

ALLOWED CLAIMS

AIRBAGS AND METHODS FOR PRODUCTION OF AIRBAGS

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Serial No: 16/650,779

Claims 1-5, 7-8, 12-17, 19, 21-23, 27 and 29-30 (renumbered as 1-20) allowed as on March 30, 2022.

1. A method for decreasing air leakage from a one piece woven (OPW) airbag, said method comprising:
 - forming an OPW airbag having seams;
 - applying a hot melt sealant material to one or more seams of the OPW airbag; and
 - compressing the hot melt sealant material into the seams.
2. The method of claim 1, further comprising calendering the OPW airbag before application of the sealant material to the one or more seams.
3. The method of claim 1, further comprising applying a lightweight coating over the OPW airbag, after applying the sealant material to the one or more seams.
4. The method of claim 1, wherein the lightweight coating is in the form of a lightweight film selected from polyurethanes, polyamides, polyolefins and polyesters, or is formed from dispersions of silicone-based coatings such as poly-dimethylenesiloxane, polyurethane and rubber compositions such as polychloroprene, having a weight per unit area selected from ranges selected from the group consisting of from $\geq 5 \text{ g/m}^2$ to $\leq 40 \text{ g/m}^2$ and from $\geq 5 \text{ g/m}^2$ to $\leq 20 \text{ g/m}^2$.
5. The method of claim 1, wherein the hot melt sealant material has a melting range less than that of a fabric of the OPW airbag, such as from $\geq 50^\circ \text{ C}$ to $\leq 180^\circ \text{ C}$, or from $\geq 120^\circ \text{ C}$ to $\leq 160^\circ \text{ C}$.
6. The method of claim 1, wherein the hot melt sealant material further comprises tracer compound which when illuminated with ultraviolet light fluoresces in the visible light range, and the method further comprises tracing the application of the hot melt sealant material with ultraviolet light.

7. The method of claim 1, wherein the hot melt sealant material is selected from a micropore penetrable, low viscosity, low surface tension sealant, a low thickness film, an adhesive web, or an impermeable multi-layer film.

8. An OPW airbag comprising:

a one piece woven fabric, wherein a major portion of the fabric has multiple woven layers, a minor portion of the fabric having fewer woven layers than the major portion, and a seam between edges of major portions, and major and minor portions;

the seam is coated with a hot melt sealant material; and

the hot melt sealant material is compressed into the seam.

9. The OPW airbag of claim 8, wherein the seam constitutes $\geq 2\%$ and $\leq 14\%$ of the surface area of the OPW airbag.

10. The OPW airbag of claim 8, wherein the hot melt sealant material is a reactive polyurethane having a melting point range of from $\geq 50^{\circ}\text{C}$ to $\leq 180^{\circ}\text{C}$, or from $\geq 120^{\circ}\text{C}$ to $\leq 160^{\circ}\text{C}$.

11. The OPW airbag of claim 8, wherein the airbag is calendered before application of the hot melt sealant material.

12. The OPW airbag of claim 8, wherein the major, minor and seam portions of the airbag are coated with a light weight coating selected from silicone-based coatings (such as polydimethylsiloxane), urethanes (such as polyurethane) and rubber compositions (such as polychloroprene), and wherein the light weight coating has a weight per unit area selected the group of ranges consisting of:

a. from $\geq 5\text{ g/m}^2$ to $\leq 40\text{ g/m}^2$; and

b. from $\geq 5\text{ g/m}^2$ to $\leq 20\text{ g/m}^2$.

13. The OPW airbag of claim 8, wherein the major portion of the fabric is characterized by a gas permeability of $<1\text{ l/dm}^2/\text{min}$, measured by Static Air Permeability with a test area of 100 cm^2 and test pressure of 500 Pa .

14. The OPW airbag of claim 8, wherein the hot melt sealant material is present at a level of less than 100 g/m².

15. The OPW airbag of claim 8, which has an average coating weight over the entire surface of the airbag is selected from the group of ranges consisting of:

- a. from $\geq 10\text{g/m}^2$ to $\leq 65\text{g/m}^2$;
- b. $\geq 10\text{g/m}^2$ to $\leq 35\text{g/m}^2$; and
- c. $\geq 10\text{g/m}^2$ to $\leq 25\text{g/m}^2$.

16. The OPW airbag of claim 8, wherein the airbag fabric has been calendered and wherein a light weight film has been applied to the calendered airbag fabric.

17. The OPW airbag of claim 16, wherein the light weight film has been applied in the absence of separate seam sealing.

18. A method for decreasing air leakage from an OPW airbag, said method comprising:

- a. calendering the OPW airbag;
- b. compressing a hot melt sealant material into a seam of the OPW airbag; and
- c. laminating a film to the OPW airbag.

19. The method of claim 18 whereby the calendering of the OPW airbag reduces the leakage rate through the cut edge of the airbag by in-plane gas flow.

20. The method of claim 18, wherein the film is applied with heat and/or pressure.
