

FACT SHEET

FOAM GLASS: A 2ND LIFE FOR GLASS COLLECTED VIA CURBSIDE RECYCLING



MARKET OUTLETS FOR FOAM GLASS

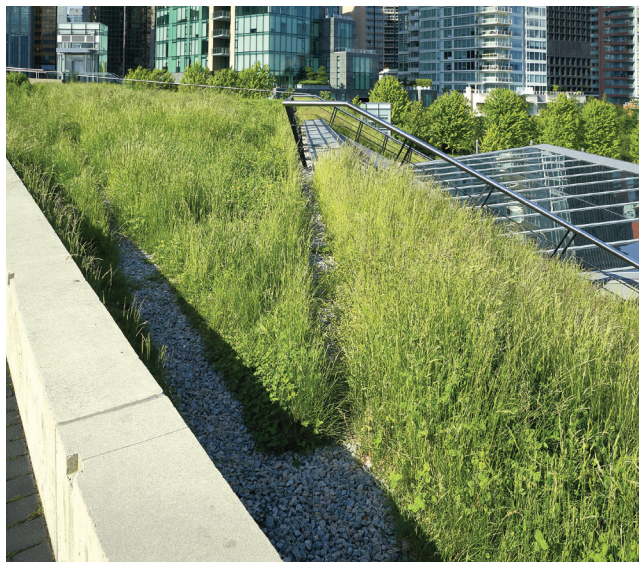
Foam glass is a “pumice stone” type of material composed of 95% recovered glass that is pre-sorted in sorting centres. The glass is reduced to a fine powder and mixed with a mineral additive, then cooked at high temperature, causing the particles to expand and capture thousands of gas bubbles. Light, hard-wearing, durable, fire-resistant with insulating properties, foam glass has been used in many European countries for the past thirty years and in many applications, especially in the construction sector. It is an ecological product with good value added.

TARGET MARKET AND POTENTIAL POOL OF CUSTOMERS

Currently, there are no foam glass producers in Quebec and only a few in North America. The product has considerable commercial potential and could benefit from proven marketing experience gained in Europe.

European producers mainly target the construction and landscaping markets, particularly for:

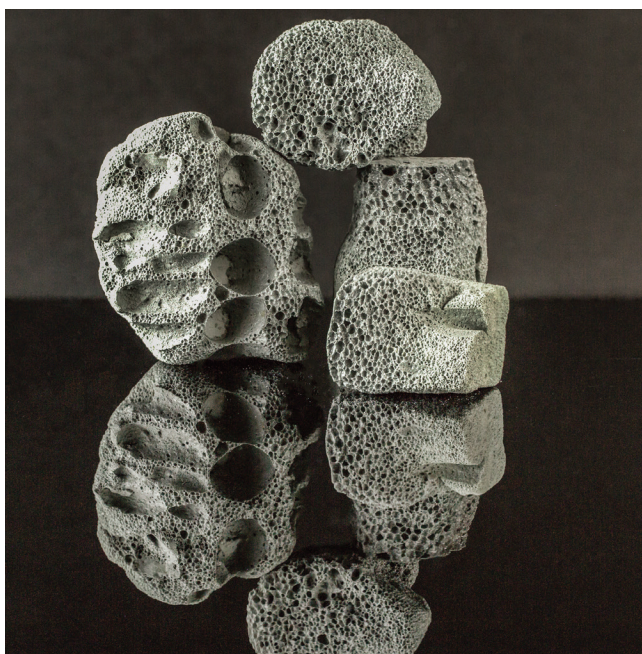
- Foundation and concrete wall insulation
- Ductwork, pipe and storage tank insulation
- Road or sports field sub-layers
- Green roof sub-layers
- Fill material for landscaping work



MARKET

Still very new in North America, this material presents a promising market for local businesses compared to Europe, where it is in its mature stage. There are foam glass manufacturing plants in many countries, including Switzerland, Germany, Sweden, Spain, the Czech Republic, Austria, Italy and Lithuania.

A typical plant produces between 30,000 t/year and 50,000 t/year of foam glass, and generates sales ranging from \$45 million to \$75 million per year¹.



COMPETING MATERIALS

- Fill materials (gravel, sand)
- Insulation materials (gravel, sand, expanded polystyrene)

MARKET FOR FOAM GLASS

The biggest markets for foam glass are the construction and landscaping sectors. In 2014, the construction industry alone accounted for \$45 billion in investments according to the Association de la construction du Québec (ACQ), which intimates the niche that foam glass can occupy in that market.

POSITIVE MARKET PENETRATION INDICATORS

- A mature market in Europe, but great potential in North America
- The product's properties provide competitive advantages:
 - Moisture resistant
 - Fire resistant
 - Thermal efficiency: the product does not absorb moisture
 - Dimensional stability: does not swell, warp, shrink or lose its shape
 - Highly resistant to compression
 - Light-weight product with drainage properties

¹ Amounts indicated are in Canadian dollars.

TECHNICAL CRITERIA AND CERTIFICATION

Currently, there are no standards for this product in North America or Europe. On the other hand, it is wise to seek out application-specific criteria in order to gain market share. For example, in the building sector, foam glass must meet Régie du bâtiment du Québec (RBQ) technical criteria for building green roofs.

Criteria vary according to the application, and include:

- Facilitates water drainage
- Reduces water absorption
- Resists crushing
- Reduces structural load
- Resists freezing and the freeze-thaw cycle

