Article Comprising Pressure-Sensitive Adhesive Stripes

Background

Pressure-sensitive adhesives (PSAs) are widely used for various bonding applications. In particular, stretch-releasable pressure-sensitive adhesive tapes are often used to bond an item to e.g. a surface of a building component. The item can be released from the surface by stretching the adhesive tape, leaving little or no adhesive residue on the surface.

Summary

In broad summary, herein is disclosed an article comprising a release liner with an adhesive layer disposed thereon, the adhesive layer comprising a plurality of stripes of a first pressure-sensitive adhesive and of a second pressure-sensitive adhesive, arranged in a generally alternating pattern. The first pressure-sensitive adhesive is a silicone-based pressure-sensitive adhesive that comprises a silicone block copolymer elastomer comprising hard segments that each comprise at least one polar moiety, and the second pressure-sensitive adhesive is an organic polymeric pressure-sensitive adhesive.

In one aspect, there is provided an article comprising: a first release liner comprising a fluorosilicone release surface on at least a first major surface thereof; a primary adhesive layer disposed on the first major surface of the release liner, wherein the primary adhesive layer comprises a plurality of stripes of a first pressure-sensitive adhesive and of a second pressure-sensitive adhesive, arranged in a generally alternating pattern across a lateral extent of the release liner; wherein the first pressure-sensitive adhesive is a silicone-based pressure-sensitive adhesive that comprises a silicone block copolymer elastomer comprising hard segments that each comprise at least one polar moiety, wherein the second pressure-sensitive adhesive is an organic polymeric pressure-sensitive adhesive, wherein the first pressure-sensitive adhesive provides a volume fraction of the primary adhesive layer that is from greater than 11 %, to about 80 %; wherein the first pressure-sensitive adhesive provides a release-liner-side area fraction on the first release liner-facing surface of the primary adhesive layer and provides an opposite-side area fraction on the surface of the primary adhesive layer that is opposite the first release liner, and wherein the primary adhesive layer exhibits a silicone surface-enrichment factor that is the ratio of the release-liner-side area fraction of the first pressure-sensitive adhesive to the opposite-side area fraction of the first pressure-sensitive adhesive, and wherein the silicone surface-enrichment ratio is at least about 1.2; and wherein the primary adhesive layer exhibits an Elevated Humidity / Static Shear Test result, measured according to ASTM Test Method D3654-82, of >30000 minutes.

Methods of making such an article are also disclosed. In another aspect, there is provided a method of making ~~an~~ the article as defined herein, the method comprising: simultaneously expelling a first precursor coating solution of a first pressure-sensitive adhesive through a first set of multiple, laterally-spaced-apart openings in a coating die and a second precursor coating solution of a second pressure-sensitive adhesive through a second set of multiple, laterally-spaced-apart openings in the same coating die, wherein the openings of the first set and the openings of the second set are arranged in a

generally alternating pattern with each other so that generally-alternating streams of the first and second precursor liquids are expelled therefrom and are deposited onto a fluorosilicone release surface of a release liner that is continuously moving past the coating die; removing solvent from the deposited first and second precursor coating solutions so as to solidify the first precursor coating solution into the first pressure-sensitive adhesive and to solidify the second precursor coating solution into the second pressure-sensitive adhesive, thereby forming generally alternating stripes of the first and second pressure-sensitive adhesives on the release liner, wherein the first pressure-sensitive adhesive is a silicone-based pressure-sensitive adhesive that comprises a silicone block copolymer elastomer comprising hard segments that each comprise at least one polar moiety, and the second pressure-sensitive adhesive is an organic polymeric pressure-sensitive adhesive.

These and other aspects of the disclosure will be apparent from the detailed description below. In no event, however, should this broad summary be construed to limit the claimable subject matter, whether such subject matter is presented in claims in the application as initially filed or in claims that are amended or otherwise presented in prosecution.

Brief Description of the Drawings

Fig. 1 is a schematic cross sectional slice view of a portion of an exemplary article as disclosed herein.

Fig. 2 is a schematic cross sectional slice view of a portion of another exemplary article as disclosed herein.

Fig. 3 is a top perspective view of another exemplary article as disclosed herein.

Fig. 4 is a schematic cross sectional slice view of a portion of another exemplary article as disclosed herein.

Fig. 5 is a schematic cross sectional slice view of a portion of another exemplary article as disclosed herein.

Fig. 6 is a schematic cross sectional slice view of a portion of another exemplary article as disclosed herein.

Fig. 7 is a schematic cross sectional slice view of a portion of another exemplary article as disclosed herein.

Fig. 8 is a schematic cross sectional slice view of a portion of another exemplary article as disclosed herein.

Fig. 9 is a schematic cross sectional slice view of a portion of another exemplary article as disclosed herein.

Like reference numbers in the various figures indicate like elements. Some elements may be present in identical or equivalent multiples; in such cases only one or more representative elements may

What is claimed is:

1. An article comprising:

a first release liner comprising a fluorosilicone release surface on at least a first major surface thereof;

a primary adhesive layer disposed on the first major surface of the release liner, wherein the primary adhesive layer comprises a plurality of stripes of a first pressure-sensitive adhesive and of a second pressure-sensitive adhesive, arranged in a generally alternating pattern across a lateral extent of the release liner;

wherein the first pressure-sensitive adhesive is a silicone-based pressure-sensitive adhesive that comprises a silicone block copolymer elastomer comprising hard segments that each comprise at least one polar moiety,

wherein the second pressure-sensitive adhesive is an organic polymeric pressure-sensitive adhesive,

wherein the first pressure-sensitive adhesive provides a volume fraction of the primary adhesive layer that is from greater than 11 %, to about 80 %;

wherein the first pressure-sensitive adhesive provides a release-liner-side area fraction on the first release liner-facing surface of the primary adhesive layer and provides an opposite-side area fraction on the surface of the primary adhesive layer that is opposite the first release liner, and wherein the primary adhesive layer exhibits a silicone surface-enrichment factor that is the ratio of the release-liner-side area fraction of the first pressure-sensitive adhesive to the opposite-side area fraction of the first pressure-sensitive adhesive, and wherein the silicone surface-enrichment ratio is at least about 1.2;

and wherein the primary adhesive layer exhibits an Elevated Humidity / Static Shear Test result, measured according to ASTM Test Method D3654-82, of >30000 minutes.

2. The article of claim 1, wherein the silicone block copolymer elastomer is selected from the group consisting of urea-based silicone block copolymers, oxamide-based silicone block copolymers, amide-based silicone block copolymers, and urethane-based silicone block copolymers, and mixtures and blends thereof.

3. The article of claim 1, wherein the organic polymeric pressure-sensitive adhesive comprises an organic elastomer selected from the group consisting of styrenic block copolymer elastomers, natural rubber elastomers, (meth)acrylate elastomers, and mixtures and blends thereof.

4. The article of claim 1 wherein at least some of the stripes of the first pressure-sensitive adhesive each comprise a first major surface that is in contact with the fluorosilicone release surface of the first

release liner and a second, oppositely-facing major surface that is adhesively bonded to a first major side of a tape backing.

5. The article of claim ~~1~~4, wherein the tape backing is a highly extensible backing and wherein the tape backing and the primary adhesive layer collectively provide a length of stretch-releasable adhesive tape.

pressure-sensitive adhesive stripe, which second major surface of the laterally-central portion of the first pressure-sensitive adhesive stripe is not in contact with the second pressure-sensitive adhesive stripe.

~~11. The article of claim 1, wherein the first pressure-sensitive adhesive provides a release-liner-side area fraction on the first release liner-facing surface of the primary adhesive layer and provides an opposite-side area fraction on the surface of the primary adhesive layer that is opposite the first release liner, and wherein the primary adhesive layer exhibits a silicone surface-enrichment factor that is the ratio of the release-liner-side area fraction of the first pressure-sensitive adhesive to the opposite-side area fraction of the first pressure-sensitive adhesive, and wherein the silicone surface-enrichment ratio is at least about 1.2.~~

~~12~~11. The article of claim 1, wherein the first pressure-sensitive adhesive provides a volume fraction of the primary adhesive layer that is from about 15 % to about 60 %.

~~13~~12. The article of claim 1, wherein the first pressure-sensitive adhesive provides an overall area fraction, on a surface of the primary adhesive layer that is opposite the first release liner, of from greater than about 20 %, to about 70 %.

~~14~~13. The article of claim 1, wherein the primary adhesive layer comprises a gap area fraction of from about 20 % to about 50 %.

~~15~~14. A method of making ~~an~~ the article of claim 1, the method comprising:

simultaneously expelling a first precursor coating solution of a first pressure-sensitive adhesive through a first set of multiple, laterally-spaced-apart openings in a coating die and a second precursor