

FORM 2

THE PATENTS ACT, 1970
(39 of 1970)
AND
THE PATENTS RULES, 2003

**COMPLETE
SPECIFICATION**

(See Section 10; rule 13)

TITLE OF THE INVENTION

“HIGH FREQUENCY WELDABLE POLYOLEFIN COMPOSITIONS
INCLUDING POLAR POLYMERS”

APPLICANT

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The following specification particularly describes
the invention and the manner in which
it is to be performed

WHAT IS CLAIMED IS:

1. A dielectrically weldable polyolefin formulation comprising

(1) at least one base polymer selected from

(a) a homogeneously branched, linear or substantially linear ethylene/ α -olefin copolymer having a density from 0.865 to 0.905 grams per cubic centimeter and a melt index (measured at 190 °C at 2.16 kilograms) from 0.5 to 30 grams per 10 minutes;

(b) a homogeneously branched propylene/ α -olefin copolymer having a density from 0.863 to 0.885 grams per cubic centimeter and a melt flow rate (measured at 230 °C at 2.16 kilograms) from 2 to 30 grams per 10 minutes; and

(c) combinations thereof;

and

(2) from 10 percent to 40 percent, based on the weight of the formulation as a whole, of at least one secondary component selected from

(a) ethylene vinyl acetate having a vinyl acetate content ranging from 5 to 40 weight percent, based on the weight of the ethylene vinyl acetate;

b) ethylene-ethyl acrylate having an ethyl acrylate content ranging from 5 to 25 weight percent, based on the weight of the ethylene-ethyl acrylate; and

(c) combinations thereof.

2. An improvement in a method of forming a polyolefin-based article that includes (a) incorporating into a polyolefin formulation a component that is capable of being excited by a high frequency electromagnetic field; (b) forming a substrate from the polyolefin formulation, the substrate having at least one surface; and (c) subjecting the surface of the polyolefin substrate to the high frequency electromagnetic field under conditions such that the substrate is welded to a second surface of the polyolefin substrate or to a surface of a second polyolefin substrate to form a polyolefin-based article;

wherein the improvement comprises

(1) employing as a base polymer in the polyolefin formulation a polyolefin selected from the group consisting of

(a) a homogeneously branched, linear or substantially linear ethylene/ α -olefin copolymer having a density from 0.865 to 0.905 grams per cubic centimeter and a melt index (measured at 190°C at 2.16 kilograms) from 0.5 to 30 grams per 10 minutes;

(b) a homogeneously branched propylene/ α -olefin copolymer having a density from 0.863 to 0.885 grams per 10 minutes and a melt flow rate (measured at 230 °C at 2.16 kilograms) from 2 to 30 grams per 10 minutes; and

(c) a combination thereof;

provided that the base polymer has a melting temperature below 100 °C; and

(2) including as a secondary component in the polyolefin formulation from 10 percent to 40 percent, based on the weight of the polyolefin formulation, of at least one polymer selected from

(a) an ethylene vinyl acetate copolymer having a vinyl acetate content from 5 weight percent to 40 weight percent, based on the weight of the ethylene vinyl acetate copolymer;

(b) an ethylene-ethyl acrylate copolymer having an ethyl acrylate content from 5 percent to 25 weight percent, based on the weight of the ethylene-ethyl acrylate copolymer; and

(c) a combination thereof;

such that the polyolefin substrate exhibits as properties a cohesive welding failure, and a weld strength for a substrate of 10 mil (0.254 millimeter) thickness that is greater than 7 pounds per inch (1.23 Newtons per millimeter) under welding conditions including less than or equal to 6 seconds welding time.

3. A high frequency welded polyolefin article according to claim 1 or 2 selected from the group consisting of medical devices selected from pressure cuffs and stabilization devices; inflatables selected from toys, watercraft, cushioning and furniture; sheetings selected from awnings, banners, signs, tents, tarpaulins, and liners for pools, ponds or landfills; book bindings; and carriers selected from sporting bags and backpacks.

dated this 16 day of June 2014.

(Arindam Paul)
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(Agent For The Applicants)