



White Paper

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Indoor Air Quality & the Knauf Insulation EcoSeal® System

EcoSeal® & Knauf Insulation Glasswool Products

AN **ECOSEAL**® WHITE PAPER

Indoor Air Quality & the Knauf Insulation EcoSeal® System

Air quality is becoming increasingly important as homes are being made more energy efficient. The energy saving practice of intentionally sealing a home acts to reduce the outside dilution air which has traditionally been relied on to ensure occupant safety. The public awareness of indoor air quality issues is rapidly expanding, fueled by often sensationalized media reports. Because of this, the selection and use of low emitting and chemically benign materials is rapidly increasing in importance for architects, builders and homeowners.

Knauf Insulation has been a leader in the area of indoor air quality and insulation materials. We were the first company to have our products certified through the GREENGUARD Environmental Institute. Today, we have all of our products certified to the extremely stringent GREENGUARD Children & Schools standard. Our new ECOSE Technology bio-based binder has taken Knauf Insulation beyond all of our competition as we have set the standard for green chemistry in insulation materials. By specifying either Knauf Insulation EcoBatts or JetStream or EcoFill Wx, you can be sure that you will receive insulation materials that are unsurpassed for their very low emissions. It is for this reason that we have been very careful in selecting a formulation for air sealing that will not negatively impact our insulations. In EcoSeal, we have a product that is extremely low in VOC content. The

current most stringent standards for sealants requires a maximum 4 gms/liter of VOC. Our EcoSeal product is less than 0.3 gms/liter (less water), or more than twelve times below the toughest standards. EcoSeal has been tested by Air Quality Sciences Underwater Laboratories against the GREENGUARD Children & Schools criteria and passed with flying colors, yielding limits below detection for most chemicals. It received its official certification and assumes its place with the rest of the Knauf Insulation product line.

The table below compares EcoSeal emission profiles at 168 hours against requirements for those chemicals:

Indoor Air Quality Emission Requirements and Measured Results for EcoSeal		
Chemical/Category	GREENGUARD Criteria	EcoSeal Measurement
Total VOC (TVOC)	<0.5 mg/m ³	<0.005 mg/m ³
Formaldehyde	<0.05 ppm	<0.001 ppm
Individual VOCs	<1/10 TLV (ACGIH)	<1/100 TLV (all chemicals)

These results dramatically illustrate the very low emissions profile associated with EcoSeal sealant. To put these emissions in a different perspective, consider the following chart which shows established criteria for "low-VOC and Zero-VOC" paints, caulks and adhesives.

Classification of Low VOC and Zero VOC Paints and Caulks		
Material	Claim Regarding TVOCs	Comparison to EcoSeal
Low VOC Paint (flat)	<50 g/l (includes water)	More than 250 x higher
Low VOC Paint (non-flat)	<150 g/l (includes water)	More than 750 x higher
Zero VOC Paint	<5 g/l (includes water)	More than 20 x higher
Low VOC Insulation Adhesive	370 g/l (includes water)	More than 1000 x higher



The point of the previous chart is to show how low EcoSeal sealant is in VOC content versus many other commonly marketed “environmentally friendly construction materials.

Besides indoor air quality during occupancy, there can also be concerns for worker exposure to hazardous chemicals during installation. Many spray foam materials require chemical respirators to protect workers from toxic fumes such as methylene diphenyl diisocyanate and polyols, both of which have known negative health effects at fairly low concentrations. They also require that the site be evacuated of all unprotected trades during installation and curing. EcoSeal does not have any hazardous components and poses no risk to either the installer or other trades. This not only results in limited risk to worker health, it also significantly reduces logistical concerns. It should also be mentioned that total cure of volatile chemicals is contingent on achieving a careful ratio of the chemicals. This ratio is highly dependent on environmental conditions such as temperature as well as human understanding and skill in the installer. If the ratios are incorrect, the resultant foam can have significant quantities of unconsumed chemicals which can offgas into the occupied space.

In summary, when EcoSeal is used in conjunction with low emitting Knauf Insulation fiber glass products, there is no risk to workers for chemical exposure. Additionally, the building occupants can rest assured that their insulation and air sealing system will have no negative contributions to their indoor air quality.

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LEED Eligible Product

Use of this product may help building projects meet green building standards as set by the Leadership in Energy and Environmental Design (LEED) Green Building Rating System.

Credit 4.1 - 4.2 Recycled Content

Credit 5.1 - 5.2 Regional Materials



Knauf Insulation EcoSeal® Sealant is certified for indoor air quality as a low emitting product by The GREENGUARD Environmental Institute to both the GREENGUARD Indoor Air Quality Certification ProgramSM and the more stringent GREENGUARD Children & Schools standard and is verified to be formaldehyde free.

www.greenguard.org