~~Claims~~

CLAIMS

1. A polyethylene composition comprising a base resin, wherein the base resin comprises

(A) a first ethylene-1-butene copolymer fraction (A) having a 1-butene content of from 0.5 wt% to 7.5 wt%, based on the total weight amount of monomer units in the first ethylene-1-butene copolymer fraction (A), and a melt flow rate MFR_2 in the range of from 1.0 to less than 50.0 g/10 min, determined according to ISO 1133 at a temperature of 190°C and a load of 2.16 kg; and

(B) a second ethylene-1-butene copolymer fraction (B) having a higher 1-butene content than the first ethylene-1-butene copolymer fraction;

wherein the base resin is polymerized in the presence of a single site catalyst system and has a density of from 913.0 to 920.0 kg/m³ and a 1-butene content of from 8.0 to 13.0 wt%, based on the total weight amount of monomer units in the base resin~~.~~, wherein the base resin further comprises up to 15 wt% of a low density polyethylene (LDPE).

2. The polyethylene composition according to claim 1 having a melt flow rate MFR_2 of 0.7 to 4.0 g/10 min, determined according to ISO 1133 at a temperature of 190°C and a load of 2.16 kg.

3. The polyethylene composition according to claims 1 or 2 having a melt flow rate MFR_{21} of 15 to 50 g/10 min, determined according to ISO 1133 at a temperature of 190°C and a load of 21.6 kg and/or a flow rate ratio $FRR_{21/2}$, being the ratio of the melt flow rates MFR_{21}/MFR_2, of from 10 to 30.

4. The polyethylene composition according to any one of the preceding claims having a polydispersity index PDI, being the ratio of weight average molecular weight Mw to number average molecular weight Mn, Mw/Mn, of from 3 to 8.

5. The polyethylene composition according to any one of the preceding claims, wherein the weight ratio of the first ethylene-1-butene copolymer (A) to the second ethylene-1-butene copolymer (B) in the base resin is from 35:65 to 47:53.

~~6. The polyethylene composition according to any one of the preceding claims, wherein the base resin further comprises up to 15 wt% of a low density polyethylene (LDPE).~~

~~7.~~6. A process for preparing the polyethylene composition according to any one of the preceding claims comprising the steps of

a) polymerizing ethylene and 1-butene monomers in the presence of a single site catalyst system in a first polymerization reactor to form a first polymerization mixture comprising a first ethylene-1-butene copolymer fraction (A) having a 1-butene content of from 0.5 wt% to 7.5 wt%, based on the total weight amount of monomer units in the first ethylene-1-butene copolymer fraction (A) and a melt flow rate MFR_2 in the range of from 1.0 to less than 50.0 g/10 min, determined according to ISO 1133 at a temperature of 190°C and a load of 2.16 kg, and said single site catalyst;
b) transferring the first polymerization mixture from the first polymerization reactor to a second polymerization reactor;
c) polymerizing ethylene and 1-butene monomers in the presence of a single site catalyst in said second polymerization reactor to form a second polymerization mixture comprising said first ethylene-1-butene copolymer fraction (A) and a second ethylene-1-butene copolymer fraction (B);
d) recovering said second polymerization mixture from said second reactor;
e) forming a base resin having a density of from 913.0 to 920.0 kg/m³ and a 1-butene content of from 8.0 to 13.0 wt%, based on the total weight amount of monomer units in the base resin, and
f) preparing the polyethylene composition.

~~8.~~7. An article comprising the polyethylene composition according to any one of the preceding claims.

~~9.~~8. The article according to claim ~~8~~7 being a film, a blow moulded article or a rotomoulded article.

~~10.~~9. The article according to claims ~~8~~7 or ~~9~~8 being a film, which has a tear strength in machine direction TS-MD (N) of at least 0.6 N and/or a tear strength in transverse direction TS-TD (N) of at least 5.0 N, determined according ISO 6383-2:1983 on a 40 µm thick blown film.

~~11.~~10. The article according to any one of claims ~~8~~7 to ~~10~~9 being a film, which has a seal initiation temperature SIT of from 90 to 100°C, determined on a 40 µm thick blown film.

~~12.~~11. The article according to any one of claims ~~8~~7 to ~~11~~10 being a film, which has a hot tack temperature of from 88 to 97°C, determined according to BICM90720 on a 40 µm thick blown film.

~~13.~~12. The article according to any one of claims ~~8~~7 to ~~12~~11 being a film, which has a haze of not more than 14.0%, determined according to ASTM D1003 on a 40 µm thick blown film.

~~14.~~13. The article according to any one of claims ~~8~~7 to ~~13~~12 being a film, which has a gloss of at least 92.0%, determined according to ISO2813 on the inside surface of a 40 µm thick blown film.

~~15.~~14. The use of a polyethylene composition according to any one of claims 1 to ~~7~~6 for the production of an article.