shipped. Furthermore, vial labels often separate from the surface of the vials when stored at cryogenic temperatures due to a loss of adhering properties of the labels at low temperatures. Additionally, difficulties have been encountered when using traditional labeling techniques to apply labels to vials at cryogenic temperatures due to the buildup of frost on the surface of the vials in addition to the loss of adhering properties of labels at low temperatures. Consequently, there is a need for a better solution for labelling vials stored at cryogenic temperatures such that the labeling can be applied at cryogenic temperatures and the labels remain adhered throughout storage and transport.

## SUMMARY

**[0005]** Accordingly, an object of the disclosure is to provide users with a vial jacket that can receive a label and maintain the label adhered at a cryogenic temperature range. It is an object of the disclosure to provide users with systems and methods to permit the user to securely surround a vial with the vial jacket during storage and transportation. It is an object of the disclosure to provide users with systems and methods to permit the user to inspect the contents of the vial through a viewing window in the vial jacket.

**[0006]** In some examples, a vial jacket configured to receive a label includes a plastic material, a hinge formed in the plastic material, a locking mechanism, and an opening formed in the plastic material. The plastic material has a cryogenic operating temperature range and is dimensioned to surround at least a portion of a vial. The hinge defines a first half shell having a first edge and a second half shell having a second edge. The locking mechanism is configured to secure the first edge of the first half shell to the second edge of the second half shell. The opening has an axial length and a transverse length.

**[0006a]** In one aspect, the present disclosure refers to a vial jacket configured to receive a label, the vial jacket comprising: a plastic material having a cryogenic operating temperature range between -190°C and 0°C, the plastic material dimensioned to surround at least a portion of a vial; a hinge formed in the plastic material, the hinge defining a first half shell comprising a first edge and a second half shell comprising a second edge; a locking mechanism configured to secure the first edge of the first half shell to the second edge of the second half shell; and an opening formed in the plastic material having an axial length and a transverse length.

**[0007]** In some examples, the cryogenic operating temperature range comprises a range of about -150°C to about 0°C. In some examples, the cryogenic operating temperature range comprises a range of about -190°C to about 0°C. In some examples, the cryogenic operating temperature range comprises a range of about -190°C to about -135°C. In some examples, the cryogenic operating temperature range comprises a range of about -150°C to

about -135°C. In some examples, the cryogenic operating temperature range comprises about one of the group consisting of -190°C, -180°C, -135°C, -80°C, and 0°C.

**[0008]** In some examples, the hinge is formed by a thinning of the plastic material. In some examples, the plastic material comprises at least one of HDPE, polypropylene, or other suitable plastic.

**[0009]** In some examples, the locking mechanism secures the vial jacket to the vial. In some examples, the locking mechanism is configured to snap fit the first edge of the first half shell to the second edge of the second half shell.

**[00010]** In some examples, the axial length of the opening is different than the transverse length of the opening. In some examples, the axial length of the opening is greater than the transverse length of the opening. In some examples, the transverse length of the opening is greater than the axial length of the opening. In some examples, the opening is proximate to at least one of the first edge of the first half shell or the second edge of the second half shell.

**[00011]** In some examples, a vial assembly includes a vial and a vial jacket configured to receive a label. The vial jacket includes a plastic material, a hinge formed in the plastic material, a locking mechanism, and an opening formed in the plastic material. The plastic material has a cryogenic operating temperature range and is dimensioned to surround at least a portion of the vial. The hinge defines a first half shell having a first edge and a second half shell having a second edge. The locking mechanism is configured to secure the first edge of the first half shell to the second edge of the second half shell. The opening has an axial length and a transverse length.

**[0011a]** In another aspect, the present disclosure refers to a vial assembly comprising a vial and a vial jacket configured to receive a label, the vial jacket comprising: a plastic material having a cryogenic operating temperature range between -190°C and 0°C, the plastic material dimensioned to surround at least a portion of the vial; a hinge formed in the plastic material, the hinge defining a first half shell comprising a first edge and a second half shell comprising a second edge; a locking mechanism configured to secure the first edge of the first half shell to the second edge of the second half shell; and an opening formed in the plastic material having an axial length and a transverse length.

**[00012]** In some examples, the cryogenic operating temperature range comprises a range of about -150°C to about 0°C. In some examples, the cryogenic operating temperature range comprises a range of about -190°C to about 0°C. In some examples, the cryogenic operating temperature range comprises a range of about -190°C to about -135°C. In some examples, the cryogenic operating temperature range comprises a range of about -150°C to

WHAT IS CLAIMED:

1. A vial jacket configured to receive a label, the vial jacket comprising:

a plastic material having a cryogenic operating temperature range between -190°C and 0°C, the plastic material dimensioned to surround at least a portion of a vial;

a hinge formed in the plastic material, the hinge defining a first half shell comprising a first edge and a second half shell comprising a second edge;

a locking mechanism configured to secure the first edge of the first half shell to the second edge of the second half shell; and

an opening formed in the plastic material having an axial length and a transverse length.

2. The vial jacket of claim 1, wherein the cryogenic operating temperature range comprises a range of ~~about~~ -150°C to ~~about~~ 0°C.

3. The vial jacket of claim 1, wherein the cryogenic operating temperature range comprises a range of ~~about~~ -190°C to ~~about 0~~ -135°C or a range of -150°C to -135°C.

4. The vial jacket of claim 1, wherein the hinge is formed by a thinning of the plastic material.

5. The vial jacket of claim 1, wherein the plastic material comprises at least one of HDPE, polypropylene, or other suitable plastic.

6. The vial jacket of claim 1, wherein the locking mechanism secures the vial jacket to the vial.

7. The vial jacket of claim 1, wherein the locking mechanism is configured to snap fit the first edge of the first half shell to the second edge of the second half shell.

8. The vial jacket of claim 1, wherein the axial length of the opening is greater than the transverse length.

9. The vial jacket of claim 1, wherein the transverse length of the opening is greater than the axial length.

10. The vial jacket of claim 1, wherein the opening is proximate to at least one of the first edge of the first half shell or the second edge of the second half shell.

11. A vial assembly comprising a vial and a vial jacket configured to receive a label, the vial jacket comprising:

a plastic material having a cryogenic operating temperature range between -190°C and 0°C, the plastic material dimensioned to surround at least a portion of the vial;

a hinge formed in the plastic material, the hinge defining a first half shell comprising a first edge and a second half shell comprising a second edge;

a locking mechanism configured to secure the first edge of the first half shell to the second edge of the second half shell; and

an opening formed in the plastic material having an axial length and a transverse length.

12. The vial assembly of claim 11, wherein the cryogenic operating temperature range comprises a range of ~~about~~ -150°C to ~~about~~ 0°C.

13. The vial assembly of claim 11, wherein the cryogenic operating temperature range comprises a range of ~~about~~ -190°C to ~~about 0~~-135°C or a range of -150°C to -135°C.

14. The vial assembly of claim 11, wherein the hinge is formed by a thinning of the plastic material.

15. The vial assembly of claim 11, wherein the plastic material comprises at least one of HDPE, polypropylene, or other suitable plastic.

16. The vial assembly of claim 11, wherein the locking mechanism secures the vial jacket to the vial.

17. The vial assembly of claim 11, wherein the locking mechanism is configured to snap fit the first edge of the first half shell to the second edge of the second half shell.

18. The vial assembly of claim 11, wherein the axial length of the opening is greater than the transverse length.

19. The vial assembly of claim 11, wherein the transverse length of the opening is greater than the axial length.

20. The vial assembly of claim 11, wherein the opening is proximate to at least one of the first edge of the first half shell or the second edge of the second half shell.