

CLAIMS

1. A multiple layer structure comprising:

a skin layer comprising a polypropylene copolymer with styrene ethylene-butene-styrene block copolymer within a range of 0-20% by weight of the polypropylene;

a barrier layer having a thickness within the range of 1.5 mil-4.0 mil is selected from the group consisting of ethylene vinyl alcohol, and highly glassy, crystalline polyamides; and

a radio frequency susceptible layer having a first polyolefin in an amount within a range of 30-60% by weight, wherein the first polyolefin is a polypropylene; a second polyolefin in an amount within the range of 25-50% by weight, wherein the second polyolefin is selected from the group of ethylene copolymers including ultra low density polyethylene, polybutene-1, butene ethylene copolymers, ethylene vinyl acetate copolymers with vinyl acetate contents between approximately 18-50%, ethylene methyl acrylate copolymers with methyl acrylate contents being between approximately 20-40%, ethylene n-butyl acrylate copolymers with n-butyl acrylate content of between 20-40%, ethylene acrylic acid copolymers with the acrylic acid content of greater than approximately 15%; a radio frequency susceptible polymer in an amount within the range of 3-40% by weight, a styrene and hydrocarbon block copolymer in an amount within the range of 5-40% by weight, wherein the radio frequency susceptible polymer is selected from the group of polyamides, ^{copolymer with a vinyl acetate content} ethylene vinyl acetate, in an amount of 18-50% by weight, ethylene methyl acrylate copolymers with methyl acrylate in an amount between 20-40% by weight, ^{copolymer} ethylene vinyl alcohol with vinyl alcohol in an amount of 15-70%.

^{ethylene} ethylene-co-vinyl acetate (EVA) copolymers, ^{ethylene} methyl acrylate (EMA) copolymers, ethylene vinyl alcohol (EVOH) copolymers, polyvinyl chloride (PVC), vinylidene chlorides, vinylidene fluorides, copolymers of bis-phenol-A, and epichlorohydrines

2. The structure of claim 1 wherein the styrene and hydrocarbon block copolymer is a styrene-ethylene-butene-styrene block copolymer.

3. The structure of claim 2 further including two tie layers, one tie

layer being disposed between the skin layer and the barrier layer, and the other tie layer being disposed between the barrier layer and the radio frequency susceptible layer.

4. The structure of claim 3 wherein the tie layers are selected from the group of modified polyolefins, and modified polypropylene and polyethylene copolymers.

5. The structure of claim 3 wherein the radio frequency polymer is a dimer fatty acid polyamide.

6. The structure of claim 3 wherein the skin layer has a thickness within a range of 0.5 mil - 4.0 mil, the barrier layer has a thickness within the range of 1.5 mil - 4.0 mil, the radio frequency susceptible layer has a thickness within the range of 2.0 mil - 8.0 mil, and the tie layers each have a thickness within the range 0.3 mil - 1.0 mil.

7. A multiple layer structure comprising:

a skin layer including a polypropylene copolymer with styrene ethylene-butene-styrene block copolymer within a range of 0-20% by weight of the polypropylene;

a barrier layer having a thickness within the range of 1.5 mil-4.0 mil is selected from the group consisting of ethylene vinyl alcohol, and highly glassy, crystalline polyamides;

a radio frequency susceptible layer having a first polyolefin in an amount within a range of 30-60% by weight, wherein the first polyolefin is a polypropylene; a second polyolefin in an amount within the range of 25-50% by weight, wherein the second polyolefin is selected from the group of ethylene copolymers including ultra low density polyethylene, polybutene-1, butene ethylene copolymers, ethylene vinyl acetate copolymers with vinyl acetate contents between approximately 18-50%, ethylene methyl acrylate copolymers with methyl acrylate

contents being between approximately 20-40%, ethylene n-butyl acrylate copolymers with n-butyl acrylate content of between 20-40%, ethylene acrylic acid copolymers with the acrylic acid content of greater than approximately 15%; a radio frequency susceptible polymer in an amount within the range of 3-40% by weight, a styrene and hydrocarbon block copolymer in an amount within the range of 5-40% by weight, wherein the radio frequency susceptible polymer is selected from the group of polyamides, ^{copolymer with a vinyl acetate content} ethylene vinyl acetate, in an amount of 18-50% by weight, ethylene methyl acrylate copolymers with methyl acrylate in an amount between 20-40% by weight, ethylene vinyl alcohol, ^{copolymer} with vinyl alcohol in an amount of 15-70%; and ^{ethylene-co-vinyl acetate (EVA) copolymers, ethylene methyl acetate (EMA) copolymers, ethylene vinyl alcohol (EVOH) copolymers, polyvinyl chloride (PVC), vinylidene chlorides, vinyl vinylidene fluorides, copolymers of bis-phenol-A, epichlorohydrins,} a first polypropylene layer dividing the radio frequency susceptible layer into first and second radio frequency susceptible layers.

8. The structure of claim 7 wherein the first and second radio frequency susceptible layer are essentially of the same thickness.

9. The structure of claim 7 wherein the first and second radio frequency susceptible layer are of different thicknesses.

10. The structure of claim 7 wherein the layers are stacked in consecutive order.

11. The structure of claim 10 further comprising:
a first tie layer disposed between the skin layer and the barrier layer; and
a second tie layer disposed between the barrier layer and the first radio frequency susceptible layer.

12. The structure of claim 7 wherein the barrier layer is selected from the group consisting of ethylene vinyl alcohol, and highly glassy, crystalline polyamides.

13. The structure of claim 12 wherein the first polyolefin is a second polypropylene, and the second polyolefin is selected from the group of ethylene copolymers including ultra low density polyethylene, polybutene-1, butene ethylene copolymers, ethylene vinyl acetate copolymers with vinyl acetate contents between approximately 18 - 50%, ethylene methyl acrylate copolymers with methyl acrylate contents being between approximately 20 - 40%, ethylene n-butyl acrylate copolymers with n-butyl acrylate content of between 20 - 40%, ethylene acrylic acid copolymers with the acrylic acid content of greater than approximately 15%.

14. The structure of claim 13 wherein the skin layer comprises: a polypropylene copolymer with styrene ethylene-butene-styrene block copolymer within a range of 0 - 20% by weight of the polypropylene.

15. A multiple layer structure comprising:

a skin layer;

a barrier sandwich layer having from 2 to 10 units of a barrier layer and a tie layer, wherein the barrier layer is selected from the group consisting of ethylene vinyl alcohol, and highly glassy, crystalline polyamides; and

a radio frequency susceptible layer having a first polyolefin in an amount within a range of 30-60% by weight, wherein the first polyolefin is a polypropylene; a second polyolefin in an amount within the range of 25-50% by weight, wherein the second polyolefin is selected from the group of ethylene copolymers including ultra low density polyethylene, polybutene-1, butene ethylene copolymers, ethylene vinyl acetate copolymers with vinyl acetate contents between approximately 18-50%, ethylene methyl acrylate copolymers with methyl acrylate contents being between approximately 20-40%, ethylene n-butyl acrylate copolymers with n-butyl acrylate content of between 20-40%, ethylene acrylic acid copolymers with the acrylic acid content of greater than approximately 15%; a radio frequency susceptible polymer in an amount within the range of 3-40% by weight, a styrene and hydrocarbon block copolymer in an amount within the range of 5-40% by weight, wherein the radio frequency susceptible polymer is selected

from ~~the group of~~ polyamides, ethylene vinyl acetate^{copolymer with a vinyl acetate content} in an amount of 18-50% by weight, ethylene methyl acrylate copolymers with methyl acrylate in an amount between 20-40% by weight, ethylene vinyl alcohol^{copolymer} with vinyl alcohol in an amount of 15-70%.

ethylene-co-vinyl acetate (EVA) copolymers, ethylene methyl acrylate (EMA) copolymers, ethylene vinyl alcohol (EVOH) copolymers, polyvinyl chloride (PVC), vinylidene chlorides, vinylidene fluorides, copolymers of bis-phenol-A, epichlorohydrines

16. The structure of claim 15 further comprising a tie layer between the skin layer and the barrier sandwich.

17. The structure of claim 16 wherein the tie layer is selected from the group of modified polyolefins, and modified polypropylene and polyethylene copolymers.