CLAIMS

1. A polymer processing composition, comprising:

a metal soap comprising an external lubricant and an internal lubricant, wherein:

the external lubricant is a fatty acid salt of zinc or magnesium; and

the internal lubricant is a fatty acid salt of calcium; and

an inorganic antacid comprising a metal-oxide, wherein the metal-oxide is chosen from zinc oxide, magnesium oxide, calcium oxide, strontium oxide, barium oxide, or combinations thereof;

wherein:

the polymer processing composition is overbased to an overbasing level of greater than or equal to 3% and less than or equal to 65%; and

the overbasing level is defined as $n_2/n_1 \times 100$, where n_1 represents moles of the metal soap in the polymer processing composition and n_2 represents moles of the inorganic antacid in the polymer processing composition.

2. The polymer processing composition of claim 1, wherein the overbasing level is greater than or equal to 8% and less than or equal to 50%.

3. The polymer processing composition of claim 1, wherein:

the inorganic antacid of the polymer processing composition further comprises a metal-hydroxide; and

the polymer processing composition comprises, based on the total mass of the polymer processing composition:

from 20% to 75% by mass, the external lubricant;

from 10% to 60% by mass, the internal lubricant;

from 0.1% to 10% by mass, the metal-oxide; and

between 0% and 10% by mass, the metal-hydroxide.

4. The polymer processing composition of claim 1, wherein:

the inorganic antacid of the polymer processing composition further comprises a metal-hydroxide; and

the polymer processing composition comprises, based on the total mass of the polymer processing composition:

from 20% to 75% by mass, the external lubricant;

from 10% to 60% by mass, the internal lubricant;

from 0.2% to 5% by mass, the metal-oxide; and

between 0% and 2% by mass, the metal-hydroxide.

5. The polymer processing composition of either one of claims 3 or 4, comprising from 0.2% to 2% by mass of the metal-hydroxide, based on the total mass of the polymer processing composition, wherein the metal-hydroxide is chosen from calcium hydroxide, zinc hydroxide, magnesium hydroxide, strontium hydroxide, barium hydroxide, or combinations thereof.

6. The polymer processing composition of any one of claims 3 to 5, wherein:

the external lubricant is zinc stearate, magnesium stearate, or combination thereof; and

the internal lubricant is calcium stearate.

7. The polymer processing composition of any one of claims 3 to 5, wherein:

the external lubricant is zinc stearate;

the internal lubricant is calcium stearate;

the metal-oxide is zinc oxide; and

the metal-hydroxide is calcium hydroxide.

8. The polymer processing composition of any one of claims 1 to 7, further comprising up to 50% by mass organic lubricant, based on the total mass of the polymer processing composition, wherein the organic lubricant is chosen from ethylene bis behenate, pentaerythritol tetrasterate, pentaerythritol adipate stearate, ethylene bis stearamide, glycerol mono and distearate, glycerol monoleate, glycerol tristearate, stearamide, behenamide, or combinations thereof.

9. A polymer processing composition, comprising by mass, based on the total mass of the composition:

from 20% to 75% external lubricant;

from 10% to 60% internal lubricant;

from 0.2% to 5% metal-oxide inorganic antacid; and

from 0 to 2% metal-hydroxide inorganic antacid,

wherein:

the external lubricant is a fatty acid salt of zinc or magnesium;

the internal lubricant is a fatty acid salt of calcium;

the metal-oxide inorganic antacid is chosen from zinc oxide, magnesium oxide, calcium oxide, strontium oxide, barium oxide, or combinations thereof; and

the metal-hydroxide inorganic antacid is chosen from calcium hydroxide, zinc hydroxide, magnesium hydroxide, strontium hydroxide, barium hydroxide, or combinations thereof.

10. A masterbatch comprising a carrier polymer and the polymer processing composition according to any one of claims 1 to 9, wherein the carrier polymer is LDPE, LLDPE, HDPE, or polypropylene.

11. A polymer resin comprising a polymer material and the masterbatch of claim 10, wherein the polymer material comprises LDPE, LLDPE or a copolymer of LLDPE with an alpha-olefin chosen from 1-butene, 1-hexene, or 1-octene, HDPE, or polypropylene.

12. A method for processing a polymer, the method comprising:

combining a polymer material and the polymer processing composition according to any one of claims 1 to 9 to obtain an initial mixture; and

processing the initial mixture to obtain a final article.

13. The method of claim 12, further comprising preparing a masterbatch comprising the polymer processing composition and a carrier polymer, then combining the polymer material and the masterbatch to obtain the initial mixture.

14. A method for processing a polymer, the method comprising:

combining a polymer material, n_1 moles of metal soap, and n_2 moles of inorganic antacid to obtain an initial mixture, wherein:

the metal soap comprises an external lubricant and an internal lubricant, wherein:

the external lubricant is a fatty acid salt of zinc or magnesium; and

the internal lubricant is a fatty acid salt of calcium;

the inorganic antacid comprises a metal-oxide, wherein the metal-oxide is chosen from zinc oxide, magnesium oxide, calcium oxide, strontium oxide, barium oxide, or combinations thereof;

$n_2/n_1 \times 100$ is at least 0.1%; and

the initial mixture comprises from 500 ppm to 10,000 ppm by mass, a combination of the metal soap and the inorganic antacid, based on the total mass of the initial mixture; and

processing the initial mixture to obtain a final article.

15. The method of any one of claims 12 to 14, wherein the polymer material comprises LDPE, LLDPE, a copolymer of LLDPE with an alpha-olefin chosen from 1-butene, 1-hexene, or 1-octene, HDPE, or polypropylene.