

Recycling and Recovery of Polyurethanes



RECYCLING & RECOVERY OF POLYURETHANE FOAM FROM CONSTRUCTION AND DEMOLITION

Legislation

The Building Sector, which encompasses the two major sectors of construction and demolition, is not regulated with a specific EU Waste Directive, unlike other major waste sectors such as tires, packaging, automotive and electrical & electronic waste.

The Building Sector has recently been regulated through the new Directive 2008/98/EC on waste (Waste Framework Directive or WFD). The WFD sets the basic concepts and definitions related to waste management. According to Article 11b of the WFD, building and construction (B&C) waste should be reused, recycled or recovered in 2020 to a minimum of 70% by weight. However, this quota applies to all site waste and does not mean that 70% of End-of-Life polyurethane (EoL PU) must always be recycled.

The List of Wastes (LoW), formerly known as the European Waste Catalogue, forms the basis for classifying all types of hazardous and non-hazardous waste and for defining handling, disposal and recovery operations. It assigns six-digit waste classification numbers for different types of waste.

Besides the EU WFD Directive EoL PU foam has to comply to international agreed treaties such as the Montreal protocol on ozone depleting substances, which is enforced through European Commission Regulation No. 2037/2000.

Market Size

The building sector is a major market for polyurethane, as with many other plastics. PU has a strong market position in applications such as housing insulation. The market size is > 0.5 Mio t/2007, one of the largest market outlets for PU, indicating the high value recognition from customers of all types: architects, housing owners, building companies.

Application Description

There are various different types of applications, beginning with boards and block foam or pipes made out of rigid PU raw materials. These PU products are further tailor made into many different types of articles. Other insulation types like metal facing facades show the excellent product performance of PU as an insulation and adhesive material.

PU Product Characteristics

The major product selection criteria for insulation applications are: thermal insulation, efficiency expressed in volume and price, compression and structural strength, fire resistance and water pick-up behaviour. Rigid PU has very balanced characteristics, which allow it to meet many of the customer demands. However, even with the high durability of PU the end of life phase has to be considered.

The waste PU characteristic has to be understood from an historical perspective due to its long life span of > 50 years. This requires the owners of EoL



PU waste to understand historical uses or products which are no longer manufactured.

Recycling & Recovery Technologies

EoL PU waste may be reused when panels or boards have been not glued to other materials such as gypsum, concrete or bitumen. In most cases this option is not available, due to demolition and rebuilding creating a mixture of PU and other organic C&D waste or its separation into a foam mostly containing different materials. In these two cases municipal solid waste incineration is the most eco-efficient route.

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Eco-Considerations

Cost-effective sustainable results are achieved by applying the quota in the WFD to all materials. The overall quota for building and construction waste allows many options to be combined and the careful weighing of dismantling, logistics and R&R technologies to achieve cost-effective sustainable results.

References

See Fact Sheet List of References and suggested reading material.