

We claim:

1. A barrier member (102) for use in forming an assembly (100, 200) with an interference fit standard barrier (199), the barrier member (102) comprising:
 - a first face (120);
 - 5 a second face (122);
 - a peripheral edge (124) between the first face (120) and the second face (122),
the peripheral edge (124) being at least partially angled by an angle (128)
relative to a barrier reference line (130) that is perpendicular to both of at
least part of the first face (120) and at least part of the second face (122),
10 the angle (128) declining from the first face (120) to the second face
(122); and
 - an interior channel (126) extending through a member depth (123) of the barrier
member (102), the member depth (123) being between the first face (120)
and the second face (122), the interior channel (126) having a longer
15 length than width in a surface of the first face (120) and a surface of the
second face (122),
 - wherein the barrier member (102) is at least partially composed of a polymer.
2. An assembly (100, 200), comprising:
 - 20 a barrier member (102) comprising:
 - a first face (120);
 - a second face (122);
 - a peripheral edge (124) between the first face (120) and the second face
(122);
 - 25 and an interior channel (126) that extends through a member depth (123)
of the barrier member (102), the member depth (123) being
between the first face (120) and the second face (122);
 - an element having an aperture (104), the aperture (104) comprising
 - a first opening (160);
 - 30 a second opening (162); and
 - a conformal interior peripheral edge (150) between the first opening (160)
and the second opening (162),

- wherein the barrier member (102) is at least partially engaged to the aperture (104), the barrier member (102) engaged to the aperture (104) by the peripheral edge (124) being at least partially conformally engaged with the conformal interior peripheral edge (150),
- 5 wherein the barrier member (102) is at least partially composed of a material that is more malleable than a material of which the element having the aperture (104) is composed,
- wherein the second face (122) of the barrier member (102) is situated in an interior of the aperture (104),
- 10 wherein the assembly (100, 200) is a pre-press assembly (200) that can be pressed to form an interference fit standard barrier (199).
3. An assembly (100, 200) as claimed in claim 2, wherein the member depth (123) is less than an aperture depth (164) between the first opening (160) and the second
- 15 opening (162).
4. An assembly (100, 200) as claimed in one of claim 2 and claim 3, wherein a surface area of the first face (120) is greater than surface areas of all of the second face (122), the first opening (160), and the second opening (162), wherein the surface area of
- 20 the second face (122) is smaller than the surface area of the first opening (160) but the surface area of the second face (122) is greater than the surface area of the second opening (162).
5. An assembly (100, 200) as claimed in any one of the foregoing claims 2 to 4,
- 25 further comprising a passthrough element (106) that is engaged with the interior channel (126) by passing through the interior channel (126), wherein the passthrough element (106) has portions on each side of the barrier member (102) when the passthrough element (106) is engaged with the barrier member (102).
- 30 6. An assembly (100, 200) as claimed in any one of the foregoing claims 2 to 5, further comprising a pressure distribution element (108), a face of the pressure distribution element (108) engaged with the first face (120) of the barrier member (102),

the pressure distribution element (108) having a slot (182) that extends from the surface of the pressure distribution element (108) to an opposite surface of the pressure distribution element (108), wherein the slot (182) coincides with the interior channel (126) when the pressure distribution element (108) is engaged with the barrier member (102), such that a passage exists through both the barrier member (102) and the pressure distribution element (108).

7. An assembly (100, 200) as claimed in any one of the foregoing claims 2 to 6, further comprising a press block (220), the press block (220) having at least one surface that engages one or more of at least a portion of the passthrough element (106), at least a portion of the pressure distribution element (108), and at least a portion of the barrier member (102).

8. An assembly (100, 200) as claimed in claim 7, wherein the press block (220) has at least one recess, wherein the press block (220) at least partially engages the passthrough element (106) in the at least one recess.

9. An assembly (100, 200) as claimed in any one of the foregoing claims 2 to 8, wherein the barrier member (102) is engaged with the aperture (104) such that the barrier member (102) cannot be pushed further into the aperture (104) without deforming the barrier member (102).

10. An assembly (100, 200) as claimed in any one of the foregoing claims 2 to 9, wherein the element having the aperture (104) has a first surface (152) around a first opening (160) of the aperture (104), wherein the first surface (152) has alignment elements (222) to align one or more engaged elements.

11. An assembly (100, 200) as claimed in claim 10, wherein the alignment elements (222) comprise holes in the first surface (152) and separably couplable alignment pins (224) that are separably couplable with the holes in the first surface (152), wherein one or more of the press block (220) and the pressure distribution element (108) have holes

for receiving the alignment pins (224), the holes for receiving the alignment pins (224) to align the one or more engaged elements.

12. An assembly (100, 200), comprising:
- 5 an interference fit standard barrier (199), comprising:
- a barrier member (102) comprising:
- a first face (120);
- a second face (122);
- a peripheral edge (124); and
- 10 an element with an aperture (104), the element composed of a material that is less malleable than a material of which the barrier member (102) is composed, the aperture (104) having a conformal interior peripheral edge (150), at least a portion of the conformal interior peripheral edge (150) conforming to at least a portion of the
- 15 peripheral edge (124),
- wherein the barrier member (102) has stored elastic potential energy that exerts pressure against the aperture (104) and maintains the interference fit standard barrier (199),
- wherein the interference fit standard barrier (199) complies with one or
- 20 more of a flameproof barrier standard and an explosion proof barrier standard.
13. An assembly (100, 200) as claimed in claim 12, wherein the stored elastic potential energy is sufficient to maintain compliance of the interference fit standard
- 25 barrier (199) to the one or more of the flameproof barrier standard and the explosion proof barrier standard over at least one predetermined range of at least one operating condition.
14. An assembly (100, 200) as claimed in one of claim 12 and claim 13, wherein any
- 30 gaps between the barrier member (102) and the aperture (104) in the interference fit standard barrier (199) are less than five thousandths of an inch.

15. An assembly (100, 200) as claimed in any one of the foregoing claims 12 to 14, further comprising a passthrough element (106), wherein the passthrough element (106) passes through the interference fit standard barrier (199) by passing through at least an interior channel (126) of the barrier member (102), wherein any gaps between the passthrough element (106) and the interior channel (126) are less than five thousandths of an inch.
16. An assembly (100, 200) as claimed in any one of the foregoing claims 12 to 15, further comprising a pressure distribution element (108), wherein the pressure distribution element (108) is coupled by coupling elements (180) being coupled to a first surface (152) that surrounds a first side (197) of the aperture (104).
17. An assembly (100, 200) as claimed in any one of the foregoing claims 12 to 16, wherein the barrier member (102) has a portion that cold flowed over one or more of a first opening (160) and a second opening (162) of the aperture (104).
18. An assembly (100, 200) as claimed in any one of the foregoing claims 12 to 17, wherein the peripheral edge (124) is at an angle (128) relative to a barrier reference line (130), the conformal interior peripheral edge (150) is at a complementary angle (158) relative to an aperture reference line (156), wherein the aperture reference line (156) and the barrier reference line (130) are coincident, and wherein the angle (128) and complementary angle (158) are both of a magnitude less than five degrees.
19. A method for making an assembly (100, 200) having an interference fit standard barrier (199), the method comprising:
engaging a barrier member (102) having a peripheral edge (124) with an aperture (104) having a conformal interior peripheral edge (150), wherein, when the barrier member (102) is engaged with the aperture (104), at least a portion of the peripheral edge (124) is engaged with and conformal to at least a portion of the conformal interior peripheral edge (150), wherein the barrier member (102) is at least partially but not entirely interior of the aperture (104); and

- applying pressure to the barrier member (102) to form the interference fit standard barrier (199) with the aperture (104), wherein elastic potential energy from the pressure applied is stored in the barrier member (102), and the elastic potential energy causes an application of force by the at least a portion of the peripheral edge (124) against the at least a portion of the conformal interior peripheral edge (150),
wherein the interference fit standard barrier (199) complies with one or more of a flameproof barrier standard and an explosion proof barrier standard.
20. A method as claimed in claim 19, wherein the pressure applied causes the barrier member (102) to store sufficient amounts of the elastic potential energy that the interference fit standard barrier (199) maintains the compliance with the one or more of the flameproof barrier standard and the explosion proof barrier standard over at least one predefined range of at least one operating condition.
21. A method as claimed in one of claim 19 and 20, wherein the pressure applied is less than or equal to 3000 pounds distributed mainly on the pressure distribution element (108).
22. A method as claimed in any one of the foregoing claims 19 to 21, wherein the pressure applied is sufficient such that any gaps that exist within the interference fit standard barrier (199) have a gap depth less than two thousandths of an inch.
23. A method as claimed in any one of the foregoing claims 19 to 22, wherein the applying pressure to the barrier member (102) comprises applying pressure through a pressure distribution element (108), wherein a face of the pressure distribution element (108) that presses on the barrier member (102) is substantially flat, allowing a substantially uniform application of pressure to the barrier member (102).
24. A method as claimed in any one of the foregoing claims 19 to 23, further comprising:

- engaging a passthrough element (106) with an interior channel (126) of the barrier member (102), the interior channel (126) extending through a first face (120), a member depth (123), and a second face (122), the engaging the passthrough element (106) with the interior channel (126) comprising passing the passthrough element (106) through the interior channel (126) such that a portion of the passthrough element (106) is situated on one side of the barrier member (102) and another portion of the passthrough element (106) is situated on another side of the barrier member (102), wherein the applying pressure to the barrier member (102) causes compression of the interior channel (126) against the passthrough element (106) such that a passthrough element interference fit is formed, the passthrough element interference fit complying with the one or more of the flameproof barrier standard and the explosion proof barrier standard.
25. A method as claimed in any one of the foregoing claims 19 to 24, wherein pressure is applied through a press block (220).
26. A method as claimed in any one of the foregoing claims 19 to 25, further comprising aligning parts of the assembly (100, 200) using one or more alignment elements (222).
27. A method as claimed in any one of the foregoing claims 19 to 26, wherein the engaging the barrier member (102) with the aperture (104) is engaging the barrier member (102) with the aperture (104) such that the barrier member (102) cannot be pressed further into the aperture (104) without deforming the barrier member (102).
28. A method as claimed in any one of the foregoing claims 19 to 27, wherein the pressure applied is sufficient that at least part of the barrier member (102) cold flows over one or more of a first opening (160) of the aperture (104) and a second opening (162) of the aperture (104).

29. A method as claimed in any one of the foregoing claims 19 to 28, further comprising forming the barrier member (102) by cutting away material from a block of material having sufficient material for forming more than one barrier member (102).
- 5 30. A method as claimed in any of the foregoing claims 19 to 29, wherein the method does not include heating the barrier member (102) above a melting temperature of the material of which the barrier member (102) is composed, the melting temperature determined at standard temperature and pressure.
- 10 31. A method as claimed in any of the foregoing claims 19 to 30, further comprising aging the interference fit standard barrier (199), wherein the interference fit standard barrier (199) is at least partially comprised of a polymer.
32. An assembly (100, 200) as claimed in any one of the foregoing claims 2 to 31,
15 wherein a static, dry and clean coefficient of friction between the material of which the peripheral edge (124) is composed and the material of which the conformal interior peripheral edge (150) is composed is less than .2 at standard temperature and pressure.
33. An assembly (100, 200) as claimed in any one of the foregoing claims 2 to 32,
20 wherein the barrier member (102) has a volume greater than the volume of the aperture (104).
34. An assembly (100, 200) as claimed in any one of the foregoing claims 2 to 33,
wherein the element with the aperture (104) is a housing for an electrical component
25 (1002), the housing having a terminal side (1097) with at least one terminal (1012) for coupling to a network (1008) and an electronics side (1098) having electronics (1010) for communicating with a device (1004), wherein the first face (120) faces the terminal side (1097) and the second face (122) faces the electronics side (1098).
- 30 35. A barrier member (102) as claimed in any one of the foregoing claims 1 to 34, wherein the barrier member (102) is at least partially composed of a fluorocarbon.

36. A barrier member (102) as claimed in claim 35, wherein the fluorocarbon is polytetrafluoroethylene (PTFE).
37. A barrier member (102) as claimed in any one of the foregoing claims 1 to 36,
5 wherein the second face (122) has a smaller surface area than a surface area of the first face (120);
38. A barrier member (102) as claimed in any one of the foregoing claims 1 to 37, wherein the barrier member (102) is not cylindrical.
- 10 39. A barrier member (102) as claimed in any one of the foregoing claims 1 to 38, wherein the barrier member (102) is shaped as a narrowing curved triangle.