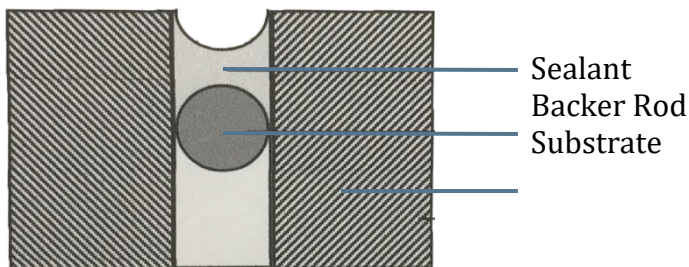


Backer Rods are used in various construction projects, so it is important to understand the differences in the types of backer rod and how to choose the right type for your application.

Why use Backer Rods?

Backer rods are used as a “backing” material to fill a void, joint, or crack in residential and commercial applications. The primary purpose of backer rods is to:

- Control the sealant thickness and amount needed to fill the joint.
- Force the sealant to the sidewalls to ensure contact and proper adhesion.
- Act as a bond-breaker to avoid 3-sided adhesion of the sealant.
- Create the optimal sealant width to depth ratio, which is 2-1 for most sealants.



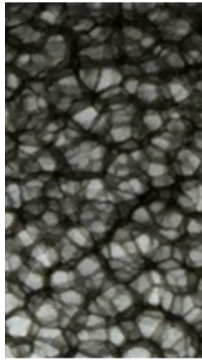
- Facilitates formation of an “hourglass” shape in the sealant for optimal performance as the joint expands or contracts.

Joint failure is common when using sealants. Sealant failure is caused by several factors, including:

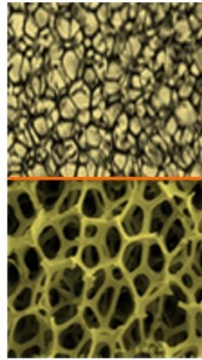
- **Joint depth:** Not enough sealant on top of the backer rod. Without a backer rod, there will be too much sealant in the joint to stretch properly. If the joint moves and the sealant is too deep or too shallow, the sealant will split causing joint failure.
- **Bubbling:** If punctured during the time of installation, closed-cell backer rods will out-gas during the sealant curing process which causes sealant bubbling. Eventually the bubbles will crack and tear apart causing sealant and joint failure.



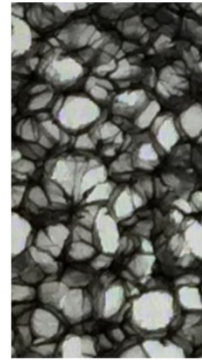
There are three main types of backer rods: open-cell, closed-cell and bi-cellular.



Closed-Cell



Open-Cell

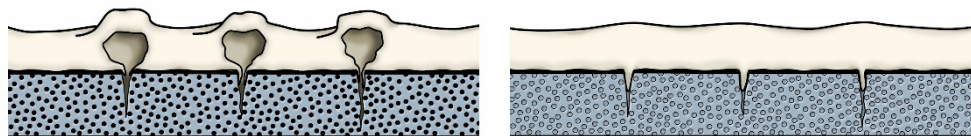
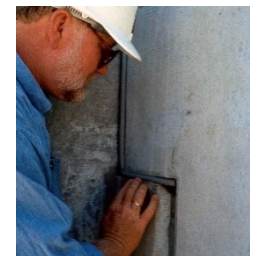


Bi-Cellular

Bi-Cellular backer rod is flexible and very compressible extruded shape (usually cylindrical), with a surface skin, that is composed of both open and closed-cell material.

SOF® Rod is a soft, bi-cellular polyethylene foam backer rod. It is made up of a non-absorbing outer skin and a highly resilient interior network of open and closed cells. SOF Rod will not out-gas when the skin is ruptured and prevents sealant bubbling and failure. The cells are not holding air under pressure and will not release air into the applied sealant, thus eliminating joint failures caused by bubbling in the sealant, and avoiding related call-backs on the job site.

- Very compressible, up to 50 percent +
- Cold-applied sealants only, including self-leveling types
- Used in vertical and horizontal joints, window frame and glazing, curtain wall construction, wall panels, parking decks, roadway, and bridge construction
- Highly versatile and can be used as an alternative to both Open-cell and Closed-cell backer rod for most applications
- Fully complies with ASTM C 1330, Type B, and ASTM D 5249, Type 3 physical property requirements.
- Available in 3/8" to 4" diameter



Above left: Section show sealant bubbling above closed-cell backer rod per ASTM C 1253 test method to determine the out-gassing potential of sealant backing. **Above right:** with the same puncture pattern, there is no sealant bubbling above the SOF Rod section

Open-Cell backer rod is flexible and very compressible fabricated shape (usually cylindrical), without a surface skin, that is composed of open-cell material.

OCFoam™ is an open-cell polyurethane foam backer rod that is used in window glazing and other applications that require polyurethane sealants. Open-cell foam allows air to pass through the backer rod, which allows the sealant to cure faster. It will absorb water, so it should primarily be used indoors. It can withstand higher temperatures (up to 400F), making it ideal for use when temperatures fluctuate from very hot to very cold.



- Non-gassing
- Very compressible, up to 75 percent
- High temperature so it can be used with polyurethane and elastomeric cold-applied or hot-pour sealants
- Airflow allows for two-sided curing
- Used in vertical and horizontal joints, window frame and glazing, curtain wall construction, wall panels, parking decks, roadway, and bridge construction
- Fully complies with ASTM C 1330, Type O and ASTM D 5249, Type 1 physical property requirements.
- Available in 3/8" to 2" diameter



Closed-Cell: a flexible and somewhat compressible extruded shape (usually cylindrical), with a surface skin, that is composed of closed-cell material.

HBR® is a closed-cell polyethylene foam backer rod used in concrete construction. HBR may out-gas if punctured.

- Somewhat compressible, up to 25 percent
- Cold-applied sealants only, including self-leveling types
- Used in expansion and contraction joints, window frame and glazing, curtain wall construction, wall panels, parking decks, roadway, and bridge construction
- Fully complies with ASTM C 1330, Type C, and ASTM D 5249, Type 3 physical property requirements.
- Available in 1/4" to 6" diameter



HBR® XL is a cross-linked, closed-cell polyethylene foam backer rod used in concrete construction. HBR XL acts as a barrier, limits the depth of both hot-pour and cold-applied sealant required, and prevents excessive sealant use.

- Both hot-pour and cold-applied sealants up to 410 degreee f.
- May out-gas if punctured
- Somewhat compressible, up to 25 percent
- Primarily used in expansion and contraction joints for roadway and bridge construction where hot-applied sealants are used
- Fully complies with ASTM D 5249, Type 1 physical property requirements.
- Available in 3/8" to 2" diameter



Reference Chart comparing the different types of backer rods.

Backer Rod – Open Cell vs. Closed-Cell vs. Bi-Cellular

Backer Rod Type	Open Cell	Closed-Cell	Cross-Linked Closed-Cell	Bi-Cellular (Reticulated)
Structure	Polyurethane foam comprised of open cells	Polyethylene foam with an impervious outer skin and a closed-cell interior composition	Cross-Linked Polyethylene foam with an impervious outer skin and a closed-cell interior composition.	Polyethylene foam with an impervious outer skin and comprised of a bi-cellular interior network of closed and open cells.
ASTM Specification	ASTM C 1330 Type O	ASTM C 1330 Type C, ASTM D 5249 Type 3	ASTM D 5249, Type 1	ASTM C 1330 Type B, ASTM 5249 type 3
Compression Use	up to 80%	up to 25%	up to 25%	up to 50%
Water Absorption Resistance	Poor	Excellent	Excellent	Good
Temperature Range	-90°F to 410°F+	-90°F to 210°F	-90°F to 410°F	-90°F to 210°F
Out-Gassing	None	Yes, if outer skin is ruptured	Yes, if outer skin is ruptured	None
Air Flow	Highly conductive	Non-conductive	Non-conductive	Non-conductive
Below Grade Use	Not recommended	Yes	Yes	Contingent on application
R Value	Better	Best	Best	Good
Cost	\$\$\$\$\$	\$\$	\$\$\$	\$\$\$\$
Primary Applications & Uses	For use in vertical expansion and interior control joints in concrete walls, floors, parking decks, curtain walls, and window glazing, where water absorption is NOT a concern.	For use in expansion and control joints in concrete walls, floors, bridge construction, parking decks/lots, curtain walls, glazing, log home construction, highway construction, and pavement maintenance with cold applied sealants only.	For use in expansion and saw cut control joints in highways, roadways, parking decks/lots, runways, driveways and pavement maintenance applications where hot-pour sealants will be applied.	For use in expansion and control joints in concrete walls, floors, bridge construction, parking decks/lots, curtain walls, glazing, log home construction, highway construction, and pavement maintenance with cold applied sealants only. Excellent for joints with varying widths.
Our Brand	OCFoam™	HBR®	HBR® XL	SOF® Rod

About Nomaco

Nomaco's engineered foam materials are designed for use in construction applications across commercial, residential, municipal, civil, and industrial applications. Our extensive product line includes materials that are used as concrete forms or as fillers for concrete expansion and contraction joints almost anywhere concrete is used including driveways, sidewalks, roadways, airport runways, bridges, curbs, and medians. For more information visit our website at www.nomaco.com.