
B.4.3.

Scraps recycling

C. Barioz

Nexans Research Center-170 Avenue Jean Jaurès 69353 LYON Cedex 07 FRANCE

Plastic recycling will be a major stake in the future for the cable manufactures. The land filling cost of the cable scraps increases drastically year after year, and the volume capacity to landfill decreases (new regulations and constraints): new technical solutions should be found in order to reduce the cable scraps amount. Up to now, the efforts have been focused on the metal /polymer separation and good results have been obtained. The main problem of plastic recycling concerns the diversity of the polymers used in cable and which are non compatible. The first step of this study was to determine the way to separate polar and non polar polymer. We tested a triboelectric separator and obtain first interesting results with pure polymers, crosslinked polymers, filled polymers. Another way is to perform a chemical compatibilisation of polymers which have different polarity. The target is to obtain polymer batches with sufficient properties to be reused in the industrial cycle. Nexans Research Center (NRC) study is conducted in partnership with Nexans RIPS, Van tech (Hamos), Ademe as partners.

The first recycling has been done with two different batches of cables from Nexans plant:

Step 1 - Metal and polymers are separated by RIPS.

Step 2 - Polymers (PVC and XLPE) are separated by Hamos

Step 3 - Recycled XLPE is processed, characterized and compared with initial XLPE by NRC.

Main result: After extrusion of recycled XLPE in a twin screw extruder + molding, mechanical properties are equivalent to those obtained for initial XLPE.

We have demonstrated that with sufficient shearing, weak cross-linking bridges of XLPE can be broken. A re-usable material with good mechanical properties can be obtained.