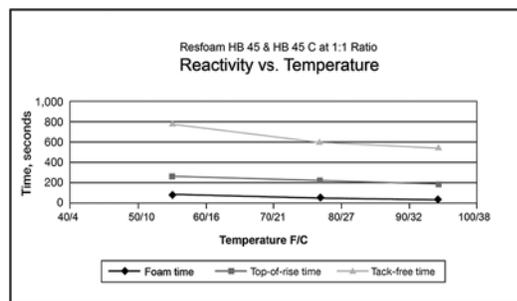
- 100 parts of *Resfoam HB 45* by weight
- Appropriate ratio of *Resfoam HBA 45* by weight per Table 1 below
- 5 parts of water by weight

### Pre-blend preparation:

1. Add *Resfoam HBA 45* to *Resfoam HB 45* and mix at slow speed to a homogenous state.
2. Add the water and mix thoroughly.
3. Determine the start time as the instant that the water is added to the mix (Step 2 above).
4. Determine the foam time as the moment in which the material begins to foam.
5. Determine the tack-free time as the moment when the material is no longer tacky to the touch.

Based on pre-blend validations, mix the appropriate amount of *Resfoam HBA 45* accelerator with *Resfoam HB 45* to realize desired gel time. Mix only enough material to be used within a reasonable amount of time.

Table 1: Ratio of <i>Resfoam HBA 45</i> to gel time at 77°F (25°C)			
Ratio (by weight) of <i>Resfoam HBA 45</i> to <i>Resfoam HB 45</i>	Foam time	Gel time	Tack-free time
1%	95 seconds	4.5 minutes	25 minutes
2%	70 seconds	3.2 minutes	15 minutes
3%	42 seconds	2 minutes	8 minutes
6%	35 seconds	1.5 minutes	3.5 minutes
10%	27 seconds	1 minute	2.75 minutes



## SITE PREPARATION AND PRODUCT APPLICATION

Read all installation instructions thoroughly before installation. Jobsite preparation depends on the type of injection method that is selected. Two techniques of injection are described below along with the site preparation.

### Activated oakum technique

The activated oakum technique is a method to help reduce or eliminate heavy water inflow in wide cracks or joints.

1. Saturate oakum rope or absorbent industrial towels in *Resfoam HB 45* already mixed with *Resfoam HBA 45*, and then soak the rope or towels in water. *Resfoam HB 45* will begin reacting once dipped in water.

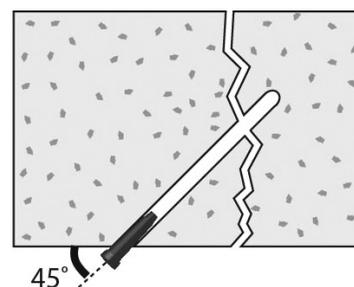
2. Force the saturated pieces into the leaking crack or joint. Push them deeply into the crack or joint using a blunt instrument. As *Resfoam HB 45* expands with the support of the rope or towels, water flow will be reduced, and the rope or towels should be held in place by the expansion.
3. Proceed by drilling holes and completing either an encapsulation or crack-injection repair as indicated above.
4. Inject the *Resfoam HB 45* catalyzed mix using a single-component injection pump. If the crack is dry, inject water at low pressure through each packer first by using a separate pump, which reduces the risk of material gelling within the pump and clogging pump valves and hoses.

### Crack injection technique

1. Prepare the repair area by drilling holes at approximately 45-degree angles to intersect the void (crack, cavity, fissure or joint) at about half the depth of the concrete. Holes are typically drilled on opposing sides of the void in an alternating (staggered) pattern. The spacing is dependent on the crack size, width and configuration, and typically ranges from 6" to 2 feet (15 cm to 61 cm).
2. Flush all drill waste liberally from holes with water to ensure a clean, wet contact surface before installing packers and injecting material.
3. Ensure that packers are securely and firmly placed in the pre-drilled holes; once the packer is placed, install the injection tip.
4. Inject the material – either from cartridges or by utilizing a single-component pump. Pump pressure typically ranges from 250 psi to 2,500 psi.
5. Begin injecting *Resfoam HB 45* from the lowest packer and watch for material escaping the surface of the crack or adjacent packers. Move systematically up the packers, ensuring that *Resfoam HB 45* penetrates the entire surface area of the crack.
6. Visually inspect injected areas for consistency of reacted material to ensure complete penetration of crack or fissure. If inconsistency is observed, the installer must adjust water ratio to achieve proper results.
7. For maximum effectiveness in completely filling voids, apply a sufficient amount of *Resfoam HB 45* to produce a satisfactory ratio of water to product. Excess material at the site may be removed with a scraper or by waterblasting as soon as the material has cured.

Fig. 1

Drill holes at a 45-degree angle for penetration into the crack/fissure at half the crack's depth.



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### Performance Properties of Resfoam HB 45

Laboratory Tests	Results
Specific gravity – ASTM D891	1.04 to 1.07
Viscosity at 77°F (25°C) – ASTM D2196	450 to 550 cps
Solids content – ASTM D2369 B	100%
Flash point (Pensky Martens) – ASTM D93	> 225°F (107°C)
VOCs (Rule #1168 of California's SCAQMD)	0.06 g per L

### Performance Properties of Resfoam HB 45C

Laboratory Tests	Part A	Part B
Specific gravity – ASTM D891	1.04 to 1.07	0.949
Viscosity at 77°F (25°C) – ASTM D2196A	550 cps maximum	450 cps maximum

### Application Properties of Cured Resfoam HB 45C

Laboratory Tests	Results
Tensile strength – ASTM D412	55 psi (0.38 MPa)
Elongation – ASTM D3574	70%
Die-C tear – ASTM D624	8 pli (142.9 kg per m)
Pot life at 77°F (25°C)	10 minutes
Density	10 to 15 lbs. per cu. ft. (160 to 240 kg per m <sup>3</sup> )
Chemical resistance	Sea water, petroleum and most acids (consult MAPEI's Technical Services Department)

### Shelf Life and Product Characteristics before curing

<i>Resfoam HB 45</i> , shelf life	1 year when stored in original, unopened packaging at 73°F (23°C)
<i>Resfoam HB 45</i> , color	Pale yellow
<i>Resfoam HB 45C</i> , shelf life	1 year when stored in original, unopened packaging at 73°F (23°C)
<i>Resfoam HB 45C</i> , color	Pale yellow (Part A) and Clear (Part B)
<i>Resfoam HBA 45</i> , shelf life	1 year when stored in original, unopened packaging at 73°F (23°C)

### CSI Division Classifications

Dampproofing and Waterproofing	07 10 00
Concrete Accessories	03 15 00

### Packaging

Size
<i>Resfoam HB 45</i> : 5 U.S. gals. (18.9 L)
<i>Resfoam HB 45C</i> : Dual cartridge, 22 U.S. oz. (651 mL)
<i>Resfoam HBA 45</i> : 1 U.S. qt. (946 mL)

### Approximate Coverage\* per dual cartridge

Yield
A typical dual cartridge will fill a volume of 302 cu. in. (4.95 L), or a 3/16" (4.5 mm) crack in an 8" (20 cm) thick by 8-ft. (2.44-m) high wall.

\* Coverage shown is for estimating purposes only. Actual jobsite coverage may vary according to substrate conditions and placement techniques.

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# Resfoam<sup>™</sup> HB 45



**Fig. 2**

Typical packer placement around a crack/fissure

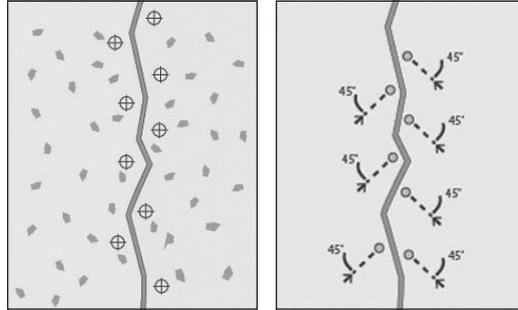


Fig. 2

Fig. 3

**Fig. 3**

Use a hammer to ensure that packers are firmly and securely placed in the drilled holes before injection of *Resfoam HB 45*.

The temperature of the concrete may impact the reaction time of *Resfoam HB 45* when it is injected. Colder concrete will extend the reaction time; conversely, warmer concrete will shorten the reaction time. For applications in cold environments, the reaction can be accelerated by heating *Resfoam HB 45*. The recommended application temperature is between 55°F to 90°F (13°C to 32°C).

### CLEANUP

- Once *Resfoam HB 45* has cured, excess material may be removed by a scraper or putty knife and disposed of. Packers may be broken off by chisel, hammer or grinder, and the concrete surface may be refinished as required.
- After injection is complete, flush the injection equipment and all mechanical components with *Resfoam PF* pump flush agent.

- Clean skin with soap and water.
- Clean up *Resfoam PF* with water on exposed surfaces before material hardens; once the material cures, mechanical removal will be required.

### STORAGE

*Resfoam HB 45* is moisture-activated, and open containers of material should be used quickly to avoid moisture contamination. If a container needs to be resealed, it should be blanketed with nitrogen or dry air (at less than -40°F [-40°C] dew point) to minimize water exposure. Store unopened cartridges in an environment between 60°F and 110°F (16°C to 43°C). Open cartridges should be used quickly to avoid the material gelling in the cartridge or static mix nozzle. Refer to the Safety Data Sheet (SDS) for further information.

### LIMITATIONS

- Cool temperatures increase viscosity and will slow reaction times.
- Environments with low pH (less than 3) may have a negative impact on foaming properties.
- *Resfoam HB 45C* is not NSF-61 approved.

Refer to the SDS for specific data related to health and safety as well as product handling.

For information on MAPEI's commitment to sustainability and transparency, as well as how MAPEI products may contribute to green building standards and certification systems, contact [sustainability\\_USA@mapei.com](mailto:sustainability_USA@mapei.com) (USA) or [sustainability-durabilite@mapei.com](mailto:sustainability-durabilite@mapei.com) (Canada).

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