We claim:

1. A bulged, forward-acting rupture disc comprising:

a central bulged section comprising a concavo-convex dome;

a flat, annular flange section surrounding the central bulged section;

a transition region that is intermediate to and interconnects the central bulged section and the flange section; and

a line of opening that overlies the transition region, the line of opening comprising an area in which material making up the rupture disc has been removed from the disc, without altering a metal grain structure in the transition region, thereby weakening the rupture disc such that when a pressure of a fluid acting upon a concave face of the dome reaches a predetermined threshold the rupture disc tears along the line of opening thereby providing an opening through the disc that has a diameter that is at least as large as an internal diameter of the flange section.

2. The rupture disc of claim 1, wherein the line of opening is C-shaped.

3. The rupture disc of claim 2, wherein the rupture disc further comprises a hinge section about which the central bulged section pivots upon tearing of the rupture disc along the line of opening, the hinge section being defined by a pair of end regions of the line of opening in which no material making up the rupture disc has been removed from the transition region.

4. The rupture disc of claim 1, wherein the dome is non-concentric.

5. The rupture disc of claim 1, wherein the line of opening extends laterally across the transition region and onto at least a portion of the flange section and/or the bulged central section.

6. A pressure relief device comprising:

a bulged, forward-acting rupture disc that is secured between an inlet ring and an outlet ring,

the rupture disc comprising-

a central bulged section comprising a concavo-convex dome;

a flat, annular flange section surrounding the central bulged section;

a transition region that is intermediate to and interconnects the central bulged section and the flange section; and

a line of opening that overlies the transition region, wherein the line of opening comprises an area in which material making up the rupture disc has been removed from the disc without altering a metal grain structure in the transition region,

the inlet ring configured to abut the side of the rupture disc comprising a concave face of the dome,

the outlet ring configured to abut the side of the rupture disc comprising a convex face of the dome and having an internal diameter D,

the rupture disc, when exposed to a fluid of a predetermined pressure acting against the concave face of the dome, tears along the line of opening thereby providing an opening through the disc that has a diameter that is at least as large as D.

7. The pressure relief device of claim 6, wherein the line of opening is C-shaped.

8. The pressure relief device of claim 6, wherein the dome is non-concentric.

9. The pressure relief device of claim 6, wherein the line of opening extends laterally across the transition region and onto at least a portion of the flange section and/or the bulged central section.

10. The pressure relief device of claim 6, wherein the line of opening comprises a stress intensity feature that overlies the transition region of the rupture disc and is configured to focus stresses within the rupture disc onto the line of opening.

11. The pressure relief device of claim 10, wherein the stress intensity feature comprises a chamfered or a fillet edge.

12. The pressure relief device of claim 6, wherein the rupture disc further comprises a hinge region about which the central bulged section pivots upon tearing of the rupture disc along the line of opening, the hinge section being defined by a pair of end regions of the line of opening in which no material making up the rupture disc has been removed from the transition region.

13. The pressure relief device of claim 12, wherein the outlet ring comprises a hinge support that is configured to engage and support the hinge region upon opening of the rupture disc so as to prevent fragmentation of the bulged section.

14. The pressure relief device of claim 6, wherein the line of opening has a diameter that is greater than D.

15. The pressure relief device of claim 6, wherein the rupture disc is welded to at least one of the inlet and outlet rings.

16. The pressure relief device of claim 6, wherein the rupture disc is bolted in between the inlet and outlet rings.

17. The pressure relief device of claim 6, wherein the inlet and outlet rings are configured with corresponding male and female threading, and wherein the inlet and outlet rings are screwed together with the rupture disc secured therebetween.

18. The rupture disc of claim 1, wherein the line of opening is formed on the same side of the rupture disc as the concave face of the dome.

19. A bulged, forward-acting rupture disc comprising:

a central bulged section comprising a concavo-convex dome;

a flat, annular flange section surrounding the central bulged section;

a transition region that is intermediate to and interconnects the central bulged section and the flange section; and

a line of opening that overlies the transition region, the line of opening comprising an area in which material making up the rupture disc has been removed from the disc thereby weakening the rupture disc such that when a pressure of a fluid acting upon a concave face of the dome reaches a predetermined threshold the rupture disc tears along the line of opening thereby forming a petal, the portion of the petal that has detached from the flange section comprising at least a portion of the central bulged section and at least a portion of the transition region.

20. A bulged, forward-acting rupture disc comprising:

a central bulged section comprising a concavo-convex dome;

a flat, annular flange section surrounding the central bulged section;

a transition region that is intermediate to and interconnects the central bulged section and the flange section; and

a line of opening that overlies the transition region, the line of opening comprising an area in which material making up the rupture disc has been removed from the disc thereby weakening the rupture disc such that when a pressure of a fluid acting upon a concave face of the dome reaches a predetermined threshold the rupture disc tears along the line of opening thereby providing an opening through the disc that has a diameter that is at least as large as an internal diameter of the flange section,

such that when a pressure of a fluid acting upon a concave face of the dome reaches a predetermined threshold the rupture disc tears along the line of opening thereby providing an opening through the disc that has a diameter that is at least as large as an internal diameter of the flange section,

wherein the transition region comprises the thinnest portion of the rupture disc.

~~18. A method of manufacturing a rupture disc formed from a disc material comprising removing disc material from a transition region of a bulged, forward-acting rupture disc to form a line of opening that overlies the transition region, the transition region being intermediate to and interconnecting a central bulged section and a flat, annular flange section that surrounds the central bulged section.~~

~~19. The method of claim 18, wherein the step of removing disc material from the transition region comprises milling of the disc material with a mechanical mill or with a laser.~~

~~20. The method of claim 18, wherein the line of opening is formed on the same side of the rupture disc as a concave face of the central bulged section.~~

~~21. The method of claim 18, wherein the step of removing disc material from the transition region further comprises removing disc material from at least a portion of the flange section and/or bulged central section so that the line of opening extends laterally across the transition region and onto at least a portion of the flange section and/or the bulged central section.~~