

“SETTING STANDARDS FOR THE INDUSTRY”

PRODUCT CATALOG

DENVER FOAM[®]
OPEN CELL POLYURETHANE BACKER ROD

TITAN FOAM[™]
BI-CELLULAR SOFT CELL POLYETHYLENE BACKER ROD

MILE HIGH FOAM[®]
CLOSED CELL POLYETHYLENE BACKER ROD

MILE HIGH FOAM XL[®]
**CROSS-LINKED CLOSED CELL POLYETHYLENE BACKER
ROD**

ULTRA BLOCK[®]
FIRE STOPPING SYSTEMS

www.backerrod.com



Backer Rod Mfg. Inc.

Backer Rod Mfg. Inc. | 4244 N. Broadway | Denver, CO 80216
Toll Free: 800-595-2950 | 303-308-0363 | Fax: 303-308-0393

WHO IS BACKER ROD MFG. INC.?

Welcome to Backer Rod Manufacturing Inc. - One of the largest manufacturers of backer rod materials in the world. We are experts in the specialty caulking field, providing backing for elastomeric and other applied sealants to the worldwide construction market. No other company manufactures and supplies backer rod products that are able to withstand temperature variations from -60° F to over 2000° F.



We serve customers in the construction industry with specific applications in expansion/construction joints to include:

- Concrete Expansion and Contraction Joints
- Curtain Wall Joints
- Parking Decks
- Bridge and Highway Construction
- Pavement Maintenance
- Window Glazing
- Log Home Chinking
- Joints Requiring Structural Fire Ratings for 2, 3 and 4 hours

Backer Rod offers five distinct products for use in construction joints:

Denver Foam®, Titan Foam, Mile High Foam®, Mile High Foam

XL® and Ultra Block®. The type of backer rod used is governed by the type of sealant used, plus environmental, seismic and temperature requirements. Backer Rod Manufacturing is proud to market our products through authorized distributors and select OEM customers around the world.



Backer Rod Mfg. Inc.



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August 1, 2018

GENERAL CERTIFICATE OF COMPLIANCE

DESCRIPTION: BACKER ROD MFG. INC. SEALANT BACKING PRODUCTS

Denver foam®
Titan Foam™
Mile High Foam®
Mile High Foam XL™
Ultra Block®

THESE PRODUCTS ARE TESTED TO AND MEET THE REQUIREMENTS OF THE FOLLOWING STANDARDS:

DENVER FOAM®	TITAN FOAM™	MILE HIGH FOAM®	MILE HIGH FOAM XL™	ULTRA BLOCK®
▪ ASTM D 1622	▪ ASTM D 1622	▪ ASTM D 1622	▪ ASTM D 1622	▪ ANSI/UL 2079
▪ ASTM D 1623	▪ ASTM C 1253	▪ ASTM C 1016 proc B	▪ ASTM D 1623	▪ ASTM E 84
▪ ASTM C 1016	▪ ASTM D 5249 type 3	▪ ASTM C 1253	▪ ASTM C 1016 proc B	▪ ASTM E 814
▪ ASTM D 5249 Type 1	▪ ASTM D 1623	▪ ASTM D 5249 type 3	▪ ASTM D 5249 type 1	▪ ASTM E 1399
▪ ASTM D 3574	▪ ASTM C 1016 proc B	▪ ASTM D 1623	▪ ASTM C 1253	▪ ASTM E 119
▪ ASTM C 1330 Type O	▪ ASTM C 1330 type B	▪ ASTM C 1330 type C	▪ ASTM C 1330 type C	▪ ASTM C 719
		▪ ASTM C 509	▪ ASTM C 509	▪ NFPA 251
				▪ NFPA 255

Final Fabrication Points:

Backer Rod Mfg
4244 N Broadway
Denver, CO 80216

Bay Foam Products
2240 W Peoria Ave
Phoenix, AZ 85029

No asbestos, PCB's, VOC's or lead are used or contained in these products. All products are proudly manufactured in the USA.

Bill Bergel
Sales, Marketing and Technical Services

Hidden, but essential

A technical review of backer rods

by J.F. Gibb

The majority of construction in commercial building today is done by use of large building panels of various types, connected by a high performance elastometric sealant material to form a waterproof seal. These panels consist of either precast concrete, prestressed concrete, or curtain wall which is predominately glass and metal. Any combination of these three types also is commonplace in modern construction.

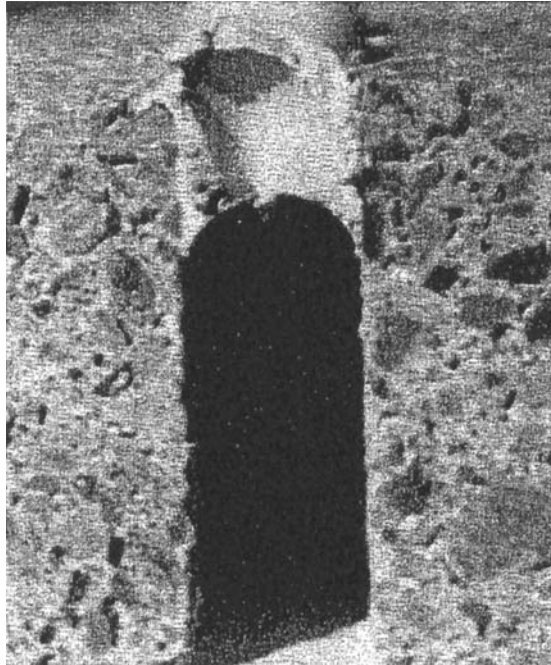
It is vitally important that the connecting link, the sealant, joining all these panels be of top quality, capable of performing satisfactorily for a great many years. Without this performance, water tightness soon is lost, resulting in long, costly modifications and repairs.

Many factors must be considered in designing a commercial building which will give many years of trouble free service. These include joint design, selection of sealant, surface preparation of joints just prior to caulking and, finally, selection of the proper backer rod (against which sealant is placed). The right decisions in these important areas, plus proper installation of the products, ensures desired results.

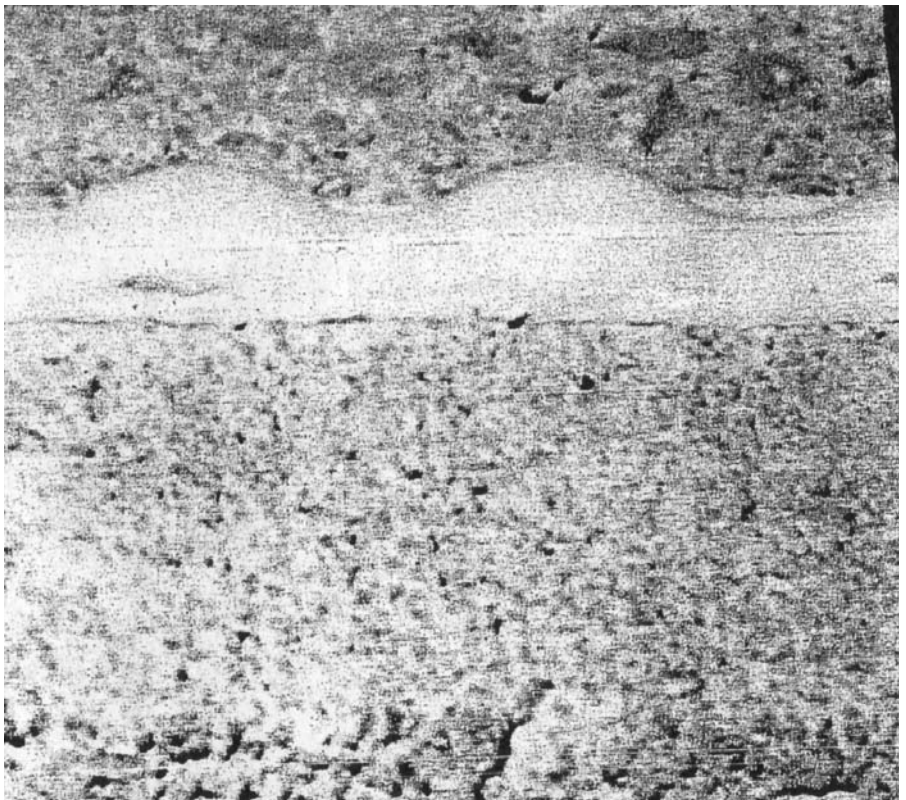
The backer rod evolves

Evolution of the backer rod from the first use of caulking to the present

John F. Gibb invented and developed the production equipment used to make open cell backer rods, and holds U.S. and foreign patents on this machinery. He is a member of the ASTM C-24 Joint Sealant Committee, and is General Manager/part owner of Backer Rod Mfg. & Supply Co., Denver.



At left, the result of outgassing by a closed cell backer rod. The rod has been removed, and the panels and sealant bead sawed in cross-section to show cavities caused by the bubbles. This is an unsatisfactory seal. Below, the sample at left seen from the side. A cured sealant bead applied above a closed cell backer rod was ruptured when trapped gases escaped from the rod.



state of the art covers use of many different types of materials. They range from sand in horizontal joints, through wood, fiber board, jute, rope, and twisted paper. About 17 years ago, a product evolved which consisted of an extruded plastic rod.

This new backer rod was a closed cell, flexible foam material. At first, it was made from polyethylene plastic. Now it consists of polyethylene and polypropylene, both nearly identical in appearance and performance. This new rod is manufactured by plastic extrusion: A gas is injected into the material, creating plastic foam. The result might be described best as being somewhat similar to a tube inflated under slight pressure as gas is trapped within its cellular structure. This rod proved to be far superior to what had been used previously in the trade, but was not without its problems.

Problems — and solutions

One of the more serious problems was outgassing. When these closed cells and their outer skin somehow become ruptured, trapped gases slowly escape to the atmosphere. If a high proportion of these cells become ruptured or deflated (so to speak), much of the rigidity of the rod is lost. The rod also loses much of its ability to regain its original round shape once it has been deformed.

The problem of outgassing associated with these new flexible foam backer rods resulted in sealant manufacturers insisting on further research, in the attempt to find a suitable material that would eliminate this problem — without creat-

ing even more serious ones.

For many years, in limited applications only, polyurethane foam materials had been used successfully. This promoted further development of this material, to determine its suitability for use in backer rods in the caulking business.

Most early applications employed a backing material cut into short strips (square or rectangular in cross-section). The material exhibited a wide range of physical properties, because much of it had been cut from scrap material used by the furniture business. The type of polyurethane used in that industry is required to have a very high degree of resiliency, and to retain this property through severe usage. This same property is necessary in expansion joint backer rod. Therefore, it proved to be an ideal material for backer rod use.

About six years ago, a round, open cell, flexible polyurethane backer rod was introduced. The product was made from special formulations of these flexible foams, producing a more uniform material. (As noted, uniformity was lacking in previous urethane backer rod produced from scrap.)

Open vs. closed cell

There are some interesting (and important) differences between open and closed cell backer rods.

Both open cell and closed cell are inert to all common and more predominately used sealant materials on the market today. Both have excellent chemical resistance.

Both, too, are classified as non-

staining. This means they contain no materials that would bleed out slowly and seep into the sidewalls (substrate), later to reappear as discoloration on the surface (some distance away). This is a particularly important point, if marble or other masonry materials are used.

The open cell rod is more flexible than its counterpart closed cell. The open cell must depend on its chemical and physical make up to attain rigidity, while closed cell rigidity is the result of gases trapped in its interior (as explained earlier).

Rarely in commercial building construction do expansion joint widths conform exactly to design. For instance, a one-half inch joint frequently will vary from as little as one-quarter inch or less to as much as three-quarter inch (or more). It is virtually impossible to manufacture or to erect large building panels economically to such precise dimensions that joints between such panels stay within close tolerances. A backer rod to be packed between these panels must be flexible enough for easy insertion.

Manufacturers of closed cell backer rods recommend that the product not be compressed more than 25 percent of its diameter. Consequently, the applicator must change sizes frequently, using closed cell in commonplace, varying width joints, and open cell rod if he is to exceed the 25 percent maximum compression limit.

Open cell backer rod must be compressed at least 25 percent; it does not hurt these rods to be compressed as much as 75 percent of their diameter. This allows the applicator to use fewer sizes in vary-

ing width joints. Many times, one size will work the full length of the joint (which might not be the case when using closed cell rod).

Three primary purposes

A backer rod has three primary purposes. First, it forms a base against which sealant is applied. (It therefore determines the thickness of the sealant bead.) Also, it forces uncured sealant out laterally under tooling pressure, resulting in 100 percent contact of sealant to sidewall (substrate). These are the bond lines. Finally, backer rods dictate the cross-sectional configuration of the sealant bead.

Flexibility of the two backer rod materials plays an important part in tooling the newly applied sealant beads. A backer rod, although important in an expansion joint, is secondary to the primary product—the sealant. The desired end result is a satisfactory seal that meets or exceeds specifications.

The more rigid closed cell backer

rod is able to withstand a heavier pressure. The greater flexibility of the open cell rod requires the caulker to use lighter tooling pressure, to minimize spring back.

(It is not a difficult technique to master, for open cell backer rod has been used successfully for 20 years or more.)

Tooling the hour glass

Tooling is done with a variety of instruments. Most incorporate a semi-flexible blade, like a spatula. It is the tooling operation that gives the cross-sectional shape to the newly applied sealant bead. This shape is referred to as an "hour glass" configuration.

The hour glass shape is important. It results in a maximum bonding surface on the sidewalls, and a thinner section midway between. This means the adhesive bond to the sidewalls will be of sufficient strength to eliminate failure caused by repeated elongations and contractions of the sealant material. In simple terms, the strength of the

bond to the sidewalls forces elastic movement of the sealant. Elasticity of the sealant comes into play by allowing stretching and contraction at the thinnest point, avoiding excessive stress at the bonds to the sidewall. Choosing the correct backer rod obviously plays an important part.

If a backer rod is placed incorrectly (too deeply) or so it doesn't force an hour glass cross section, cohesive or adhesive failure becomes a distinct possibility.

Proper cross sections

Figures 1 and 2 show the differences between the proper cross section of a newly applied sealant bead, and an incorrect one. Figure 2 is incorrect because the ratio of thickness of the sealant bead at the bond line to that at the midway point is too small. Movement of the joint sidewalls will put undue stress on the bond lines. The high cohesive strength of the overly thick sealant bead will make it very difficult or impossible for the sealant to elongate. The bonds may fail eventually because of this; they will not if they have the correct ratio depicted in Figure 1.

This problem can be compounded if an incorrect back-up is used in cases where three-sided adhesion occurs. In these cases, a sealant cures while adhered to both sidewalls, and to the backer rod. When the back-up rod is composed of a rigid, unyielding material, problems can arise.

Closed cell backer rods, being an olefin-type plastic material, are well known for their anti-stick properties. Usually, any initial adhesion to these back-ups break down quickly, and the sealant comes free.

This was thought to be the case with open cell rods as well, since the weak open cell surface structure also shears away from the sealant bead. In cases where it does not, however, the flexibility of the open cell rod allows it to move with the sealant bead (with absolutely no ill effects) for the life of the sealant.

This has been demonstrated both

FIGURE 1
Correct placement of backer rod sealant

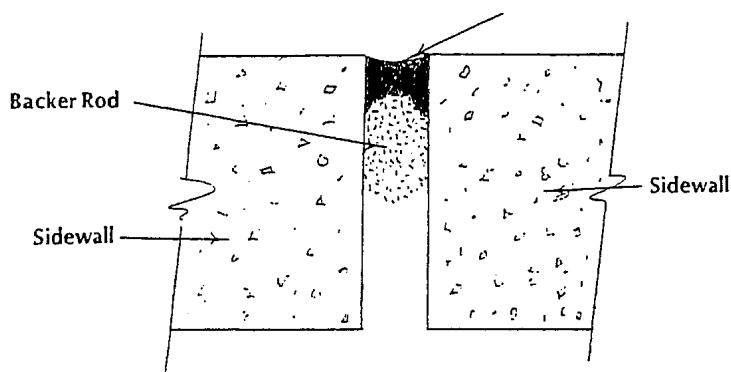


FIGURE 2
Incorrect placement of backer rod sealant

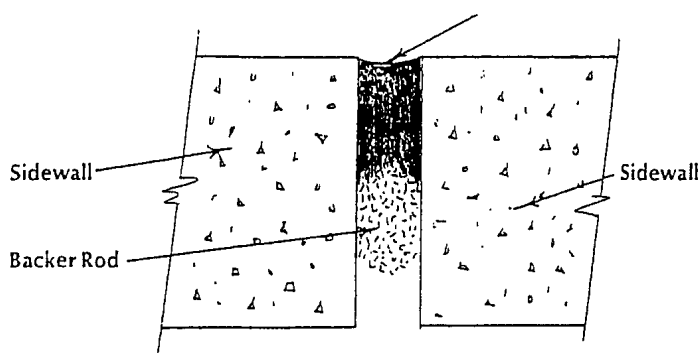


FIGURE 3
Trapped moisture, open cell backer rod

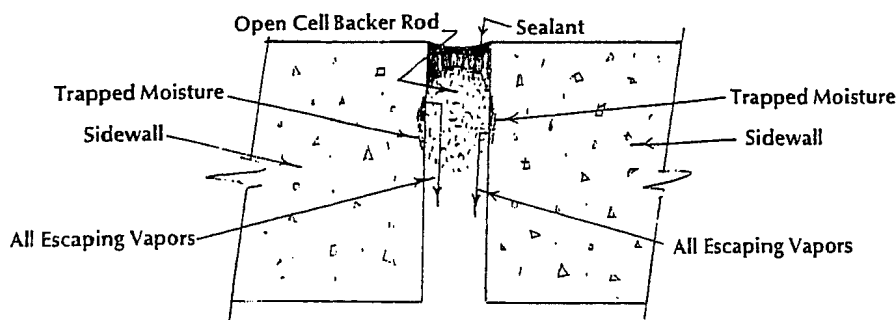
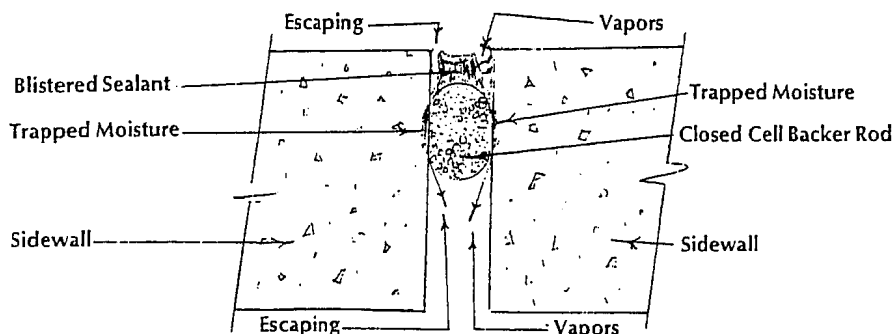


FIGURE 4
Trapped moisture, closed cell backer rod



in laboratory tests of 10,000 cycles (excess of 25 years) and in over 20 years of actual use in the field. Problems do arise when a rigid back-up is used: the sealant bonds to it tenaciously. When the joint moves, the sealant doesn't—and failure likely will occur.

Closed cell rods tend to take a set when compressed for extended periods of time. This is not the case for open cell rods. It is a basic requirement of these open cell foams in the furniture and padding industry that they not take a set. On occasion, closed cell rods have been known to move back into a joint under gunning pressure, if the rod first was placed in the joint too far. (This permits too thick a sealant bead, risking bond failure.)

Open cell rods have a high coefficient of friction, and do not slide easily over most surfaces. This results in a good grip to sidewalls, and a resistance to movement under gunning pressure. Open cell rod can move, however, if it is not com-

pressed the recommended 25 percent in joint packing.

Moisture Absorption

One of the myths that existed for years about open cell backer rod was its alleged moisture absorption. Many felt its open cell structure made it perform as a sponge. Open cell foam will absorb some water, but under most situations it does not retain it for long. Twenty-four hour total submersion tests indicate 50 percent absorption is about average. (This, of course, is not encountered in the field, but whatever water might be absorbed in actual practice still is not retained long.) Closed cell rod, on the other hand, is virtually non-absorbent; therefore, no problem.

This open cell feature has proven to be an important asset, because an escape route for gases always is readily available. Should some moisture become trapped between the sidewalls and the backer rod, the area usually is much slower to dry

out than is that part of the joint not covered by the backer rod—and exposed to the air. (See Figure 3 and Figure 4.) The portion to be caulked, however, is dry enough to be sealed.

When this moisture problem occurs and the wetness begins to evaporate, vapor pressure is built up between the backer rod and the sidewalls. In the case of the open cell rod, when these vapors take the course of least resistance they go through the backer rod to escape. As for closed cell, being impervious, the only escape route is through the newly applied sealant bead. When this occurs, the sealant bead blisters. Channels can develop throughout it; at times, the bond line fails or is seriously weakened.

Another important plus for open cell rod which became obvious in the application of air cured sealants (silicones) was the fact that a cure is initiated from both sides. This speeds up the cure substantially (highly desirable with slow-curing sealants). This faster cure to a large extent eliminates precure adhesive or cohesive failure problems.

Two-sided curing is impossible with closed cell rod material, therefore air curing sealants remain in an uncured or semi-cured state for a longer period of time. (See Figure 5 and Figure 6.)

Outgassing

Bubbling of newly applied or semi-cured sealant beads is referred to as outgassing. The results are similar to those caused by trapped moisture. This is a common problem when using closed cell rod. For many years, it was suspected this bubbling in newly applied sealant beads was caused by the sealant. However, more precise observation showed it to be from closed cell backer rod.

It was explained earlier that closed cell backer rod contains trapped gases within its surface skin and inside its closed cells. Also, it was pointed out that if this skin and/or some of these cells become ruptured, the gas begins to seep out. The impervious nature of the closed cell backer rod prevents escaping

FIGURE 5
Two-sided air cure with open cell backer rod

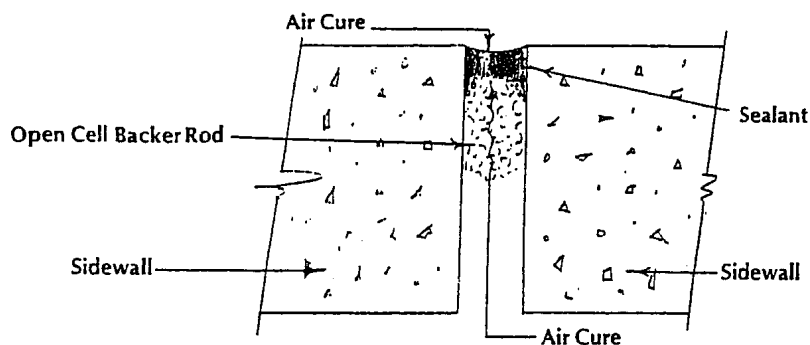
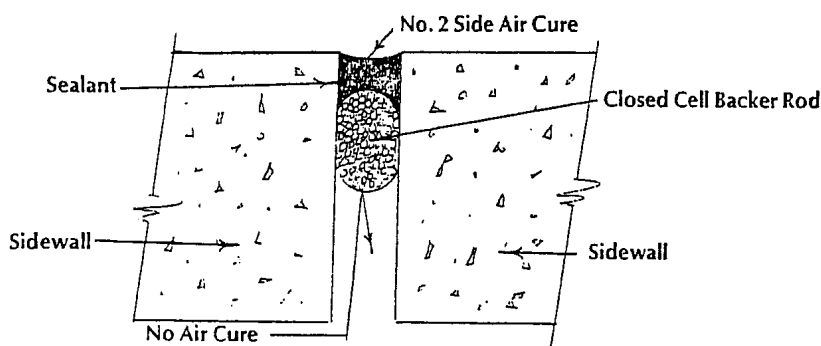


FIGURE 6
Absence of two-sided air cure with closed cell backer rod



gases from going any place other than through the newly applied sealant beads.

This seepage bubbles in the sealant, that, at times, can extend from the vent hole in the backer rod completely through the sealant bead, to its outer surface. This causes a leak in the seal. Most outgassing and bubbling isn't quite this severe. Usually, these gas bubbles stay within the sealant bead, though

they do detract from appearance, and weaken the sealant bead. (See Figure 7.)

Backer rod rupture

Rupture of closed cell backer rod can occur in several ways. Rough masonry surfaces often (and easily) cut open the surface skin and underlying cells, allowing enclosed gases to escape. Rupture also can be caused by equipment used to pack

the backer rod into the joints. As mentioned earlier, closed cell rod should not be compressed over 25 percent of its diameter. Variation in joint width is so predominant that over-compression occurs often; this too can cause rupture of the skin and underlying cells.

Over-compression in packing the joint requires heavier pressure in use of the packing tool, which introduces more chance of rupture of the skin and underlying cells, at the point of contact of the tool. The more over-compression, the more points of contact, therefore the more chance of rupture. Should the joint be in a rough masonry wall, the problem is compounded. The rough surfaces also will tear open the backer rod when it is subjected to such over-compression.

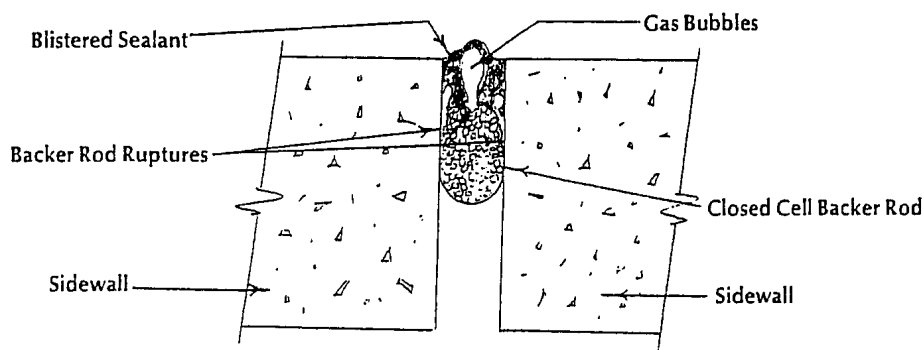
This problem can be compounded further if heat is involved, and rapid expansion of the building panels occurs. The more rapid closure of the joints (and expansion of the gases) due to heat forces gases into the uncured sealant faster, only adding to the troubles.

Another cause of outgassing with closed cell rod is sharp bends. Again, the surface skin and underlying cells can be ruptured. It is better to break closed cell backer rod at sharp turns than to bend it. The break provides an avenue of escape for these gases, away from the sealant bead.

One proposed partial solution to this outgassing problem was to pack the joint well in advance of (days before) the caulking operation. However, this would increase labor costs substantially. The closed cell rod would take a permanent set, partially releasing its grip to the sidewalls. This would risk movement during caulking (what's more, it was found closed cell rod still gassed, even after a year in a joint).

Outgassing is one problem that does not exist with open cell rod. The lack of an outer skin (or closed cells) totally eliminates any possibility of this occurring. In fact, prevention of outgassing was the primary reason open cell backer rod was developed.

FIGURE 7
Outgassing with closed cell backer rod



Other consequences of heat

Closed cell backer rod is a thermoplastic olefin material. This characteristic limits its usage if higher temperatures are encountered. (The maximum allowable temperature recommended by manufacturers is 160°F.) Open cell backer rod is a thermosetting plastic material with much higher heat resistance. It has been used successfully for limited periods under hot-applied sealant material (up to 500°F), with no ill effects.

The effects of elevated temperatures on successful application of a satisfactory sealant bead are of vital importance. New construction in hot climates reportedly will encounter temperatures of nearly 300°F for some materials. A backer rod material installed under such conditions must be able to withstand these temperatures without having a detrimental effect on applied sealants. The possibility of backer rod outgassing or shrinking brought about by contact with hot surfaces should be considered carefully.

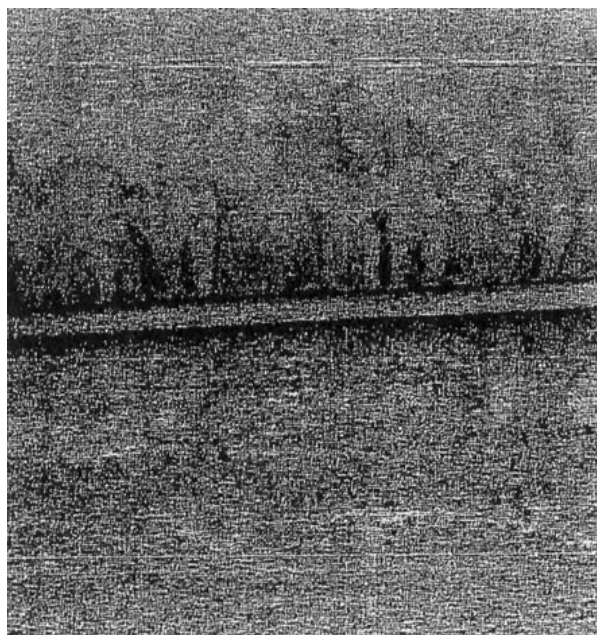
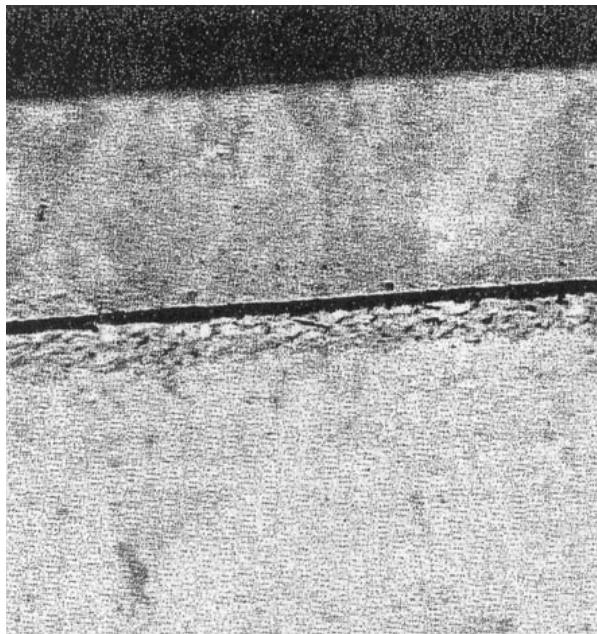
Both closed cell and open cell materials have good cold temperature characteristics under normal caulking environments. However, in extremely cold temperatures the open cell has a definite edge, remaining flexible at minus 60°F.

A minor role?

The backer rod in an expansion joint appears to play somewhat of a minor role. After the sealant has attained a full cure, the rod serves no further purpose other than, perhaps, offering some insulating properties in the expansion joints.

Although the role backer rods play may seem minor, it is important that architects, specification writers, caulking contractors and building owners ensure that seals in expansion joints perform well, and do not become the prematurely weak link in the structure.

It is in making possible that important seal that the backer rod performs its hidden, but essential task. □



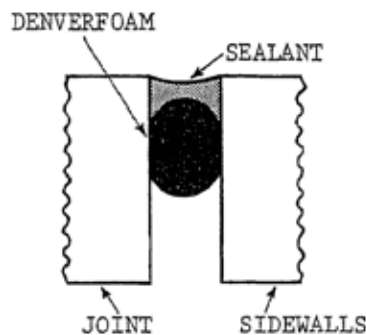
From top to bottom: (1) A typical rough masonry joint which will be sealed with a caulking material, after a backer rod has been packed between the panels. (2) An open cell backer rod being packed into an expansion joint prior to caulking. (3) A properly caulked joint in rough masonry, using an open cell backer rod (note the absence of bubbles in the cured sealant bed).

DENVER FOAM®

Manufactured under U.S. and Foreign Patents and Applications

DENVER FOAM® is a ROUND, LABOR-SAVING, continuous-length, compressible open-cell polyurethane foam used primarily as a “NON-GASSING” backer rod in caulking and sealant applications, such as expansion joints.

TIME PROVEN APPLICATION: Open-cell polyurethane foam, in various shapes and densities, has been used successfully for many years in the caulking and sealant trade without adverse effect.



1. Note that DENVER FOAM® is dispensed from the core - “binder-twine” type bale enables workman to secure to scaffolding without dispensing problems
2. Note ease of application from scaffolding. Small bales will sit flat and can be lashed easily. Bales can be stepped over easily.

Advantages:

1. **LABOR SAVING:** DENVER FOAM® can be installed rapidly with any type tool **WITHOUT REGARD FOR SURFACE DAMAGE**. Since round, compressible DENVER FOAM® can be installed in continuous form **IN JOINT WIDTHS OF LARGE VARIATION** without the necessity of changing backer rods sizes excessively, DENVER FOAM® can be installed **TWO OR THREE TIMES FASTER** than conventional closed-cell polyethylene or rectangular shaped backer rod materials.
2. **“NON-GASSING”:** DENVER FOAM® is open-cell polyurethane foam, and, being virtually “gas-free”, can be installed rapidly without regard to surface damage, thereby eliminating potential sealant failures and expensive repairs due to “gassing” action experienced by damaged closed-cell polyethylene backer rod materials.
3. **“BINDER-TWINE” PACKAGING:** DENVER FOAM® is packaged in continuous length bales in preshrunk, transparent polyethylene in such a manner that DENVER FOAM® is **dispensed from the center** of the bale. Several bales are packed in a master bag of extra-strength polyethylene, and tied with a removable and reusable plastic tie. Each diameter is designated by a different color label, and premarked at nominal 100 foot intervals. (**NOTE:** See explanation next page for master-compressed FREIGHTSAVING shipping bales, and also pre-packed MINI-BAGS for small requirements.)

4. **COMPETITIVE:** DENVER FOAM® is competitively priced, throughout the World, with most backer rod materials.
5. **SEALANT ADHESION TO BOTH OPEN-CELL AND CLOSED-CELL BACKER ROD:** Unbiased third party laboratory tests and extensive field experience show that sealant materials usually adhere to both open-cell polyurethane backer rod and closed-cell polyethylene backer rod. Performance of both type backer rod materials was found to be similar in that the behavior of the sealants was essentially the same with each back-up. Sealants subjected to dynamic movement will not be adversely affected by adhesion to DENVER FOAM® due to the low surface strength and shearing capabilities of the backer rod.
6. **NON-STAINING:** DENVER FOAM® is white to beige in color, odorless, and non-staining.
7. **INERT:** DENVER FOAM® is physically and chemically compatible with virtually every sealant.
8. **COMPRESSIBLE:** 25% nominal at 1 to 1-1/2 psi (70 to 100 gms/sq cm) with an approximate density of 4# to 6# per cubic foot (64kg to 96kg per cubic meter).
9. **FLEXIBILITY:** DENVER FOAM® has been found to handle much easier than closed-cell polyethylene due to it's greater flexibility, resulting in faster application and usage, without size change, in a wider range of joint width.
10. **LESS INVENTORY INVESTMENT:** Because each size of DENVER FOAM® can be used in such a wide range of joint widths, the amount of dollar investment to carry a full inventory is greatly reduced.
11. **LESS STORAGE SPACE REQUIREMENT:** Due to compression packaging of DENVER FOAM®, considerably less storage space is required to carry an adequate inventory.
12. **EASE OF JOB CLEAN-UP:** Since DENVER FOAM® is packaged in easily-disposable polyethylene bags, the problem of container disposal is reduced to a minimum.
13. **EASE OF SHIPMENT:** Since DENVER FOAM® is packaged in compact, compressed, light-weight master bags, ease of hauling sufficient material to the job in a minimum of space is greatly facilitated. Also, emergency shipments of a substantial amount of backer rod can be made very easily by the United Parcel Service or other small package carriers.
14. **WIDE TEMPERATURE RANGE:** DENVER FOAM® has been used successfully at temperatures of -70°F (-57°C) up to intermittent temperatures of 500°F (260°C). It has been determined by an independent testing laboratory that DENVER FOAM® subjected to 300°F (149°C) for six weeks will start to deteriorate, but since hot-pour sealants cool quite rapidly, DENVER FOAM® is an excellent hot-pour sealant backer rod.
15. **NON-WICKING:** DENVER FOAM® does not wick water, and is non-hygroscopic. DENVER FOAM® does not absorb water rapidly under field conditions. If wetted during a rainstorm, the DENVER FOAM® is usually dry enough to caulk when the sidewalls of the joint are dry enough to apply sealant. It is recommended that DENVER FOAM® should be reasonably clean, relatively dry, and free of contamination at the time of caulking application.
16. **FREIGHT SAVING ADVANTAGE:** Since DENVER FOAM® is a highly resilient open-cell polyurethane foam, it can be compressed substantially to increase the density (weight per cubic foot or meter) enough to take advantage of the lowest available freight rate, thereby offering MAXIMUM FREIGHT SAVINGS without damaging the product.



The above picture shows the two-stage compression packaging.

The Back Row contains 10 full sized Master bags approximately 17" x 31" (43cm x 79cm) weighing about 16 (7.3kg) each. The middle row contains 10 Master Bags semi-compressed and contained in a reinforced paper sleeve of about one-half the original size. The compressed bale in the foreground contains 10 semi-compressed sleeves further compressed to a size of approximately 18" x 21" x 36" (46cm x 53cm x 91cm) having a total weight of approximately 175 pounds (79kg), and resultant density of approximately 22 pounds per cubic foot (357kg per cubic meter). Upon releasing the restraining packaging, the DENVER FOAM rapidly returns to its original size without any detrimental effect to the material. **EXTREME CAUTION SHOULD BE USED WHEN CUTTING STEEL RETAINING BANDS.**

NOTE: The compressed bale in the foreground may contain all the same diameter, or mixed diameters of Master Bags including Master Bags of MINI-BAGS as indicated on back page.

DENVER FOAM®

OPEN CELL POLYURETHANE



TECHNICAL DATA SHEET

1. Product Name: **DENVER FOAM®**

2. Manufacturer: **Backer Rod Mfg. Inc.**
4244 N Broadway
Denver, CO 80216
Phone: 800-595-2950
Fax: 303-308-0393
Website: www.backerrod.com

3. Product Description:

Per ASTM C 1330 type O, **DENVER FOAM®** is a nongassing backer rod used as a backing for elastomeric and other applied caulking sealants. Denver Foam® controls the depth of the applied sealants and ensures cross sectional hour-glass configuration.

Specific Uses: For use in expansion/construction joints in concrete and pre-cast concrete walls, floors, partitions, bridge construction, parking decks, curtain walls, glazing, log home construction, highway construction, and pavement maintenance.

Both hot and cold applied sealants can be used with **DENVER FOAM®** per ASTM-D-5249-95.

Open cell **DENVER FOAM®** has an advantage allowing air to reach both sides of sealant offering a faster and more uniform cure. This is especially true for one part non-sag sealants. **DENVER FOAM®** can also be used in floor joints with self leveling sealants. Care should be taken in traffic areas where additional support is required.

4. Composition and Material:

DENVER FOAM® is continuous lengths of flexible, round, fabricated open cell polyurethane foam; yellow or black in color and available in a wide range of diameters listed in section 8 under packaging information.

DENVER FOAM® is also manufactured in half round shapes referred to as **DENVER FOAM HALF ROD**. Most commonly used in log home chinking applications, its unique design compresses securely into the joint while providing a flat chinking surface eliminating rounded backer rod telegraphing.

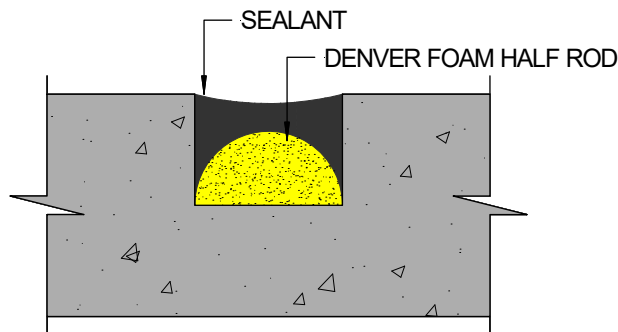
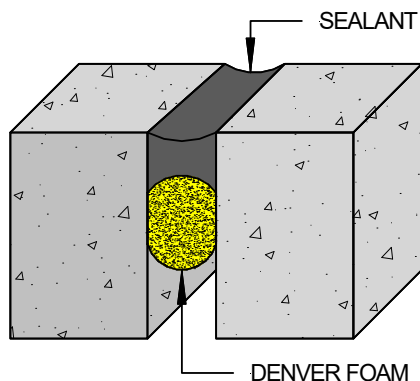
DENVER FOAM® HALF ROD can also be used in control joints with shallow depths where conventional round backer rod will not fit. Half Rod still allows for the proper sealant hour glass configuration and offers all of the advantages of traditional **DENVER FOAM®**. Please contact for packaging information.

5. Installation:

DENVER FOAM® should be installed in construction joints free from all contaminants, loose materials, and dry and free from frost. Install under minimum 25%, maximum 80% compression to offer a good tooling base. Systems can be installed without the fear of out-gassing associated with polyethylene closed cell backer rods.

6. Compatibility:

DENVER FOAM® is chemically inert and will resist oil, gasoline and most solvents. Material is odorless and will not stain. The open cell construction eliminates the out-gassing and cold flow problem associated with closed cell polyethylene backer rods.



1. Physical Properties:

Physical Properties		
Property	Value	ASTM Test Method
Density (Normal)	1.7 pcf	D 1622
Out-gassing	NONE	C 1253
Compression Recovery	>90	D 5249
Tensile Strength PSI	25 psi	D 1623
Temperature Range	-60° F to +500°F	D 5249
Auto Ignition	700° - 800° F	NA
Water Absorption	≤ 0.107 g/cm ³	C 1016 - Proc. B
Air Flow	90%	D 3574



The picture above details how “bales” are packaged into “Master Bags”

2. Packaging Information

Packaging Information					
Linear Feet Per Unit/ (metric)					Master Bag/ Bale Breakdown
Color Code	Diameter	LFT Master Bag	LFT Mini Bag	LFT Super Bundle (8 per)	
Beige	3/8" (10mm)	3600' (1097m)	200' (61m)	28,800' (8780m)	3/8" x 900' Bale - 4 Bales = 3600' Master Bag
Red	5/8" (16 mm)	2000' (608m)	100' (30m)	16,000' (4878m)	5/8" x 500' Bale – 4 Bales = 2000' Master Bag
Orange	7/8" (22mm)	1050' (318m)	100' (30m)	8,400' (2561m)	7/8" x 350' Bale – 3 Bales = 1050' Master Bag
Green	1-1/8" (29mm)	600' (182m)	75' (23m)	4,800' (1463m)	1 1/8" x 300 Bale – 2 Bales = 600' Master Bag
Yellow	1-1/2" (38mm)	350' (106m)	40' (12m)	2,800' (854m)	1 1/2" x 350' Bale - 1 Bale = 350' Master Bag
Blue	2" (51mm)	200' (61m)	25' (8m)	1,600' (488m)	2" x 200' Bale - 1 Bale = 200' Master Bag

DENVER FOAM® Master Bags are compressed into Super Bundles, 8 - 10 Master Bags per Super Bundle, for economical shipment and storage. Each individual size is color coded for identification. Super Bundles should be opened immediately upon receiving to ensure proper rebounding.

- Sleeved individual Master Bag 14" x 20" x 22" 8 lbs. ea
- Super Bundle 20" x 24" x 40" 85 lbs. ea



This picture clearly shows the two-stage compression packaging. The back row contains 10 full sized, uncompressed master bags approximately 17" in diameter by 31" tall. The middle row contains the same bags semi-compressed into a reinforced plastic sleeve about one half the original size. The compressed 'Super Bundle' in the foreground contains the 10 semi-compressed sleeved Master Bags further compressed to a size approximately 20" x 24" x 40"

3. Limitations

Whatever restriction the sealant manufacturer places on their product, the same will apply to **DENVER FOAM®**.

4. Availability and Cost

DENVER FOAM® is marketed nationally and internationally by select authorized distributors. For name, address and telephone number of your nearest distributor please contact us at: 800-595-2950 or sales@backerrod.com

5. Warranty

Unless otherwise agreed to in writing, **DENVER FOAM®** is sold without warranty, express or implied. Buyer must make their own determination as to the suitability of the product and application.

6. Technical Services

Please contact Backer Rod Mfg. Inc. for technical guidance, special project engineering designs and drawings.

PRODUCT INFORMATION SHEET

DENVER FOAM® POLYURETHANE FOAM BACKER ROD

IMPORTANT INFORMATION: Flexible polyurethane is an “article”, not a chemical, as defined in 29 CFR 1910.1200©. It does not require a Safety Data Sheet under OSHA’s Hazard Communication Standard. As a service to our customers, however, Backer Rod Mfg. Inc. has produced this Product Information Sheet.

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Date of Preparation: August 1, 2018

Product Name: Denver Foam® open cell polyurethane foam backer rod.

Other Names: Flexible polyurethane foam (FPF), prime foam, bonded foam, densified foam, HR foam, foam, and viscoelastic foam

Supplier Details: Backer Rod Mfg. Inc.
4244 N Broadway
Denver, CO 80216
800-595-2950
Fax: 303-308-0396
www.backerrod.com

SECTION 2 - PHYSICAL AND CHEMICAL CHARACTERISTICS

Since flexible polyurethane foam is a solid, physical characteristics such as boiling point, vapor pressure, vapor density evaporation rate, etc., do not apply.

Appearance: Cellular flexible material, canary yellow and/ or charcoal gray in color. May also be in various colors.

Density: 1.7 lbs per cubic foot

Solubility in Water: Insoluble

Stability & Reactivity: Stable. No hazardous polymerization will occur in normal use.
Prolonged exposure to temperatures in excess of 240°F may cause some loss of volatile components (e.g., flame retardants) through evaporation.
Unprotected polyurethane foam will discolor and degrade under prolonged exposure to UV light.
Solvent resistance will vary with solvent type.

SECTION 3 - FIRE HAZARD INFORMATION

Auto-Ignition Point: In excess of 600°F (ASTM D1929)

SECTION 3 - FIRE HAZARD INFORMATION CONTINUED

Fire Hazard:	<p>WARNING: Urethane Foam will burn if exposed to an open flame or other sufficient heat source. Do not expose urethane foam to open flames or any other direct or indirect high temperature ignition source such as burning operations, welding, space heaters, or naked lights</p> <p>Once ignited, urethane foam will burn rapidly, releasing great heat and consuming oxygen at a high rate. In an enclosed space the resulting deficiency of oxygen will present a danger of suffocation to the occupants. Hazardous gasses released by the burning foam can be incapacitation or fatal to human beings if inhaled in sufficient quantities.</p> <p>Once ignited, urethane foam is difficult to extinguish. Foam fires that appear to be extinguished may smolder and re-ignite. Always have fire officials determine whether a fire has been extinguished.</p> <p>Piles of foam dust can be readily ignited and present a potential fire hazard. High concentrations of foam dust in the air can be a potential explosion hazard if exposed to flames, sparks, or other ignition sources.</p>
Extinguishing Media:	Water, dry chemical, carbon dioxide
Fire-fighting Protection:	Fire-fighting personnel must be equipped with a self-contained breathing apparatus (SCBA) and fire-fighting clothing.

SECTION 4 - HEALTH HAZARDS

Exposure Limits:	None Established
Acute Toxicity:	LD50 (Oral) >5000 mg/kg (rat) LD50 (Dermal) No data available LC50 (Inhalation) No data available
Note:	<p>Foam is not known to be a skin irritant.</p> <p>Foam dust can cause eye irritation.</p> <p>Foam dust generated from such operations as continuous grinding or buffering can create nuisance particulates, which can cause irritation to the respiratory tract or even cause lung infections, airway obstructions and fibrosis. OSHA has established PEL values of 15 mg/m³ or respirable dust (8-hour TWA) for such particulates.</p>

SECTION 5 - HANDLING AND STORAGE

Keep foam away from sparks, naked lights, open flames, exposed electrical elements, or other ignition sources. Smoking should be forbidden in areas where material is stored or processed.

Maintain adequate sprinkler protection where large volumes of foam are kept (e.g. warehouse, fabrication areas and storage rooms). Check for compliance with insurance regulations, local building codes or other legal requirements.

Never use foam as an exposed interior wall or ceiling finish

Maintain sufficient aisle space to permit access for fire-fighting equipment and personnel to all foam storage areas.

SECTION 5 - HANDLING AND STORAGE CONTINUED

Do not allow cutting or foam scrap to accumulate

Be aware that terms sometimes used to describe polyurethane foam, like “fire-retardant” and “flame resistant”, do not mean fire safety under all conditions. Flammability ratings from small-scale laboratory tests are not to be taken as an indication of the materials behavior under actual fire conditions.

SECTION 6 - PERSONAL PROTECTION AND EXPOSURE CONTROLS

Protective Equipment: Unless exposure to foam dust is anticipated, dust masks, goggles, and gloves are not required. Long sleeves are recommended if arms are repeatedly rubbed against foam.

Ventilation: Mechanical ventilation should be considered in operations that generate abnormal quantities of foam dust, or where thermal decomposition of the foam occurs (e.g. hot-wire cutting, heat sealing, hot stamping and flame laminating).

SECTION 7 - EMERGENCY AND FIRST AID PROCEDURES

Skin: Wash off any foam dust.

Eyes: Flush thoroughly with water.

Ingestion: None necessary

Inhalation: Consult physician if coughing, discomfort, or obstruction of air passage occurs.

The information presented here is offered for your consideration, investigation and verification. The information is presented in good faith and was obtained from sources Backer Rod Mfg. Inc. believes to be reliable. Backer Rod Mfg. Inc., however, makes no representation as to the completeness and accuracy. Backer Rod Mfg. Inc. makes no warranty, express or implied, with respect to the information contained herein.

Backer Rod Mfg. Inc. cannot anticipate all conditions under which this information and the product may be used. The conditions of handling, storage, use and disposal of the product are beyond Backer Rod Mfg. Inc.’s control. Thus, we expressly disclaim responsibility or liability for any loss, damage or expense arising out of reliance on the information contained herein. You are advised to make your own determination as to safety, suitability and appropriate manner of handling, storage, use and disposal.

DENVER FOAM®

Engineering & Technical Bulletin

Open Cell Polyurethane Backer Rod

HOT POUR TESTED TO + 500°F

Date: October 25, 2004

- Manufacturer -** Backer Rod Mfg. Inc., 4244 N. Broadway, Denver, CO 80216
- Trade Name -** DENVER FOAM®
- Prescribed Tests -** ASTM D 5249 – 95
U.S. Dept. of Commerce National Institute of Standards
- Description -** Denver Foam® is a backer rod serving as a backing for elastomeric, **hot applied** and other applied caulking sealants. Denver Foam® controls the depth and amount of sealant required.
- Specific Uses -** For use in expansion/construction joints in concrete and pre-cast concrete walls, floors, partitions bridge construction, parking decks, curtain walls, glazing, log home construction, **highway construction, and pavement maintenance.**
- Recommendation -** **WIDE TEMPERATURE RANGE:** Denver Foam® can be used successfully at temperatures of -70° (-57°C) up to intermittent temperatures of 500°F (260°C). **Denver Foam® is an excellent hot pour sealant backer rod.** Tested under ASTM 5249-95 at +500°F, Denver Foam® showed no signs of deterioration and actually expanded in the joint. Cross linked (hot type) backer rods shrink and break down at approximately 180°F.
- Denver Foam® is chemically inert and will resist oil, gasoline, jet fuel and most solvents. Material is odorless and will not stain. The open cell construction eliminates the out-gassing problems associated with closed cell cross linked (hot type) backer rods. **Denver Foam® is 100% non out-gassing.**
- Easy installation:** Denver Foam® can be compressed as much as 80% of its original diameter. This allows the applicator to use fewer sizes in varying and/or twisting joint widths.

“Setting Standards for the Industry”

Backer Rod Mfg. Inc.

4244 N. Broadway • Denver, CO 80216

800 595 2950 • 303 308 0363 • Fax 303 308 0393

www.backerrod.com

TITAN FOAM™

BI-CELLULAR SOFT CELL POLYETHYLENE BACKER ROD

TECHNICAL DATA SHEET

1. Product Name: **TITAN FOAM™**

2. Exclusively Sold By: **Backer Rod Mfg. Inc.**
4244 N Broadway
Denver, CO 80216
Phone: 800-595-2950
Fax: 303-308-0393
Website: www.backerrod.com

3. Product Description:

Per ASTM C 1330 type B, **TITAN FOAM™** is a soft, grey, non-gassing, non-staining, pliable backer rod, with an impervious outer skin, used as a backing for elastomeric and other cold applied sealants. **TITAN FOAM™** controls the depth of the applied sealants and ensures cross-sectional hour-glass configuration.

Specific Uses: **TITAN FOAM™** is suited for specialty applications such as irregular and varying joint widths where standard closed cell backer rods are not appropriate. Common applications include but are not limited to: concrete expansion and contraction joints, curtain walls, parking decks, bridge and highway construction, pavement maintenance, window glazing and log home chinking.

4. Composition and Material:

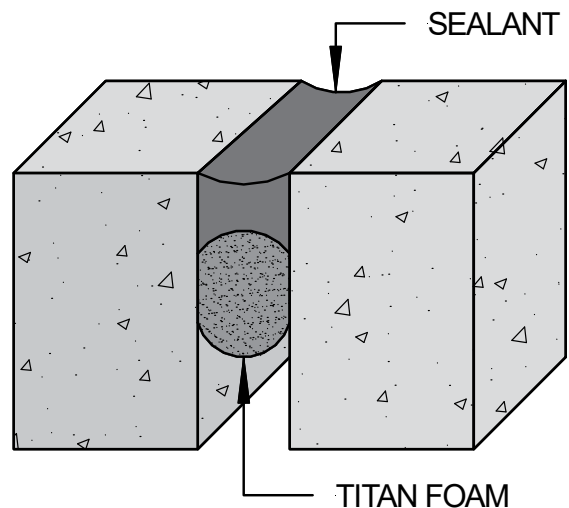
TITAN FOAM™ is an extruded polyethylene bicellular foam product which when punctured per ASTM C 1253 does not exhibit any out-gassing. **TITAN FOAM™** has an impervious outer skin that resists moisture. It is easily compressible, flexible and pliable for easy installation. It is furnished in a wide variety of sizes listed in section 8 under packaging information.

5. Installation:

Prior to installing **TITAN FOAM™**, all joints must be free from all contaminants such as curing compounds and form-release agents, as well as loose and foreign materials. Install **TITAN FOAM™** under 25% minimum, 50% maximum compression to the depth recommended by the sealant manufacturer. Before applying sealant, all joints must be clean and dry.

6. Compatibility:

TITAN FOAM™ is an inert material and therefore is compatible with virtually all known cold applied sealants including silicones, polyurethanes, acrylics, polysulfide, and butyl.



Backer Rod Mfg. Inc.

7. Physical Properties:

Physical Properties		
Property	Value	ASTM Test Method
Density (Nominal)	1.8 - 2.5 lb/ft ³	D 1622
Out-gassing	NONE	C 1253
Compression Recovery	95% min	D 5249
Tensile Strength PSI	39 - 50 psi	D 1623
Temperature Range	-90° F to 210°F	D 5249 Type 1
Water Absorption	< 0.03 g/cc	C 1016 - Proc. B



8. Packaging Information

Packaging Information						
Linear Feet Per Unit/ (metric)				Weight & Measurements		
Diameter	Mini Box	Standard Box	Super Box	Mini Carton	18-1/4" x 18-1/4" x 15"	7 lbs ea.
3/8" (10mm)	1800 (548m)	3600 (1097m)		Standard Carton 18-1/4" x 18-1/4" x 30-1/2" 10 lbs ea.		
5/8" (16mm)	775 (236m)	1550 (472m)				
7/8" (22mm)		850 (257m)		Super Carton 13-1/2" x 13-1/4" x 74-1/4" 14 lbs ea.		
1-1/8" (25mm)		550 (168m)		Mini Carton • 1 spool per carton		
1-1/2" (38mm)			420 (128m)			
2" (51mm)			252 (77m)	Standard Carton • 3/8" through 7/8" 2 spools per carton • 1-1/8" 1 spool per carton		
2-1/2" (63mm)			162 (49m)			
3" (76mm)			102 (31m)	Super Carton • 1-1/2" through 4" manufactured in 6' lengths		
4" (102mm)			54 (16m)			

9. Limitations

Do not use with hot applied sealants.

10. Availability and Cost

TITAN FOAM™ is marketed nationally and internationally by select authorized distributors. For name, address and telephone number of your nearest distributor please contact us at: 800-595-2950 or sales@backerrod.com

11. Warranty

Unless otherwise agreed to in writing, **TITAN FOAM™** is sold without warranty, express or implied. Buyer must make their own determination as to the suitability of the product and application. Sizes and lengths of products shown are at time of packaging and will vary with climate conditions after manufacture.

12. Technical Services

Please contact Backer Rod Mfg. Inc. for technical guidance, special project engineering designs and drawings.



PRODUCT INFORMATION SHEET

TITAN FOAM™ BI-CELLULAR POLYETHYLENE FOAM BACKER ROD

IMPORTANT INFORMATION: Flexible polyurethane is an “article”, not a chemical, as defined in 29 CFR 1910.1200©. It does not require a Safety Data Sheet under OSHA’s Hazard Communication Standard. As a service to our customers, however, Backer Rod Mfg. Inc. has produced this Product Information Sheet.

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Date of Preparation: August 1, 2018
Product Name: Titan Foam™ bi-cellular polyethylene foam backer rod
Other Names: Bi-Cellular low density polyethylene foam (LDPE)
Manufacturer Name: Bay Foam Products
2240 West Peoria Ave
Phoenix, AZ 85029
602-943-4151
www.bayfoamproducts.com

SECTION 2 - PHYSICAL AND CHEMICAL CHARACTERISTICS

Since flexible polyethylene foam is a solid, physical characteristics such as boiling point, vapor pressure, vapor density evaporation rate, etc., do not apply.

Appearance: Cellular flexible material, light brown in color. May also be in various colors.
Density: 1.25 - 2lbs per cubic foot
Solubility in Water: Insoluble
Stability & Reactivity: Stable. No hazardous polymerization will occur in normal use.
Prolonged exposure to temperatures in excess of 196°F may cause some loss of volatile components (e.g., flame retardants) through evaporation.
Unprotected polyurethane foam will discolor and degrade under prolonged exposure to UV light.
Solvent resistance will vary with solvent type.

SECTION 3 - FIRE HAZARD INFORMATION

Auto-Ignition Point: 343°F (ASTM D1929)

SECTION 3 - FIRE HAZARD INFORMATION CONTINUED

Fire Hazard:	<p>WARNING: Polyethylene Foam will burn if exposed to an open flame or other sufficient heat source. Do not expose polyethylene foam to open flames or any other direct or indirect high temperature ignition source such as burning operations, welding, space heaters, or naked lights</p> <p>Once ignited, polyethylene foam will burn rapidly, releasing great heat and consuming oxygen at a high rate. In an enclosed space the resulting deficiency of oxygen will present a danger of suffocation to the occupants. Hazardous gasses released by the burning foam can be incapacitation or fatal to human beings if inhaled in sufficient quantities.</p> <p>Once ignited, polyethylene foam is difficult to extinguish. Foam fires that appear to be extinguished may smolder and re-ignite. Always have fire officials determine whether a fire has been extinguished.</p> <p>Piles of foam dust can be readily ignited and present a potential fire hazard. High concentrations of foam dust in the air can be a potential explosion hazard if exposed to flames, sparks, or other ignition sources.</p>
Extinguishing Media:	Water spray, dry chemical, foam of carbon dioxide
Fire-fighting Protection:	Fire-fighting personnel must be equipped with a self-contained breathing apparatus (SCBA) and fire-fighting clothing.

SECTION 4 - HEALTH HAZARDS

Exposure Limits:	None Established
Acute Toxicity:	Skin Absorption - Not likely, Non-irritating
	Swallowing - None determined
	Inhalation - Inhalation of foam dust may cause irritation to nose, throat, and lungs.
	Skin Contact - Non-irritating
	Eye Contact - Foam dust may cause eye irritation or injury

SECTION 5 - HANDLING AND STORAGE

Keep foam away from sparks, naked lights, open flames, exposed electrical elements, or other ignition sources. Smoking should be forbidden in areas where material is stored or processed.

Maintain adequate sprinkler protection where large volumes of foam are kept (e.g. warehouse, fabrication areas and storage rooms). Check for compliance with insurance regulations, local building codes or other legal requirements.

Never use foam as an exposed interior wall or ceiling finish

Maintain sufficient aisle space to permit access for fire-fighting equipment and personnel to all foam storage areas.

Do not allow cutting or foam scrap to accumulate

Be aware that terms sometimes used to describe polyethylene foam, like "fire-retardant" and "flame resistant", do not mean fire safety under all conditions. Flammability ratings from small-scale laboratory tests are not to be taken as an indication of the materials behavior under actual fire conditions.

SECTION 6 - PERSONAL PROTECTION AND EXPOSURE CONTROLS

- Protective Equipment:** Unless exposure to foam dust is anticipated, dust masks, goggles, and gloves are not required. Long sleeves are recommended if arms are repeatedly rubbed against foam.
- Ventilation:** Mechanical ventilation should be considered in operations that generate abnormal quantities of foam dust, or where thermal decomposition of the foam occurs (e.g. hot-wire cutting, heat sealing, hot stamping and flame laminating).
-

SECTION 7 - EMERGENCY AND FIRST AID PROCEDURES

- Skin:** Wash off any foam dust.
- Eyes:** Flush thoroughly with water.
- Ingestion:** None necessary unless throat is obstructed
- Inhalation:** Consult physician if coughing, discomfort, or obstruction of air passage occurs.

The information presented here is offered for your consideration, investigation and verification. The information is presented in good faith and was obtained from sources Bay Foam Products Inc. believes to be reliable. Bay Foam Products Inc., however, makes no representation as to the completeness and accuracy. Bay Foam Products Inc. makes no warranty, express or implied, with respect to the information contained herein.

Bay Foam Products Inc. cannot anticipate all conditions under which this information and the product may be used. The conditions of handling, storage, use and disposal of the product are beyond Bay Foam Products Inc.'s control. Thus, we expressly disclaim responsibility or liability for any loss, damage or expense arising out of reliance on the information contained herein. You are advised to make your own determination as to safety, suitability and appropriate manner of handling, storage, use and disposal.

MILE HIGH FOAM®

CLOSED CELL POLYURETHANE

TECHNICAL DATA SHEET

1. Product Name: **MILE HIGH FOAM®**
2. Exclusively Sold By: **Backer Rod Mfg. Inc.**
4244 N Broadway
Denver, CO 80216
Phone: 800-595-2950
Fax: 303-308-0393
Website: www.backerrod.com

3. Product Description:
Per ASTM C 1330 type C **Mile High Foam®** is a resilient, polyethylene backer rod used as a backing material for cold applied elastomeric caulking sealants. Mile High Foam® controls the depth of the sealant installation and ensures cross – sectional hour-glass configuration. No bond breaker is required.

Specific Uses:

- Expansion joints
- Highway joints
- Glazing
- Log home chinking
- Parking Decks
- Curtain walls
- Coping joints
- Isolation joints
- Temporary joint seal

4. Composition and Material:

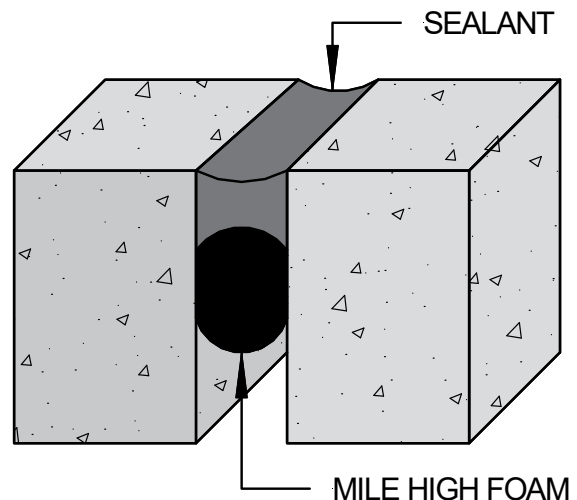
Mile High Foam® is a round, black, resilient, extruded closed cell polyethylene backer rod with a water resistant outer skin. It is compatible with most known cold applied sealants such as urethane, silicone, acrylic, butyl, polysulfide, latex, and log chinking sealants.

5. Installation:

Joint openings must be free of all contaminants, loose materials, dry and free of frost. Select correct rod size for joint width. With a blunt instrument or roller, seat rod to depth recommended by sealant manufacturer.

6. Compatibility:

Mile High Foam® is chemically inert and will resist gasoline, oil, and most solvents. Product will not stain or adhere to sealants.



Backer Rod Mfg. Inc.

7. Physical Properties:

Physical Properties		
Property	Value	ASTM Test Method
Density (Normal)	1.25 - 2 lb/ft ³	D 1622
Out-gassing	> 1	C 1253
Compression Recovery	>90	D 5249
Tensile Strength PSI	39 - 50 psi	D 1623
Temperature Range	-90° F to 210°F	D 5249
Water Absorption	0.002 g/cm ³	C 1016 - Proc. B



8. Packaging Information

Packaging Information						
Linear Feet Per Unit/ (metric)				Weight & Measurements		
Diameter	Mini Box	Standard Box	Super Box	Mini Carton	18-1/4" x 18-1/4" x 15"	7 lbs ea.
1/4" (6mm)	3200 (975m)	6400 (1951m)		Standard Carton	18-1/4" x 18-1/4" x 30-1/2"	10 lbs ea.
3/8" (10mm)	1800 (548m)	3600 (1097m)				
1/2" (13mm)	1250 (381m)	2500 (762m)				
5/8" (16mm)	775 (236m)	1550 (472m)				
3/4" (19mm)	550 (167m)	1100 (335m)				
7/8" (22mm)		850 (257m)		Super Carton	18-1/4" x 18-1/4" x 74-1/4"	14 lbs ea.
1" (25mm)		550 (168m)		Mini Carton • 1 spool per carton		
1-1/4" (32mm)		400 (122m)				
1-1/2" (38mm)			420 (128m)	Standard Carton • 1/4" through 3/4" 2 spools per carton • 7/8" through 1-1/4" 1 spool per carton		
2" (51mm)			252 (77m)			
2-1/2" (63mm)			162 (49m)			
3" (76mm)			102 (31m)	Super Carton • 1-1/2" through 4" manufactured in 6' lengths		
4" (102mm)			54 (16m)			

9. Limitations

Do not use with hot applied sealants. Do not puncture, over compress or stretch **MILE HIGH FOAM®** during installation.

10. Availability and Cost

MILE HIGH FOAM® is marketed nationally and internationally by select authorized distributors. For name, address and telephone number of your nearest distributor please contact us at: 800-595-2950 or sales@backerrod.com

11. Warranty

Unless otherwise agreed to in writing, **MILE HIGH FOAM®** is sold without warranty, express or implied. Buyer must make their own determination as to the suitability of the product and application. Sizes and lengths of products shown are at time of packaging and will vary with climate conditions after manufacture.

12. Technical Services

Please contact Backer Rod Mfg. Inc. for technical guidance, special project engineering designs and drawings.

PRODUCT INFORMATION SHEET

MILE HIGH FOAM® CLOSED CELL POLYETHYLENE FOAM BACKER ROD

IMPORTANT INFORMATION: Flexible polyurethane is an “article”, not a chemical, as defined in 29 CFR 1910.1200©. It does not require a Safety Data Sheet under OSHA’s Hazard Communication Standard. As a service to our customers, however, Backer Rod Mfg. Inc. has produced this Product Information Sheet.

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Date of Preparation: August 1, 2018
Product Name: Mile High Foam® closed cell polyethylene backer rod
Other Names: Closed cell low density polyethylene foam (LDPE)
Manufacturer Name: Bay Foam Products
2240 West Peoria Ave
Phoenix, AZ 85029
602-943-4151
www.bayfoamproducts.com

SECTION 2 - PHYSICAL AND CHEMICAL CHARACTERISTICS

Since flexible polyethylene foam is a solid, physical characteristics such as boiling point, vapor pressure, vapor density evaporation rate, etc., do not apply.

Appearance: Cellular flexible material, light brown in color. May also be in various colors.
Density: 1.25 - 2lbs per cubic foot
Solubility in Water: Insoluble
Stability & Reactivity: Stable. No hazardous polymerization will occur in normal use.
Prolonged exposure to temperatures in excess of 196°F may cause some loss of volatile components (e.g., flame retardants) through evaporation.
Unprotected polyurethane foam will discolor and degrade under prolonged exposure to UV light.
Solvent resistance will vary with solvent type.

SECTION 3 - FIRE HAZARD INFORMATION

Auto-Ignition Point: 343°F (ASTM D1929)

SECTION 3 - FIRE HAZARD INFORMATION CONTINUED

Fire Hazard:	<p>WARNING: Polyethylene Foam will burn if exposed to an open flame or other sufficient heat source. Do not expose polyethylene foam to open flames or any other direct or indirect high temperature ignition source such as burning operations, welding, space heaters, or naked lights</p> <p>Once ignited, polyethylene foam will burn rapidly, releasing great heat and consuming oxygen at a high rate. In an enclosed space the resulting deficiency of oxygen will present a danger of suffocation to the occupants. Hazardous gasses released by the burning foam can be incapacitation or fatal to human beings if inhaled in sufficient quantities.</p> <p>Once ignited, polyethylene foam is difficult to extinguish. Foam fires that appear to be extinguished may smolder and re-ignite. Always have fire officials determine whether a fire has been extinguished.</p> <p>Piles of foam dust can be readily ignited and present a potential fire hazard. High concentrations of foam dust in the air can be a potential explosion hazard if exposed to flames, sparks, or other ignition sources.</p>
Extinguishing Media:	Water spray, dry chemical, foam of carbon dioxide
Fire-fighting Protection:	Fire-fighting personnel must be equipped with a self-contained breathing apparatus (SCBA) and fire-fighting clothing.

SECTION 4 - HEALTH HAZARDS

Exposure Limits:	None Established
Acute Toxicity:	Skin Absorption - Not likely, Non-irritating
	Swallowing - None determined
	Inhalation - Inhalation of foam dust may cause irritation to nose, throat, and lungs.
	Skin Contact - Non-irritating
	Eye Contact - Foam dust may cause eye irritation or injury

SECTION 5 - HANDLING AND STORAGE

Keep foam away from sparks, naked lights, open flames, exposed electrical elements, or other ignition sources. Smoking should be forbidden in areas where material is stored or processed.

Maintain adequate sprinkler protection where large volumes of foam are kept (e.g. warehouse, fabrication areas and storage rooms). Check for compliance with insurance regulations, local building codes or other legal requirements.

Never use foam as an exposed interior wall or ceiling finish

Maintain sufficient aisle space to permit access for fire-fighting equipment and personnel to all foam storage areas.

Do not allow cutting or foam scrap to accumulate

Be aware that terms sometimes used to describe polyethylene foam, like "fire-retardant" and "flame resistant", do not mean fire safety under all conditions. Flammability ratings from small-scale laboratory tests are not to be taken as an indication of the materials behavior under actual fire conditions.

SECTION 6 - PERSONAL PROTECTION AND EXPOSURE CONTROLS

- Protective Equipment:** Unless exposure to foam dust is anticipated, dust masks, goggles, and gloves are not required. Long sleeves are recommended if arms are repeatedly rubbed against foam.
- Ventilation:** Mechanical ventilation should be considered in operations that generate abnormal quantities of foam dust, or where thermal decomposition of the foam occurs (e.g. hot-wire cutting, heat sealing, hot stamping and flame laminating).
-

SECTION 7 - EMERGENCY AND FIRST AID PROCEDURES

- Skin:** Wash off any foam dust.
- Eyes:** Flush thoroughly with water.
- Ingestion:** None necessary unless throat is obstructed
- Inhalation:** Consult physician if coughing, discomfort, or obstruction of air passage occurs.

The information presented here is offered for your consideration, investigation and verification. The information is presented in good faith and was obtained from sources Bay Foam Products Inc. believes to be reliable. Bay Foam Products Inc., however, makes no representation as to the completeness and accuracy. Bay Foam Products Inc. makes no warranty, express or implied, with respect to the information contained herein.

Bay Foam Products Inc. cannot anticipate all conditions under which this information and the product may be used. The conditions of handling, storage, use and disposal of the product are beyond Bay Foam Products Inc.'s control. Thus, we expressly disclaim responsibility or liability for any loss, damage or expense arising out of reliance on the information contained herein. You are advised to make your own determination as to safety, suitability and appropriate manner of handling, storage, use and disposal.

MILE HIGH FOAM XL®

CROSS-LINKED CLOSED CELL POLYETHYLENE BACKER ROD FOR HOT OR COLD APPLIED SEALANT APPLICATIONS

TECHNICAL DATA SHEET

1. Product Name: **MILE HIGH FOAM XL®**
2. Exclusively Sold By: **Backer Rod Mfg. Inc.**
4244 N Broadway
Denver, CO 80216
Phone: 800-595-2950
Fax: 303-308-0393
Website: www.backerrod.com
3. Product Description:
Per ASTM C 1330 type C **Mile High Foam XL®** is a resilient, cross-linked polyethylene backer rod used as a backing material for hot and cold applied sealants. **Mile High Foam XL®** controls the depth of the sealant installation and ensures cross – sectional hour-glass configuration. No bond breaker is required. Product has been tested and passed the heat resistance requirements of ASTM D 5249 at a certified independent laboratory.

Specific Uses:

- Highway joints
- Parking Decks
- Runways
- Driveways
- Parking Lots
- Saw cut expansion joints

4. Composition and Material:

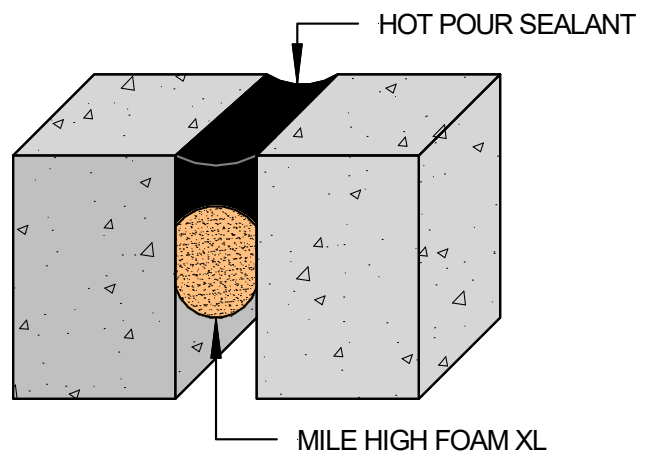
Mile High Foam XL® is a round, light brown, resilient, extruded cross-linked closed cell polyethylene backer rod with a water resistant outer skin. It is compatible with most known hot and cold applied sealants such as rubber asphalt, coal tar-rubber polymer thermoplastic compounds, urethane, silicone, acrylic, butyl, polysulfide and latex.

5. Installation:

Joint openings must be free of all contaminants, loose materials, dry and free of frost. Select correct rod size for joint width. With a blunt instrument or roller, seat rod to depth recommended by sealant manufacturer.

6. Compatibility:

Mile High Foam XL® is chemically inert and will resist gasoline, oil, and most solvents. Product will not stain or adhere to sealants.



Backer Rod Mfg. Inc.

7. Physical Properties:

Physical Properties		
Property	Value	ASTM Test Method
Density (Nominal)	1.3 - 2 lb/ft ³	D 1622
Compression Deflection	< 15	D 5249
Compression Recovery	> 90	D 5249
Tensile Strength PSI	> 29 psi	D 1623
Temperature Range	-90° F to 410°F	D 5249 Type 1
Water Absorption	< 0.03 g/cm ³	C 1016 - Proc. B



8. Packaging Information

Packaging Information				
Linear Feet Per Unit/ (metric)			Weight & Measurements	
Diameter	Standard Box	Super Box		
3/8" (10mm)	3600 (1097m)		Standard Carton	18-1/4" x 18-1/4" x 30-1/2" 10 lbs ea.
1/2" (13mm)	2500 (762m)			
5/8" (16mm)	1550 (472m)			
3/4" (19mm)	1100 (335m)		Super Carton	18-1/4" x 13-3/4" x 74-1/4" 14 lbs ea.
7/8" (22mm)	850 (257m)			
1" (25mm)	550 (168m)		Standard Carton	2 spools per carton 1 spool per carton
1-1/4" (32mm)	400 (122m)			
1-1/2" (38mm)		420 (128m)		
2" (51mm)		252 (77m)		
			Super Carton	• 1-1/2" and 2" manufactured in 6' lengths

9. Limitations

Do not puncture, over compress or stretch **MILE HIGH FOAM XL®** during installation.

10. Availability and Cost

MILE HIGH FOAM XL® is marketed nationally and internationally by select authorized distributors. For name, address and telephone number of your nearest distributor please contact us at: 800-595-2950 or sales@backerrod.com

11. Warranty

Unless otherwise agreed to in writing, **MILE HIGH FOAM XL®** is sold without warranty, express or implied. Buyer must make their own determination as to the suitability of the product and application. Sizes and lengths of products shown are at time of packaging and will vary with climate conditions after manufacture.

12. Technical Services

Please contact Backer Rod Mfg. Inc. for technical guidance, special project engineering designs and drawings.

PRODUCT INFORMATION SHEET

MILE HIGH FOAM XL® CROSS-LINKED CLOSED CELL POLYETHYLENE FOAM BACKER ROD

IMPORTANT INFORMATION: Flexible polyurethane is an “article”, not a chemical, as defined in 29 CFR 1910.1200©. It does not require a Safety Data Sheet under OSHA’s Hazard Communication Standard. As a service to our customers, however, Backer Rod Mfg. Inc. has produced this Product Information Sheet.

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Date of Preparation: August 1, 2018

Product Name: Mile High Foam XL® cross-linked closed cell polyethylene foam backer rod

Other Names: Closed cell low density polyethylene foam (LDPE)

Manufacturer Name: Bay Foam Products
2240 West Peoria Ave
Phoenix, AZ 85029
602-943-4151
www.bayfoamproducts.com

SECTION 2 - PHYSICAL AND CHEMICAL CHARACTERISTICS

Since flexible polyethylene foam is a solid, physical characteristics such as boiling point, vapor pressure, vapor density evaporation rate, etc., do not apply.

Appearance: Cellular flexible material, light brown in color. May also be in various colors.

Density: 1.25 - 2lbs per cubic foot

Solubility in Water: Insoluble

Stability & Reactivity: Stable. No hazardous polymerization will occur in normal use.
Prolonged exposure to temperatures in excess of 196°F may cause some loss of volatile components (e.g., flame retardants) through evaporation.
Unprotected polyurethane foam will discolor and degrade under prolonged exposure to UV light.
Solvent resistance will vary with solvent type.

SECTION 3 - FIRE HAZARD INFORMATION

Auto-Ignition Point: 343°F (ASTM D1929)

SECTION 3 - FIRE HAZARD INFORMATION CONTINUED

Fire Hazard:	<p>WARNING: Polyethylene Foam will burn if exposed to an open flame or other sufficient heat source. Do not expose polyethylene foam to open flames or any other direct or indirect high temperature ignition source such as burning operations, welding, space heaters, or naked lights</p> <p>Once ignited, polyethylene foam will burn rapidly, releasing great heat and consuming oxygen at a high rate. In an enclosed space the resulting deficiency of oxygen will present a danger of suffocation to the occupants. Hazardous gasses released by the burning foam can be incapacitation or fatal to human beings if inhaled in sufficient quantities.</p> <p>Once ignited, polyethylene foam is difficult to extinguish. Foam fires that appear to be extinguished may smolder and re-ignite. Always have fire officials determine whether a fire has been extinguished.</p> <p>Piles of foam dust can be readily ignited and present a potential fire hazard. High concentrations of foam dust in the air can be a potential explosion hazard if exposed to flames, sparks, or other ignition sources.</p>
Extinguishing Media:	Water spray, dry chemical, foam of carbon dioxide
Fire-fighting Protection:	Fire-fighting personnel must be equipped with a self-contained breathing apparatus (SCBA) and fire-fighting clothing.

SECTION 4 - HEALTH HAZARDS

Exposure Limits:	None Established
Acute Toxicity:	Skin Absorption - Not likely, Non-irritating
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	Inhalation - Inhalation of foam dust may cause irritation to nose, throat, and lungs.
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Maintain adequate sprinkler protection where large volumes of foam are kept (e.g. warehouse, fabrication areas and storage rooms). Check for compliance with insurance regulations, local building codes or other legal requirements.

Never use foam as an exposed interior wall or ceiling finish

Maintain sufficient aisle space to permit access for fire-fighting equipment and personnel to all foam storage areas.

Do not allow cutting or foam scrap to accumulate

Be aware that terms sometimes used to describe polyethylene foam, like “fire-retardant” and “flame resistant”, do not mean fire safety under all conditions. Flammability ratings from small-scale laboratory tests are not to be taken as an indication of the materials behavior under actual fire conditions.

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-

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Bay Foam Products Inc. cannot anticipate all conditions under which this information and the product may be used. The conditions of handling, storage, use and disposal of the product are beyond Bay Foam Products Inc.'s control. Thus, we expressly disclaim responsibility or liability for any loss, damage or expense arising out of reliance on the information contained herein. You are advised to make your own determination as to safety, suitability and appropriate manner of handling, storage, use and disposal.



HIDDEN DANGER

There exists today many high occupancy buildings which claim to meet fire codes, that actually may have some very serious **“Hidden Dangers”**. These hidden dangers are in the expansion/construction joints. The fire stopping material used in these joints are almost always covered over with some type of sealant.

The expansion/construction joints do exactly as the name infers - they open and close as a result of temperature changes. These changes occur generally once a day. Warmer temperatures close the joint and cooler temperatures opening them. To have an effective joint packing material it must be capable of moving within the joint, and remain in place.

There are three well-known fire blocking backup materials used in expansion/construction joints. The materials being ceramic fibers, mineral wool and Ultra Block®. All three are capable of blocking fires in fire related joints when they are installed with standard construction sealants. However, only when they are initially installed.

To be an effective fire blocking joint packing material the product must remain in and completely seal the entire joint for a great number of years.

The structural movement testing of Ultra Block® was done by Hauser Laboratories in Boulder, CO. The results were impressive. The test was run on a $\pm 50\%$ joint movement. All tests were run on all three products: ceramic fiber, mineral wool and Ultra Block®. Both the ceramic fiber and the mineral wool failed in less than 600 cycles over 1.6 years. Ultra Block® tested for 28,000 cycles without failure, which represents 76 years of service. There was no physical change in the Ultra Block® at the end of the test. When mineral wool and ceramic fibers are subjected to cycling at $\pm 50\%$, they fail. When the joint closes the joint packing compresses, when the joint opens mineral wool and ceramic fibers do not recover. The ceramic fiber and the mineral wool actually fell out of the test apparatus. The Ultra Block® retained its resiliency and looked exactly the same as it did before it was tested.

Unfortunately, in the past, on a number of occasions, the packing materials used in perimeter joints, had already fallen out of the joint when there happened to be a fire. In many instances human lives were lost. The **“Hidden Danger”** was exposed.

Ultra Block® would not have let this happen, as it would have still had the joint sealed from fire. Do not let this **“Hidden Danger”** cost more lives.

ULTRA BLOCK®

MECHANICAL EXPANSION AND CONSTRUCTION JOINT FIRE STOPPING SYSTEMS

TECHNICAL DATA SHEET

1. Product Name: **ULTRA BLOCK®**
2. Exclusively Sold By: **Backer Rod Mfg. Inc.**
4244 N Broadway
Denver, CO 80216
Phone: 800-595-2950
Fax: 303-308-0393
Website: www.backerrod.com

3. Product Description:
ULTRA BLOCK® is a pre-engineered, patented, flexible textile fiberglass roll material with a fiberglass matt facing, containing approximately 30% by weight unexpanded vermiculite.

Specific Uses: **ULTRA BLOCK®**, when used together with an approved sealant, provides a 2-Hour, 3-Hour, or 4-Hour fire rated joint system as designated by design configuration, which is capable of withstanding $\pm 50\%$ expansion and contraction. Most sealant manufacturers in the United States have tested one or more of their sealants in a UL® classified **ULTRA BLOCK®** system ranging in joint size from 1/2" up to 7". We ask that you verify your sealant selection complies with our UL system design. Approved sealant manufacturers include:

- Dow Corning
- Momentive Performance Materials
- C R Lawrence
- LymTal International
- Pecora Corporation
- Quaker
- Sika Corporation
- BASF Construction Chemical
- Specified Technologies Inc
- EGS Nelson
- Rectorseal Corporation

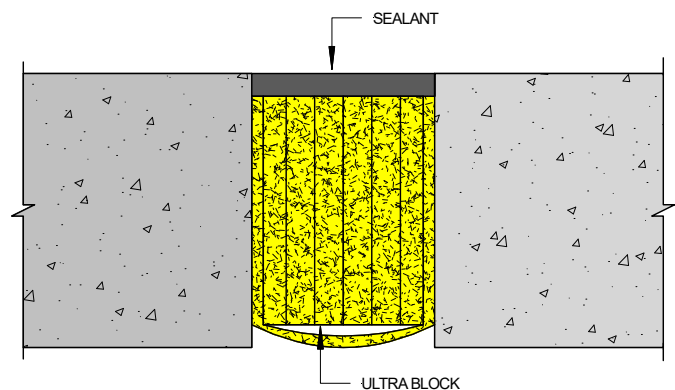
4. Composition, Material and Ordering

All **ULTRA BLOCK®** systems are manufactured in accordance with project requirements. **ULTRA BLOCK®** is manufactured in various widths and thicknesses, depending on the joint width, hourly rating and movement requirements. Ultra Block is manufactured and sold in roll form. Ultra Block configurations should be ordered to the maximum joint opening.

5. Benefits:

Resiliency: To be an effective fire blocking joint packing system, a product must remain highly resilient and must completely fill the moving joint for a great number of years. In most packed and caulked joints, examination of the resiliency of the forming material is difficult to check, as the material is covered up with sealant. Many joint packing materials, such as mineral wool and ceramic fiber, are not designed to handle joint movement and may fall out or slump in the joint when subjected to continuous joint expansion and contraction. Under fire situations, the fire blocking material must be in the same condition as when it was installed, meaning that the material must completely fill the void in order to block a fire. **ULTRA BLOCK®** has a unique patented, hinged design and composition that remains highly resilient under the most extreme conditions.

Structurally Tested: The structural testing of **ULTRA BLOCK®** was performed by Hauser Laboratories. The test was run on a 950% joint movement. Mineral wool and ceramic fiber joint packing materials were also tested. The joints were packed in the fully open position and were under the 25% joint side compression. The test ran continuously until either failure occurred or the test was terminated. Failure of both the mineral wool and ceramic fiber materials occurred in less than 600 cycles, or 1.6 years. The **ULTRA BLOCK®** successfully performed for over 28,000 cycles without failure or loss of resiliency, representing 76 years of service at one cycle per day.



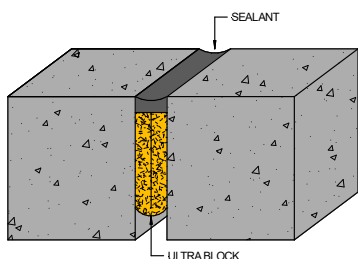
Backer Rod Mfg. Inc.

1. Installation:

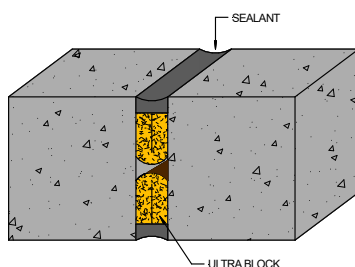
ULTRA BLOCK® requires no cutting, fitting, or fabrication. Simply open the bag, unwind the roll, fold in half with the matt side facing outward, compress and slide it in the joint to required depth. Apply the sealant per the manufacturer's installation instructions. When creating splice joints, cut each end at a 45° angle, alternating cuts so that the folded over ULTRA BLOCK® forms an interlocking v-shape skive joint.

2. Configurations, Sizing and Packaging

Configuration # 1



Configuration # 2



Sizing Chart

Joint Width	Ultra Block Thickness	Ultra Block Width 2 Hours		Ultra Block Width 3 Hours		Ultra Block Width 4 Hours	
		Configuration		Configuration		Configuration	
		No. 1	No. 2	No. 1	No. 2	No. 1	No. 2
1/2"	3/8"	6"	2"	8"	4"	12"	6"
3/4"	1/2"	6"	2"	8"	4"	12"	6"
1"	3/4"	6"	3-1/2"	8"	4"	12"	6"
1-1/2"	1"	6"	3-1/2"	8"	4"	12"	6"

Packaging Information

Thickness	Roll Length	LFT Per Bag Per Width					
		2"	3-1/2"	4"	6"	8"	12"
3/8"	70 LF	1260		630	420	280	210
1/2"	60 LF	1080		540	360	240	180
3/4"	40 LF		400	360	240	160	120
1"	30 LF	6"	300	270	180	120	90

3. Availability and Cost

ULTRA BLOCK® is marketed nationally and internationally by select authorized distributors. For name, address and telephone number of your nearest distributor please contact us at:
800-595-2950 or sales@backerrod.com

4. Warranty

Unless otherwise agreed to in writing, ULTRA BLOCK® is sold without warranty, express or implied. Buyer must make their own determination as to the suitability of the product and application.

5. Specification Compliance:

Testing of ULTRA BLOCK® for use in expansion/ construction joints was conducted at Underwriters Laboratories®, Northbrook, Illinois. The full scale testing earned us classifications by UL® for use in horizontal and vertical joints plus compliance with the International Building Code. ULTRA BLOCK® Systems comply with and/or have been tested under the following standards and building codes:

- IBC - International Building Code
- City of Los Angeles Building Code
- ANSI/UL 2049 - UL Standard for Safety Tests for Fire Resistance of Building Joint Systems
- UL 263-92 - UL Standard for Safety Fire Test of Building Construction and Materials
- UL 1479 - UL Standard for Safety Fire Test of Through Penetration Firestops
- UL 723 - UL Standard for Safety Test for Surface Burning Characteristics of Building Materials
- ASTM E119 - Method for Fire Tests of Building Construction and Materials
- ASTM E814 - Methods for Fire Tests of Through Penetration Fire Stops
- ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials
- ASTM E1399 - Test Method of Cyclic Movement and Measuring the Minimum and Maximum joint Widths of Architectural Joint System
- ASTM C719 - Test Method of Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement
- ASTM C920 - Specification for Elastomeric Joint Sealants
- NFPA 251 - Fire Test of Building Construction Materials
- NFPA 255 - Burning Character of Building Materials

6. Technical Services:

Please contact Backer Rod Mfg. Inc. for technical guidance, special project engineering designs and drawings.



PRODUCT INFORMATION SHEET

ULTRA BLOCK® MECHANICAL EXPANSION AND CONSTRUCTION JOINT FIRESTOPPING SYSTEMS

IMPORTANT INFORMATION: Textile Fiberglass is an “article”, not a chemical, as defined in 29 CFR 1910.1200©. It does not require a Safety Data Sheet under OSHA’s Hazard Communication Standard. As a service to our customers, however, Backer Rod Mfg. Inc. has produced this Product Information Sheet.

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Product Name: Ultra Block®
Product Code: Not available
Other Means of Id: Not available
Product Type: Solid
Identified Uses: Fiberglass blanket for the construction industry
Manufacturer Name: Backer Rod Mfg. Inc.
4244 N Broadway
Denver, CO 80216
800-595-2950
Fax: 303-308-0363
www.backerrod.com

SECTION 2 - HAZARDOUS IDENTIFICATION

OSHA/HCS Status: While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CF 1910.1200), this product information sheet contains valuable information critical to the safe handling and proper use of this product. This product information sheet should be retained and available for employees and other users of this products.

Classification of the substance or mixture: Not classified

GHS Label Elements

Signal Word No signal word
Hazardous Statements No known significant effects or critical hazards

Precautionary Statements

Prevention Not applicable
Response Not applicable
Storage Not applicable
Disposal Not applicable

Hazards not otherwise classified (HNOC): None Known

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Mixture: Mixture

Other means of ID: Not available

CAS Number/Other Identifiers

Ingredient Name	CAS Number	%
Glass, Oxide, Chemicals	65997-17-3	60-70
Vermiculite Ore	N/A	25-30
Phenol, polymer with formaldehyde, reaction products with hexamethylenetetramine (cured)	68585-23-9	10-30
Black Mat Facing	N/A	1-2

“Phenolic Nocalac Resin/Hexamine” is thermoset into our insulation during our glass manufacturing process. Berkeley Analytical lab testing, for Formaldehyde Emissions, concluded that our final product was free of formaldehyde. The formaldehyde emission test was performed following the guidance of ASTM Standard Guide D 5116. Sampling and analysis for low molecular weight aldehydes were performed following ASTM Standard Method D 5197.

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are in Section 8.

SECTION 4 - FIRST AID MEASURES

Description of Necessary First Aid Measures:

- Eye Contact:** Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eye lids. Check for and remove any contact lenses. Get medical attention if irritation occurs. Do not rub or scratch eyes. Dust particles may cause eye to be scratched.
- Inhalation:** Remove victim to fresh air and keep at a rest in a position comfortable for breathing. Get medical attention if symptoms occur. Drink water to clear throat, and blow nose to remove dust. A saline spray in the nose may help clear any fibers. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Skin Contact:** Wash gently with soap and cool or room temperature water to remove dust and fibers. Get medical attention if symptoms occur.
- Ingestion:** Rinse mouth out with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. This material is not meant to be ingested. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

SECTION 4 - FIRST AID MEASURES CONTINUED

Most Important Symptoms/Effects, Acute and Delayed Potential Acute Health Effects

Eye Contact:	Dust and fibers from this product may cause temporary mechanical irritation to the eyes.
Skin Contact:	Dust and fibers from this product may cause temporary mechanical irritation and redness to the skin
Ingestion:	Ingestion of this product is unlikely, however, may cause gastrointestinal irritation.

Over-exposed Signs/Symptoms

Eye Contact:	No known significant effects or critical hazards.
Inhalation:	No known significant effects or critical hazards.
Skin Contact:	No known significant effects or critical hazards.
Ingestion:	No known significant effects or critical hazards.

Indication of Immediate Medical Attention and Special Treatment Needed, If Necessary:

Notes to Physician:	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific Treatments:	No specific treatment
Protection of First-Aiders:	No special protection is required

See Toxicological Information (Section 11)

SECTION 5 - FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media	Use dry chemical, CO ₂ , water spray (fog) or foam
Unsuitable Extinguishing Media:	None known
Specific hazard arising from the chemical:	No Specific fire or explosion hazard.
Hazardous Thermal Decomposition Products:	Decomposition products may include the following materials: Carbon Dioxide, Carbon Monoxide, Ammonia, Water
Special Actions for Fire-Fighters:	Fire-Fighters should avoid inhaling any combustion products.
Special Protective Equipment for Fire-Fighters:	Fire-Fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a face-piece operated in a positive pressure mode.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

For non-emergency Personnel:	Put on appropriate personal protective equipment.
For emergency responders:	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental Precautions:	Pick up large pieces and dispose as listed in Section 13 of this PIS

Methods and Materials for Containment and Cleaning Up

Spill:	Pick up large pieces. Vacuum dusts and loose fibers. If sweeping is necessary, use a dust suppressant such as water. Do not dry sweep dust. Never use compressed air for clean-up. Dispose of via a licensed waste disposal contractor. Note: See Section 13 for waste disposal.
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SECTION 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Protective Measures:	Put on appropriate personal protective equipment (see Section 8)
Advise on General Occupational Hygiene:	Eating, drinking and smoking should be prohibited in areas where this material is being handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See Section 8 for additional information on hygiene measures.
Storage:	Storage should be in accordance with packaging directions, if any. Material should be stored in a dry place and kept in its original packaging until use.
Conditions for Safe Storage including any incompatibilities:	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (See Section 10) and food and drink. Keep in original packaging until ready for use.

SECTION 8 - EXPOSURE CONTROLS/ PERSONAL PROTECTION

Control Parameters

Occupational Exposure Limits:	The Occupational Safety and Health Administration (OSHA) have not adopted specific exposure standards for fiber glass. Fiber glass is treated as a nuisance dust and is regulated by OSHA as a particulate not otherwise regulated (total dust) shown in CFR 1910-10000 Table Z-3
Appropriate Engineering Controls:	Good general ventilation should be sufficient to control worker exposure to airborne dust.
Environmental Exposure Controls:	Pick up solid pieces and dispose of as listed in Section 13.

Individual Protection Measures

Hygiene Measures:	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the work station.
Eye/Face Protection:	Safety eye wear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases, or dust. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields. In dusty environments chemical goggles should be worn to protect against mechanical abrasion.

Skin Protection

Hand Protection:	Cotton or leather gloves should be worn to protect against mechanical abrasion.
Body Protection:	Wear a cap, a loose fitting long sleeve shirt and long pants to protect skin from mechanical irritation. Exposed skin areas should be washed with soap and water after handling or working with fiber glass.

SECTION 8 - EXPOSURE CONTROLS/ PERSONAL PROTECTION

Other Skin Protection:	Clothing should be washed separately from other cloths, and the washer should be rinsed thoroughly (run an empty wash cycle). This will help reduce the chances of fiber glass being transferred to other clothing.
Respiratory Protection:	A NIOSH approved N-95 series disposable respirator should be used if ventilation is unavailable, or is inadequate for keeping dust and fiber levels below applicable exposure limits referenced in Section 8 of this Product Information Sheet.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical State:	Solid (Fibrous Glass Blanket)
Color:	Black
Odor:	Organic (Slight)
Odor Threshold:	Not available
pH:	Not applicable
Melting Point:	Not available
Boiling Point:	Not applicable
Flash Point:	Not applicable
Evaporation Rate:	Not applicable
Flammability (Solid, Gas):	Non-flammable
Lower and Upper Explosive (Flammable) Limits:	Not available
Vapor Pressure:	Not applicable
Vapor Density:	Not applicable
Relative Density:	Not applicable
Solubility:	Slight
Partition Coefficient Octanol/Water:	Not available
Auto-Ignition Temp:	Not available
Decomposition Temp:	Not available
Viscosity	Not applicable
Volatility	Not available
VOC (w/w)	0% (w/w)

SECTION 10 - STABILITY AND REACTIVITY

Reactivity:	No specific test data related to reactivity available for this product or its ingredient
Chemical Stability:	The product is stable under most conditions.
pH:	Not applicable
Possibility of hazardous reactions:	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to Avoid:	None
Incompatible Materials:	None
Hazardous Decomposition Products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11 - TOXICOLOGICAL INFORMATION

Information on Toxicological Effects

Acute Toxicity:	There is not data available.
Irritation/Corrosion:	Dust from this product is a mechanical irritant; which means it may cause irritation or scratchiness of the throat and/ or itching and redness of the eyes and skin.
Sensitization:	There is not data available

Carcinogenicity

Classification

Product/Ingredient Name	OSHA	IARC	NTP	ACGIH	EPA	NIOSH
Glass, Oxide, Chemicals	-	3	-	A4	-	-

Specific Target Organ Toxicity (Single Exposure):	There is not data available
Specific Target Organ Toxicity (Repeated Exposure):	There is not data available
Aspiration Hazard:	There is not data available
Information on the likely Routes of Exposure:	Dermal contact, Eye Contact, Inhalation, Ingestion

Potential Acute Health Effects

Eye Contact:	Dust and fibers from this product may cause temporary mechanical irritation to the eyes.
Inhalation:	Dust and fibers from this product may cause temporary mechanical irritation to the nose, throat and respiratory track.
Skin Contact:	Dust and fibers from this product may cause temporary mechanical irritation and redness to the skin.
Ingestion	Ingestion of this product is unlikely; however, ingestion may cause gastrointestinal irritation.

SECTION 11 - TOXICOLOGICAL INFORMATION CONTINUED

Symptoms related to the Physical, Chemical, and Toxicological Characteristics

Eye Contact:	No known significant effects or critical hazards.
Inhalation:	No known significant effects or critical hazards.
Skin Contact:	No known significant effects or critical hazards.
Ingestion:	No known significant effects or critical hazards.

Delayed and Immediate Effects and also Chronic Effects from Short and Long Term Exposure

Short Term Exposure

Potential Immediate Effects:	No known significant effects or critical hazards
Potential Delayed Effects:	No known significant effects or critical hazards.

Long Term Exposure

Potential Immediate Effects:	No known significant effects or critical hazards
Potential Delayed Effects:	No known significant effects or critical hazards.

Potential Chronic Health Effects

General:	No known significant effects or critical hazards.
Carcinogenicity:	No known significant effects or critical hazards.
Mutagenicity:	No known significant effects or critical hazards.
Teratogenicity:	No known significant effects or critical hazards.
Developmental Effects:	No known significant effects or critical hazards.
Fertility Effects:	No known significant effects or critical hazards.

Numerical Measures of Toxicity

Acute Toxicity Estimates:	There is no data available.
----------------------------------	-----------------------------

SECTION 12 - ECOLOGICAL INFORMATION

Toxicity:	There is no data available.
Persistence and Degradability:	There is no data available.
Bioaccumulative Potential:	There is no data available.

Mobility in Soil

Soil/Water Partition Coefficient (Koc): There is no data available.

Other Adverse Effects:	No known significant effects or critical hazards.
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SECTION 13 - DISPOSAL CONSIDERATIONS

Disposal Methods:	This product is not to be expected a hazardous waste when it is disposed of according to the U.S. Environmental Protection Agency (EPA). Disposal of this products, solutions and any by-products should comply with the requirements of the environmental protection and waste disposal legislation and any regional local authority requirements.
--------------------------	---

SECTION 14 - TRANSPORTATION INFORMATION

	DOT	IMDG	IATA
UN Number	Not regulated	Not regulated	Not regulated
UN Proper Shipping Name	-	-	-
Transport Hazard Class(es)	-	-	-
Packing Group	-	-	-
Environmental Hazards	No.	No.	No.
Additional Information	-	-	-

Special Precautions for User: These products are not classified as dangerous goods according to international transport regulations.

**Transport in bulk according to:
Annex II of MARPOL 73/78
and the IBC Code** Not available

SECTION 15 - REGULATORY INFORMATION

U.S. Federal Regulations: TSCA 8(a) Exempt/Partial exemption: Not determined
United States Inventory (TSCA 8b): All components are listed exempted.

**Clean Air Section 112(b):
Hazardous Air Pollutants (HAPs)** Not Listed

**Clean Air Section 602 Class I:
Substances** Not Listed

**Clean Air Section 602 Class II:
Substances** Not Listed

**DEA List I Chemicals:
(Precursor Chemicals)** Not Listed

**DEA List I Chemicals:
(Precursor Chemicals)** Not Listed

SARA 302/304

Composition/Information on Ingredients: No products were found

SARA 304 RQ: Not applicable

SARA 311/312 Classification: Not Applicable

SARA 313: No products were found.

State Regulations: There is no data available.

Massachusetts: The following components are listed: Glass, Oxide, Chemicals.

New York: None of the components are listed.

New Jersey: None of the components are listed.

Pennsylvania: None of the components are listed.

California Prop. 65: None products were found

SECTION 16 - OTHER INFORMATION

History

Date of Issue mm/dd/yyyy: 08/01/2018

Version: 1

Prepared By: Backer Rod Mfg. Inc.

Key to Abbreviations:

ATE - Acute Toxicity Estimate

BCF - Bioconcentration Factor

GHS - Globally Harmonized System of Classification and labeling of chemicals

IATA - International Air Transport Association

IBC - Intermediate Bulk Container

IMDG - International Maritime Dangerous Goods

LogPow - Logarithm of octanol/water partition coefficient

MARPOL 73/78 - International Convention for the Protection of Pollution from Ships, 1973 as modified by the protocol of 1978 ("Marpol" - Marine Pollution)

UN - United Nations

Notice to Reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein/

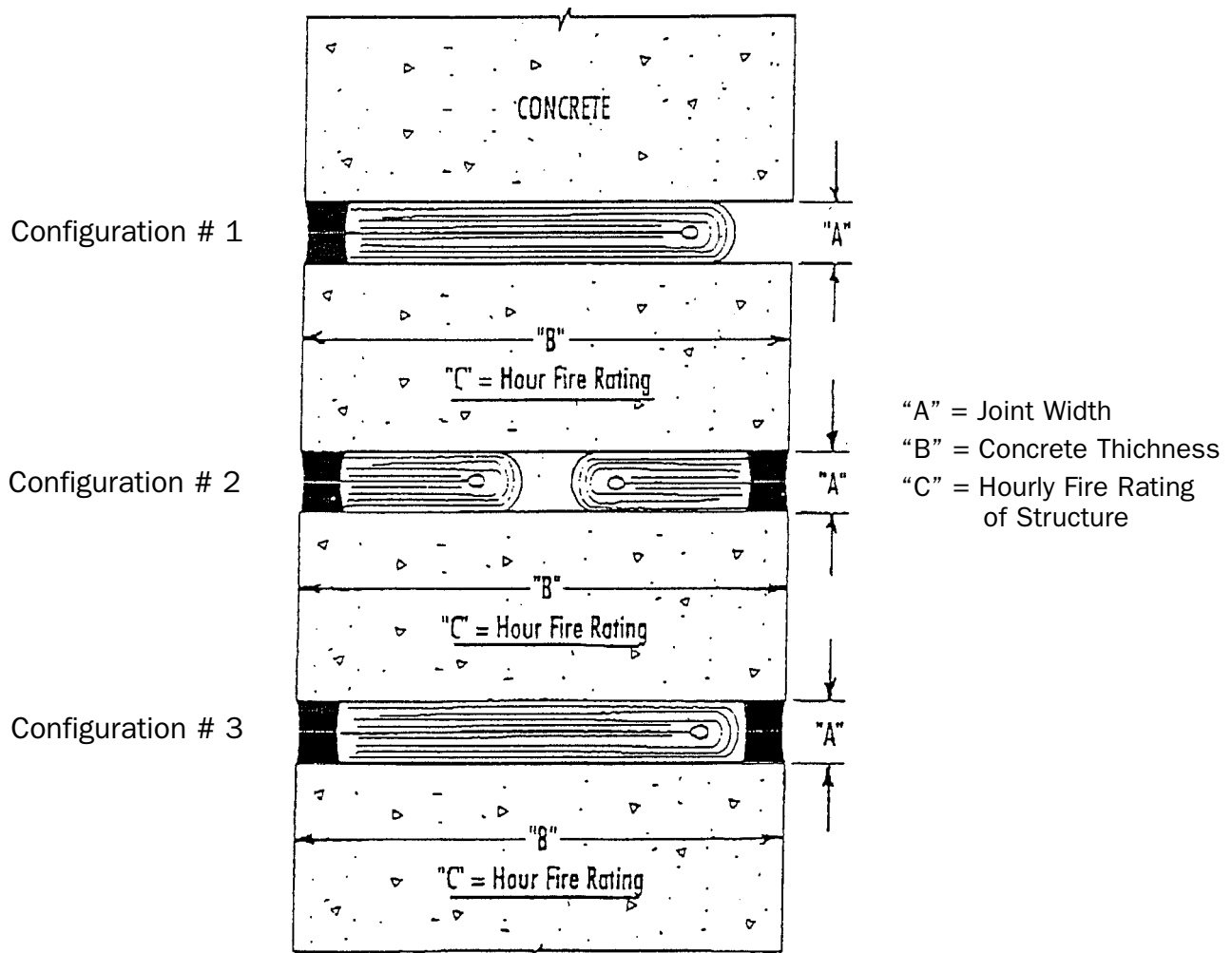
Final determination of the suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

ULTRA BLOCK[®] SYSTEMS

ENGINEERING & TECHNICAL BULLETIN

File No. Ultra Block Configuration Designs

All we need are the ABC's of your project and we will furnish you our drawing.



ASTM E119 Fire Tested by Underwriters Laboratories - All Horizontal & Vertical Joints

ASTM E1399 Movement Tested by Hauser Research - 50% movement - 28,000 openings and closings.

Seismic Tested-Drift Tested by University of California San Diego for U.S. Government on a National Science Foundation project.



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“C” Material Safety Data Sheet:

Ultra Block® MSDS Lists Products as Non-Carcinogenic

1. Not Listed (NTP)
2. Not Classifiable (IARC)
3. Not Regulated (OSHA)

“D” The Elastometric Sealants:

Tested in Ultra Block® Systems are an important part of our design. ASTM C-920 establishes the elasticity of the sealant. The sealant manufacturer dictates the type of sealant you use (latex, urethane, silicone), and the selection you choose based on your joint design and location.

Every major sealant manufacturer in the United States has tested one or more of their sealants in a UL Classified Ultra Block® System. Alphabetical listing as follows:

- Carlisle Coatings & Water
- C.R> Laurence Co., Inc.
- Dow Corning
- General Electric
- Lyntal Int. IS-Flex
- Nelson
- Pecora
- Sika
- Sonneborn
- Specified Technologies Inc.
- Tremco Vulkem

“E” Seismic Testing:

Sika Corporation listed their Sikalex 15-LM sealant in an Ultra Block® Design in a ICBO elevation report. When the University of California, San Diego received a contract from the U.S. Government and Japan on a masonry research project named TCCMAR Sika's Ultra Block® expansion joint was specified. The Ultra Block® Design with Sikaflex 15-LM based on ICBO report specified and worked so well on their 2-story structure that we were specified and tested in the project's 5-story structure. The project was designed to elevate the performance of expansion joints between shear walls.

Backer Rod Mfg. Inc. has continued its testing with companies like Construction Research Lab, Miami, Florida in their hurricane test. We continue to offer, at no charge, engineering services and design for projects where special or custom designs are needed.

The staff at Backer Rod Mfg. Inc. looks forward to the opportunity to work with you on your future projects.

ULTRA BLOCK[®] SYSTEMS

ENGINEERING & TECHNICAL BULLETIN

U.S.A Code Compliance | Fire/Structural/Seismic

Manufacturer: Backer Rod Mfg. Inc., 4244 N. Broadway, Denver, CO 80216

Trade Name: Ultra Block[®] (U.S. Patent 4,756,946)

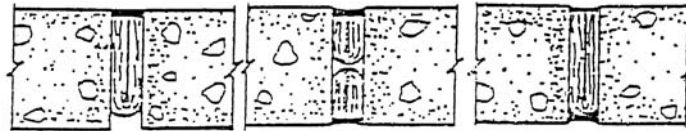
Product: Fire stop filler systems for mechanical expansion/construction joints, both horizontal and vertical

Pertinent Code: -

Prescribed Tests: ASTM E 119 - Structural Fire Test) 14'x17' Full Scale Test Panel)
ASTM E 1399 - Movement - 10,000 openings and closings (at ± 50 +))

Laboratories: Underwriters Laboratories Inc.
Hauser Research Laboratories
University of California - San Diego

Test Report(s): **Fire Test** - Underwriters Laboratories Inc.
Master File R-13729 (ASTM E 119) 2-hour, 3-hour, 4-hour fire rating
joints up to 7" wide on one of these configurations (UL 263 - NFPA 251)



Structural Test - Hauser Research In.
Accelerated fatigue test 90-1326 ASTM E 1399, 50% movement capability.

Seismic Test - University of California - San Diego
TCCMAR masonry research (no ASTM to date)

Description: ULTRA BLOCK[®] is a heat expandable fire stopping material. Product is a 3 lb density textile fiberglass blanket containing 32% by weight unexpanded vermiculite. All systems are designed to serve as the fire protection in all horizontal and vertical mechanical, expansion/construction joints. ULTRA BLOCK's[®] resiliency under compression allows expansion joints to move and compensate for the ongoing everyday expansion and contraction while remaining in place to perform to its fire rated design function, if and when needed.

Recommendation: ULTRA BLOCK[®] is to be installed in fire rated structures. Joint must be clean and dry. Sealant selection is based on joint location and must have adhesion and cohesion capabilities to contain the smoke and toxic fumes created by fire. Manufacturer will furnish (at no charge) system design drawings for contractor to present to Code authority.



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ULTRA BLOCK®

INSTALLATION INSTRUCTIONS

IMPORTANT! - READ THE FOLLOWING CAREFULLY BEFORE PROCEEDING

1. Select the ULTRA BLOCK® bag containing the proper width and thickness for the joints to be packed and caulked
2. Remove roll of ULTRA BLOCK® from the package. The end of each roll is glued slightly to prevent unwinding during transit. Pull this glued end loose and the ULTRA BLOCK® is ready for installation
3. Referring to the installation diagrams, make sure the printed side of the ULTRA BLOCK® is against the surface to be packed. The groove in the ULTRA BLOCK® is to be positioned directly over the center of the expansion joint. This is shown in the diagram in Step 1 of Configurations 1-2 and assures proper folding so both edges of the ULTRA BLOCK® match to give the proper caulking surface. This step is shown in Step 3 of Configurations 1 and 2.

Should the groove not be exactly in the middle of the expansion joint when it is inserted resulting in an uneven edge match up, the ULTRA BLOCK® can be easily pulled out and reinserted properly.

4. Mult-Layer Designs

Follow installation as outlined above. However, “Mult-Layer” Designs are seated under hand compression. Align pad edges, finish closing, compress and seat. Make sure pad surfaces on side to be caulked are smooth. Flat faced wood towel may be used to seat ULTRA BLOCK to caulking depth.

In cases where wider ULTRA BLOCK® is used it may be necessary during packing of the joint to put some tension on the ULTRA BLOCK® to remove any folds that may develop. This tension need not be much, but sufficient to eliminate such folds.

Splicing of two pieces of ULTRA BLOCK® together in an expansion joint is easily accomplished by cutting material in a flat position. Using 45° angles and overlapping as shown assures a tight fit with no voids or gaps.

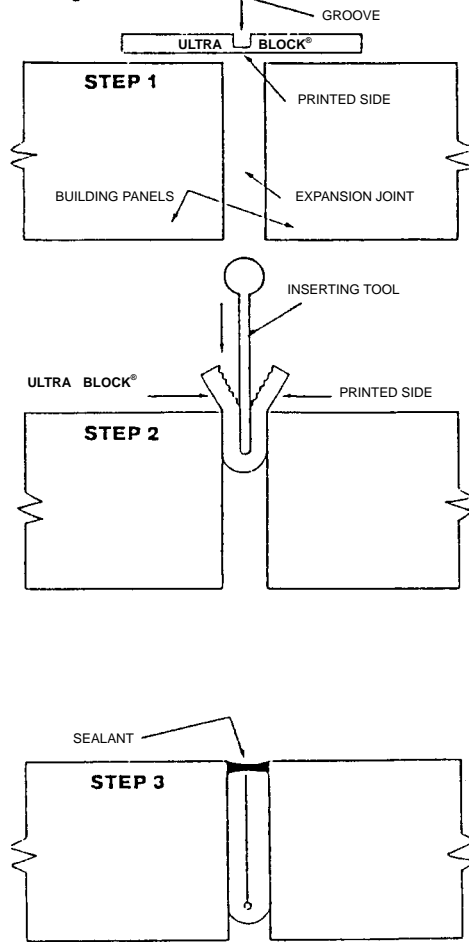
Drawings are displayed on next page.

INSTALLATION PROCEDURES FOR **ULTRA BLOCK®** SYSTEM CONFIGURATIONS 1 AND 2

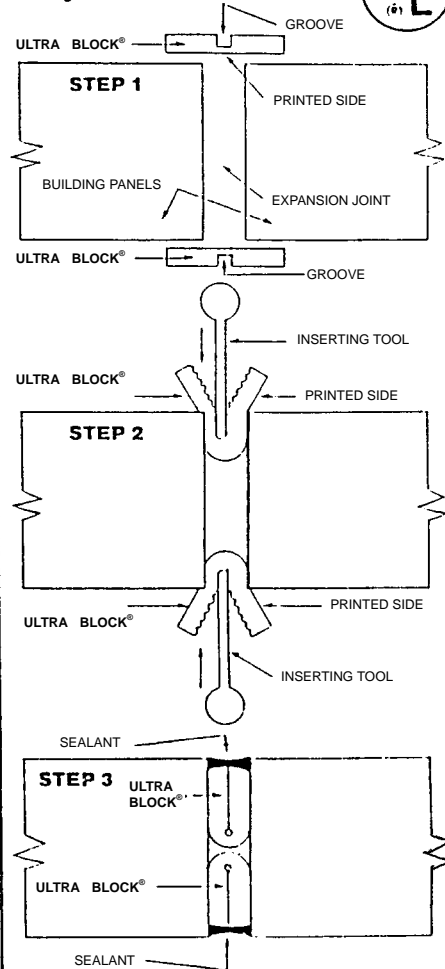
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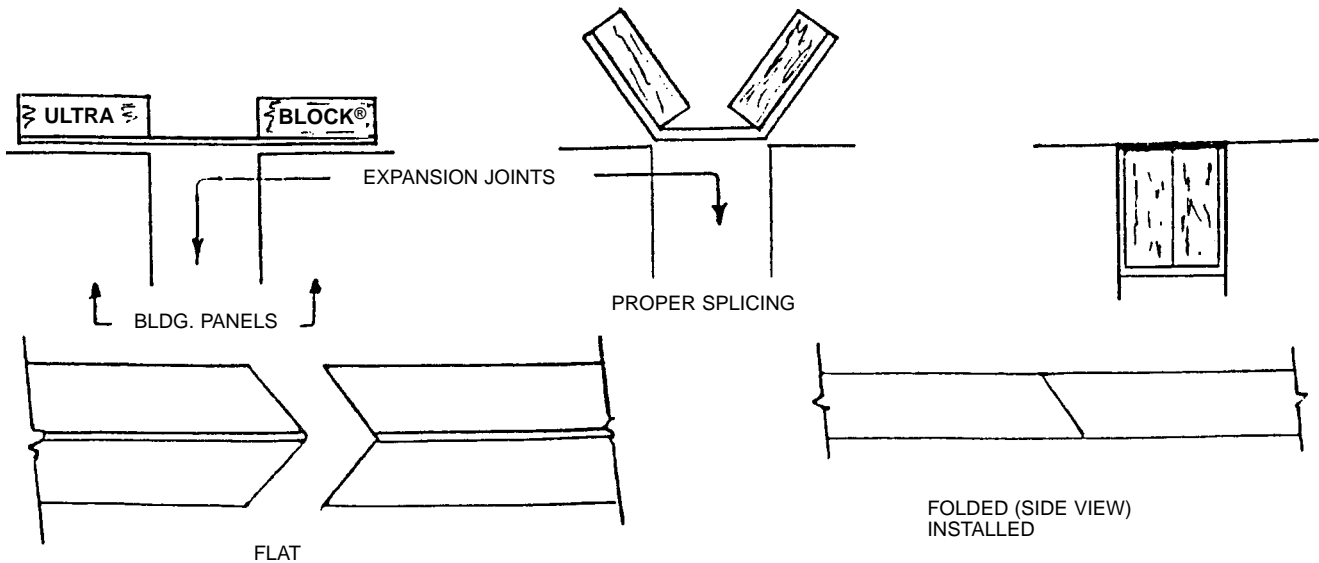
Configuration #1



Configuration #2



PROPER FOLDING OF MULTI-LAYER **ULTRA BLOCK®**



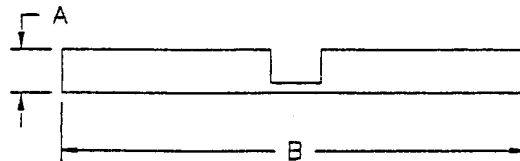
ULTRA BLOCK[®] SYSTEMS

ENGINEERING & TECHNICAL BULLETIN

File: Flat Thickness

Joint Width: Up to 1/2"

CONFIGURATION #1
(CAULK FROM 1 SIDE)

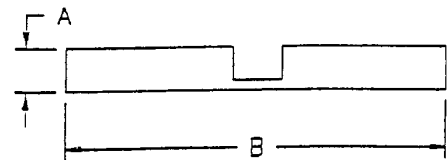
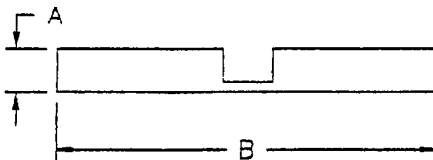


<u>FIRE RATING</u>	<u>"A"</u>	<u>"B"</u>	<u>ROLL LENGTH</u>	<u>FT PER BAG</u>
2 HOUR	3/8"	6"	70 LF	420 LF
3 HOUR	3/8"	8"	70 LF	280 LF
4 HOUR	3/8"	12"	70 LF	210 LF

FOLD IN HALF, SEAT IN JOINT AND CAULK OVER

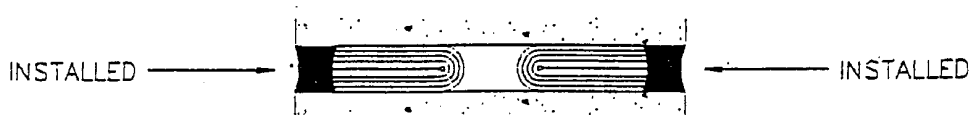


CONFIGURATION #2
(CAULK FROM 2 SIDES)



<u>FIRE RATING</u>	<u>"A"</u>	<u>"B"</u>	<u>ROLL LENGTH</u>	<u>FT PER BAG</u>
2 HOUR	3/8"	2"	70 LF	1260 LF
3 HOUR	3/8"	4"	70 LF	630 LF
4 HOUR	3/8"	6"	70 LF	420 LF

FOLD IN HALF, SEAT FROM BOTH SIDES OF JOINT AND CAULK OVER



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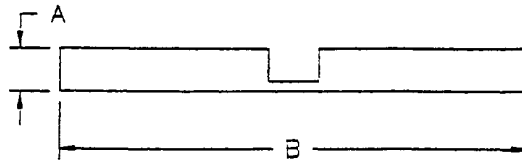
ULTRA BLOCK[®] SYSTEMS

ENGINEERING & TECHNICAL BULLETIN

File: Flat Thickness

Joint Width: Up to 3/4"

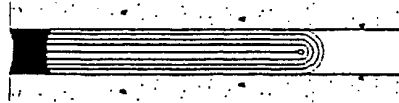
CONFIGURATION #1
(CAULK FROM 1 SIDE)



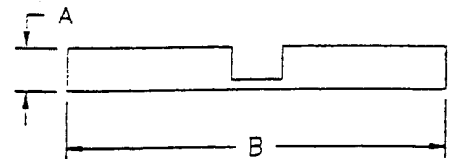
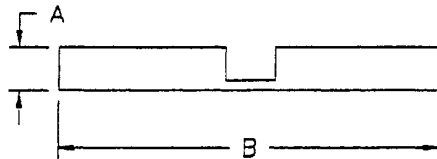
<u>FIRE RATING</u>	<u>"A"</u>	<u>"B"</u>	<u>ROLL LENGTH</u>	<u>FT PER BAG</u>
2 HOUR	1/2"	6"	60 LF	360 LF
3 HOUR	1/2"	8"	60 LF	240 LF
4 HOUR	1/2"	12"	60 LF	180 LF

FOLD IN HALF, SEAT IN JOINT AND CAULK OVER

INSTALLED →



CONFIGURATION #2
(CAULK FROM 2 SIDES)



<u>FIRE RATING</u>	<u>"A"</u>	<u>"B"</u>	<u>ROLL LENGTH</u>	<u>FT PER BAG</u>
2 HOUR	1/2"	2"	60 LF	1080 LF
3 HOUR	1/2"	4"	60 LF	540 LF
4 HOUR	1/2"	6"	60 LF	360 LF

FOLD IN HALF, SEAT FROM BOTH SIDES OF JOINT AND CAULK OVER

INSTALLED →



← INSTALLED



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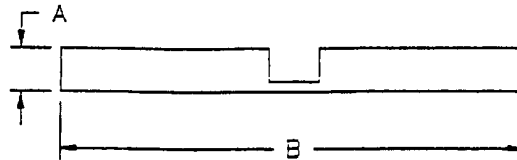
ULTRA BLOCK[®] SYSTEMS

ENGINEERING & TECHNICAL BULLETIN

File: Flat Thickness

Joint Width: Up to 1"

CONFIGURATION #1
(CAULK FROM 1 SIDE)

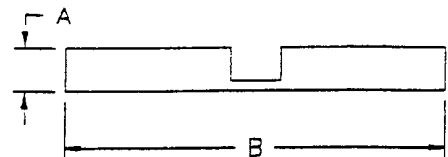
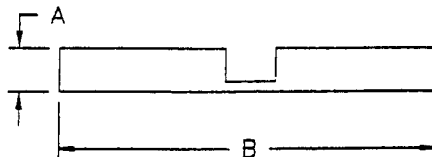


<u>FIRE RATING</u>	<u>"A"</u>	<u>"B"</u>	<u>ROLL LENGTH</u>	<u>FT PER BAG</u>
2 HOUR	3/4"	6"	40 LF	240 LF
3 HOUR	3/4"	8"	40 LF	160 LF
4 HOUR	3/4"	12"	40 LF	120 LF

FOLD IN HALF, SEAT IN JOINT AND CAULK OVER

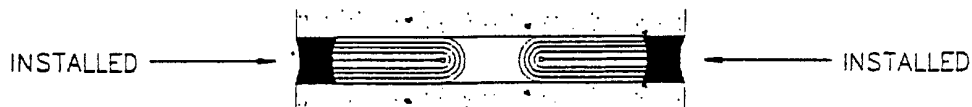


CONFIGURATION #2
(CAULK FROM 2 SIDES)



<u>FIRE RATING</u>	<u>"A"</u>	<u>"B"</u>	<u>ROLL LENGTH</u>	<u>FT PER BAG</u>
2 HOUR	3/4"	3 1/2"	40 LF	400 LF
3 HOUR	3/4"	4"	40 LF	360 LF
4 HOUR	3/4"	6"	40 LF	240 LF

FOLD IN HALF, SEAT FROM BOTH SIDES OF JOINT AND CAULK OVER



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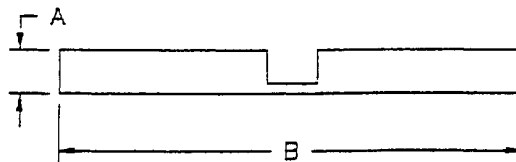
ULTRA BLOCK[®] SYSTEMS

ENGINEERING & TECHNICAL BULLETIN

File: Flat Thickness

Joint Width: Up to 1-1/2"

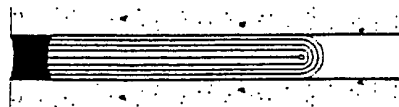
CONFIGURATION #1
(CAULK FROM 1 SIDE)



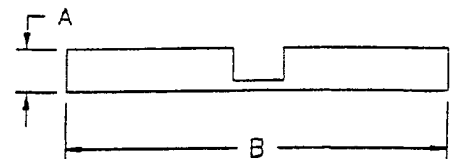
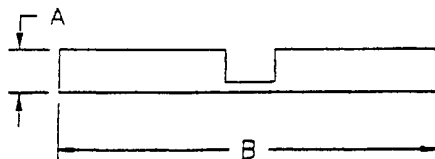
<u>FIRE RATING</u>	<u>"A"</u>	<u>"B"</u>	<u>ROLL LENGTH</u>	<u>FT PER BAG</u>
2 HOUR	1"	6"	30 LF	180 LF
3 HOUR	1"	8"	30 LF	120 LF
4 HOUR	1"	12"	30 LF	90 LF

FOLD IN HALF, SEAT IN JOINT AND CAULK OVER

INSTALLED



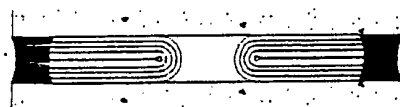
CONFIGURATION #2
(CAULK FROM 2 SIDES)



<u>FIRE RATING</u>	<u>"A"</u>	<u>"B"</u>	<u>ROLL LENGTH</u>	<u>FT PER BAG</u>
2 HOUR	1"	3 1/2"	30 LF	300 LF
3 HOUR	1"	4"	30 LF	270 LF
4 HOUR	1"	6"	30 LF	180 LF

FOLD IN HALF, SEAT FROM BOTH SIDES OF JOINT AND CAULK OVER

INSTALLED



INSTALLED



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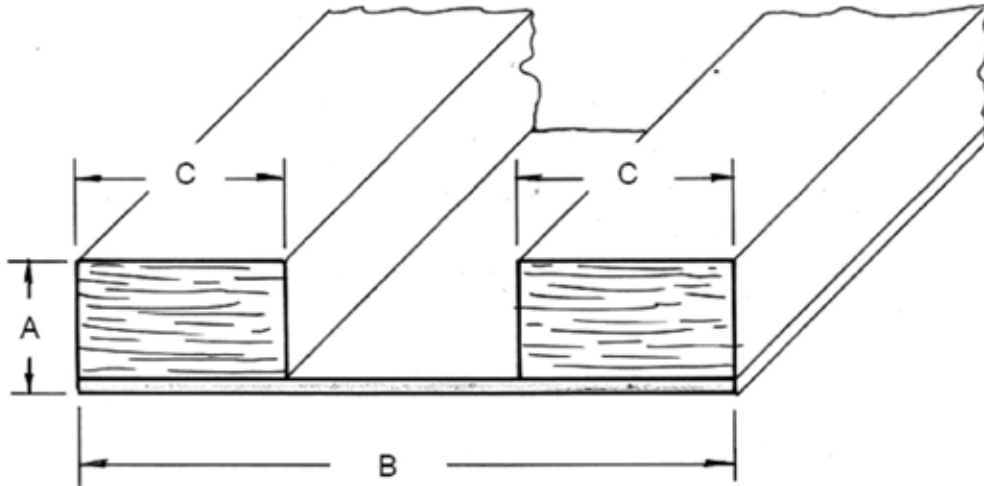
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ULTRA BLOCK[®] SYSTEMS

ENGINEERING & TECHNICAL BULLETIN

File: Built Up Configurations for Joint widths 2 inches and greater



2-Hour Built Up Assemblies				
Joint	Configuration	A	B	C
2.0	1-3/8" x 9"	1.375	9	3.5
2.5	1-7/8" x 10"	1.875	10	3.5
3.0	2-3/8" x 10"	2.375	10	3.5
4.0	3-3/8" x 11"	3.375	11	3.5
4.5	3-1/2" x 13"	3.5	13	4
5.0	4-3/8" x 13"	4.375	13	4
5.5	4-3/5" x 14"	4.375	14	4
6.0	4-1/2" x 14"	4.5	14	4

4-Hour Built Up Assemblies				
Joint	Configuration	A	B	C
2.0	1-3/8" x 14"	1.375	14	6
2.5	1-7/8" x 15"	1.875	15	6
3.0	2-3/8" x 15"	2.375	15	6
4.0	3-3/8" x 16"	3.375	16	6

3-Hour Built Up Assemblies				
Joint	Configuration	A	B	C
2.0	1-7/8" x 10"	1.875	10	4
2.0	2-1/2" x 10"	2.5	10	4
2.5	2-3/8" x 11"	2.375	11	4
3.0	2-1/2" x 11"	2.5	11	4
4.0	3-3/8" x 14"	3.375	14	5
4.5	3-3/8" x 15"	3.375	15	5
5.0	4-3/8" x 15"	4.375	15	5
5.5	4-3/8" x 16"	4.375	16	5
6.0	5-3/8" x 16"	5.375	16	5
6.5	5-3/8" x 17"	5.375	17	5
7.0	5-1/2" x 17"	5.5	17	5



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