CLAIMS

What Is Claimed Is:

1. An adhesive composition comprising:

(a) at least one propylene-based polymer comprising more than 50 wt% of propylene-derived units and at least one first comonomer-derived units, said propylene-based polymer having a Brookfield viscosity of at least 250 mPa•sec measured by ASTM D-3236 at 190°C, a heat of fusion of at least 60 J/g measured by differential scanning calorimetry and a characteristic time (t_c) in the range from 1 to 1000 nanoseconds;

(b) an ethylene-based polymer comprising more than 50 wt% ethylene-derived units and at least one second comonomer-derived units, said ethylene-based polymer having a Brookfield viscosity of at least 250 mPa•sec measured by ASTM D-3236 at 190°C, a heat of fusion in the range from 1 to 100 J/g measured by differential scanning calorimetry and a characteristic time (t_c) in the range from 1 to 1500 nanoseconds;

wherein said at least one first comonomer and said at least one second comonomer are the same or different;

wherein said characteristic time (t_c) in units of nanoseconds is defined by Equation 1:

$$t_c = \frac{BV}{\text{Density} \times \text{Heat of Fusion}} \qquad \text{(Equation 1)}$$

wherein said BV is the Brookfield viscosity of said propylene-based polymer or said ethylene-based polymer measured by ASTM D-3236 at 190°C in units of mPa•sec, said Density is the density of said propylene-based polymer or said ethylene-based polymer in units of g/cm^3 at 23°C, and said Heat of Fusion is the heat of fusion of said propylene-based polymer or said ethylene-based polymer in units of J/g.

2. The adhesive composition of claim 1, wherein said at least one first comonomer is selected from the group consisting of ethylene and a C_4 to C_{20} alpha-olefin.

3. The adhesive composition of any ~~preceding claim~~ one of claims 1-2, wherein said at least one first comonomer comprises ethylene.

4. The adhesive composition of any ~~preceding claim~~ one of claims 1-3, wherein said propylene-based polymer comprises 90 wt% to 99 wt% of propylene-derived units and 10 wt% to 1 wt% of ethylene-derived units, based on the weight of said propylene-based polymer.

5. The adhesive composition of any ~~preceding claim~~ one of claims 1-4, wherein said Brookfield viscosity measured by ASTM D-3236 at 190°C of said propylene-based polymer is from 250 to 25,000 mPa•sec.

~~6. The adhesive composition of any preceding claim, wherein said heat of fusion measured by differential scanning calorimetry of said propylene-based polymer is from 60 to 150 J/g.~~

~~7.~~6. The adhesive composition of any ~~preceding claim~~ one of claims 1-5, wherein said characteristic time (t_c) of said propylene-based polymer is from 1 to 800 nanoseconds.

~~8. The adhesive composition of any preceding claim, wherein said propylene-based polymer has a ratio of a weight-average molecular weight (M_w) to a number-average molecular weight (M_n) in the range from 2 to 10.~~

~~9.~~7. The adhesive composition of claim 1, wherein said at least one second comonomer is a C_3 to C_{20} alpha-olefin.

~~10. The adhesive composition of claim 9, wherein said at least one second comonomer comprises octene.~~

~~11.~~8. The adhesive composition of ~~claims 9 or 10~~ claim 7, wherein said ethylene-based polymer comprises 51 wt% to 99 wt% of ethylene-derived units and 49 wt% to 1 wt% of octene-derived units, based on the weight of the said ethylene-based polymer.

~~12. The adhesive composition of claims 9 to 11, wherein said Brookfield viscosity measured by ASTM D-3236 at 190°C of said ethylene-based polymer is from 250 to 50,000 mPa•sec.~~

~~13. The adhesive composition of claims 9 to 12, wherein said heat of fusion measured by differential scanning calorimetry of said ethylene-based polymer is from 1 to 60 J/g.~~

~~14. The adhesive composition of claims 9 to 13, wherein said characteristic time (t_e) of said ethylene-based polymer is from 1 to 1200 nanoseconds.~~

~~15. The adhesive composition of claims 9 to 14, wherein said ethylene-based polymer has a ratio of a weight-average molecular weight (M_w) to a number-average molecular weight (M_n) in the range from 1 to 10.~~

~~16. The process of claims 1 or 2, wherein the ratio of said characteristic time (t_e) of said propylene-based polymer to said characteristic time (t_e) of said ethylene-based polymer is from 1 to 1000.~~

~~17.~~9. The adhesive composition of claim 1, wherein said first comonomer and said second comonomer are different, said first comonomer is ethylene, and said second comonomer is octene.

~~18.~~10. The adhesive composition of claim ~~17~~ 9, further comprising one or more additives, said additives selected from the group consisting of a functionalized component, a tackifier component, a process oil component, a wax component, an antioxidant component, or a mixture thereof.

~~19.~~11. The adhesive composition of ~~claims 17 or 18~~ any one of claims 9-10, wherein said adhesive composition comprises 99 wt% to 1 wt% of said propylene-based polymer and 1 wt% to 99 wt% of said ethylene-based polymer, based on the weight of said adhesive composition.

~~20. The adhesive composition of claims 17 to 19, wherein said adhesive composition has a Brookfield viscosity measured by ASTM D-3236 at 177°C is from 250 to 30,000 mPa•sec.~~

~~21.~~12. The adhesive composition of ~~claims 17 to 20~~ any one of claims 9-11, wherein said adhesive composition has a melting temperature measured by differential scanning calorimetry at second melt with a heating rate of 10°C/min is no more than 130°C.

~~22.~~13. The adhesive composition of ~~claims 17 to 21~~ any one of claims 9-12, wherein said adhesive composition has one or more of the following properties:

(i) a Brookfield viscosity of 250 to 5000 mPa•sec measured by ASTM D-3236 at 177°C;

(ii) a percent fiber tear at 25°C greater than or equal to 85%;

(iii) a percent fiber tear at 2°C greater than or equal to 80%;

(iv) a percent fiber tear at -18°C greater than or equal to 75%;

(v) an adhesion set time of 6 seconds or less; and

(vi) a melting temperature (T_m) of 130°C or less measured by differential scanning calorimetry at second melt with a heating rate of 10°C/min.

~~23.~~14. An adhesive composition comprising:

(a) a propylene-based polymer comprising from 50 wt% to 100 wt% propylene-derived units and from 0 wt% to 50 wt% ethylene-derived units, said propylene-based polymer having a Brookfield viscosity in the range of 250 to 25,000 mPa•sec measured by ASTM D-3236 at 190°C, a heat of fusion in the range of 60 to 150 J/g measured by differential scanning calorimetry at second melt with a heating rate of 10°C/min and a characteristic time (t_c) in the range from 1 to 1000 nanoseconds;

(b) an ethylene-based polymer comprising from 50 wt% to 100 wt% ethylene-derived units and from 0 wt% to 50 wt% octene-derived units, said ethylene-based polymer having a Brookfield viscosity in the range of 250 to 50,000 mPa•sec measured by ASTM D-3236 at 190°C, a heat of fusion in the range of 1 to 100 J/g measured by differential scanning calorimetry at second melt with a heating rate of 10°C/min and a characteristic time (t_c) in the range from 1 to 1500 nanoseconds;

wherein said characteristic time (t_c) is defined by Equation 1:

$$t_c = \frac{BV}{\text{Density} \times \text{Heat of Fusion}} \qquad \text{(Equation 1)}$$

wherein said BV is the Brookfield viscosity of said propylene-based or said ethylene-based polymer measured by ASTM D-3236 at 190°C in units of mPa•sec, said Density is the density of said propylene-based or said ethylene-based polymer in units of g/cm^3 at 23°C, and said Heat of Fusion is the heat of fusion of said propylene-based or said ethylene-based polymer in units of J/g.

~~24.~~15. A hot melt adhesive composition comprising:

(a) 40 wt% to 60 wt% of a propylene-based polymer based on the weight of said hot melt adhesive, said propylene-based polymer comprising from 50 wt% to 100 wt% propylene-derived units, and 0 wt% to 50 wt% ethylene-derived units, said propylene-based polymer having a Brookfield viscosity in the range of 250 to 25,000 mPa•sec measured by ASTM D-3236 at 190°C, a heat of fusion in the range of 60 to

150 J/g measured by differential scanning calorimetry at second melt with a heating rate of 10°C/min and a characteristic time (t_c) in the range from 1 to 1000 nanoseconds;

(b) 40 wt% to 60 wt% of an ethylene-based polymer based on the weight of said hot melt adhesive, said ethylene-based polymer comprising from 50 wt% to 100 wt% ethylene-derived units and from 0 wt% to 50 wt% octene-derived units, said ethylene-based polymer having a Brookfield viscosity in the range of 250 to 50,000 mPa•sec measured by ASTM D-3236 at 190°C, and a heat of fusion in the range of 1 to 100 J/g measured by differential scanning calorimetry at second melt with a heating rate of 10°C/min and a characteristic time (t_c) in the range from 1 to 1500 nanoseconds;

wherein said characteristic time (t_c) is defined by Equation 1:

$$t_c = \frac{BV}{\text{Density} \times \text{Heat of Fusion}} \qquad \text{(Equation 1)}$$

wherein said BV is the Brookfield viscosity of said propylene-based or said ethylene-based polymer measured by ASTM D-3236 at 190°C in units of mPa•sec, said Density is the density of said propylene-based or said ethylene-based polymer in units of g/cm^3 at 23°C, and said Heat of Fusion is the heat of fusion of said propylene-based or said ethylene-based polymer in units of J/g; and

(c) at least one of a functionalized component, a tackier component, a process oil component, a wax component, an antioxidant component, or a mixture thereof.