

Counting Carbon: Low Global Warming Potential Blowing Agents for Closed-Cell Spray Foam

Blowing Agent Regulations to Reduce Global Warming

The 2003 regulations initiating a transition to HFC blowing agents with zero ODP (ozone depletion potential) for closed-cell SPF did not address the issue of carbon footprint. To address GWP (global warming potential), blowing agent manufacturers soon began development of low-GWP products. In 2014, the first low-GWP foam using HFO technology was commercially launched. Since 2014, every SPF manufacturer has launched low-GWP insulation and roofing spray foam products.

Despite a relaxation in US regulations proposed by the EPA, several US states and Canada have laws requiring the use low-GWP blowing agents starting 2020 or 2021. A summary is provided below.

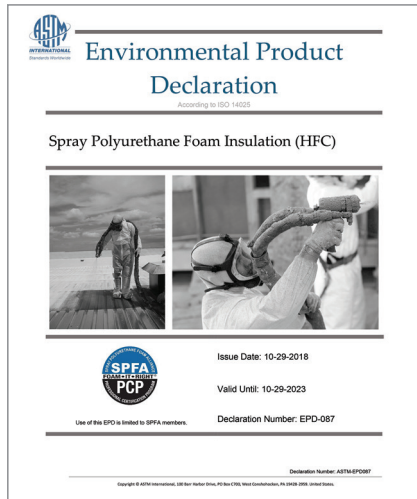
Other jurisdictions are developing similar legislation including Connecticut, Delaware, Hawaii, Maine, Nevada, Oregon, Pennsylvania, Rhode Island and Texas. For an up-to-date list of all legislative activities visit the American Chemistry Council’s Center for the Polyurethanes Industry website on State Phase-Down of HFCs in the Polyurethanes Industry <https://polyurethane.americanchemistry.com/State-Phase-Down-of-HFCs/>

HFO-Based Spray Foam Makes a Difference

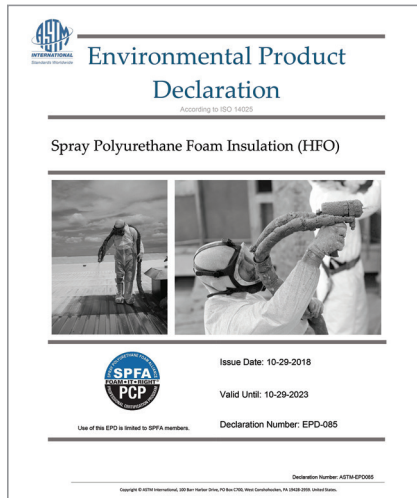
In 2018 the Spray Polyurethane Foam Alliance funded an update of their ISO-compliant, industry-wide life cycle assessment (LCA) and environmental product declaration (EPD). The updated LCA report is available on the SPFA website at <https://sprayfoam.org/sustainable> and the EPDs for both HFC and HFO based SPF products can be obtained from ASTM using the links provided.

Jurisdiction*	Date	Product Group
California	January 1, 2020	4
	January 1, 2021	5
Colorado	January 1, 2021	1
Maryland	January 1, 2021	2
	July 1, 2021	3
Massachusetts	January 1, 2021	1
New Jersey	July 1, 2020	4
	January 1, 2021	5
New York	January 1, 2021	1
Vermont	January 1, 2021	1
Washington	January 1, 2020	4
	January 1, 2021	5
Canada	January 1, 2021	1
Product Group		
1 All foam products		
2 All foam products except SPF		
3 All SPF		
4 All foam products except low-pressure, two-component SPF		
5 low-pressure, two component SPF		
<i>*Jurisdictions may have different regulations regarding labeling, recordkeeping and sell-through periods.</i>		

Comparison of the two EPDs shows that using HFO-blowing agents reduce the carbon impact of SPF by about 80%. For medium-density closed-cell SPF insulation HFO blowing agents reduce GWP from 20.2 to 4.2 kg CO₂-eq. Similar comparison of HFO vs HFC-based roofing foams show that GWP is reduced from 26.5 to 5.0 kg CO₂-eq.

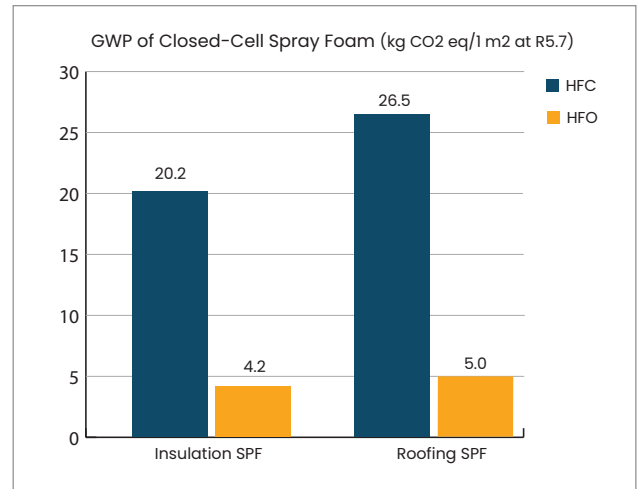


For HFC-based SPF:
https://www.astm.org/CERTIFICATION/DOCS/450.EPD_for_SPFA_EP_D_20181029_HFC.pdf

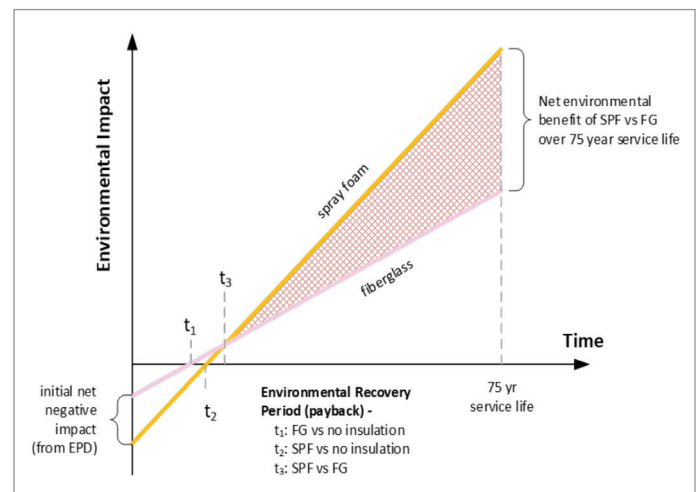


For HFO-based SPF
https://www.astm.org/CERTIFICATION/DOCS/451.EPD_for_SPFA_EP_D_20181029_HFO_excl_2K-LP.pdf

A use-phase study of medium density closed-cell SPF with low-GWP HFO blowing agents show that within a few years after installation SPF insulated homes will have a lower net carbon impact than fiberglass insulated homes. Beyond this environmental impact recovery period, shown as t₃ below, the net environmental impact (carbon footprint) of SPF over the insulation's 75-year service life can make a significant difference. A copy of this report can be found at <https://sprayfoam.org/sustainable>.



Closed-cell spray foam insulation and roofing products using HFO blowing agents do make a difference!



www.sprayfoam.org

About the SPFA

Founded in 1987, the Spray Polyurethane Foam Alliance (SPFA) is the voice, and educational and technical resource for the spray polyurethane foam industry. The Alliance is a 501(c)6 trade association comprised of contractors, manufacturers, and distributors of polyurethane foam, related equipment, and protective coatings, inspections, surface preparations, and other services. The organization supports the best practices and the growth of the industry through a number of core initiatives, including: educational programs and events; a Professional Certification Program; technical services and publications; federal and state advocacy; and networking opportunities.