CLAIMS

What is claimed is:

1. A paper-based container assembly comprising:

a container body comprising:

at least one sidewall defining a container interior,

a top rim circumscribing a top end of the at least one sidewall, and

a bottom peripheral edge circumscribing a bottom end of the at least one sidewall;

a top closure affixed to the top rim; and

a bottom closure recessed into the bottom end and forming a seal with an interior surface of the container body;

wherein each of the container body, top closure, and bottom closure comprises a plurality of layers including one or more barrier layers and one or more paper-based layers;

wherein the one or more paper-based layers of the container body, top closure, and bottom closure comprise at least 95% by mass of the paper-based container assembly; and

wherein the paper-based container assembly has an oxygen transmission rate of 0.5 cm^3/m^2/day or less and a water vapor transmission rate of 0.5 g/m^2/day or less,

wherein the paper-based container assembly is configured to withstand a pressure differential of at least 10 inHg between the container interior and the external environment for at least 10 minutes without failure of the top closure or the bottom closure.

2. The paper-based container assembly of Claim 1, wherein the oxygen transmission rate of the paper-based container assembly 0.05 cm^3/m^2/day or less.

3. The paper-based container assembly of Claim 1, wherein the water vapor transmission rate of the paper-based container assembly is 0.05 g/m^2/day or less.

4. The paper-based container assembly of Claim 1, wherein:

the plurality of layers includes one or more ionomer layers within at least one of the container body and the bottom closure; and

the one or more ionomer layers are of the same grade and, when heated, form a seal between the bottom closure and the interior surface of the container body.

5. The paper-based container assembly of Claim 1, wherein each of the container body, top closure, and bottom closure comprise a plurality of layers including one or more barrier layers and one or more paper-based layers.

6. The paper-based container assembly of Claim 5, wherein the one or more barrier layers of at least one of the container body, top closure, and bottom closure comprise metalized polyethylene terephthalate (MPET).

7. The paper-based container assembly of Claim 5, wherein the one or more barrier layers of at least one of the container body, top closure, and bottom closure comprise aluminum.

8. The paper-based container assembly of Claim 5, wherein the one or more barrier layers of at least one of the container body, top closure, and bottom closure comprise metalized polybutylene terephthalate (MPBT).

9. The paper-based container assembly of Claim 5, wherein the one or more barrier layers of at least one of the container body, top closure, and bottom closure comprise aluminum oxide (AlOx) coated polyethylene terephthalate (PET).

10. The paper-based container assembly of Claim 1, wherein the plurality of layers includes one or more tie layers.

11. The paper-based container assembly of Claim 1, wherein the bottom closure is recessed into the bottom end of the container body at a recessed distance within a range of 0.2–2 cm.

12. The paper-based container assembly of Claim 1, wherein the seal between the interior surface of the container body and the bottom closure is hermetic.

13. The paper-based container assembly of Claim 1, wherein the container body is cylindrical.

14. The paper-based container assembly of Claim 1, wherein the top closure comprises a peelable membrane sealed to the top rim.

15. A paper-based container assembly comprising:

a container body comprising:

at least one sidewall, wherein the at least one sidewall comprises:

one or more paper-based layers adhered to one or more barrier layers; and one or more ionomeric layers adhered to the one or more barrier layers, wherein the one or more ionomeric layers define a container interior;

a top rim circumscribing a top end of the at least one sidewall, and

a bottom peripheral edge circumscribing a bottom end of the sidewall;

a top closure sealed to the top rim, wherein the top closure comprises:

one or more paper-based layers adhered to one or more barrier layers; and

one or more peelable sealant layers adhered to the one or more barrier layers; and

a bottom closure recessed into the bottom end and forming a seal with an interior surface of the cylindrical container body, wherein the bottom closure comprises:

one or more cup stock board layers adhered to one or more barrier layers; and

one or more ionomeric layers adhered to the one or more barrier layers,

wherein:

the one or more paper-based layers of the cylindrical container body, top closure, and bottom closure comprise at least about 95% by mass of the paper-based container assembly, and

the paper-based container assembly has an oxygen transmission rate of 0.05cm^3/m^2/day or less and a water vapor transmission rate of 0.5 g/m^2/day or less,

wherein the paper-based container assembly is configured to withstand a pressure differential of at least 10 inHg between the container interior and the external environment for at least 10 minutes without failure of the top closure or the bottom closure.

16. The paper-based container assembly of Claim 16, wherein the sidewall at least one barrier layer, the top closure at least one barrier layer, and the bottom closure at least one barrier layer each comprise metalized polyethylene terephthalate (MPET).

17. The paper-based container assembly of Claim 16, wherein the sidewall at least one barrier layer, the top closure at least one barrier layer, and the bottom closure at least one barrier layer each comprise metalized polybutylene terephthalate (MPBT).

18. The paper-based container assembly of Claim 16, wherein the sidewall at least one barrier layer, the top closure at least one barrier layer, and the bottom closure at least one barrier layer each comprise aluminum oxide (AlOx) coated polyethylene terephthalate (PET).

19. The paper-based container assembly of Claim 16, wherein the sidewall at least one barrier layer, the top closure at least one barrier layer, and the bottom closure at least one barrier layer each comprise aluminum.

20. A paper-based container assembly comprising:

a container body comprising:

at least one sidewall, wherein the at least one sidewall comprises:

one or more paper-based layers adhered to one or more barrier layers, wherein the one or more barrier layer are selected from the group consisting of metalized polyethylene terephthalate (MPET), metalized polybutylene terephthalate (MPBT), aluminum oxide (AlOx) coated polyethylene terephthalate (PET), and aluminum; and

one or more ionomeric layers adhered to the one or more barrier layers, wherein the one or more ionomeric layers define a container interior;

a top rim circumscribing a top end of the at least one sidewall, and

a bottom peripheral edge circumscribing a bottom end of the sidewall;

a top closure sealed to the top rim, wherein the top closure comprises:

one or more paper-based layers adhered to one or more barrier layers, wherein the one or more barrier layer are selected from the group consisting of metalized polyethylene terephthalate (MPET), metalized polybutylene terephthalate (MPBT), aluminum oxide (AlOx) coated polyethylene terephthalate (PET), and aluminum; and

one or more peelable sealant layers adhered to the one or more barrier layers; and

a bottom closure recessed into the bottom end and forming a seal with an interior surface of the cylindrical container body, wherein the bottom closure comprises:

one or more cup stock board layers adhered to one or more barrier layers, wherein the one or more barrier layer are selected from the group consisting of metalized polyethylene terephthalate (MPET), metalized polybutylene terephthalate (MPBT), aluminum oxide (AlOx) coated polyethylene terephthalate (PET), and aluminum; and

one or more ionomeric layers adhered to the one or more barrier layers,

wherein:

the one or more paper-based layers of the cylindrical container body, top closure, and bottom closure comprise at least about 95% by mass of the paper-based container assembly, and

the paper-based container assembly has an oxygen transmission rate of 0.05cm^3/m^2/day or less and a water vapor transmission rate of 0.5 g/m^2/day or less,

wherein the paper-based container assembly is configured to withstand a pressure differential of at least 10 inHg between the container interior and the external environment for at least 10 minutes without failure of the top closure or the bottom closure.

21. The paper-based container assembly of claim 21 wherein the paper-based container assembly has an oxygen transmission rate of 0.05 cm^3/m^2/day or less and a water vapor transmission rate of 0.05 g/m^2/day or less.