Claims

What is claimed is:

1. A sealing assembly for an open-hole wellbore, the sealing assembly comprising:

at least one element comprising a first expandable sealing element and a second expandable sealing element;

a sealing mixture; and

a container housing positionable between the first expandable sealing element and the second expandable sealing element for retaining the sealing mixture that is releasable, in response to the sealing assembly being actuated, from the container housing (i) to directly contact a wall of the open-hole wellbore for pressure sealing the open-hole wellbore between the at least one element and the container housing and (ii)for providing multiple layers of seal, wherein differential pressure is receivable by a plurality of pistons to form the multiple layers of seal, and wherein the plurality of pistons, in response to receiving the differential pressure, cause the sealing assembly to expand such that retaining teeth of at least two retainer rings, which are positionable adjacent to a tubing around which the sealing assembly is positionable, contact a retaining mechanism of the tubing to retain the sealing assembly in an expanded state.

2. The sealing assembly of claim 1, further comprising:

the at least two retainer rings positioned adjacent to the first expandable sealing element and the second expandable sealing element, the at least two retainer rings comprising the retaining teeth positioned on an interior surface of the at least two retainer rings adjacent to the tubing, wherein the tubing comprises the retaining mechanism, and wherein the sealing assembly is positionable around the tubing for being positioned downhole in the open-hole wellborethe plurality of pistons mechanically coupled to the at least two retainer rings;

at least two internal seals adjacent to the at least two retainer rings and to the container housing; and

a rigid containing mechanism positioned adjacent to the first expandable sealing element and the second expandable sealing element opposite the at least two retainer rings.

3. The sealing assembly of claim 1, wherein:

the sealing mixture is positionable within the container housing for retaining the sealing mixture before the sealing assembly is expanded;

the multiple layers of seal include a first pressure seal formed by the first expandable sealing element and the second expandable sealing element and a second pressure seal formed by the sealing mixture;

the multiple layers of seal are formable in response to the plurality of pistons receiving the differential pressure and the sealing assembly expanding;

the rigid containing mechanism, in response to the plurality of pistons receiving the differential pressure, contains the first expandable sealing element and the second expandable sealing element and allows the first expandable sealing element and the second expandable sealing element to expand to contact a wall of the open-hole wellbore to form the first pressure seal; and

the at least two internal seals provide seals within the sealing assembly to prevent the sealing mixture from leaking, and to allow the sealing mixture to form the second pressure seal, after the sealing assembly is expanded.

4. The sealing assembly of claim 1 , wherein the at least one element includes an expandable elastomeric material, and wherein the expandable elastomeric material is characterized by an expansion ratio of between 3% to 50% of an outside diameter of the sealing assembly.

5. The sealing assembly of claim 1 , wherein the sealing assembly is a first sealing assembly, wherein the first sealing assembly is included in a plurality of sealing assemblies, each sealing assembly in the plurality of sealing assemblies being identical to the first sealing assembly, and wherein the plurality of sealing assemblies are positionable downhole in the open-hole wellbore to form the multiple layers of seal in a plurality of sections of the open-hole wellbore.

6. A method comprising:

positioning a sealing assembly downhole in an open-hole wellbore, the sealing assembly comprising (i) at least one element having a first expandable sealing element and a second expandable sealing element and (ii) a container housing positioned between the first expandable sealing element and the second expandable sealing element, the container housing comprising a sealing mixture;

applying differential pressure to a plurality of pistons of the sealing assembly to release the sealing mixture from the container housing (i) to cause the sealing mixture to directly contact a wall of the open-hole wellbore for pressure-sealing the open-hole wellbore and (ii) to form multiple layers of seal between the at least one element and the container housing , wherein the plurality of pistons, in response to receiving the differential pressure, cause the sealing assembly to expand such that retaining teeth of at least two retainer rings, which are positionable adjacent to a tubing around which the sealing assembly is positionable, contact a retaining mechanism of the tubing to retain the sealing assembly in an expanded state;and

performing wellbore-related tasks in the pressure-sealed open-hole wellbore.

7. The method of claim 6, wherein the sealing assembly is a first sealing assembly, wherein the first sealing assembly is included in a plurality of sealing assemblies, each sealing assembly in the plurality of sealing assemblies being identical to the first sealing assembly, and wherein the plurality of sealing assemblies are positioned downhole in the open-hole wellbore to form the multiple layers of seal in a plurality of sections of the open-hole wellbore.

8. The method of claim 6, wherein the at least one element includes an expandable elastomeric material, and wherein the expandable elastomeric material is characterized by an expansion ratio of between 3% and 50% of an outside diameter of the sealing assembly.

9 . The method of claim 6, wherein the at least one element is a first expandable sealing element, and wherein the sealing assembly further comprises:

a second expandable sealing element, wherein the container housing is positionable between the first expandable sealing element and the second expandable sealing element for

retaining the sealing mixture that is releasable from the container housing for pressure sealing the open-hole wellbore between the first expandable sealing element and the second expandable sealing element;

at least two retainer rings adjacent to the first expandable sealing element and the second expandable sealing element, the at least two retainer rings comprising retaining teeth positioned on an interior surface of the at least two retainer rings adjacent to a tubing, wherein the tubing comprises a retaining mechanism, and wherein the sealing assembly is positionable around the tubing for being positioned downhole in the open-hole wellbore;

a plurality of pistons mechanically coupled to the at least two retainer rings;

at least two internal seals adjacent to the at least two retainer rings and to the container housing; and

a rigid containing mechanism positioned adjacent to the first expandable sealing element and the second expandable sealing element opposite the at least two retainer rings.

10. The method of claim 9 , wherein applying the differential pressure to the sealing assembly includes applying the differential pressure to the plurality of pistons to expand the sealing assembly such that the retaining teeth of the at least two retainer rings contact the retaining mechanism of the tubing to retain the expanded sealing assembly.

11. The method of claim 9 , wherein applying differential pressure to the sealing assembly to form multiple layers of seal to pressure seal the open-hole wellbore includes:

forming a first pressure seal by causing the first expandable sealing element or the second expandable sealing element to expand to contact the wall of the open-hole wellbore; and

forming a second pressure seal by causing the sealing mixture to be released from the container housing to contact the wall of the open-hole wellbore, wherein:

the differential pressure is received by the plurality of pistons to cause the first expandable sealing element or the second expandable sealing element to expand and to cause the sealing mixture to be released;

the multiple layers of seal include the first pressure seal and the second pressure seal; and

the at least two internal seals provide seals within the sealing assembly to prevent the sealing mixture from leaking, and to allow the sealing mixture to form the second pressure seal, after the plurality of pistons receive the applied differential pressure.

12. The method of claim 11 wherein:

the sealing mixture is positioned within the container housing for retaining the sealing mixture before the differential pressure is received by the plurality of pistons; and

the rigid containing mechanism, in response to the plurality of pistons receiving the applied differential pressure, contains the first expandable sealing element and the second expandable sealing element and allows the first expandable sealing element and the second expandable sealing element to expand to contact a wall of the open- hole wellbore to form the first pressure seal.

13. A system for forming multiple layers of seal in an open-hole wellbore, the system comprising:

a sealing assembly comprising:

at least one element comprising a first expandable sealing element and a second expandable sealing element;

a sealing mixture; and

a container housing positionable between the first expandable sealing element and the second expandable sealing element for retaining the sealing mixture that is releasable, in response to the system being actuated, from the container housing (i) to directly contact a wall of the open-hole wellbore for pressure sealing the open- hole wellbore between the at least one element and the container housing and (ii) for providing multiple layers of seal, wherein differential pressure is receivable by a plurality of pistons to form the multiple layers of seal, and wherein the plurality of pistons, in response to receiving the differential pressure, cause the sealing assembly to expand such that retaining teeth of at least two retainer rings,

which are positionable adjacent to a tubing around which the sealing assembly is positionable, contact a retaining mechanism of the tubing to retain the system in an expanded state; and

a tubing comprising a retaining mechanism for retaining the system after the system expands.

14. The system of claim 13, further comprising:

the at least two retainer rings positioned adjacent to the first expandable sealing element and the second expandable sealing element, the at least two retainer rings comprising retaining teeth positioned on an interior surface of the at least two retainer rings adjacent to the tubing;

the plurality of pistons mechanically coupled to the at least two retainer rings;

at least two internal seals adjacent to the at least two retainer rings and to the container housing; and

a rigid containing mechanism positioned adjacent to the first expandable sealing element and the second expandable sealing element opposite the at least two retainer rings.

15. The system of claim 14, wherein differential pressure is receivable by the plurality of pistons to form the multiple layers of seal, and wherein the plurality of pistons, in response to receiving the differential pressure, cause the system to expand such that the retaining teeth of the at least two retainer rings contact the retaining mechanism of the tool to retain the expanded system.

16. The system of claim 15, wherein:

the sealing mixture is positionable within the container housing before the system is expanded;

the multiple layers of seal include a first pressure seal formed by the first expandable sealing element and the second expandable sealing element and a second pressure seal formed by the sealing mixture;

the rigid containing mechanism, in response to the plurality of pistons receiving the differential pressure, contains the first expandable sealing element and the second expandable sealing element and allows the first expandable sealing element and the second expandable sealing element to expand to contact a wall of the open-hole wellbore to form the first pressure seal;

the at least two internal seals provide seals within the system to prevent the sealing mixture from leaking, and to allow the sealing mixture to form the second pressure seal, after the system is expanded; and

the multiple layers of seal are formable in response to the plurality of pistons receiving the differential pressure and the system expanding.

17. The system of claim 13, wherein the at least one element includes an expandable elastomeric material, and wherein the expandable elastomeric material is characterized by an expansion ratio of between 3% and 50% of an outside diameter of the system.