

Pressure-Sensitive Adhesive Layers with Surface-Enriched Stripes And Methods of Making

Background

Pressure-sensitive adhesives (PSAs) are widely used for various bonding applications.

Summary

In broad summary, herein is disclosed an article comprising a pressure-sensitive adhesive layer on a substrate, the adhesive layer comprising stripes of first and second pressure-sensitive adhesives. The surface of the adhesive layer that faces the substrate is surface-enriched with the first pressure-sensitive adhesive. In one aspect, there is provided an article comprising a substrate comprising a first major surface; a primary adhesive layer disposed on the first major surface of the substrate, 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 substrate; wherein for at least for selected stripes of the first pressure-sensitive adhesive, a lateral edge portion of the first pressure-sensitive adhesive stripe inwardly underlies, and is in contact with, a lateral edge portion of a second pressure-sensitive adhesive stripe that is laterally adjacent to the first pressure-sensitive adhesive stripe, and a substrate-side lateral width of the first pressure-sensitive adhesive stripe is greater than an opposite-side lateral width of the first pressure-sensitive adhesive stripe by a factor of at least about 1.2.

Methods of making such articles are also disclosed. In another aspect, there is provided a method of making an article, the method comprising: simultaneously expelling a first precursor liquid of a first pressure-sensitive adhesive through a first set of multiple, laterally-spaced-apart openings in a coating die and simultaneously expelling a second precursor coating liquid 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 surface of a substrate that is continuously moving past the coating die; allowing, for at least selected laterally-adjacent streams of the first and second precursor liquids, a lateral edge of the deposited first precursor liquid to laterally displace a lateral edge of the deposited second precursor liquid at the surface of the substrate, and solidifying the first precursor liquid into the first pressure-sensitive adhesive and solidifying the second precursor liquid into the second pressure-sensitive adhesive, thereby forming generally alternating stripes of the first and second pressure-sensitive adhesives on the substrate, wherein at least for selected stripes, the lateral displacing of a lateral edge of the second precursor liquid by a lateral edge of the first precursor liquid at the surface of the substrate causes a lateral edge portion of the first pressure-sensitive adhesive stripe to inwardly underlie, and to be in contact with, a lateral edge portion of a laterally-adjacent second pressure-sensitive adhesive stripe, and causes a

substrate-side lateral width of the first pressure-sensitive adhesive stripe to be greater than an opposite-side lateral width of the first pressure-sensitive adhesive stripe by a factor of at least about 1.2.

These and other aspects of the ~~invention-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 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 be designated by a reference number but it will be understood that such reference numbers apply to all such identical elements. Unless otherwise indicated, all figures and drawings in this document are not to scale and are chosen for the purpose of illustrating different embodiments of the invention. In particular the dimensions of the various components are depicted in illustrative terms only, and no relationship between the dimensions of the various components should be inferred from the drawings, unless so indicated.

Although terms such as "top", "bottom", "upper", "lower", "under", "over", "front", "back", "up" and "down", and "first" and "second" may be used in this disclosure, it should be understood that those terms are used in their relative sense only unless otherwise noted. The terms inward, outward, and lateral have particular meanings as defined later herein. The term "adhesive" as used herein means a pressure-sensitive adhesive. As used herein as a modifier to a property or attribute, the term "generally", unless otherwise specifically defined, means that the property or attribute would be readily recognizable by a person of ordinary skill but without requiring absolute precision or a perfect match (e.g., within +/- 20 % for quantifiable properties). The term "substantially", unless otherwise specifically defined, means to a high degree of approximation (e.g., within +/- 10% for quantifiable properties) but again without