ABSTRACT

AN IMPROVED LOW DENSITY ETHYLENIC POLYMER COMPOSITION AND METHOD OF MAKING THE SAME

The instant invention is an improved low-density ethylenic polymer composition and method of making the same. The polymer composition according to instant invention includes a major component, and a minor component. The major component is an LDPE resin having a melt index (I_2) in the range of about 0.01 dg/min to about 100 dg/min, a $M_{W(abs)}/M_{W(GPC)}$ ratio of about 2.6 or less, and a melt strength of less than (14.0 e $^{(-\ i.o5*log10(MI))}$)cN Jj16 minor component is an LDPE resin having a melt index (I_2) of less than about 5 dg/min, a molecular weight distribution of greater than about 7, and a $M_{W(abs)}/M_{W(GPC)}$ ratio of at least 2.7. The polymer composition of the instant invention may further include additional components. Furthermore, the free radical initiation polymerization process according to instant invention includes the following steps: providing ethylene; and reacting the ethylene in a reactor system, which includes at least one tubular reactor and at least one autoclave reactor, at a high pressure range of about 18,000 psig to about 55,000 psig, at a reactor temperature of about 190°C to about 400°C, wherein the ethylene feed into the reactors is divided into multiple ethylene feed streams, and at least one of the ethylene feed streams into the tubular reactor consists essentially of the unreacted ethylene. Additionally, the free radical initiation polymerization process according to instant invention may further include the steps of providing at least one or more comonomers; and reacting the ethylene and the comonomer(s) in the reactor system a high pressure range of about 18,000 psig to about 55,000 psig, at a reactor temperature of about 190°C to about 400°C.

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