



FIBERGLAS™ Insulation Solutions vs. Spray Polyurethane Foam Insulation

Know the facts before you insulate



www.insulatewithintegrity.com



An investment you can trust.

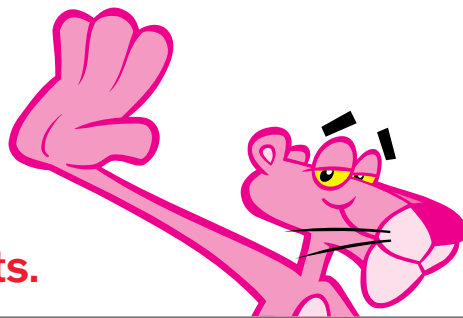
For more than 70 years, Owens Corning has been committed to providing quality building solutions that meet the needs of the contractors and builders who work with our products, as well as the expectations of the homeowners who live with them day in and day out. We believe in performance that provides greater energy efficiency and comfort without sacrificing safety, sustainability and cost. As the building materials industry advances, it's important to thoroughly test materials and installation procedures.

Spray Polyurethane Foam (SPF) is a manufactured-on-site form of building insulation that has gained some acceptance in recent years. SPF is typically composed of two chemical components that, when combined in prescribed ratios by a properly trained and protected installer, can be an effective insulator. SPF is also available in two varieties — open cell and closed cell — each with specific installation requirements and/or performance attributes that make them more or less suitable for home applications. Due to its lower price point, open cell Spray Polyurethane Foam is used much more frequently than closed cell, although installed prices for both variants are typically higher than that of fiberglass insulation.

In this brochure, we will examine the characteristics of Owens Corning® PINK® FIBERGLAS™ insulation and open and closed cell Spray Polyurethane Foam insulation in five critical areas that impact quality of life and the value of a home over time: Safety, Performance, Installation, Environmental Impact and Accountability. We believe that after reading the facts, you will conclude that Owens Corning® PINK® FIBERGLAS™ blanket and loosefill insulation offers a better choice over both types of Spray Polyurethane Foam and thus is the right investment.

Take a look for yourself as we share the facts. Citations are found at the bottom of each page and on www.insulatewithintegrity.com, where there is additional information on this topic.

STOP!
Before you
consider SPF,
consider the facts.



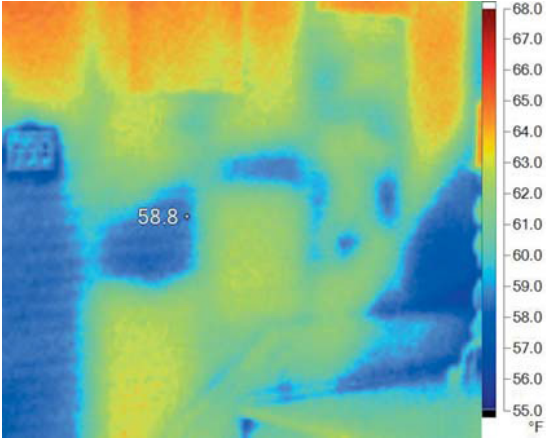
- SPF is manufactured on site and its performance is **highly dependent on properly trained installers**.
- SPF creates the **potential for moisture buildup**, a common cause of wood-based building failures.
- SPF **cannot provide a complete air-sealing solution** and does not seal the top or bottom plate.
- SPF **lengthens the build cycle** due to increased health risks for other trades during installation.
- SPF **costs more to install** with no performance increase over other air-sealing and insulation systems.

PERFORMANCE

Spray Polyurethane Foam entered the residential building industry as both an insulator and an early air-sealing solution. However, recent advancements in building science, along with Owens Corning's groundbreaking air-sealing study¹, provide a better understanding of the impact air leakage has on a home's performance. It is now known that most air leakage occurs where components are joined, not in framing cavities where most insulation is installed. Extensive research shows that once a building is sealed, R-value, not insulation type, is all that matters for thermal performance.² Owens Corning understands that insulating and air sealing are two separate concerns that require dedicated solutions. SPF is only a partial solution that adds cost.



Owens Corning® PINK® Insulation solutions allow installers to meet specific R-value performance targets.



SPF, when improperly installed or left to undertrained installers, often will not perform to expectations. Blue areas in this thermographic image indicate underinsulation. [Photo credit: thermal-inspection.net]

Fiberglass Insulation Solutions	PERFORMANCE CATEGORIES	SPF Insulation
<div>✓</div> <p>Product quality is managed by Owens Corning during manufacture in a controlled environment with frequent quality control checks.</p> <p>Fiberglass insulation is easily inspected to ensure performance.</p>	Thermal Performance	<div>✓</div> <p>Installed in a properly sealed building, SPF can deliver intended R-value and thermal performance.²</p> <p>However... Shrinkage occurs when SPF has been incorrectly manufactured at the job site and/or installed while framing lumber is wet, a real-world condition in the new home construction process. This shrinkage creates gaps in the building envelope, compromising thermal performance and increasing the potential for thermal convection looping and moisture damage.³</p> <p>SPF advocates often claim credit for air sealing as a way to offset insulating to the full R-value. However, building science does not support these claims.²</p>
<div>✓</div> <p>Experiments and analysis continually provide data confirming that PINK® FIBERGLAS™ outperforms SPF in similar conditions.</p> <p>Historical data shows that buildings insulated with fiberglass are resistant to moisture issues.</p>		<div>?</div> <p>Building failures have occurred in wall system experiments. Moisture management is an emerging problem tied to the use of SPF that has been known to contribute to structural damage. Guidance for proper use of SPF is not available for all climate zones.⁴</p> <p>OSB and plywood manufacturers, as well as the Engineered Wood Association, are beginning to provide recommendations to avoid the use of SPF under roof decks or adopt moisture management construction methods that are expensive and challenging to build.⁵</p>
<div>✓</div> <p>EcoTouch® Insulation paired with EnergyComplete® Sealant meets R-value targets while sealing the most critical air leakage points in a home.⁶</p> <p>The most important leaks are best sealed with a gasketing material. EnergyComplete® Sealant is an air-sealing solution that creates a gasket to reduce both air leakage and noise penetration.</p>		<div>✗</div> <p>While SPF is often marketed as a dual solution that can provide air sealing and insulation, it leaves many sources of air leaks unsealed and therefore is not a complete air-sealing solution.²</p> <p>SPF does not form a gasket.</p>
	Moisture Control	
	Air Sealing	

1. Source: https://www.highperformancebuildingexchange.com/system/redactor_assets/documents/26/Air_Sealing_Study.pdf

2. Source: http://www.buildingscience.com/documents/special/content/thermal-metric/BSCThermalMetricSummaryReport_20131021.pdf

3. Source: http://web.ornl.gov/sci/buildings/2016/2010%20B11%20papers/129_Yuan.pdf

4. Source: http://products.royomartin.com/sites/default/files/productdocs/disclaimer_for_undersheathing_spray-foam_application.pdf

5. Source: <http://ocenergycomplete.com/docs/literature/EnergyComplete%20White%20Paper%20>

6. Source: <http://ocenergycomplete.com/docs/literature/EnergyComplete%20White%20Paper%20>

INSTALLATION

Owens Corning understands the building industry and the importance of maintaining a production schedule. For us, simplicity matters because it matters to contractors and builders. Our PINK® FIBERGLAS™ Insulation products come to the job site ready to install, with no mixing or complicated equipment required.



Owens Corning® EcoTouch® Insulation installs safely and easily without the need for extensive safety equipment. Other trades can continue to work during installation.



NIOSH recommends that SPF installers wear extensive personal protective equipment including full-face supplied-air respirators and chemical protective clothing during installation.¹ The home must be quarantined for up to 72 hrs.³

Fiberglass Insulation Solutions	INSTALLATION CATEGORIES	SPF Insulation
✓ No risk of chemical exposure. Minimal off-shelf protective gear is needed.	Worksite Management	✗ The National Institute for Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) recommend that SPF installers wear extensive personal protective equipment, including full-face supplied air respirators and chemical protective clothing, during installation. ¹
✓ Owens Corning provides training materials to our network of installers and the industry to ensure product performance and the highest level — Grade 1 — installations.	Application Training	? OSHA strongly recommends that SPF installers be trained due to the potential exposure to hazardous chemicals and the associated risks. ² Initial training lasts from 5 to 7 days and can be quite costly.
✓ No one is required to leave or stay away from the job site when installing Owens Corning® products. Drywall can be installed immediately with no wait time.	Build-Cycle Management	✗ The health risks associated with Spray Polyurethane Foam chemical exposure require that other trades vacate the job site during installation and for up to 24 hours after. ³ Drywall installers often must spend additional time removing overspray from framing prior to drywall installation.

1. Source: <http://www.epa.gov/saferchoice/health-concerns-about-spray-polyurethane-foam>
http://www.epa.gov/dfe/spf_presentation_2009_epa_osh_niosh_cpssc.pdf
2. Source: <http://www.sprayfoam.org/files/docs/2011/Agency%20Report%20-%20NIOSH.pdf>
3. Source: <http://www.epa.gov/saferchoice/health-concerns-about-spray-polyurethane-foam>

SAFETY

Owens Corning takes safety seriously. We believe that further research is needed to define the safe use of Spray Polyurethane Foam chemicals. The job-site manufacturing process of SPF includes many variables. If those variables are altered, outcomes can be affected. OSHA, NIOSH and the EPA have voiced concerns about worker and job-site safety, as well as concerns about the health effects of SPF.¹ We believe safety must come first.



The High Performance Conditioned Attic System requires minimal protective equipment and no heavy equipment.



SPF installers must wear extensive personal protective equipment and be fully trained.

Fiberglass Insulation Solutions	SAFETY CATEGORIES	SPF Insulation
<div>✓</div> <p>Owens Corning controls the manufacturing process — and quality control — of its PINK® FIBERGLAS® insulation.</p>	Manufacturing Process	<div>✗</div> <p>Job-site manufacturing puts an extreme burden on the SPF installer to avoid increased emissions and exposure to Volatile Organic Compounds (VOCs).²</p> <p>Installers must wear extensive personal protective equipment, including full-face supplied-air respirators and chemical protective clothing, to protect against emissions.³</p>
<div>✓</div> <p>Owens Corning® products are easy to install and do not cause health concerns for installers, other on-site workers or homeowners. There is no emission risk and fiberglass is not combustible.</p>	Fire/ Combustibility	<div>✗</div> <p>Firefighting organizations are expressing concerns about the ignition and fire-spread hazards associated with SPF.⁴</p> <p>Because closed cell SPF cures via exothermic reaction, it must be built up in a series of less than 2" thick layers that must fully cure before the next layer is applied. Rushing this process traps heat generated during the curing process and has resulted in charring and self-ignition within the framing cavity.⁵</p> <p>The Smoke Development Index (SDI) of unfaced Owens Corning® EcoTouch® Insulation is zero, as compared to Spray Polyurethane Foam with a typical SDI rating of less than 450.</p>
<div>✓</div> <p>Fiberglass poses no risk of harmful off-gassing.</p>	Off-Gassing/ Indoor Air Quality	<div>?</div> <p>•Articles found on sprayfoamsafety.com recognize the need for further investigation into off-gassing.</p> <p>•"The potential for off-gassing of volatile chemicals from Spray Polyurethane Foam is not fully understood and is an area where more research is needed."⁶</p> <p>•EcoTouch insulation (unfaced) has been assessed by for Material Health impact and received a Gold rating Material Health Certification and is fully optimized for impact on human health.⁷</p>

Colors represent Owens Corning's assessments of the facts presented.

1 Source: https://www.osha.gov/dep/greenjobs/spf_chemical.html

2 Source: <http://www.epa.gov/saferchoice/health-concerns-about-spray-polyurethane-foam>

3 Source: <http://www.epa.gov/saferchoice/health-concerns-about-spray-polyurethane-foam>

4 Source: <http://www.firemarshalsarchives.org/pdf/FireSafetyGreenBuildingHiResFINALv3sec.pdf>

5 Source: <http://www.volatiliefree.com/pdfs/product-data/VFI-714.pdf>

6 Source: <http://www.epa.gov/saferchoice/health-concerns-about-spray-polyurethane-foam>

7 Source: <https://www.owenscorning.com/ocbuildingspec/hotTopics.html#sustainability>

ENVIRONMENTAL IMPACT

Owens Corning's commitment to environmental sustainability, in our operations and our products, is aggressive and among the best in the industry. We are committed to meeting the needs of our industry to achieve higher performing homes that are energy efficient, comfortable, durable and sustainable. We call this "Green Without Compromise."



For the sixth year in a row, Owens Corning has earned placement in the Dow Jones Sustainability World Index in recognition of its sustainability initiatives. This year, Owens Corning was again named the Industry Leader for the DJSI World Building Products



Approximately one-fifth of the material used in a typical open cell SPF job is waste that goes to a landfill.²

THIRD PARTY VALIDATION

EcoTouch® PINK® FIBERGLAS™ Insulation Solutions



UL
GREENGUARD
PRODUCT CERTIFIED FOR
LOW CHEMICAL EMISSIONS
UL.COM/CGC
12.2012
GOLD



CERTIFIED
RECYCLED CONTENT
FOR
RESIDENTIAL SERVICE
AVERAGE 55% RECYCLED CONTENT
18% PRE-CONSUMER
37% POST-CONSUMER



Home Innovation
NGBS GREEN CERTIFIED™



USDA
CERTIFIED
BIOBASED
PRODUCT
PRODUCT 57%



Seal and
Insulate
with
ENERGY STAR
LEARN MORE AT
energystar.gov

Fiberglass Insulation Solutions	ENVIRONMENTAL CATEGORIES	SPF Insulation
<div>✓</div> <p>EcoTouch® is a new class of high-performance insulation made with a minimum of 55% total recycled content (37% post-consumer recycled content). It is GreenGuard Gold Certified and formaldehyde-free.</p>	Product Composition	<div>✗</div> <p>The majority of SPF products are synthetic chemical-based, including di-isocyanates, flame retardants, surfactants, and catalysts to name some of the types of chemicals.</p>
<div>✓</div> <p>Life Cycle Assessment (LCA) and Environmental Product Declarations (EPD) verified data show that Owens Corning® EcoTouch® Insulation has a lower embodied primary energy and global warming potential than SPF formulations. They also show PINK® FIBERGLAS™ batts and loosefill insulation consistently perform better than SPF in acidification, smog and ozone depletion measurements.</p>		<div>✗</div> <p>Open cell SPF embodied energy is 3 times higher than Owens Corning® EcoTouch® unfaced Insulation, and its Global Warming Potential is 2 times higher.¹</p> <p>The Embodied Energy of closed cell SPF is 14 times higher than Owens Corning® EcoTouch® Insulation, and its Global Warming Potential is 55 times higher.¹</p> <p>Approximately one-fifth of the material used in a typical open cell SPF job is waste that goes to a landfill.²</p>
<div>✓</div> <p>The details and environmental impact of Owens Corning® processes and product makeup are well-documented in Life Cycle Assessment and Environmental Product Declarations (EPDs).⁴ EPDs are on file and online. Results have been peer-reviewed and verified by ULEnvironment. Owens Corning published the North American fiberglass insulation industry's first EPD in 2012.</p>	Life Cycle	<div>?</div> <p>A generic SPF industry Life Cycle Assessment is on file and online. Results have been third-party verified and peer-reviewed.⁴ To date, individual manufacturer Environmental Product Declarations are not available.</p>

1. Source: http://www.epa.gov/dfe/spf_presentation_2009_epa_osh_niosh_cpssc.pdf
http://www.epa.gov/dfe/pubs/projects/spf/health_concerns_associated_with_chemicals_in_spray_polyurethane_foam_products.html
<http://www.sprayfoam.org/files/docs/2011/Agency%20Report%20-%20NIOSH.pdf>
http://www.epa.gov/dfe/pubs/projects/spf/exposure_potential.html

2. Source: <http://www.sprayfoam.org/files/docs/2011/Agency%20Report%20-%20NIOSH.pdf>
3. Source: http://www.epa.gov/dfe/pubs/projects/spf/when_is_it_safe_to_re-enter_after_spf_installation.html
<http://www.sprayfoam.org/files/docs/2011/Agency%20Report%20-%20NIOSH.pdf>
4. Source: <http://www.owenscorning.com/ocbuildingspec/sustainBuildScience.html>

ACCOUNTABILITY

Owens Corning controls the quality and performance of our products from design through manufacturing, and we maintain a close relationship with builders, contractors and consumers. We proudly stand behind every product we manufacture and sell and fully support the people who install them.



A complete wall insulating system featuring ProPink® L77 Loosefill Insulation, ProPink Complete™ Fabric and the Inspect-R® Gauge, which allow you to dial in the exact R-value you need for the job.



OSB and plywood manufacturers, as well as the Engineered Wood Association, are beginning to provide recommendations to avoid the use of SPF under roof decks due to rot. (Photo credit: The Florida Roofing, Sheet Metal, and Air Conditioning Contractors Association)

Fiberglass Insulation Solutions		ACCOUNTABILITY CATEGORIES	SPF Insulation
✓	Product Stewardship	Product Stewardship	✗
Fiberglass wool is among the most studied materials, and the International Agency for Research on Cancer, the National Toxicology Program and California Prop 65 do not consider that fiberglass wool causes cancer in humans.			Organizations such as OSHA, NIOSH and the EPA have expressed concerns about worker and job-site safety, as well as health effects of spray polyurethane foam. ¹
✓			✗
Owens Corning is committed to quality from manufacture through installation. Our PINK® FIBERGLAS® products minimize field failure issues.	Install Standards	Install Standards	SPF must be manufactured at the job site, typically using a truck-mounted rig with several pieces of equipment. Failures related to improper field manufacturing are well-documented. Surface conditions, equipment, operator skill and weather all tend to alter product performance. ²
✓			?
None.	Product Liability	Product Liability	Leading environmental, safety, health and building product manufacturer organizations have raised concerns over the use of Spray Polyurethane Foam in the built environment.

1. Source: https://www.osha.gov/dep/greenjobs/spf_chemical.html
<http://www.epa.gov/saferchoice/spray-polyurethane-foam-spf-insulation-and-how-use-it-more-safely>
2. Source: <http://www.volatilerefrees.com/pdfs/product-data/VFI-714.pdf>
Spray Polyurethane Foam Uses in Modern Building Construction Applications and Limitations: The perspective of a system failure investigator. Build Boston, 2010. Ned Lyon, Simpson Gumpertz & Heger



Choose performance over perception.

Know the facts before you insulate

In the end, there's one simple reason that we at Owens Corning recommend PINK® FIBERGLAS™ solutions over Spray Polyurethane Foam: It works. We've built our reputation on knowing how it works, where it works best and what's important to builders, contractors, businesses and homeowners. And we're just as concerned about performance as we are about safety, reliability and sustainability. We are often asked, "Why isn't Owens Corning in the SPF business?" Now you know.

To stay informed, go to www.InsulateWithIntegrity.com.



OWENS CORNING INSULATING SYSTEMS, LLC

ONE OWENS CORNING PARKWAY
TOLEDO, OHIO, USA 43659

1-800-GET-PINK®
www.owenscorning.com

Pub No. 10018869-D. Printed in U.S.A. December 2015. THE PINK PANTHER™ & © 1964–2016 Metro-Goldwyn-Mayer Studios Inc. All Rights Reserved. The color PINK is a registered trademark of Owens Corning. © 2016 Owens Corning. All Rights Reserved.
Energy Star and the Energy Star logo are registered trademarks of the Environmental Protection Agency. The GREENGUARD INDOOR AIR QUALITY CERTIFIED Mark is a registered certification mark used under license through GREENGUARD Environmental Institute. Patents Pending.