

Health & Safety Questions & Answers



ICYNENE®

The Evolution of Insulation

What is formaldehyde and why is it a common concern relating to foam products?

Formaldehyde is a naturally-occurring and widely present chemical in our world. Formaldehyde is a simple chemical compound made of hydrogen, oxygen and carbon, with the formula CH_2O . Most organic life forms--bacteria, plants, fish, animals and humans--produce formaldehyde at various levels. In fact, formaldehyde is even present in human breath. Formaldehyde does not accumulate in the environment or within plants, animals or people, as metabolic processes quickly break it down in the body and the atmosphere.

Formaldehyde is used in the manufacture of many products in the home: asphalt shingles; sheathing & cladding; walls & wall panels; floors & roofs; electrical boxes & outlets; furniture; counter tops, cabinets & cabinet doors; appliances: washers, dryers, & dishwasher; plumbing: taps, showerheads, & valve mechanisms; paints & varnishes; and others. Most of the fiberglass batt insulation existing in walls and attics today was manufactured with formaldehyde-based binders.

Formaldehyde became linked to spray foam insulation because a common, early generation type of foam was formed using formaldehyde (i.e. urea-formaldehyde foam) and it contained substantial levels of residual formaldehyde. Icynene products are polyurethane, NOT urea-formaldehyde, foams and formaldehyde is not used to produce this type of foam.

Should I be worried about potential exposure to formaldehyde from Icynene spray foam insulation products?

No, there is no reason to be worried about exposure to formaldehyde from Icynene spray foam insulation. Formaldehyde is NOT used as an ingredient in the manufacture of Icynene spray foam insulation.

Icynene spray foam insulation has been tested numerous times for over 25 years, by highly-sophisticated and reputable third party laboratories, for levels of formaldehyde. Tiny amounts of formaldehyde detected in conjunction with application of Icynene spray foam insulation originate from other materials in the application space or "trace" amounts occurring normally in the raw materials used to manufacture the foam. In all cases, the data show levels of formaldehyde to be virtually undetectable with sensitive laboratory equipment within a short time after spraying.

Independent laboratory testing confirms that formaldehyde emissions from even freshly-sprayed Icynene foam are well within the strict guidelines for use in schools and offices set by the Collaborative for High Performance Schools (CHPS) in the state of California

soon after spraying.

You can be certain that formaldehyde is not an ingredient in Icynene spray foam insulation and has been thoroughly tested by reputable third-party laboratories to ensure that any trace amounts of formaldehyde conform to normal indoor air levels and meet the strictest guidelines in the world. Furthermore, Icynene is "A+" certified in Europe, the highest possible rating for VOC emissions.

Should I be worried about potential exposure to isocyanates, or to MDI (methylene diphenyl diisocyanate) or TDI (toluene diisocyanate) in particular?

No, provided proper safety guidelines are followed during and immediately after spraying. TDI is not used at all, and never has been used, in the manufacture or application of Icynene spray foam insulation.

MDI is the main ingredient in "Side A" of the Icynene two-part spray foam system. When the MDI "Side A" is combined with the water and polyols of "Side B", spray foam is produced. The main risk of isocyanates in general, and MDI specifically, is for workers who handle these materials in a work setting. For this reason, various agencies (e.g. EPA, OSHA, American Chemistry Council) have provided guidance and regulations to address workers handling MDI.

MDI is highly reactive with water and water vapor, so it is completely consumed by the water in "Side B" (and water vapor in the air) within minutes of spraying. In fact, "Side B" of Icynene light density spray foam (e.g. Icynene Classic and Classic Max) contains three times the amount of water required to consume 100% of the MDI that is initially present in "Side A".

Data from independent laboratory testing of Icynene spray foam insulation shows that reaction and consumption of MDI begins immediately upon spraying and that the MDI is fully consumed within 30 minutes of spraying. Further, no MDI of any consequence remains anywhere inside the foam during or after curing (full curing is complete within 24 hours after spraying is finished).

With lorry-based (truck-based) spray rigs, the only period during which exposure to MDI is a concern is during that 30-minute period following the exit of the reacting foam from the spray nozzle. Icynene-trained spray applicators are protected from exposure during this time by the Personal Protective Equipment they wear while spraying. Others are protected by remaining outside the premises and away from the spray area in accordance with Icynene's broadly-published guidelines and the spray applicator's instructions.

Should I be worried about potential exposure to any chemicals from Icynene spray foam insulation?

No, because testing shows that potential exposures are negligible within 24 hours after spraying is complete.

Icynene spray foam insulation has been extensively tested for off-gassing / chemical exposure over our 28-year history. Third party laboratories have tested for the presence of a broad range of chemicals and found that exposure levels are well within established guidelines and standards well within the 24-hour period immediately following the spraying of the foam. As specific examples, the Lawrence Berkeley Laboratories in California and the University of Saskatchewan in Canada have repeatedly confirmed that the levels of any Volatile Organic Compounds emitted during the spray process are well below generally-accepted emission levels within the 24-hour period after spraying. These laboratories also confirmed that after 30 days, VOC emissions become so low that they are nearly undetectable with even sophisticated and sensitive laboratory equipment. In addition, Icynene is certified “A+” for VOC emissions in Europe, the best possible rating.

In view of its long and extensive testing history all over the world, you can be confident in the safety of Icynene spray foam insulation.

Should I be worried about “off-gassing” from Icynene spray foam insulation in my home, beyond the 24-hour vacancy period?

No. Icynene spray foam insulation has been tested extensively for off-gassing by several reputable third-party laboratories, regulators, and research institutions... for example, Berkeley Analytical Labs, Home Innovation Research Labs (formerly NAHB Research Labs), CERTECH lab in Belgium, the Collaborative for High Performance Schools in California, the University of Saskatchewan, the International Code Council – Evaluation Service, and the Canadian Construction Materials Centre.

Again, once Icynene spray foam is cured (always within the 24-hour period immediately after spraying is complete), the house or building is safe for re-occupancy. So there is no reason to worry about “off-gassing” of Icynene spray foam insulation beyond the 24-hour vacancy period.

Why am I required to vacate my home while the foam is being applied and for 24 hours after spraying is completed?

Vacating ensures that no one will be exposed to the foam insulation before it has fully cured. Once cured, Icynene spray foam is safe, as described in the answers to the preceding questions.

Should I worry about my Icynene spray foam applicator making a mistake and spraying my foam insulation “off ratio”?

No. Icynene’s equipment is designed to avoid “off ratio” spraying, and testing shows that “off ratio” Icynene spray foam does not present a safety concern. An “off ratio” condition is said to occur when the two components of the spray foam (Side A and Side B) are mixed and sprayed in a ratio other than 1 to 1.

This might happen when, for example, a chemical delivery hose becomes clogged during active spraying. However, there are three fundamental reasons why you should not worry about “off ratio” foam in your house:

1. Spray foam equipment used by Icynene dealers is designed to automatically shut off whenever the foam mixture ratio deviates significantly from 1 to 1.
2. Off ratio foam is obvious and easily seen because it looks and sprays very poorly causing a severe drop in foam quality and sprayer productivity. So sprayers will very quickly notice foam that is off ratio and bring the ratio back to 1 to 1.
3. Icynene modified spray equipment so as to intentionally spray Icynene foam in an extremely off ratio condition for relatively long periods of time. Samples of this off ratio foam were subject to rigorous testing, just as with conventionally-sprayed foam. Just as with conventionally-sprayed Icynene foam, releases from the off ratio Icynene spray foam dissipated sufficiently for re-occupancy within the 24-hour vacancy period.

Will I detect any new odours in my home after installation is complete?

Not likely, but some occupants do notice a new odour after spraying is complete. This can happen in two ways:

1. A small percentage of people can smell very low (but safe) concentrations of chemicals called amine catalysts, which are used in all spray foams. So any odour detected by especially-sensitive people is safe from a health standpoint. Even for these few especially-sensitive people, this smell usually disappears within a few days of application.
2. Installation of spray foam insulation creates a “tighter”, less “leaky”, house; that is precisely the reason it increases home energy efficiency. Unless properly ventilated, a tighter house can sometimes trap odors that, prior to spraying, used to be released through wall cracks and other air leaks in the home along with heated or cooled air. This is not usually a problem when a home is properly ventilated. Your Icynene dealer can advise you on whether your home is adequately ventilated and whether you need to improve your home’s ventilation system.

If you do notice new odours that have not disappeared after around 30 days, contact your Icynene dealer for help in solving the situation.

I've heard that poorly trained spray foam applicators can cause problems. What training do Icynene spray foam applicators receive?

Icynene certified dealers are the best trained installers in the spray foam insulation industry. There are several reasons you should have confidence in Icynene trained and certified sprayers versus other non-Icynene sprayers:

1. For more than 20 years, Icynene has required Icynene dealers' sprayers to undergo comprehensive, person-to-person training on the proper handling and application of Icynene products. Within the spray foam insulation industry, Icynene is highly regarded for its sprayer training program.
2. Every day, spray trainers from Icynene's Technical Support team travel throughout Europe, North America and Asia to strengthen the knowledge and skill of our dealers' sprayers. This training occurs with dealers' actual equipment on actual spray jobs. You might very well notice Icynene Technical Support team members present on your Icynene spray job at your own home or business.
3. The spray foam industry as a whole has recently made great strides in the area of sprayer training with respect to the health and safety of all concerned: sprayers, sprayer helpers, home and building occupants, other construction trades, etc. Many training resources are now available.
4. Finally, Icynene is unique in the spray foam industry in that we sell only and directly to certified Icynene dealers who have been trained and approved directly by Icynene. Unlike most of our competitors, we refuse to sell our products to non-approved contractors, nor do we sell through third-party distributors (who then can sell to untrained contractors or to anyone else). This company policy enables Icynene to tightly control the contractors who spray Icynene products.

What will my authorised Icynene contractor do to protect me and my family from any potential chemical exposure?

Two simple actions are all that is necessary to ensure you are not exposed to any potentially unsafe concentration of chemicals while the work is being performed or at any time thereafter:

1. Your Icynene dealer will make sure you know to vacate your home during spray application and for 24 hours after spraying is completed.
2. Your Icynene dealer will properly ventilate the spray area during and after the job.

All of Icynene's company literature, websites, technical data sheets, Safety Data Sheets, and internet/website videos communicate the requirement to vacate for 24 hours. Your Icynene dealer will tell you directly to vacate your home and will restrict access to the spray area via a physical barrier and job site signage. Finally, your Icynene dealer may refuse to perform the job if anyone refuses to vacate the home in accordance with his instructions.

What do various government agencies have to say about spray foam insulation?

Government agencies began studying spray foam insulation several years ago because of their general interest in isocyanates, which is the chemical family that includes MDI. Their view is that personal protective equipment should be worn by applicators of spray foam insulation. They have not expressed concern about the safety of spray foam insulation once it is fully cured. Icynene has worked for several years directly with EPA, OSHA, and the American Chemistry Council to develop industry guidelines and regulations for the safe handling of MDI.

Which third-party environmental or green building approvals do Icynene products have?

All Icynene products have been third-party tested and shown to meet the requirements of the International Code Council-Evaluation Service (ICC-ES) and carry publicly-available ICC-ES evaluation reports. Furthermore Icynene in Europe is "A+" certified for VOC emissions, the highest possible ranking for the industry. All Icynene products sold in Canada have been third-party tested and shown to meet the requirements of the Canadian Construction Materials Centre (CCMC) and carry the publicly-available, appropriate listing or evaluation report.



In terms of chemical exposure, off-gassing, and Volatile Organic Compounds (VOC) emissions, all Icynene products meet the very stringent requirements of the California Collaborative for High Performance Schools (acceptable for use in the construction of both schools and offices), as well as the requirements of the Canadian national standard for VOC emissions for spray foam insulation, CAN/ULC S774.

In addition, all Icynene products qualify for the highest point ratings of any insulation type under the United

States Green Buildings Council (USGBC) LEED Program, the UK Green Building Council (UKGBC) and the Green Certification Program of the National Association of Home Builders (NAHB). Some Icynene products also have USDA Bio-Preferred Status.

Are all brands of spray foam insulation basically the same, in terms of chemical make-up and potential exposure to chemicals?

The fundamental building blocks of polyurethane spray foam insulation are similar and represent a different and newer technology than older foams, such as urea-formaldehyde foam. However, the selection of the specific raw materials in a polyurethane spray foam's formulation (the polyols, catalysts, surfactants, blowing agents, etc.) can influence things like odor, emissions, etc. You can be certain Icynene has developed its product formulations with health and safety as its highest priorities. In fact, Icynene spray foam is generally more expensive than other brands because the high quality and the superior health and safety performance of its products require more expensive raw materials.

How many successful home and building insulation projects have been completed using Icynene spray foam insulation?

Icynene spray foam insulation products have been successfully installed in more than 400,000 homes and buildings over more than 26 years. Our list of happy customers is very, very long!

Visit **icynene.co.uk** or **icynene.eu** to learn more about Icynene's portfolio of H₂Foam open and closed cell spray foam insulation products.

For the most current product information, please consult the Icynene website. Icynene is a registered trademark of Icynene Inc.

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