CLAIMS

1. A bag holder for supporting a bioprocess bag during freezing, comprising:

a bag tray including:

a basin, surrounded in part by a first side wall and a second side wall;

a neck formed at one end of the basin, between the first side wall and the second side wall, the neck having a height that is between a height of the bottom portion of the basin and a height of at least one of the first side wall or the second side wall; and

a tube guide formed on each of an area between the neck and the first side wall and an area between the neck and the second side wall, wherein the tube guide comprises opening cutouts, and wherein the tube guide is sized such that tubes extending from the neck can be directed through the tube guides towards the opening cutouts,

wherein the first side wall includes one or more first retaining features, each of the first retaining features having a first shape;

the second side wall includes one or more second retaining features, each of the second retaining features having a second shape;

each of the opening cutouts is formed along the first side wall and the second side wall; and

the first shape and the second shape are such that the first shape and the second shape can be mechanically joined to one another.

2. The bag holder of claim 1, wherein the bag tray is a first bag tray, the bag holder further comprising a second bag tray, the second bag tray identical to the first bag tray.

3. The bag holder of claim 2, wherein the first bag tray is configured to be joined to the second bag tray by engagement of the first retaining features of the first bag tray with the second retaining features of the second bag tray and engagement of the second retaining features of the first bag tray with the first retaining features of the second bag tray.

4. The bag holder of claim 3, wherein when the first bag tray is joined to the second bag tray, the bag holder includes an opening in communication with the neck of the first bag tray.

5. The bag holder of claim 1, further comprising a partial fill bar comprising a resilient material and configured to extend from the first side wall of the bag tray to the second side wall of the bag tray.

6. The bag holder of claim 5, wherein the first side wall includes a plurality of the first retaining features and the second side wall includes a plurality of the second retaining features.

7. The bag holder of claim 1, wherein the basin includes a flat bottom surface.

8. The bag holder of claim 1, further comprising one or more bulkheads around at least a portion of the basin.

9. The bag holder of claim 1, further comprising a metal insert forming a portion of the basin.

10. The bag holder of claim 1, wherein the first shape and the second shape are complementary to one another.

11. The bag holder of claim 2, further comprising:

a partial fill bar,

wherein the first bag tray and the second bag tray are configured such that when the first bag tray is joined to the second bag tray, the partial fill bar can be retained between the first bag tray and the second bag tray such that the partial fill bar extends across the space defined by the basin of the first bag tray and the basin of the second bag tray from the first side wall of the first bag tray to the second side wall of the first bag tray.

12. The bag holder of claim 11, wherein the first bag tray and the second bag tray are configured such that the partial fill bar can be slid in a direction extending from the neck to a back wall of the basin opposite the neck.

13. A method of manufacturing a bag holder for freezing of a bioprocess bag, comprising:

forming a first bag tray, the first bag tray including:

a basin, surrounded in part by a first side wall and a second side wall;

a neck formed at one end of the basin, between the first side wall and the second side wall, the neck having a height that is between a height of the bottom portion of the basin and a height of at least one of the first side wall or the second side wall; and

a tube guide formed on each of an area between the neck and the first side wall and an area between the neck and the second side wall, wherein the tube guide comprises opening cutouts, and wherein the tube guide is sized such that tubes extending from the neck can be directed through the tube guides towards the opening cutouts,

wherein the first side wall includes one or more first retaining features, each of the first retaining features having a first shape,

the second side wall includes one or more second retaining features, each of the second retaining features having a second shape, and

each of the opening cutouts is formed along the first side wall and the second side wall,

the first shape and the second shape are such that the first shape and the second shape can be mechanically joined to one another; and

forming a second bag tray, identical to the first.

14. The method of claim 13, wherein forming the first bag tray includes thermoforming or injection molding a material.

15. The method of claim 13, wherein each of the first side wall and the second side wall is configured to accommodate a partial fill bar.

16. The method of claim 13, wherein the basin of the first bag tray includes a flat bottom surface.

17. The method of claim 13, wherein the first bag tray includes one or more bulkheads around at least a portion of the basin.

18. The method of claim 13, wherein forming the first bag tray includes providing a metal sheet, the metal sheet forming a portion of the basin.

19. The method of claim 13, wherein the first bag tray and the second bag tray are configured such that when the first bag tray is joined to the second bag tray, a partial fill bar can be retained between the first bag tray and the second bag tray such that the partial fill bar extends across the space defined by the basin of the first bag tray and the basin of the second bag tray from the first side wall of the first bag tray to the second side wall of the first bag tray.

20. The method of claim 19, wherein the first bag tray and the second bag tray are configured such that the partial fill bar can be slid in a direction extending from the neck to a back wall of the basin opposite the neck.