

Zukunft Bau

ABSTRACT STRUCTURE / OUTLINE

Title

Options for recycling the components of dismantled EIFS – from feeding the production loop for insulation materials or downcycling to produce lower-quality goods, to energy recovery

Reason / starting point

How we deal with waste and recover raw materials are among the most pertinent sociopolitical issues of our time. Bringing buildings into line with the latest energy efficiency standards means using vast amounts of EPS insulation. Carrying out alterations on these buildings or removing an EIFS produces waste EPS. Demonstrating ways of avoiding waste, of dismantling EIFS and of ecologically and economically reusing any waste produced will aid public acceptance of insulating with EIFS.

Subject of the research study

When a building is dismantled, the various products that went into it are generally treated as waste – and this is true also for a dismantled EIFS. Germany has a legal framework for waste management (Kreislaufwirtschaftsgesetz). As part of our study, we researched and compiled information on all laws and regulations governing the management of waste EPS. These place a great deal of emphasis on the language used to define what is a product and what is waste. Our study also indicated where these definitions may change should individual components be reclassified on account of potential health risks.

National and international regulations relating to potential scenarios for further use through doubling up, reuse, as well as all material and energy uses were examined in terms of how they affect EIFS and their final use. This concerns the transition from product to waste, which includes the relevant process steps, selective or partial selective dismantling, selection and classification processes, and utilization. These are looked at alongside the overriding protection aims and long-term political goals that could also affect how EIFS and EIFS components are handled at the end of their useful life.

Information presented in the study relating to waste generation in the construction industry is supported by secondary data provided by the German Federal Statistics Office (DESTATIS) and the company Consultic. Requests for information and interviews with waste management companies about waste quotas do not allow us to accurately determine the true extent of EIFS dismantling.

In addition to secondary data drawn from public sources, the study looked at information provided by trade associations (FV-WDVS and IVH) as well as manufacturers (EJOT Baubefestigungen GmbH, Oberschleißheim). The accuracy of the waste data collected was assessed and, where possible, several sources were compared. Waste data was compared against production data. Any missing data, for example on the amount of EIFS dismantled, were estimated based on the available production and waste data. The information collected was then used to compile future dismantling forecasts, taking into account the amount of EPS both from EIFS and in total.

The levels of waste from EIFS indicated have an impact on which recycling method is selected from a technical, environmental and economic viewpoint. Arranging the individual process steps – such as dismantling, separating and utilizing – into a process chain that makes ecological and economic sense hinges on knowing what mass flow rates to expect. These were determined by first looking at established dismantling techniques in use and then considering decoating techniques in other sectors, such as those used in the paint and wood industries to separate material compounds.

In addition to established utilization techniques (tapping EPS for materials and energy), other techniques were considered that, although not yet established, are expected to be able to make the transition from pilot-plant to industrial scale. The primary focus here was on techniques that also permit hexabromocyclododecane (HBCD), a flame retardant, to be discharged safely and that offer an alternative to using materials for energy.

The study collated examples of practical attempts to dismantle EIFS using established manual and mechanical techniques. These ranged from partial selective dismantling of EIFS at construction sites – where the entire material compound is detached from the building envelope – to selective techniques conducted at Fraunhofer IBP. The latter method involves removing the individual layers of the EIFS one at a time.

Conclusion

Levels of waste EPS accumulating from EIFS are currently low, but will increase in the decades to come. Since no statistical record is being kept, reliable data does not exist. This means that forecasts are met with considerable skepticism and tend to be worst-case scenarios. Until alternative utilization techniques are established that mitigate the dangers of discharging HBCD, we should continue to rely on using materials for energy recovery. Germany has made it a priority to avoid waste and recommends doubling up existing EIFS. This calls for positive labelling of HBCD-free EPS insulation to make it clearly distinguishable..

Key information

Brief title:

Dismantling and reusing EIFS

Researchers / project management:

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210,000 euros

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105,000 euros

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IMAGES/ ILLUSTRATIONS:
