WHAT IS CLAIMED IS:

1. A connector assembly for connecting two tubular members, comprising:

a first connector member having an exterior curvilinear sealing surface;

a second connector member having an interior curvilinear sealing surface;

wherein the first connector member is adapted to be received by the second connector member, allowing a connection to be formed; and

wherein the exterior curvilinear sealing surface and the interior curvilinear sealing surface have portions with non-complementary surface shapes, wherein the exterior curvilinear sealing surface and the interior curvilinear sealing surface are adapted to provide a metal-to-metal seal against internal pressure by metal-to-metal contact between the portions having non-complementary surface shapes.

2. The connector assembly of claim 1 wherein:

the interior and exterior curvilinear sealing surfaces are selected from a group consisting of frustoconical surfaces, frustocylindrical surfaces, frustoellipsoidal surfaces, frustospheroidal surfaces, frustohemispherical surfaces, frustoparabolic surfaces, frustohyperbolic surfaces, frutstoroidal surfaces, and blends thereof; and

wherein one of the curvilinear sealing surfaces is selected from the group and the other of the curvilinear sealing surfaces is selected from the remaining members of the group.

3. The connector assembly of claim 1 wherein:

the first connector member further comprises tapered external threads disposed on a section of the first connector member adjacent to the exterior curvilinear sealing surface; and

the second connector member further comprises tapered internal threads disposed on a section of the second connector member adjacent to the interior

curvilinear sealing surface, wherein the tapered external threads are complementary to the tapered internal threads.

4. The connector assembly of claim 3 wherein:

the second connector member contains a recess adjacent to a nose of the first connector member when the first connector member is seated in the second connector member, the recess being located below the interior curvilinear sealing surface and the exterior curvilinear sealing surface.

5. The connector assembly of claim 3 wherein:

the first connector member has a flexible nose that will allow the first connector member to rotate into a different orientation while seated inside of the second connector member.

6. The connector assembly of claim 5 wherein:

the different orientation creates a new contact area between the interior curvilinear sealing surface and exterior curvilinear sealing surface; and

surface contact stresses are exerted by a metal-to-metal seal in the contact area.

7. The connector assembly of claim 6 wherein:

the different orientation causes a rapid pressure-energization of the metal-to-metal seal when the connection is under either internal or external pressure; and

wherein during the pressure-energization, the new contact area widens and the surface contact stresses increase in magnitude.

8. The connector assembly of claim 1 wherein:

the first connector member comprises a pin; and

the second connector member comprises a box.

9. The connector assembly of claim 1 wherein:

the first connector member is a pin connector comprising the exterior curvilinear sealing surface, followed by a pin nose and an annular groove on the exterior surface of the pin connector proximate the pin nose; and

the second connector is a box connector.

10. The connector assembly of claim 1 wherein:

a gap in a direction parallel to an axis of the first and second connector members is present between an end of the first connector member and a shoulder of the second connector member.

11. A method for connecting two tubular members, comprising:

receiving a first connector member into a second connector member;

wherein the first connector member has an exterior curvilinear sealing surface and the second connector member has an interior curvilinear sealing surface; wherein the exterior curvilinear sealing surface and the interior curvilinear sealing surface have portions with non-complementary surface shapes; and

providing a metal-to-metal seal against internal pressure via the external curvilinear sealing surface and the interior curvilinear sealing surface by metal-to-metal contact between the portions having non-complementary surface shapes.

12. The method of claim 11 wherein:

the interior and exterior curvilinear sealing surfaces are selected from a group consisting of frustoconical surfaces, frustocylindrical surfaces, frustoellipsoidal surfaces, frustospheroidal surfaces, frustohemispherical surfaces, frustoparabolic surfaces, frustohyperbolic surfaces, frutstoroidal surfaces, and blends thereof; and

wherein one of the curvilinear sealing surfaces is selected from the group and the other of the curvilinear sealing surfaces is selected from the remaining members of the group.

13. The method of claim 11 wherein:

the first connector member further comprises tapered external threads disposed on a section of the first connector member adjacent to the exterior curvilinear sealing surface; and

the second connector member further comprises tapered internal threads disposed on a section of the second connector member adjacent to the interior curvilinear sealing surface, wherein the tapered external threads are complementary to the tapered internal threads.

14. The method of claim 13 wherein:

the second connector member contains a recess adjacent to a nose of the first connector member when the first connector member is seated in the second connector member, the recess being located below the interior curvilinear sealing surface and the exterior curvilinear sealing surface.

15. The method of claim 13 further comprising:

allowing the first connector member to rotate into a different orientation while seated inside the second connector member via a flexible nose of the first connector member.

16. The method of claim 15 further comprising:

creating a new contact area between the interior curvilinear sealing surface and exterior curvilinear sealing surface via the first connector member rotating into the different orientation; and

exerting surface contact stresses via a metal-to-metal seal in the new contact area.

17. The method of claim 16 further comprising:

causing a rapid pressure-energization of the metal-to-metal seal when the connection is under either internal or external pressure; and

during the pressure-energization, widening the new contact area and increasing a magnitude of the surface contact stresses.

18. The method of claim 11 wherein:

the first connector member comprises a pin; and

the second connector member comprises a box.

19. The method of claim 11 wherein:

the first connector member is a pin connector comprising the exterior curvilinear sealing surface, followed by a pin nose and an annular groove on the exterior surface of the pin connector proximate the pin nose; and

the second connector is a box connector.

20. The method of claim 11 wherein:

a gap in a direction parallel to an axis of the first and second connector members is present between an end of the first connector member and a shoulder of the second connector member.