

EP Application No.: 18 750 020.2
Applicant: Berry Global, Inc.
Our Ref.: EP127109-JH181
Date: June 15, 2022

NEW CLAIMS 1 to 15
(Clean Copy)

1. An absorbent composite, comprising:
 - (a) a nonwoven top layer comprising hydrophilic fibers; wherein the nonwoven top layer has an air permeability of at least 200 cubic-feet-per-minute (CFM) as determined by IST 70.1; wherein the nonwoven top layer comprises a basis weight from 10-60 grams-per-square-meter (gsm); and
 - (b) an absorbent core layer directly or indirectly attached to the nonwoven top layer, wherein the absorbent core layer comprises a high-loft through-air-bonded nonwoven including a plurality of absorbent-core-fibers, the plurality of absorbent-core fibers comprise crimped multi-component fibers; wherein the absorbent core layer comprises an absorbent-core-layer-basis weight from 10-200 gsm;

wherein the hydrophilic fibers of the nonwoven top layer comprise monocomponent fibers, multicomponent fibers, or a combination thereof; wherein the monocomponent fibers comprise one or more synthetic polymers, selected from the group, comprising polyolefins, polyesters, polyamides, polylactic acid, polyglycolic acid, or any combination thereof; wherein the multicomponent fibers include bicomponent fibers including a sheath-and-core configuration and/or a side-by-side configuration;

wherein the high-loft through-air-bonded nonwoven is a material that is compressible by 20% or more when an applied pressure changes from 0.1kPa to 0.5kPa according to BS EN ISO 9703-2 (1995);

wherein the absorbent composite includes (i) a composite-run-off value of less than 50% as determined by ISO 9073-11; (ii) a composite-absorption capacity of at least 600% as determined by ISO 9073; and (iii) a composite-rate of absorption of less than 10 seconds for a 5 ml liquid sample as determined by D824-94.
2. The absorbent composite of claim 1, wherein the nonwoven top layer comprises a spunmelt nonwoven, spunbond nonwoven, meltblown nonwoven, or a combination thereof.

2

3. The absorbent composite of claim 2, wherein the spunmelt nonwoven comprises a S1a-

Mb-S2c structure; wherein 'S1' is a first spunbond material, 2  2

~~4M~~ is a meltblown material,

'S2' is a second spunbond material, and 'a', 'b', and 'c' indicate the number of respective layers and each may independently be selected from 1, 2, 3, 4, or 5.

4. The absorbent composite of claims 1-3, wherein the nonwoven top layer comprises a carded web comprising staple fibers.
5. The absorbent composite of claims 1-4, wherein the nonwoven top layer comprises at least 30% by weight of hydrophilic fibers, such as at least 40%, at least 50%, at least 60%, at least 70%, at least 80%, at least 90%, or 100% by weight of hydrophilic fibers.
6. The absorbent composite of claims 1-5, wherein nonwoven top layer has an air permeability of at least 250 CFM, at least 300 CFM, at least 350 CFM, at least 400 CFM, or at least 500 CFM as determined by IST 70.1; and wherein the nonwoven top layer includes a bonding area prior to formation of the absorbent composite comprising from 1-30%, such as from 1-25%, from 3-20%, or from 5-15%.
7. The absorbent composite of claims 1-6, wherein the nonwoven top layer includes a bonding pattern prior to formation of the absorbent composite comprising thermally-formed point bonds, ultrasonic bonds, mechanical bonds, or any combination thereof.
8. The absorbent composite of claims 1-7, wherein the nonwoven top layer comprises a top-layer-Martindale Abrasion value of less than 2 mg as determined by IST 20.5, such as less than 1.75 mg, less than 1.5 mg, less than 1.25 mg, less than 1.0 mg, less than 0.75 mg, or less than 0.50 mg as determined by IST 20.5 and wherein the nonwoven top layer preferably comprises a basis weight from 15-50 gsm, 20-50 gsm, 25-45 gsm, 25-40 gsm, or from 25-35 gsm; and wherein the plurality of absorbent-core-fibers comprises at least 30% by weight of hydrophilic fibers, such as at least 40%, at least 50%, at least 60%, at least 70%, at least 80%, at least 90%, or 100% by weight of hydrophilic fibers.
9. The absorbent composite of claims 1-8, wherein the absorbent core layer is devoid of natural cellulosic materials and synthetic cellulosic materials.

10. The absorbent composite of claims 1-9, wherein the plurality of absorbent-core-fibers include monocomponent fibers comprising one or more synthetic polymers, such as polyolefins, polyesters, polyamides, polylactic acid, polyglycolic acid, or any combination thereof.
11. The absorbent composite of claims 1-10, wherein the plurality of absorbent-core-fibers have an average denier of at most 5 denier, such as at most 4, 3, 2.5, 2, or 1.5 denier.
12. The absorbent composite of claims 1-11, wherein the absorbent core layer comprises a blend of (i) a first group of bicomponent fibers having a polyethylene sheath and a polypropylene core, and (ii) a second group of bicomponent fibers having a polyethylene sheath and a polyester core.
13. The absorbent composite of claim 1-12, wherein the absorbent core layer comprises a void volume greater than 12 cc/g, such as greater than 14 cc/g, greater than 15 cc/g, greater than 16 cc/g, greater than 17 cc/g, greater than 18 cc/g, greater than 19 cc/g, or greater than 20 cc/g.
14. The absorbent composite of claim 1-13, wherein the absorbent core layer comprises an absorbent-core-layer-air permeability below 1600 CFM, such as below 1500 CFM, 1400 CFM, 1300 CFM, 1200 CFM, 1100 CFM, 1000 CFM, 900 CFM, 800 CFM, and 700 CFM; wherein the absorbent core layer comprises an absorbent-core-layer-absorption capacity that is greater than 1200% as determined by ISO 9073, such as greater than 1400%, 1600%, 1800%, 2000%, 2200%, 2400%, 2600%, 2800%, or 3000% as determined by ISO 9073; wherein the absorbent core layer preferably comprises an absorbent-core-layer-basis weight from 10-175 gsm, from 10-150 gsm, from 10-125 gsm, from 10-100 gsm, from 10-75 gsm, from 10-50 gsm, from 10-25 gsm, or from 15-25 gsm.
15. The absorbent composite of any of the preceding claims, wherein the absorbent core layer has a bulk density that is less than 50 kg/m³.