Composition based on recycled polyethylene from cable waste

The present invention relates to a new polyethylene composition which comprises at least one polyethylene obtained from recycled waste material. Furthermore, the present invention relates to a process for producing said polyethylene composition and the use of said composition in infrastructure, engineering applications and packaging applications.

SUMMARY

In one aspect, the present invention provides a polyethylene composition characterized in that it comprises a base resin and an inorganic mineral filler which is present in the composition in an amount of 1 to 50 wt% in respect to the weight of composition, wherein said base resin comprises:

a) a first crosslinked polyethylene (PEX) having a gel content (measured according to ASTM D 2765:2006) in the range of 5% to 80% in respect to the weight of crosslinked polyethylene (PEX), said crosslinked polyethylene (PEX) being obtained from recycled waste, and
b) a second polyethylene (PE) selected from virgin polyethylene and recycled polyethylene, or mixtures thereof.

In one aspect, the present invention provides a process for producing a polyethylene composition as described herein, characterized in that the said process comprising the steps of:

a) feeding the ingredients into the inlet hopper of a compounding unit;
b) compounding the ingredients which compounding is carried out by homogenizing the ingredients fed into the inlet and raising the temperature to above the melting point of the main thermoplastic polymer ingredient, obtaining a mixture compound;
c) optionally cooling down the said mixture compound and pelletizing.

In one aspect, the present invention provides a process for producing a shaped article comprising a polyethylene composition as described herein, or a polyethylene composition produced by the process as described herein, characterized in that the said process comprises the additional step of shaping the said polyethylene composition with a moulding step.

In one aspect, the present invention provides a use of the polyethylene composition as described herein in the field of infrastructure, building & construction, engineering applications and packaging, to reduce the carbon foot print in the manufacturing step.

For the purposes of the present description and of the subsequent claims, the term "recycled waste" is used to indicate the material recovered from both post-consumer waste and industrial waste. Namely, post-consumer waste refers to objects having completed at least a first use cycle (or life cycle), i.e. having already served their first purpose; while industrial waste refers to the manufacturing scrap which does normally not reach a consumer. Respectively, the term "virgin" denotes the newly- produced materials and/or objects prior to first use and not being recycled.

Nowadays, the attempt of using polymers obtained from waste materials for the manufacturing of new products is of increasing interest and importance for ecological reasons and for reducing costs.

In the field of cables, some efforts have already been undertaken in order to use recycled polymer materials from cable waste, in particular polyethylene or polyvinyl chloride obtained from waste cable sheaths. Said recycled polymer materials are generally used for making cable coating layers.

An example of one of those efforts is JP2002/080671 which discloses a polyvinyl chloride-based recycled plastic composition obtained by mixing and melting covering plastics and sheaths of waste cables containing: (A) polyvinyl chloride and (B) polyethylene or silane-crosslinked polyethylene, with chlorinated polyethylene. The abovementioned polyvinyl chloride-based resin is said to be useful for making cable sheaths.

JP2013045643 relates to insulated electric wire and cable which use a large amount of waste-derived recycled material which contains crosslinked polyolefin homopolymer.