POLYPROPYLENE LAMINATE SHEET

BACKGROUND

[0001] Known are fabric sheets, such as scrims and tarpaulins for example, for use in myriad commercial and industrial applications. Fabric sheets made from polyolefin—and in particular, fabric sheets made of polypropylene—find widespread use in outdoor industrial environments because of polypropylene's high modulus, high mechanical strength, and resilience when exposed to harsh weather conditions.

[0002] Further known is the lamination of a layer of polyethylene onto polypropylene fabric sheet. Polypropylene and polyethylene, however, are not compatible with each other. Over time, the polyethylene layer peels away from the polypropylene fabric, leaving a degraded and ineffective fabric sheet.

[0003] Consequently, the art recognizes the need for structures and compositions that can impart greater adhesion between the polypropylene layer and the polyethylene layer in multilayer fabric sheets. A need exists for a fabric sheet with improved adhesion between the polypropylene fabric sheet and the polyethylene layer.

SUMMARY

[0004] The present disclosure provides an article. The article is a fabric laminate. In an example, the fabric laminate includes a fabric sheet, a coating layer, and a tie layer. The fabric sheet is composed of propylene-based polymer fibers. The coating layer is composed of one or more ethylene-based polymers. The tie layer is located between the fabric sheet and the coating layer. The tie layer is composed of at least 50 wt% of a crystalline block composite (CBC) and an optional blend component. The CBC includes (i) an isotactic crystalline propylene homopolymer (iPP); (ii) an ethylene/propylene copolymer; and (iii) a diblock with the formula (EP)-(iPP). The CBC has a block composite index(CBCI) from 0.1 to 1.0. The fabric laminate has a peel force from 20 N/15mm to 40 N/15mm (Peak Load).

[0004a] In one aspect, the present disclosure provides a fabric laminate comprising:

a fabric sheet composed of propylene-based polymer fibers;

a coating layer composed of one or more ethylene-based polymers;

a tie layer located between the fabric sheet and the coating layer, the tie layer composed of

at least 50 wt% of a crystalline block composite (CBC) and an optional blend component, the CBC comprising

(i) an isotactic crystalline propylene homopolymer (iPP);

(ii) an ethylene/propylene copolymer; and

(iii) a diblock with the formula (EP)-(iPP);

the CBC having a block composite index(CBCI) from 0.1 to 1.0,

wherein the fabric laminate has a peel force from 20 N/15mm to 40 N/15mm.

BRIEF DESCRIPTION OF THE DRAWING

[0005] Figure 1 is a schematic representation of the fabrication of a fabric laminate in accordance with an embodiment of the present disclosure.

CLAIMS

We Claim:

1. A fabric laminate comprising:

a fabric sheet composed of propylene-based polymer fibers;

a coating layer composed of one or more ethylene-based polymers;

a tie layer located between the fabric sheet and the coating layer, the tie layer composed of

at least 50 wt% of a crystalline block composite (CBC) and an optional blend component, the CBC comprising

(i) an isotactic crystalline propylene homopolymer (iPP);

(ii) an ethylene/propylene copolymer; and

(iii) a diblock with the formula (EP)-(iPP);

the CBC having a block composite index(CBCI) from 0.1 to 1.0,

wherein the fabric laminate has a peel force from 20 N/15mm to 40 N/15mm.

2. The fabric laminate of claim 1 wherein the tie layer is in direct contact with the fabric sheet and the tie layer is in direct contact with the coating layer.

3. The fabric laminate of any of claim 1 or 2 wherein the coating layer is composed of a blend of an ethylene/α-olefin multi-block copolymer and an ethylene/α-olefin copolymer;

the tie layer consists of the CBC; and

the fabric laminate has a peel force from 20 N/15mm to 40 N/15mm.

4. The fabric laminate of any of the preceding claims wherein the coating layer is composed of a blend of an ethylene/α-olefin multi-block copolymer and an ethylene/α-olefin copolymer;

tie layer comprises from 70 wt% to 90 wt% of the CBC and from 30 wt% to 10 wt% of a blend component that is an ethylene/α-olefin copolymer; and

the fabric laminate has a peel force from greater than 20 N/15mm to 40 N/15mm.

5. The fabric laminate of any of the preceding claims wherein

the coating layer consists of an ethylene/α-olefin block copolymer;

the tie layer consists of the CBC; and

the fabric laminate has a peel force from 20 N/15mm to 40 N/15mm.

6. The fabric laminate of any of the preceding claims wherein

the coating layer consists of an ethylene/α-olefin multi-block copolymer;

tie layer comprises from 70 wt% to 90 wt% of the a CBC and from 30 wt% to 10 wt% of a blend component that is an ethylene/α-olefin copolymer; and

the fabric laminate has a peel force from greater than 20 N/15mm to 40 N/15mm.