## CLAIMS

1. A packaging having anti-microbial properties, comprising a substrate and a coating, wherein said coating comprises:

- a first polymeric component selected from the group consisting of polyacrylic resins, polyvinyl butyral, polyurethanes, polyvinyl alcohols, cellulosic polymers and polyesters, preferably selected from polyhydroxyalkanoates, polybutylene succinate and polylactic acid and mixtures thereof;
- a low adhesion, slip or release agent selected from the group consisting of polysiloxanes, carnauba wax, lecithin, fatty acids, fatty acid amides, fatty acid esters, magnesium stearate, vegetable oils, and mixtures thereof
- an anti-microbial agent, wherein said antimicrobial agent is a metal selected from the group consisting of titanium, silver, gold, copper, platinum, and zinc, an oxide or salt of said metals, alloys, glasses or clays comprising said metal oxides, wherein said metals may be in the form of nanoparticles or may be supported on nano-, micro- or macro-silica, silicone or clay supports or is selected from the group consisting of anti-microbial peptides, silicone based anti-microbial agents and quaternary ammonia cations (Qua Ts).

wherein said coating comprises:

- from 50 to 99.49% by weight of the first polymeric component;
- from 0.5 to 35% by weight of the low adhesion, slip or release agent, and
- from 0.01 to 15% by weight of the anti-microbial agent,
- the percentages by weight being referred to 100 parts by weight of the dry coating.

2. The packaging according to claim 1 wherein said first polymeric component is a polyacrylic resin selected from polyacrylic acid, polyacrylates and polymethacrylates and said low adhesion slip or release agent is a polysiloxane, preferably a mixture of dimethylpolysiloxane and silicone wax.

3. The packaging according to claim 1, wherein said first polymeric component is polyvinyl butyral and said low adhesion slip or release agent is a polysiloxane, preferably a mixture of dimethylpolysiloxane and silicone wax.

4. The packaging according to claims 1, 2 or 3 wherein said polysiloxane is selected from the group consisting of dimethylpolysiloxane, silicone vinyl polymers, silicone emulsions and silicone oils, silicone wax and mixtures thereof.

5. The packaging according to claim 1 wherein said polyester is selected from the group consisting of polyhydroxyalkanoates, polyethylene terephthalate, polycaprolactone, polybutylene succinate, polyinyl succinate, polylactic acid and mixtures thereof.

6. The packaging according to claim 1 wherein said vegetable oil is selected from the group consisting of soybean oil, castor oil, rapeseed oil, palm oil, sunflower oil, and coconut oil and mixtures thereof.

7. The packaging according to claim 1 wherein in said coating:
the first polymeric component is a polyester,
the slip or release agent is selected from polysiloxanes, carnauba wax, fatty acids, fatty acids amides and mixtures thereof,
the antimicrobial agent is selected from silver chloride, titanium, silver phosphate, and silicone tethered quaternary amine , said coating optionally further comprising an isocyanate based crosslinking agent.

8. The packaging, according to any of the preceding claims, wherein said substrate is made or comprises a material selected from the group consisting of paper, paperboard, glass, metal or a polymeric material selected from the group consisting of polypropylene, polyethylene, polyethylene-polypropylene copolymers, polystyrene, polyethylene terephthalate and bioplastics preferably polyhydroxyalkanoates, polybutylene succinate or polylactic acid and mixtures of said polymeric materials.

9. A packaging, according to any of the preceding claims, wherein said coating is applied to provide a coating grammage from 0.01 to 20 g/sqm, referred to the dry coating.

10. A packaging according to any of the preceding claims, wherein said substrate comprises a single or multi- layer film or sheet comprising or consisting of paper,

paperboard, polypropylene, polyethylene, polyethylene-polypropylene copolymers, polystyrene, polyethylene terephthalate and bioplastics preferably polyhydroxyalkanoates, polybutylene succinate or polylactic acid and mixtures of said polymeric materials, optionally including a metallized layer.

11. The packaging according to any of the preceding claims where the coating layer is applied to a flexible substrate and the coating is heat sealable to enable the sealing of the substrate against itself or against other surfaces, such as trays or boxes.

12. The packaging according to claim 11 wherein the packaging is sealed in a tubular form with said coating on the inside of said tubular form.

13. The packaging according to any of the previous claims where the coating is applied to a paper, paperboard or plastic substrate before the substrate is subsequently thermoformed.

14. The packaging according to any of the previous claims where the coating is applied to paper, paperboard or plastic substrate before the substrate is folded into a rigid or semi-rigid form.

15. The packaging according to claim 1, wherein the substrate is an injection molded or extruded packaging structure and is obtained by injection molding or extruding a polymer blend comprising:

a polymer selected from the group consisting of polypropylene, polyethylene, polyethylene-polypropylene copolymers ABS, polystyrene, polyethylene terephthalate and bioplastics, preferably polyhydroxyalkanoates, polybutylene succinate or polylactic acid and mixtures thereof,

an anti-microbial agent selected from the group consisting of titanium, silver, gold, copper, platinum, zinc, an oxide or salt of said metals, alloys, glasses or clays comprising said metal oxides, anti-microbial peptides, silicone based anti-microbial agents and quaternary ammonia cations (Qua Ts), and

a low adhesion, slip or release agent selected from the group consisting of silicone vinyl

polymers, silicone emulsions, dimethyl polysiloxanes, silicone oils, silicone wax, carnauba wax, lecithin, fatty acids, fatty acid esters, magnesium stearate, vegetable oils, preferably soybean oil, rapeseed oil, palm oil, sunflower oil, coconut oil, castor oil and mixtures thereof and mixtures thereof.

16. The packaging according to claim 15 wherein the substrate is an injection molded or extruded packaging structure obtained by injection molding or extruding a polymer blend comprising:

a polymer selected from the group consisting of polypropylene, polyethylene, polyethylene-polypropylene copolymers, ABS, polystyrene, polyethylene terephthalate, and bioplastics, preferably polyhydroxyalkanoates, polybutylene succinate or polylactic acid and mixtures thereof with a master batch comprising:

- a polymeric component selected from the group consisting of polyurethanes, polyacrylic resins, polyethylene terephthalate, polyvinyl alcohols, polyhydroxyalkanoates, polylactic acid, cellulosic polymers and mixtures thereof,

- a low adhesion, slip or release agent selected from the group consisting of silicone vinyl polymers, silicone emulsions, dimethyl polysiloxanes, silicone oils, carnauba wax, lecithin, fatty acids, fatty acid esters, magnesium stearate, vegetable oils, preferably soybean oil, rapeseed oil, palm oil, sunflower oil, coconut oil, castor oil and mixtures thereof and mixtures thereof and;

- an anti-microbial agent selected from the group consisting of titanium, silver, gold, copper, platinum, zinc, an oxide or salt of said metals, alloys, glasses or clays comprising said metal oxides, anti-microbial peptides, silicone based anti-microbial agents, and quaternary ammonia cations (Qua Ts).

17. The packaging according to claims 15 or 16 wherein said substrate is an extruded packaging structure and said coating is coextruded with said substrate.

18. The packaging according to any of claims 1 to 17, comprising an adhesion enhancing layer placed between the substrate and the anti-microbial coating, selected from the group consisting of a clay coating, a printed layer printed with printing inks, a barrier coating and an acrylic primer.