CLAIMS

WHAT IS CLAIMED IS:

1. A method comprising:

casting an annular packer on a tubular, wherein casting the annular packer comprises: preparing a two-part liquid resin mixture by combining a dicyclopentadiene polymeric resin with a catalyst;

supplying the two-part liquid resin mixture to a casting mold, wherein the casting mold comprises an annular region around the tubular;

curing the two-part liquid resin mixture at ambient conditions to form the annular packer, wherein the annular packer is cured in less than 5 hours; and

removing the annular packer from the casting mold;

introducing the annular packer into a wellbore;

exposing a dicyclopentadiene polymeric resin region of the annular packer to a hydrocarbon fluid having a temperature of from 130 °C to 300 °C; and

sealing an annular region of the wellbore with the dicyclopentadiene polymeric resin region of the annular packer.

2. The method of claim 1, further comprising increasing a temperature of the dicyclopentadiene polymeric resin region to above a glass transition temperature of the dicyclopentadiene polymeric resin to swell the dicyclopentadiene polymeric resin region of the annular packer with the hydrocarbon fluid.

3. The method of claim 2, wherein increasing the temperature of the dicyclopentadiene polymeric resin region comprises contacting the annular packer with the hydrocarbon fluid having a temperature that ranges between from 130 °C to 300 °C.

4. The method of claim 1, wherein the dicyclopentadiene polymeric resin comprises dicyclopentadiene and one or more monomers.

5. The method of claim 4, wherein the monomers comprise at least one of norbornene, ethylene, propylene, styrene, butadiene, cyclopentene, cycloheptene, cyclooctene, or their derivatives.

6. The method of claim 1, further comprising swelling the dicyclopentadiene polymeric resin region of the annular packer swells' in response to exposure to the hydrocarbon fluid.

7. The method of claim 1, wherein the annular packer has a hardness of at least 50 Shore D.

8. The method of claim 7, wherein the annular packer has a hardness of at least 80 Shore D.

9. The method of claim 1, wherein the catalyst comprises up to 10 weight percent of the two-part liquid resin mixture.

10. The method of claim 1, wherein the ambient conditions include room temperature conditions.

11. The method of claim 1, wherein the ambient conditions include a relative humidity of from 20 to 100%.

12. The method of claim 1, wherein the ambient conditions include a barometric pressure of from 975 mbar to 1050 mbar.

13. The method of claim 1, wherein the annular packer has a tensile strength of from 60 and 80 MPa.

14. The method of claim 1, wherein a temperature of the hydrocarbon fluid exceeds a glass transition temperature of the dicyclopentadiene polymeric resin.

15. The method of claim 1, wherein casting the annular packer further comprises combining the two-part liquid resin mixture with fillers or reinforcement fibers, wherein the fillers include one or more of fumed silica, precipitated silica, clay, functionalized clay, talc, functionalized talc, carbon black, graphite, and PTFE, and wherein the reinforcement fibers include one or more of mineral fibers, carbon fibers, glass fibers, and synthetic fibers.

16. The method of claim 15, wherein combining the two-part liquid resin mixture with the reinforcement fibers enhances a swell speed of the annular packer.

17. The method of claim 1, wherein the casting mold includes at least one of an aluminum alloy, a steel alloy, a copper alloy, brass lead, glass, or thermoset resins.

18. The method of claim 1, further comprising adding a barrier coating to the annular packer prior to introducing the annular packer into the wellbore.

19. The method of claim 1, wherein the two-part liquid resin mixture, upon curing, forms a thermoset material.

20. The method of claim 1, wherein the annular packer is cured in less than 4 hours.