Bayseal™ OC

Bayer MaterialScience

7-Polyurethane Spray Foam
Open-Cell Insulation
Technical Datasheet: 04/15/08

Product Description

Bayseal OC spray polyurethane foam insulation is an open-cell, two-component, low-density, water-blown system specifically designed for insulation applications. This technically advanced, economical insulation system provides improved occupant comfort, a cleaner indoor environment, greater noise reduction and superior energy savings over conventional insulation systems.

Unique Properties

Bayseal OC spray polyurethane foam insulation expands 120:1 from its liquid state, filling cracks, voids, crevices and building cavities to provide a climate controlled building by mitigating airflow through and within walls (infiltration and exfiltration), heat and cold transfer (also referred to as thermal conductivity), moisture accumulation in the building materials (reducing the chance for mold and mildew) and minimizing transfer of sound.

Recommended Uses

- Insulation for residential, commercial and industrial structures.

Environmental Consideration and Substrate Temperatures

Applicators must recognize and anticipate climatic conditions prior to application to ensure highest quality foam and to maximize yield. Ambient air and substrate temperatures, moisture, and wind velocity are all critical factors, variations in ambient air and substrate temperature will influence the chemical reaction of the two components, directly affecting the expansion rate, amount of rise, yield, adhesion and the resultant physical properties of the foam insulation. To obtain optimum results, BaySeal OC should be spray-applied to substrates when ambient air and surface temperatures fall within a range of 50ºF to 120ºF. All substrates to be sprayed must be dry at the time of application. Moisture in the form of rain, fog, frost, dew, or high humidity (>85% R.H.) Will react chemically with the mixed components, adversely affecting the polyurethane foam formation, dimensional stability, and physical properties of the finished product. Wind velocities in excess of 12 miles per hour may result in excessive loss of exotherm and interfere with the mixing efficiency of the spray gun affecting foam surface texture, cure, physical properties, and will cause overspray. Precautions must be taken to prevent damage to adjacent areas from fugitive overspray.

Processing Equipment

Store at 65º to 85ºF in a dry and well-ventilated area. Material in containers should be maintained at 80ºF to 90ºF while in use. Heated trailers, hotboxes, or heated tank storage may be necessary. Material temperature should be confirmed with a thermometer or an infrared gun if calibrated for drum material. Bayseal OC should be mixed once a day with a high-speed mixer for 30 to 45 minutes prior to application. Bayer Material Science recommends the use of a through-bung mixer equipped with three (3) sets of mixing blades: (2) six inch and (1) eight inch. To properly drive the mixer, 20cfm of air is preferred. Using less air pressure may require extended mixing times. A thorough high-speed mix is an essential step in high quality foam production. Do not configure equipment to recirculate Bayseal OC from proportioner back into drum. Do not recirculate or mix other suppliers' A or B component into Bayseal OC containers. 2:1 transfer pumps are recommended for material transfer from container to the proportioner.

The plural component proportioner must be capable of supplying each component within ± 2% of the desired 1:1 mixing ratio by volume. (continued)

Typical Physical Properties

Properties	Test Method	Value
Fungus Resistance:	ASTM G-21	Rating of "0"
"R" Value (aged):	ASTM C-518	3.85 per inch
Air Leakage:	ASTM E-283	0.00 ± .01 lps/m²
Sound Transmission Coefficient	ASTM E-90	51 (STC)
Noise Reduction Coefficient:	ASTM C-423	0.7 (NRC)
Oxygen Index:	ASTM D-2863	25
Compressive Strength:	ASTM D-1621	.88 pcf
Apparent Density:	ASTM D-1622	.5 pcf
Open Cell Content:	ASTM D-2856	>92%
Tensile Strength:	ASTM D-1623	3.2 psi
Shear Strength:	ASTM C-273	1.4 psi
Permeance:	ASTM E-96	10.25 perms
Permeability:	ASTM E-96	20.587 perm-in

Processing Parameters & Physical Characteristics

Pre-heater Temperature:	"A" and "B" 125-140°F
Hose Temperature:	"A" and "B" 125-140°F
Pressures:	1100-1500 psi (dynamic)*
Mix RatioParts:	1 to 1 by volume "A" to "B"
Viscosity at 75°F:	225 cps "B" Component
Shelf Life:	3-4 Months @ 65° - 85°F

Product Reactivity

Surface Temperature:	50-120°F
Cream Time:	1-3 seconds
Gel Time:	3-5 seconds
Tack Free Time:	5-7 seconds

*Dependent upon hose length

Test values may vary depending on type of equipment, equipment settings and environmental conditions.

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Credentials/Certifications

Bayseal OC is available in a Class I and II formulation, as set forth under Underwriters Laboratories (UL 723, ASTM E-84), and possess the flammability characteristics shown:

Underwriters Laboratories UL 723, Surface Burning Characteristics

ASTM Method E-84 Tunnel Test

	Class I	Class II	Class III
Flame Spread	≤25	≤75	Non-rated
Smoke Development	≤450	≤450	Non-rated

Processing Equipment (continued)

Hose heaters should be set to deliver 125ºF - 140ºF materials to the spray gun. Proportioner dynamic pressures should be 1100-1500 psi range. These settings will ensure thorough mixing in the spray gun mix chamber in typical applications. Optimum hose pressure and temperature may vary as a function of the type of equipment, ambient and substrate conditions, and the specific application. It is the responsibility of the applicator to properly interpret equipment technical literature, particularly information that relates acceptable combinations of gun chamber size, proportioner output, and material pressures. The relationship between proper chamber size and the capacity of the proportioner's pre-heater is critical. Mechanical purge spray guns (specifically direct impingement or DI type) are recommended over air purge guns for highest foam quality. Contact your local Bayer Material Science salesperson for specific recommendations, pricing, and availability of spray and auxiliary equipment.

CAUTION: Extreme care must be taken when removing and reinstalling drum transfer pumps so as NOT to reverse the "A" and "B" components.

Thermal Barrier

IRC and IBC codes require that SPF be separated from the interior of a building by a thermal barrier, which is applied over SPF to slow thermal rise during a fire, and delay its involvement in a fire. A building code definition of an approved thermal barrier is one that is equal in fire resistance to 1/2 inch gypsum board. Thermal barriers limit the temperature rise of the underlying SPF to not more than 121°C (250°F) after 15 minutes of fire exposure in compliance with ASTM-E119 (Test Methods for Fire Tests of Building Construction Materials). Thermal barriers meeting this criterion are termed a "15 minute thermal barrier" or classified as having an "index of 15". Bayer Material Science recommends that an approved thermal barrier separate Bayseal OC from the building interior unless waived by a local building code official. There are exceptions to the thermal barrier requirement: (1) Code authorities may approve coverings based on fire tests specific to the SPF application. For example, covering systems that successfully pass large scale tests may be approved by code authorities in lieu of a thermal barrier; (2) SPF protected by 1" thick masonry does not need a thermal barrier. Certain materials that offer protection from ignition, called "ignition barriers," may not be considered as thermal barrier alternatives unless they comply with ASTM E-119. Just because a material is advertised as a "thermal barrier" or "ignition barrier" does not mean that it has been tested in conjunction with SPF and approved by a code agency or a local code official. Applicators should request test data and code body approvals or other written indications of acceptability under the code to be sure that the product selected offers code-compliant protection.

Vapor Retarder

Bayseal OC is intended for indoor applications, and is not a vapor retarder. It is vapor permeable and will allow some diffusion of moisture through the insulation. The following considerations are needed: (1) A vapor retarder needs to be considered in the design of the building envelope in cold climates, such as zones 6 and higher in the U.S., as defined in 2004 Supplement To The IRC, Table N1101.2; (2) A vapor retarder also needs to be considered where high interior humidity conditions exist; (3) When applying Bayseal OC in crawl spaces under living space, the underside of floor system may require the application of vapor retarder primer to prevent moisture diffusion into the flooring system. This is a concern when applying in warm, humid counties as defined in 2004 Supplement To The IRC, Table N1101.2.1; (4) The applicator should consider a vapor retarder in crawl space applications with hardwood floors, which may be damaged by moisture intrusion. Crawl space applications may require a thermal barrier between the foam and wood flooring, depending upon local codes. Where exposed rim joist applications are approved, vapor retarder criteria must be strictly adhered to for successful application. Refer to local codes and manufacturer's written specifications to ensure compliance.

Exotherm Caution

SPF liquid to cellular plastic transition depends upon an exothermic (heat-producing) reaction between the "A" and "B" components. Applicators should limit Bayseal OC thickness to 4" to 6" per pass to avoid fire hazards resulting from excessive heat generation. If subsequent passes are needed, applicators should wait 10 to 15 minutes between passes to allow reaction heat to dissipate. The exothermic reaction can cause temporary substrate thermal rises in excess of 150ºF, which may result in substrate thermal expansion. If the substrate then contracts when the reaction heat dissipates, substrate deformation can occur.

Handling and Safety
Respiratory protection is MANDATORY! Contact Bayer Material Science for a copy of the Model Respiratory Protection Program developed by API or visit their website at www.polyurethane.org. Persons with known respiratory allergies should avoid exposure to the A component. The A component contains reactive isocyanate groups while the B component contains amine and/or organometallic catalysts with blowing agents. Both materials must be handled and used with adequate ventilation. The vapors must not exceed the TLV (0.02 parts per million) for isocyanates. Avoid breathing vapors. Wear a NIOSH approved respirator. If inhalation of vapors occurs, remove victim from contaminated area and administer oxygen if breathing is difficult. Call a physician immediately. Avoid contact with skin, eyes, and clothing. Open containers carefully, allowing any pressure to be relieved slowly and safely. Wear chemical safety goggles and rubber gloves when handling or working with these materials. In case of eye contact, immediately flush with large amounts of water for at least fifteen minutes, consult a physician immediately. In case of skin contact, wash area with soap and water. Wash clothes before reuse.

Fire Hazard
Fires involving either of these components may be extinguished with carbon dioxide, dry chemical, or inert gas. Application of large quantities of water spray is recommended for spill fires. Personnel fighting the fire must be equipped with NIOSH approved self-contained breathing apparatus.

Cleaning of Spills or Leakage
Cover the area with an inert absorbent material such as clay or vermiculite and transfer to metal waste containers. Saturate with water but do not seal the container with the isocyanates and water mixture. The area should then be flushed with large amounts of water, in the case of the B component, or a 5% aqueous ammonia, in the case of the A component. Dispose of these materials in compliance with federal, state and local regulations.

Caution: Isocyanates will react with water and generate carbon dioxide. This could result in rupture of closed containers.

Disclaimer

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