CLAIMS

1. A composition comprising an ethylene/CO interpolymer, formed from a high pressure, free-radical polymerization, and wherein the ethylene/CO interpolymer has the following properties:

a) a CO content from "greater than 0" weight percent to less than, or equal to, 10 weight percent CO (carbon monoxide), based on the weight of the interpolymer; and

b) a melting point, Tm, in °C that meets the following relationship:

$$Tm\ (°C) \leq 601.4 * (\text{Density in g/cc}) - 452.5(°C).$$

2. The composition of claim 1, wherein the ethylene/CO interpolymer meets the following relationship: MS (cN) $\geq$ 2.0 (wt%CO) + 2.0.

3. The composition of claim 1 or claim 2, wherein the ethylene/CO interpolymer has a melt index (I2) from 0.1 to 100 g/10 min.

4. The composition of claim 1, wherein the ethylene/CO interpolymer has a Tm (°C) $\geq$ 601.4 * (Density in g/cc) – 460.0(°C).

5. The composition of claim 1, wherein the ethylene/CO interpolymer has a melting temperature, Tm, from 105.5°C to 110.5°C.

6. The composition of claim 1, wherein the ethylene/CO interpolymer has a density from 0.910 to 0.990 g/cc.

7. The composition of claim 1, wherein the ethylene/CO interpolymer has an amyl group level greater than, or equal to, 0.5 amyl group per 1000 carbon atoms, as determined by 13C NMR.

8. The composition of claim 1, wherein ethylene/CO interpolymer is an ethylene/CO copolymer.

9. The composition of claim 1, wherein the composition further comprises a second ethylene-based polymer and wherein the second ethylene-based polymer is selected from a LDPE, an ethylene/alpha-olefin copolymer, or a combination thereof.

10. An article comprising at least one component formed from the composition of claim 1, wherein the article is a coated substrate or a film and wherein the article is a coating, which is produced by extrusion coating or extrusion lamination.

11. A process to form a composition, said composition comprising an ethylene/CO interpolymer, formed from a high pressure, free-radical polymerization, and wherein the ethylene/CO interpolymer has the following properties:

a) a CO content from "greater than 0" weight percent to less than, or equal to, 10 weight percent CO (carbon monoxide), based on the weight of the interpolymer; and

b) a melting point, Tm, in °C that meets the following relationship:

$$Tm\ (°C) \leq 601.4 * (\text{Density in g/cc}) - 452.5(°C);$$

said process comprising polymerizing ethylene and CO, using a high pressure, free-radical polymerization process, to form the ethylene/CO interpolymer, and wherein the polymerization takes place in a reactor configuration comprising at least one autoclave reactor comprising ≥ 2 reaction zones, and at least one tubular reactor comprising ≥ 2 reaction zones, and

wherein in the autoclave reactor, the polymerizations takes place in the presence of at least one "medium temperature free-radical initiator" denoted FRm_{auto}, and at least one "low temperature free-radical initiator" denoted FRl_{auto}, and wherein the weight ratio ($ratio_{auto}$) of the FRm_{auto} to FRl_{auto} is from 0.04 to 1.00 for each reaction zone in the autoclave reactor; and

wherein in the tubular reactor, the polymerizations takes place in the presence of at least one "high temperature free-radical initiator" denoted FRh_{tube}, and at least one "medium temperature free-radical initiator" denoted FRm_{tube}, and wherein the weight ratio ($ratio_{tube}$) of the FRh_{tube} to FRm_{tube} is from 0.06 to 0.50 for each reaction zone in the tubular reactor.

12. The process of claim 11 , wherein the polymerization temperature in each reaction zone of the autoclave reactor is, independently, from 190°C to 270°C, and wherein, for the autoclave reactor, the weight ratio of "the amount of ethylene added to a reaction zone" to "the amount of CO added to the same reaction zone" is from 388 to 39.

13. The process of claim 11, wherein the polymerization temperature of each reaction zone of the autoclave reactor is, independently, < 250°C.

14. The process of claim 11 , wherein the polymerization temperature of each reaction zone of the tubular reactor is, independently, from 260°C to 300°C.

15. The process of claim 11, wherein ethylene/CO interpolymer is an ethylene/CO copolymer.