**FORM CPV-2**
**RECOMMENDED FORM FOR QUALIFYING THE LAMINATE DESIGN AND THE LAMINATE PROCEDURE SPECIFICATION USED IN THE FABRICATION OF COMPOSITE REINFORCED PRESSURE VESSELS (CLASS III)**
**(Revision A — 2017)**
**As required by the Provisions of the ASME Boiler and Pressure Vessel Code**

Qualification Test Report No. _____

Laminate Procedure Specification No. _____

A change in any of the essential variables denoted by an asterisk below requires a new Laminate Procedure Specification.

*Fiber _____
(Manufacturer and Designation)

*Sizing or Finish _____
(Manufacturer and Designation)

*Resin _____
(Type, Manufacturer, and Designation)

*Curing Agent _____
(Type, Manufacturer, and Designation)

Curing Agent/Resin Ratio _____

Viscosity of Resin System _____ cP (min.) to _____ cP (max.) @ _____ °F (°C)

*Manner of Impregnation _____
(Prepregnation, Wet Wind, Postpregnation)

*Percent Fiber by Weight in Composite _____
[See Note (1)]

*Variables of Winding Process [See Note (2)] _____

Helix Angle _____ (Measured on Cylinder Between Axis and Band Path)

Circumferential Band Density _____ end/in. (mm) _____

Circumferential Band Width _____ in. (mm) _____

Tension: Per Strand (End), Roving, or Band (Specify Which) _____ lb. (kg) per _____

Method of Control _____ Program _____

Layer Sequence _____
[See Note (2)]

*Primer _____
(Type, Manufacturer, and Designation)

Primer Application Method _____

*Primer Curing Schedule _____ °F (°C) for _____ hr _____ min _____

NOTES:
(1) Where a range of values or a tolerance applies, state the applicable range or tolerance.
(2) Use "O" to indicate full layer of circumferential windings (down and back), include number of passes.
Use "o" to indicate half layer of circumferential windings (single pass).

Exterior Treatment (Non-Structural, Describe) _____

| | Fiber Type | Fiber Form | Manufacturer | Manufacturer No. |
|---|---|---|---|---|
| Material No. 1 | _____ | _____ | _____ | _____ |
| Material No. 2 | _____ | _____ | _____ | _____ |

*Inner Liner _____
(Material, Grade, and Thickness [see Note (1)].)

*Liner Size and Configuration _____ (OD) _____ (Length) _____ (Cylindrical, Spherical, Other)

Laminate Strength _____ psi (kPa) Method of Measurement _____ (If Other Than ASTM D 2290)

Interlaminar Shear Strength _____

Acoustic Emission Examination Report Number _____

*Laminate Curing Schedule _____ °F (°C) for _____ hr _____ min _____

_____ °F (°C) for _____ hr _____ min _____

_____ °F (°C) for _____ hr _____ min _____

_____ °F (°C) for _____ hr _____ min _____

_____ °F (°C) for _____ hr _____ min _____

Manner of Measuring Temperature: Oven Air _____ Wrong Surface _____

Vessel Head _____ Other (Describe) _____

*Barcol Hardness _____
(Use a separate sheet to record individual readings and their location [see Note (1)].)

Laminate Thickness _____
(Use a separate sheet to record individual readings and their location [see Note (1)].)

*Volumetric Expansion _____

Gel Time _____ min Peak Exothermic Temperature _____ °F (°C)

Minimum Temperature Cycle Test: _____ (No. of Cycles) from _____ psi (kPa) to _____ psi (kPa) at _____ °F (°C) maximum test temperature

Maximum Temperature Cycle Test: _____ (No. of Cycles) from _____ psi (kPa) to _____ psi (kPa) at _____ °F (°C) minimum test temperature

Burst Pressure _____ psi (kPa) Qualification Pressure _____ psi (kPa)

Mode of Failure _____

ASME BOILER AND PRESSURE VESSEL CODE, Section X _____ (Year) _____ [Addenda (if applicable) Date] _____ (Case No.)

We certify that the statements in this Specification are correct:

Date _____ , _____ Signed _____ (Fabricator)

By _____

Certificate of Authorization Number _____ Expires _____

## CERTIFICATION BY SHOP INSPECTOR OF QUALIFICATION OF LAMINATE DESIGN AND LAMINATE PROCEDURE SPECIFICATION

Laminate Procedure Specification of _____ at _____
For _____ process of fabricating vessel(s) described in
User's Design Specification Number _____ and
Fabricator's Design Report Number _____
I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of _____ and employed by _____ of _____ have inspected the pressure vessel and witnessed tests described in the Qualification Test Report of the Laminate Design and Procedure Specification and state that to the best of knowledge and belief, the Fabricator has constructed this part in accordance with the ASME BOILER AND PRESSURE VESSEL CODE, Section X, Class III and the Laminate Design and Procedure Specification being qualified. By signing this certificate, neither the inspector nor his employer makes any warranty, expressed or implied, concerning the design or procedure covered by this Qualification Test Report. Furthermore, neither the inspector nor his employer shall be liable in any manner for any personal injury or property damage or loss of any kind arising from or connected with this inspection.

Date _____ Signed _____ (Authorized Inspector) Commissions _____ (National Board Authorized Inspector Number)