CLAIMS

What is claimed is:

1. A contraceptive device comprising a polymeric ring, a porous barrier material and an injection molding guide, both of the injection molding guide and the porous barrier material at least partially embedded within the polymeric ring, wherein the injection molding guide comprises a plurality of planar surfaces, and wherein the injection molding guide has a corner formed by two planar surfaces intersecting at an angle.

2. The contraceptive device of claim 1, wherein the barrier material is a mesh.

3. The contraceptive device of claim 1, wherein the barrier material is fibrous.

4. The contraceptive device of claim 1, wherein the barrier material is circular or substantially circular.

5. The contraceptive device of claim 1 wherein the barrier material has a diameter of 40 mm to 60 mm, e.g., from 45 mm to 53 mm.

6. The contraceptive device of claim 1, wherein the injection molding guide is symmetrical.

7. The contraceptive device of claim 1, where the angle is between a 45 degree angle and a 135 degree angle, e.g., an angle of 90 degrees.

8. The contraceptive device of claim 1, wherein the injection molding guide is at least one of non-fibrous and non-porous.

9. The contraceptive device of claim 1, wherein the injection molding guide is completely embedded within the polymeric ring and the porous barrier material is partially embedded within the polymeric ring.

10. The contraceptive device of claim 1, wherein the injection molding guide is uncoated and/or does not contain a sizing polymer.

11. The contraceptive device of claim 1, wherein the injection molding guide is affixed to the porous barrier material.

12. The contraceptive device of claim 1, wherein the injection molding guide has a composition, and the composition is constant at each location of the injection molding guide.

13. The contraceptive device of claim 1, wherein the injection molding guide is biodegradable.

14. The contraceptive device of claim 1, wherein the injection molding guide is located along an edge of the porous barrier material.

15. The contraceptive device of claim 1, wherein the injection molding guide is located close to an edge of the porous barrier material.

16. The contraceptive device of claim 1, wherein the injection molding guide extends into the porous barrier material.

17. The contraceptive device of claim 1, wherein the injection molding guide is 3D-printed on the porous barrier material.

18. The contraceptive device of claim 1, wherein the injection molding guide is injection molded onto the porous barrier material.

19. The contraceptive device of claim 1, wherein the polymeric ring comprises an elastomeric polymer.

20. The contraceptive device of claim 1, wherein the polymeric ring encircles the porous barrier material.

21. The contraceptive device of claim 1, further comprising a biologically active agent located within the polymeric ring.

22. The contraceptive device of claim 1, further comprising a ferrous compound located within the polymeric ring.

23. The contraceptive device of claim 1, further comprising ferrous gluconate or a hydrate thereof located within the polymeric ring, optionally also further comprising ascorbic acid located within the polymeric ring.

24. A kit comprising the contraceptive device of claim 1, the kit further comprising at least one of a lubricant, a spermicidal gel, a spermicidal film, a contraceptive gel and an applicator.

25. A construct for forming a contraceptive device, the construct comprising a porous barrier material affixed to an injection molding guide, wherein the injection molding guide comprises a plurality of planar surfaces, and wherein the injection molding guide has a corner formed by two planar surfaces intersecting at an angle .

26. The construct of claim 25, wherein the barrier material is a mesh.

27. The construct of claim 25, wherein the barrier material is fibrous.

28. The construct of claim 25, wherein the barrier material is circular or is substantially circular.

29. The construct of claim 25, wherein the barrier material has a diameter of 40 mm to 60 mm, e.g., 45 mm to 53mm.

30. The construct of claim 25, wherein the injection molding guide is symmetrical.

31. The construct of claim 25, wherein the injection molding guide has a uniform cross-section at all locations around the injection molding guide.

32. The construct of claim 25, where the angle is between 45 degrees and 135 degrees, for example an angle of 90 degrees.

33. The construct of claim 25, wherein the injection molding guide is non-fibrous and optionally is non-porous.

34. The construct of claim 25, wherein the injection molding guide has a melting point above 120°C.

35. The construct of claim 25, wherein the injection molding guide is uncoated.

36. The construct of claim 25, wherein the injection molding guide does not contain a sizing polymer.

37. The construct of claim 25, wherein the injection molding guide has a single composition at each location of the injection molding guide .

38. The construct of claim 25, wherein the injection molding guide is biodegradable.

39. The construct of claim 25, wherein the injection molding guide is located along an edge of the porous barrier material.

40. The construct of claim 25, wherein the injection molding guide is located close to an edge of the barrier material.

41. The construct of claim 25, wherein the injection molding guide extends into the porous barrier material.

42. The construct of claim 25, wherein the injection molding guide is 3D-printed on the porous barrier material.

43. The construct of claim 25, wherein the injection molding guide is injection molded onto the porous barrier material.

44. A method of forming a contraceptive device, the method comprising:

a. providing a construct comprising a porous barrier material affixed to an injection molding guide;
b. placing the construct into a die;
c. adjusting a location of at least one pin within the die so that the at least one pin contacts a surface of the injection molding guide; and
d. injecting a molten polymer into the die to form a polymeric ring, where each of the injection molding guide and the porous barrier material is at least partially embedded within the polymeric ring.

45. The method of claim 44, wherein the construct is provided by a method comprising 3D-printing the injection molding guide onto the porous barrier material.

46. The method of claim 44, wherein the construct is provided by a method comprising:

a. forming an injection molding guide by an injection molding process;

b. affixing the injection molding guide to the porous barrier material.

47. A method of forming a contraceptive device, the method comprising:

a. providing a construct comprising a porous barrier material affixed to an injection molding guide;

b. placing the construct into a heated die;

c. adjusting a location of at least one pin within the die so that at least one pin contacts a surface of the injection molding guide;

d. injecting a mixture of a two part heat curable polymer into the die to form a polymeric ring, where each of the injection molding guide and the porous barrier material is at least partially embedded within the polymeric ring;

e. allowing the mixture of a two part heat curable polymer to cure in the mold such that the mixture of a two part heat curable polymer is transformed from a liquid state to a solid state; and

f. ejecting the molded product from the die.

48. The method of claim 47, wherein the construct is provided by a method comprising 3D-printing the injection molding guide onto the porous barrier material.