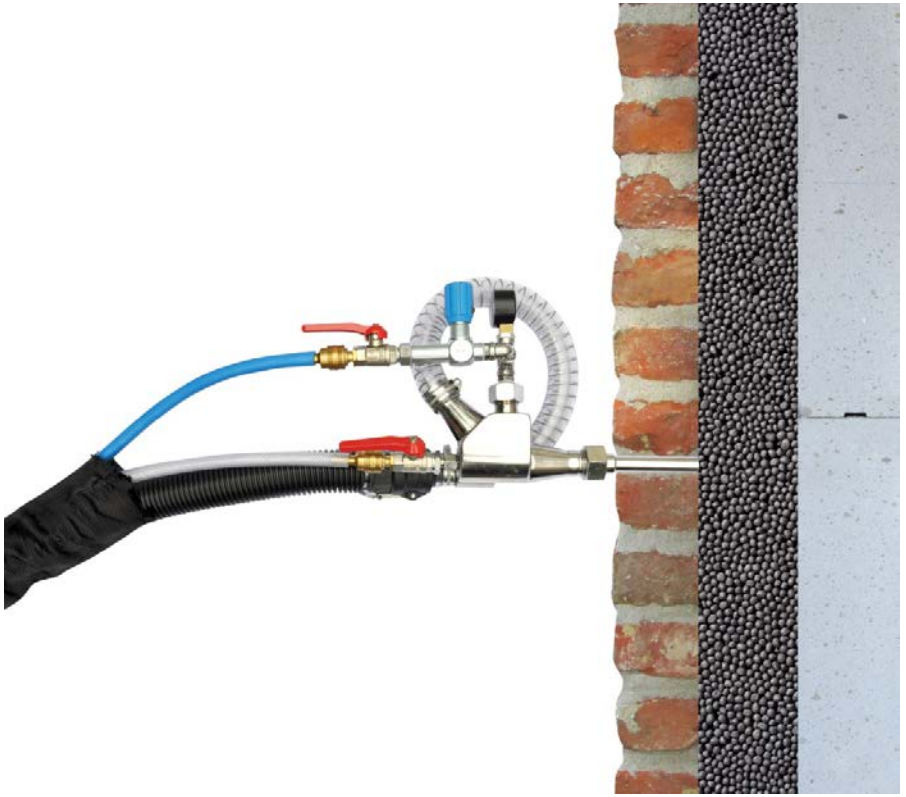
Carbon footprint of Neopixels Premium HR Insulation®

Executive summary[1]



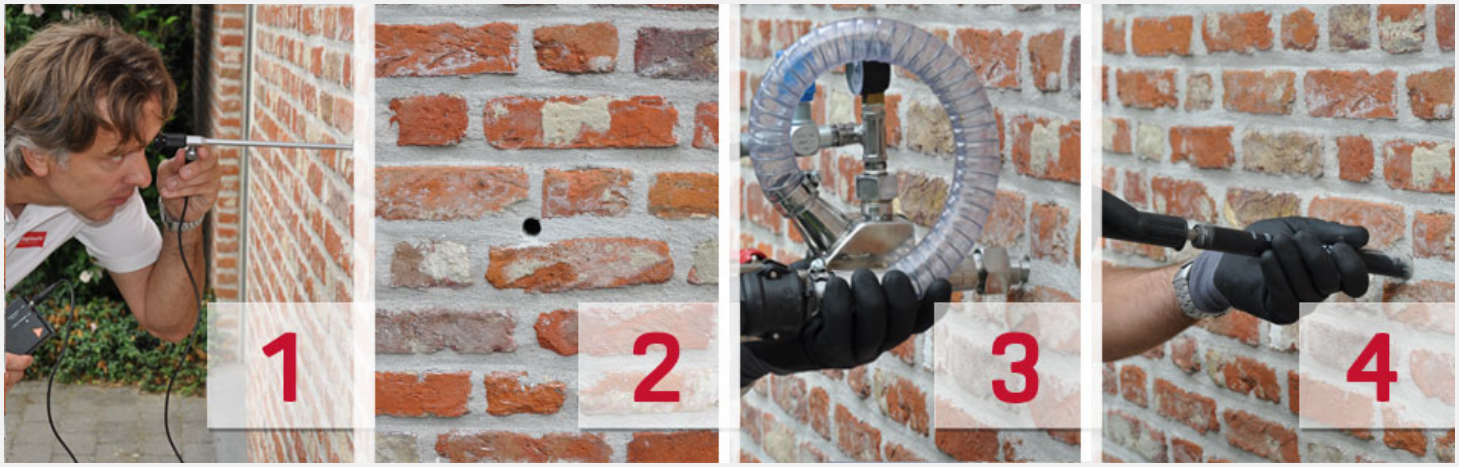
[1] In 2016 SGS INTRON estimated the carbon footprint of the application of Neopixels Premium HR Insulation. This sheet report summarizes the highlights of this study. A full report of the carbon footprint is included in SGS INTRON report A883320/R20160047 of 3-16-2016.

Introduction to Neopixels

Neopixels Insulation BV has developed Neopixels® Premium HR Insulation. This is a technology for applying cavity wall insulation into existing buildings. The technology relies on expanded polystyrene (EPS), more specifically BASF's NEOPOR®, blown into the cavity wall. As opposed to most traditional EPS cavity wall insulation for existing buildings, Neopixels® Premium HR Insulation also includes Neofixx binder which is used to "*glue*" the individual EPS pearls together. According to Neopixels Insulation BV, this ensures that the loose EPS pearls form a contiguous, solid EPS mass in the cavity wall.

The application of Neopixels:

1. Step 1 is inspection of the cavity wall;
2. Step 2 is drilling holes in the outer wall according to a predetermined grid (1 hole per m^2);
3. Step 3 is blowing the Neopixels and the Neofixx into the cavity wall using a specialized nozzle;
4. Step 4 is closing the holes with mortar.



Goal and scope of the study

By insulating dwellings, the overall energy use of the building is reduced by saving energy needed for heating. This results in lower greenhouse gas (GHG) emissions.

The goal of the carbon footprint study is to objectively and transparently estimate the release of GHG with the application of Neopixels® Premium HR into a building. Furthermore we estimate the reduction of GHG emissions by the energy saved during application.

Neopixels Insulation BV provided information on the life cycle of Neopixels® Premium HR insulation. SGS INTRON evaluated the usability of the data. Furthermore, since SGS INTRON has a vast experience with life cycle assessment (LCA) of building materials we selected the literature values of carbon footprint data for the underlying materials and processes. For this publicly available data from LCA databases were used.

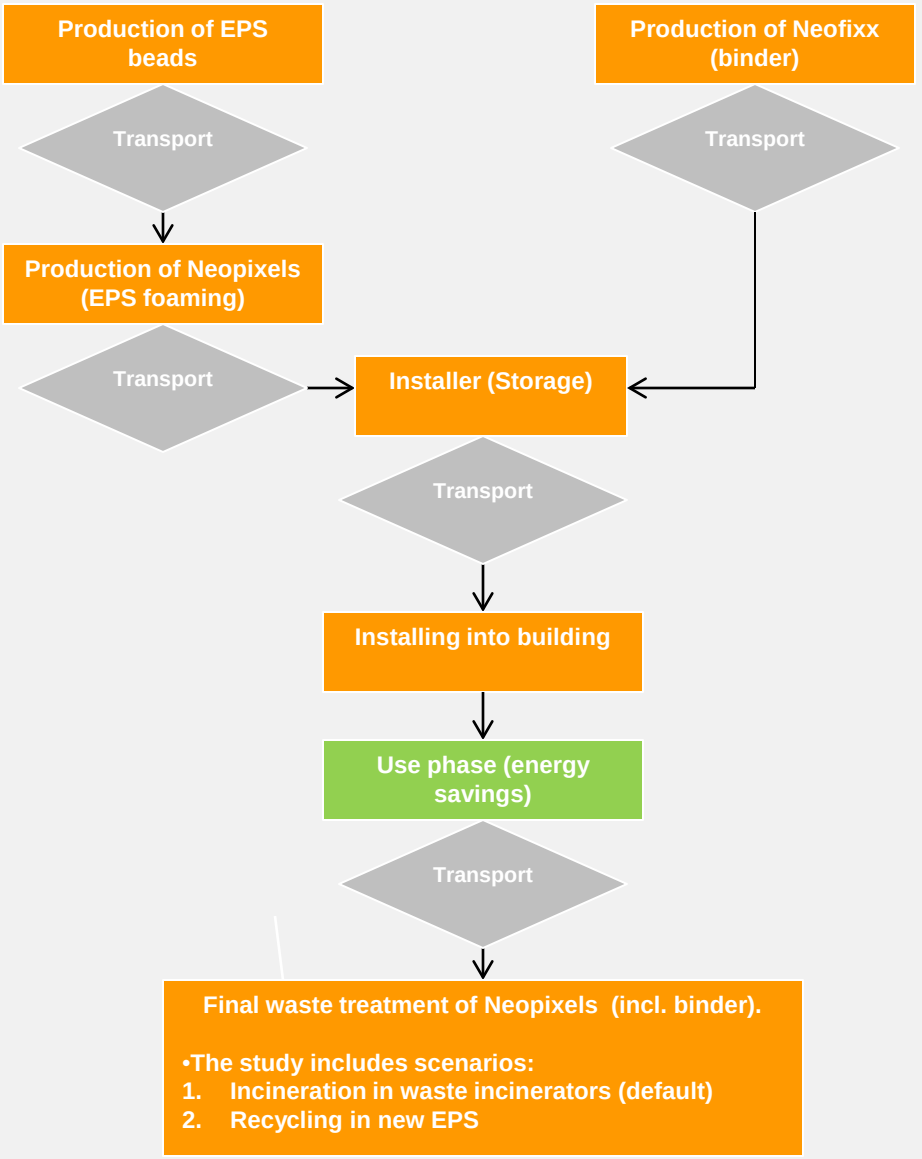
Limitations

In this study we thoroughly inventoried the life cycle of Neopixels® Premium HR insulation and carefully selected literature sources for all subsequent materials and processes. However, this study is not intended to fully comply with the LCA standards ISO 14040 and ISO 14044; furthermore a critical review from a third party was not included.

Reference

This sheet report only includes the highlights of the carbon footprint. All details of the study are included in SGS INTRON report ***A883320/R20160047 of 3-16-2016***

The life cycle of Neopixels



Conclusion

We observed that the production of EPS is the most important contributor to the overall GHG emissions. Other important contributors to the carbon footprint of Neopixels Premium HR Insulation® are the waste treatment scenario at the end of the life cycle of EPS and the service life of the Neopixels.

Employing two scenario's that consider EPS to be either largely incinerated or recycled in new EPS, and a service life of 50 and 75 years, we estimated that the GHG emission of applying Neopixels is exceeded by the avoided GHG emissions by a factor 150 to 340.

This means that on average, the break even point for the GHG emission is reached after 2.7 – 3.9 months after application of the Neopixels. During this period of application, the same amount of GHG emissions are saved, compared to the GHG emissions resulting from the other stages in the life cycle of the Neopixels.

Results

The results of the study are summarized in the table below (numbers in carbon dioxide equivalents (kg CO_2 eq.), negative numbers correspond to avoided emissions during the service life of the Neopixels:

Scenario *end-of-life*	Application into building + *end-of-life*	Savings in 50 years application (kg CO_2 eq.)*	Savings in 75 years application (kg CO_2 eq.)*	Conclusion
Incineration	910	-140000	-210000	Savings surplus emissions from application and final waste treatment 150 and 230 times (during 50 and 75 years of application respectively).
Recycling	620	-140000	-210000	Savings surplus emissions from application and final waste treatment 230 and 340 times (during 50 and 75 years of application respectively).

* The calculation of the of the natural gas use savings obviously is dependant on specific parameters like insulation thickness and the thermal resistance of the cavity wall. We calculated with an insulation thickness of 6 cm, according to Neopixels BV this is common cavity wall thickness in Dutch dwellings. At this insulation thickness the thermal resistance of the cavity wall is assumed to be 1.86 m^2K/W. This value is retrieved via the Website of Bureau CRG, Verified quality statement, code: 20120366GKBKUW (march 15, 2016).

Colophon

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