

Polar Insulation Foam Panel Products

Product Name	% Post-industrial Recycled Content	R-value (RSI)	Density lbs/ft ³ (kg/m ³)	Dimensions	Use
PolarR10	60+	10 [1.76]	2 [32]	2 1/3" x 2' x 8' (T&G)	Foundation (exterior)
PolarGuard	40-50	3.85 [0.68]	1 [16]	1" & 2" x 2' x 8' and 4' x 8'	Foundation/Basement Under Siding
Polar HouseWrap (foil-faced)	0	3.3 [0.58]	1 [16]	3/4" x 2' x 4' (fanfold) (3/8" & 1/2" available)	Airseal (new & retrofit)

Polar Industries of Prospect, Connecticut, manufactures a line of rigid foam insulation building products using recycled expanded polystyrene (EPS). EPS scrap from Polar building product and packaging plant operations, as well as waste material from some of their higher-volume customers, is used in a customized manufacturing process Polar describes as “pulfusion,” a hybrid expansion/extrusion technology. Paul Greenhalgh of Polar Industries explains: “Normally, recycling EPS generates a product with hard spots and irregularities; they don’t necessarily affect the material’s performance, but the product appearance and difficulties in cutting can make it a tough sell.” The pulfusion process Polar has perfected permits recycled content up to just over 60%, depending on the type of product and board thickness (see table).



Photo: Polar Industries, Inc.

EPS packaging returned from Polar customer Ethan Allen is fed into a milling machine for recycling. Up to 30% of Polar’s recycled content comes as takeback from its customers.

Betsy Steiner, Executive Director of the EPS Molders Association, puts the Polar Insulation recycling capability in perspective. She states that, in packaging, a recycled content of 25% is not unheard of, but, in building products, performance requirements of the foam normally limit recycled content to a maximum of 10%. “Polar Insulation’s achievement of a 60% recycled content in foam building products is remarkable and a credit to their efforts in developing the pulfusion technology,” said Steiner.

Perhaps the most interesting aspect of Polar’s exceptionally high recycled content is the fact that they take no credit for it in the marketplace. According to Greenhalgh, there are two reasons. First, in the very competitive EPS market, it is not unheard of for competitors to portray recycled

content as lower-quality product, regardless of what quality tests the product may pass. Second, the technical definitions can be ambiguous about whether waste generated and then recycled within the same facility is considered recycled content at all. So, while Polar Industries has a waste diversion content in its building products up to 50% *more* than its competitors, its “recycled content” is uncertain.

Another environmental distinction for Polar Industries is its use of low-pentane EPS (See *EBN Vol. 4, No. 1*). “Our plants are in a serious non-attainment area under the Clean Air Act,” says Greenhalgh, “and we use 85 to 90% low-pentane EPS to keep our emissions as low as possible.” (Pentane is the blowing agent for EPS and does not contribute to global warming or ozone depletion—though it does contribute to smog.) Polar has been reluctant to pursue pentane recovery that could further reduce emissions, because recovery requires the handling of highly flammable concentrated pentane and because of industry reports on the development of a pentane-free EPS.

PolarR10 is designed to meet the R-10 (RSI 1.76) foundation insulation requirement in most building codes in the Northeast. The higher density and 2”-plus (>51 mm) thickness permits Polar’s highest recycled content. PolarGuard is designed for use on basement interiors with 1x3 strapping. The HouseWrap foam panel provides both air sealing and thermal insulation. Its fanfold configuration and 1/2-inch (13 mm) overlap tab are designed to control air leakage, and the patented grid system is designed for efficient cutting and fitting along roof lines and around windows and doors. The inherently high moisture permeability of the EPS foam is retained by tiny slits—64 per square inch (10/cm²)—in the reflective foil skins of Polar HouseWrap. Polar also manufactures a product for use under vinyl siding and a kraft-faced ventilation channel, although the profiles of these products do not permit any significant recycled content.

All of the foam products are treated with a brominated compound as a flame retardant, but *EBN* was not able to determine the exact chemical substance used, or the quantity. (A wide variety of brominated flame retardants are used in many building products, and their impact on health and the environment are poorly understood— *EBN* will be addressing flame retardants in a future issue.)

Polar Industries has chosen not to treat any of their foam products for insect resistance. “We used to use cedar oil to some extent in our foam products a number of years ago, but the marketplace does not seem to regard insect resistance in our distribution region as an issue,” says Greenhalgh. Polar Industries distributes its building products throughout the Northeast.