SUMMARY

[0004] A painted article includes a primer layer between a substrate and a paint layer, of which the substrate is the product of a substrate forming composition including an olefin block copolymer and a polypropylene polymer having a density from 0.89 g/cm^3 and 0.92 g/cm^3. The substrate is free of (1) phthalate-based plasticizer, (2) halogen-containing polymer, and (3) leachable, small polymeric units derived from styrene monomer.

[0004a] In one aspect, there is provided a painted article, comprising:

a primer layer between a substrate and a paint layer, the substrate being the product of a substrate forming composition including an olefin block copolymer and a polypropylene polymer having a density from 0.89 g/cm^3 and 0.92 g/cm^3,

wherein the substrate is free of (1) phthalate-based plasticizer, (2) halogen-containing polymer, and (3) leachable, small polymeric units derived from styrene monomer.

DETAILED DESCRIPTION

[0005] Substrates prepared using polyolefin compositions can be used with various painting systems (primer, base coat, paint layer, top coat/clear coat). It has been found that when using a primer based painting system, a substrate prepared using olefin block copolymers (OBC) and polypropylene provide both excellent paint adhesion and abrasion resistance. For example, the finished surface coating (e.g., an outermost surface of the painted article) has excellent paint adhesion (i.e., a score of 0 according to ISO 2409, where 0 is the best and 5 is the worst rating) and resistance to cohesive delamination (i.e., able to pass 10 cycles of an eraser abrasion test).

[0006] According to embodiments, the composition for forming a substrate includes an olefin block copolymer (such as copolymer of ethylene and at least one other alpha-olefins such as propylene, butene, octene, etc.) and polypropylene (such as at least one of homopolymer polypropylene - hPP, impact copolymer polypropylene - ICP, and random copolymer polypropylene - RCPP). For example, the olefin block copolymer is a copolymer of ethylene and a C_{3-20} alpha-olefin. The olefin block copolymer may include chemically differentiated units that are joined end-to-end with respect to polymerized the ethylenic functionality and the C_{3-20} alpha-olefin functionality.

[0007] For example, the composition for forming the substrate may consist essentially of the compounds that form the olefin block copolymer (e.g., polymer blend that includes the olefin block copolymer and polymers having the same composition as the olefin block copolymer) and polypropylene. The composition for forming the substrate includes from 5 wt% to 95 wt% (e.g., 10 wt% to 90 wt%, 15 wt% to 85 wt%, 20 wt% to 80 wt%, etc.) of the olefin block copolymer and from 5 wt% to 95 wt% (e.g., 10 wt% to 90 wt%, 15 wt% to 85 wt%, 20 wt% to 80 wt%, etc.) of the polypropylene. According to an exemplary embodiment, the composition for forming the substrate includes at least 15 wt% and/or at