CLAIMS

What is claimed is:

1. A method of manufacturing a poly(vinyl butyral) resin, the method comprising:

providing a high shear mixer;

adding a continuous stream of poly(vinyl alcohol) to said high shear mixer;

adding a continuous stream of butyraldehyde to said high shear mixer;

mixing said stream of poly(vinyl alcohol) and said stream of butyraldehyde in a region of said high shear mixer wherein said streams are mixed at an overall average shear rate of at least $20s^{-1}$, wherein said stream of poly(vinyl alcohol) is at a temperature of greater than 95°C to form said poly(vinyl butyral) resin; and,

processing said poly(vinyl butyral) resin from said high shear mixer.

2. A method of manufacturing a poly(vinyl butyral) resin, comprising the steps:

providing a high shear mixer;

adding a continuous stream of poly(vinyl alcohol) to said high shear mixer;

adding a continuous stream of butyraldehyde to said high shear mixer;

mixing said stream of poly(vinyl alcohol) and said stream of butyraldehyde in a region of said high shear mixer wherein said streams are mixed at an overall average shear rate of at least $20s^{-1}$, wherein said stream of poly(vinyl alcohol) is at a temperature of greater than 105°C to form said poly(vinyl butyral) resin; and,

processing said poly(vinyl butyral) resin from said high shear mixer.

3. The method of claim 1, wherein said poly(vinyl alcohol) stream is at a temperature greater than 115°C.

4. The method of claim 1, wherein said poly(vinyl alcohol) stream is at a temperature of 110°C to 170°C.

5. The method of claim 1, wherein said poly(vinyl alcohol) stream is at a temperature of 120°C to 160°C.

6. The method of claim 1, further including adding a continuous stream of water prior to or during said mixing.

7. The method of claim 1, wherein said high shear mixer imparts an average shear force of at least 20 Pascals.

8. The method of claim 1, wherein said high shear mixer imparts an average shear force of at least 30 Pascals.

9. The method of claim 1, wherein said high shear mixer imparts an average shear force of at least 40 Pascals.

10. The method of claim 1, further including the step of adding an acid catalyst prior to or during said mixing.

11. The method of claim 10, wherein said acid catalyst is an inorganic acid.

12. The method of claim 1, wherein said mixing occurs in less than five minutes.

13. The method of claim 1, wherein said mixing occurs in less than three minutes.

14. The method of claim 1, further comprising passing said poly(vinyl butyral) resin through a continuously mixed reactor system positioned after the high shear mixer.

15. The method of claim 1, further comprising washing said poly(vinyl butyral) resin.

16. The method of claim I, wherein said overall mixing is at an average shear rate of at least $30s^{-1}$.

17. The method of claim 1, wherein said overall mixing is at an average shear rate of at least $40s^{-1}$.

18. The poly(vinyl butyral) resin made by the method of claim 1.

CLAIMS

1. A method of manufacturing a poly(vinyl butyral) resin, the method comprising:
providing a high shear mixer;
adding a continuous stream of poly(vinyl alcohol) to said high shear mixer;
adding a continuous stream of butyraldehyde to said high shear mixer;
mixing said stream of poly(vinyl alcohol) and said stream of butyraldehyde in a region of said high shear mixer wherein said streams are mixed at an overall average shear rate of at least $20s^{-1}$, wherein said stream of poly(vinyl alcohol) is at a temperature of greater than 95°C to form said poly(vinyl butyral) resin; and,
processing said poly(vinyl butyral) resin from said high shear mixer.

2. A method of manufacturing a poly(vinyl butyral) resin, comprising the steps: providing a high shear mixer;
adding a continuous stream of poly(vinyl alcohol) to said high shear mixer;
adding a continuous stream of butyraldehyde to said high shear mixer;
mixing said stream of poly(vinyl alcohol) and said stream of butyraldehyde in a region of said high shear mixer wherein said streams are mixed at an overall average shear rate of at least $20s^{-1}$, wherein said stream of poly(vinyl alcohol) is at a temperature of greater than 105°C to form said poly(vinyl butyral) resin; and,
processing said poly(vinyl butyral) resin from said high shear mixer.

3. The method of claim 1, wherein said poly(vinyl alcohol) stream is at a temperature greater than 115°C.

4. The method of claim 1, wherein said poly(vinyl alcohol) stream is at a temperature of 110°C to 170°C.

5. The method of claim 1, wherein said poly(vinyl alcohol) stream is at a temperature of 120°C to 160°C.

6. The method of claim 1, further including adding a continuous stream of water prior to or during said mixing.

7. The method of claim 1, wherein said high shear mixer imparts an average shear force of at least 20 Pascals.

8. The method of claim 1, wherein said high shear mixer imparts an average shear force of at least 30 Pascals.

9. The method of claim 1, wherein said high shear mixer imparts an average shear force of at least 40 Pascals.

10. The method of claim 1, further including the step of adding an acid catalyst prior to or during said mixing.

11. The method of claim 10, wherein said acid catalyst is an inorganic acid.

12. The method of claim 1, wherein said mixing occurs in less than five minutes.

13. The method of claim 1, wherein said mixing occurs in less than three minutes.

14. The method of claim 1, further comprising passing said poly(vinyl butyral) resin through a continuously mixed reactor system positioned after the high shear mixer.

15. The method of claim 1, further comprising washing said poly(vinyl butyral) resin.

16. The method of claim 1, wherein said overall mixing is at an average shear rate of at least $30s^{-1}$.

17. The method of claim 1, wherein said overall mixing is at an average shear rate of at least $40s^{-1}$.