connections. The demands of well environments include the need for threads to be made up relatively quickly, and with minimum risk of damage to the threaded connections at the ends of tubulars, such as drill and production pipe. In addition, the threaded connections must resist significant torsional loading encountered as a tubular string is built at a rig and deployed into the well, many times at great lengths that may cause distortion and twisting of the string. Moreover, very significant axial and thrust loads, as well as very high tensile loads are encountered as the tubular string are forced into a well.

[0005] Thread forms for well tubulars include very specialized profiles designed with such demands in mind. While many of these function well, there remains a need for improved thread forms and threaded products incorporating such forms, particularly for applications requiring joining of tubulars for deviations in wells and for short radius programs. There is a particular need for threaded tubulars that may be employed in different demanding environments in well applications, both onshore and offshore, and that can better withstand axial, tensile, torsional, bending, and other loading, as well as vibration.

BRIEF DESCRIPTION

[0005a] According to a first aspect of the present disclosure, there is provided a threaded product including: a tubular pin member comprising an external thread form at a pin end thereof, the external thread form comprising an external load flank, an external crest, an external stab flank, an external root, a first external radiused transition between the external load flank and the external crest, and a second external radiused transition between the external crest and the external stab flank, the external load flank being inclined with respect to a centerline of the pin member by between 1 and 6 degrees, the external stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the external load flank by between 27 degrees and 33 degrees, and wherein the external root has an elliptical profile tangentially joining the external load and external stab flanks; and a tubular box member configured to coaxially threadingly engage the tubular pin member and comprising an internal thread form at a box end thereof, the internal thread form comprising an internal load flank, an internal crest, an internal stab flank, an internal root, a first internal radiused transition between the internal load flank and the internal crest, and a second internal radiused transition between the internal crest and the internal stab flank, the internal load flank being inclined with respect to a centerline of the tubular box member by between 1 and 6 degrees, the internal stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the internal load flank by between 27 degrees and 33 degrees, and wherein the internal root has a

shape that does not conform to the elliptical profile of the external thread form; wherein when threadingly engaged the external load flank and the internal load flank form a first area of mating contact and the external stab flank and the internal stab flank form a second area of mating contact, and a dope volume is created between the external root and the internal root.

[0005b] According to a second aspect of the present disclosure, there is provided a threaded product including: a tubular pin member comprising an external thread form at a pin end thereof, the external thread form comprising an external load flank, an external crest, an external stab flank, an external root, a first external radiused transition between the external load flank and the external crest, and a second external radiused transition between the external crest and the external stab flank, the external load flank being inclined with respect to a centerline of the pin member, the external stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the external load flank, and wherein the external root has an elliptical profile tangentially joining the external load and external stab flanks, wherein the external load flank being inclined with respect to the centerline of the pin member by between 1 and 6 degrees; and a tubular box member configured to coaxially threadingly engage the tubular pin member and comprising an internal thread form at a box end thereof, the internal thread form comprising an internal load flank, an internal crest, an internal stab flank, an internal root, a first internal radiused transition between the internal load flank and the internal crest, and a second internal radiused transition between the internal crest and the internal stab flank, the internal load flank being inclined with respect to a centerline of the tubular box member, the internal stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the internal load flank, and wherein the internal root has a shape that does not conform to the elliptical profile of the external thread form, wherein the internal load flank being inclined with respect to a centerline of the tubular box member by between 1 and 6 degrees; wherein when threadingly engaged the external load flank and the internal load flank form a first area of mating contact and the external stab flank and the internal stab flank form a second area of mating contact, and a dope volume is created between the external root and the internal root.

[0006] Embodiments of the present disclosure set forth a novel thread form and threaded product designed to respond to such needs. In an embodiment, the tubular product comprises a tubular pin member comprising an external thread form at a pin end thereof, the external thread form comprising an external load flank, an external crest, an external stab flank, an external root, a first external radiused transition between the external load flank and the external crest, and a

second external radiused transition between the external crest and the external stab flank. The external root may have an elliptical profile tangentially joining the external load and external stab flanks. A tubular box member coaxially threadingly engages the tubular pin member and comprises an internal thread form at a box end thereof, the internal thread form comprising an internal load flank, an internal crest, an internal stab flank, an internal root, a first internal radiused transition between the internal load flank and the internal crest, and a second internal radiused transition between the internal crest and the internal stab flank. The internal root may have a shape that does not conform to the elliptical profile of the external thread form. When threadingly engaged the external load flank and the internal load flank form a first area of mating contact (which may form a seal) and the external stab flank and the internal stab flank form a second area of mating contact (which may also form a seal), and a dope volume is created between the external root and the internal root.

[0007] In certain embodiments, the external load flank is inclined with respect to a centerline of the pin member by between 1 and 6 degrees, the external stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the external load flank by between 27 degrees and 33 degrees. Moreover, in certain embodiments, the internal load flank is inclined with respect to a centerline of the tubular box member by between 1 and 6 degrees, the internal stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the internal load flank by between 27 degrees and 33 degrees.

[0008] According to a third aspect of the present disclosure, there is provided a threaded product including a tubular pin member comprising an external thread form at a pin end thereof, the external thread form comprising an external load flank, an external crest, an external stab flank, an external root, a first external radiused transition between the external load flank and the external crest, and a second external radiused transition between the external crest and the external stab flank, the external load flank being inclined with respect to a centerline of the pin member, the external stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the external load flank, and wherein the external root has an elliptical profile tangentially joining the external load and external stab flank, wherein the external load flank being inclined with respect to the centerline of the pin member by between 1 and 6 degrees. When threadingly engaged with a mating tubular box member the external load flank forms a first area of mating contact with an internal load flank of the mating tubular box member, and the external stab flank forms a second area

CLAIMS:

1. A threaded product comprising:

a tubular pin member comprising an external thread form at a pin end thereof, the external thread form comprising an external load flank, an external crest, an external stab flank, an external root, a first external radiused transition between the external load flank and the external crest, and a second external radiused transition between the external crest and the external stab flank, the external load flank being inclined with respect to a centerline of the pin member by between 1 and 6 degrees, the external stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the external load flank by between 27 degrees and 33 degrees, and wherein the external root has an elliptical profile tangentially joining the external load and external stab flanks; and

a tubular box member configured to coaxially threadingly engage the tubular pin member and comprising an internal thread form at a box end thereof, the internal thread form comprising an internal load flank, an internal crest, an internal stab flank, an internal root, a first internal radiused transition between the internal load flank and the internal crest, and a second internal radiused transition between the internal crest and the internal stab flank, the internal load flank being inclined with respect to a centerline of the tubular box member by between 1 and 6 degrees, the internal stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the internal load flank by between 27 degrees and 33 degrees, and wherein the internal root has a shape that does not conform to the elliptical profile of the external thread form;

wherein when threadingly engaged the external load flank and the internal load flank form a first area of mating contact and the external stab flank and the internal stab flank form a second area of mating contact, and a dope volume is created between the external root and the internal root.

2. The threaded product of claim 1, wherein the external load flank and the internal load flank have substantially the same incline.

3. The threaded product of claim 1, wherein the external stab flank and the internal stab flank have substantially the same incline.

4. The threaded product of claim 1, wherein the external crest has a taper and the elliptical profile has a major axis substantially parallel to the taper.

5. The threaded product of claim 4, wherein the taper comprises a minimum of 0.003” per revolution of thread.

6. The threaded product of claim 1, wherein the elliptical profile has a major axis that is not parallel to the external crest.

7. The threaded product of claim 1, wherein the tubular pin member comprises a first metal-to-metal compression seal surface near a forward end thereof, and/or the tubular box member comprises a second metal-to-metal compression seal surface that mates with the first metal-to-metal compression seal surface to form an internal seal.

8. The threaded product of claim 1, wherein the tubular box member comprises a torque shoulder that abuts a forward end of the tubular pin member.

9. The threaded product of claim 1, wherein the threaded product comprises a first extended tube with the tubular pin member and the tubular box members at opposite ends thereof.

10. The threaded product of claim 1, wherein the threaded product comprises a first threaded tube with the tubular pin members at ends thereof, and a tubular connector with the tubular box members at opposite ends thereof.

11. A threaded product comprising:

a tubular pin member comprising an external thread form at a pin end thereof, the external thread form comprising an external load flank, an external crest, an external stab flank, an external root, a first external radiused transition between the external load flank and the external crest, and a second external radiused transition between the external crest and the external stab flank, the external load flank being inclined with respect to a centerline of the pin member, the external stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the external load flank, and wherein the external root has an elliptical profile tangentially joining the external load and external stab flanks, wherein the external load flank being inclined with respect to the centerline of the pin member by between 1 and 6 degrees; and

a tubular box member configured to coaxially threadingly engage the tubular pin member and comprising an internal thread form at a box end thereof, the internal thread form comprising an internal load flank, an internal crest, an internal stab flank, an internal root, a first internal radiused transition between the internal load flank and the internal crest, and a second internal radiused transition between the internal crest and the internal stab flank, the internal load flank being inclined with respect to a centerline of the tubular box member, the internal stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the internal load flank, and wherein the internal root has a shape that does not conform to the elliptical profile of the external thread form, wherein the internal load flank being inclined with respect to a centerline of the tubular box member by between 1 and 6 degrees;

wherein when threadingly engaged the external load flank and the internal load flank form a first area of mating contact and the external stab flank and the internal stab flank form a second area of mating contact, and a dope volume is created between the external root and the internal root.

12. The threaded product of claim 11, wherein the external load flank and the internal load flank have substantially the same incline.

13. The threaded product of claim 11, wherein the external stab flank and the internal stab flank have substantially the same incline.

14. The threaded product of claim 11, wherein the external crest has a step taper and the elliptical profile has a major axis substantially parallel to the step taper.

15. The threaded product of claim 11, wherein the tubular pin member comprises a first metal-to-metal compression seal surface near a forward end thereof, and/or the tubular box member comprises a second metal-to-metal compression seal surface that mates with the first metal-to-metal compression seal surface to form an internal seal.

16. A threaded product comprising:

a tubular pin member comprising an external thread form at a pin end thereof, the external thread form comprising an external load flank, an external crest, an external stab flank, an external root, a first external radiused transition between the external load flank and the external crest, and a second external radiused transition between the external crest and the external stab flank, the external load flank being inclined with respect to a centerline of the pin member, the external stab flank being inclined with respect to the centerline of the pin member and in a direction opposite the external load flank, and wherein the external root has an elliptical profile tangentially joining the external load and external stab flanks, wherein the external load flank being inclined with respect to the centerline of the pin member by between 1 and 6 degrees;

wherein when threadingly engaged with a mating tubular box member the external load flank forms a first area of mating contact with an internal load flank of the mating tubular box member, and the external stab flank forms a second area of mating contact with an internal stab flank of the mating tubular box member, and a dope volume is created between the external root and an internal root of the mating tubular box member.

17. The threaded product of claim 16, wherein the external crest has a step taper and the elliptical profile has a major axis substantially parallel to the step taper.

18. The threaded product of claim 17, wherein the step taper comprises a minimum of 0.003” per revolution of thread.

19. The threaded product of claim 16, wherein the elliptical profile has a major axis that is not parallel to the external crest.

20. The threaded product of claim 16, wherein the threaded product comprises a first extended tube with the tubular pin member at one end thereof and the tubular box member at an opposite end.