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Environmental considerations for "end of life" disposal of cables

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Cables have, for a long time, been collected at the "end of life", EOL. The value of metal within them has paid for the handling and processing. After the metal recovery a polymer fraction remains and this needs to be addressed. At the present time this fraction is sent for landfill. New legislation from the European Union on waste materials going into landfills and the introduction of a tax on landfill have the effects of steering the volume of waste now going to landfill to other solutions. Such solutions are recycling and recovery. The new directive in this area, the increased volume to be treated and the increasing landfill costs makes it imperative that there is a convenient solution an alternative to landfill, for this polymer fraction.

Studies show that the polymer fraction of cables (of all types) at EOL today consists on average of 2/3 PVC and 1/3 polyethylene, PE. To facilitate successful recycling or recovery the polymers need to be separated. The PVC fraction could be recycled to a PVC resin with the Vinyloop process or to calcium chloride (salt) and coke in a process developed by Watech/NKT. The polyethylene fraction is most amenable to energy recovery where it is treated as valuable high grade fuel. This is the best solution considering the technical, economical and environmental aspects. It should be noted that both of these approaches require the separation of the fractions.

There are a number of separation techniques available, however their efficiency depends on the characteristics of the incoming polymer fraction. Therefore it is important to develop an efficient means to classify incoming mixed polymers to select the best separation method. Fig 1 illustrates the challenges using a method based on a simple test, differential scanning calorimetry, DSC, which provides an estimate of the fractions.

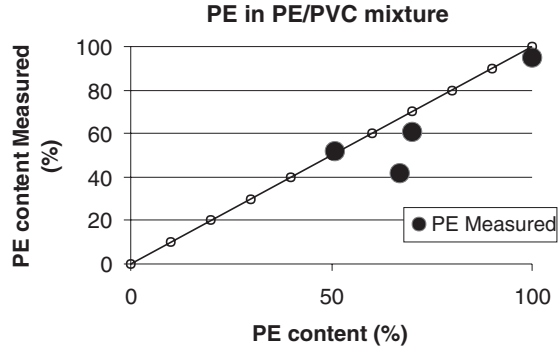

Fig. 1. Correlation of measured (DSC test) mixed fractions with true values

The efficiency of the main recovery techniques (material and energy) is critically dependent upon the purity of the separated fractions. This is illustrated by the fact that the PE content in the PVC fraction needs to be minimised if the Vinyloop process is used to recover

this fraction. PE will not be dissolved and will be found in the rejected part from this process. It is also important that the amount of PVC in the PE fraction is minimised as chlorine will form hydro chlorine acid during combustion that will cause problem with corrosion of the furnace. How efficient the separation is will be of great importance for how the fraction could be used. It is not only the amount of PVC but also the content of heavy metals that is of importance. As this will determine if this fraction could be regarded as fuel and used in a heat power station or if it is regarded as waste and transported to a waste incineration unit. Finland has developed a standard for "Solid recovered fuel. Quality control system".

This paper will examine the critical areas for the disposal of cables at the end of life. These areas will include

- The legislative environment
- The material mix of typical wastes
- Material separation techniques
- Assessment methods for polymer fractions
- Material recovery techniques
- Energy recovery techniques
- Practical steps that may be taken in today's designs to permit easier disposal in the future

REFERENCES

Council Directive 1999/31/EC – on the landfill of waste

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