Position Paper

EUROPEAN DIISOCYANATE & POLYOL PRODUCERS ASSOCIATION

Best Practice for Recovering Polyurethane Rigid Foam from Construction & Demolition Waste

1. Polyurethane rigid (PUR) foam for thermal insulation – eco-efficiency throughout its whole life cycle

PUR foam is utilised in the construction industry because it is one of the most efficient materials available for thermal insulation. It is used to insulate, for example, in roofs, in walls and floors in a wide range of buildings. The foam is extremely durable: it fulfils its function as long as the building "lives". PUR foamhas a useful life of 50 years and more, during which it saves at least 100 times more energy than the fossil fuel used to produce it in the first place. In addition, during that same period, emissions into air due to fossil fuel use will be minimised.

The recovery of PUR foam from demolition waste demonstrates how savings of resources can be optimised. With the earth's energy resources being continuously depleted, energy recovery from PUR foam has a role to play. PUR foam has an energy content comparable to that of coal, recovering it at the end of the foam's useful life means increasing its energy efficiency by a significant amount. By use of up to date incineration processes, demands for safety, protection of health and environment are met.

2. Energy recovery of PUR foam: MSW incineration approved by the parties to the Montreal Protocol

Energy recovery is also the best available technology for the destruction of old foam, since it ensures that insulation gases, still contained in the foam, are dealt with in the most environmentally beneficial way.

Most historical PUR foam in demolition waste still contains CFCs or HCFCs, which have been used in the past as blowing agents and insulation gases. Such gases must be destroyed efficiently in order to prevent their release into the atmosphere. Indeed, EU Regulation 2037/2000 requires their recovery for destruction or recycling if practicable. Since the composition of old foam often is no longer known, it should not be physically recycled, but should be incinerated together with municipal solid waste (MSW). This ensures that the insulation gases are effectively destroyed. The Parties to the Montreal Protocol approve MSW combustion as a destruction technology for ozone-depleting substances.

Importantly, it has been demonstrated that the very low emissions from modern MSW combustion plants are not increased by the presence of PUR foams. Equally importantly, this holds true, if they contain halogens or not.

It is not advisable to attempt to separate the insulation gases from the foam, because a significant part will remain dissolved in the matrix. Additionally the destruction efficiency of the insulation gases in the foam is better than in the gas phase.

Furthermore, recovery of the gases for destruction - as pre-treatment for foam recycling processes - results in higher losses of gases to the atmosphere, and therefore should be avoided. Recycling of PUR foams that are 50 years old (or even older) is problematic anyway, since details on the composition are virtually impossible to find. This does not allow for standardisation of any recycling process. Contamination with bitumen, glues, mortar or other building materials is another barrier to recycling. As are logistics, identification and collection of small quantities of material ”scattered” throughout Europe.

3. Energy recovery in municipal solid waste incinerators: a practical option

The combined handling and treatment of PUR foam with other types of foam or other organic material (wood) in building demolition waste for the purpose of energy recovery in the nearest MSW incinerator is the best option. Based on independent scientific evidence, we conclude that plastic foam does not need to be separated prior to energy recovery.

To prevent potential ignition within the feeding device of the incinerator and to balance the effects of low density, localised high concentrations of foams should be avoided by standard mixing procedures with municipal solid waste prior to feeding. Foams should not exceed 2% by weight (30% by volume).

4. Conclusion

Incineration with energy recovery in municipal solid waste incinerators is a realistic and environmentally responsible solution for the waste management of PUR foam from the demolition of buildings. Other recycling options for historical post-consumer demolition wastes have been shown to be either technically or environmentally less advantageous. Energy recovery is a key process in the clean waste management of post-consumer PUR foams.

5. Literature references

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