

Claims

1. An x-ray inspection system comprising:

an x-ray source;

an x-ray detector;

5 a sample support comprising a pliable material; and

a sample support positioning assembly configured to position the sample support between the x-ray source and the x-ray detector;

wherein the sample support is configured to removably clamp a sample for inspection in a fixed position with respect to the sample support and configured so that, in use, at least
10 one surface of the sample is in contact with the pliable material.
2. An x-ray inspection system according to claim 1, wherein the pliable material is a resilient material.
3. An x-ray inspection system according to claim 1 or 2, wherein the pliable material is a compressible foam.
- 15 4. An x-ray inspection system according to any of the preceding claims, wherein the sample support is configured to completely surround the sample in use.
5. An x-ray inspection system according to any of the preceding claims, wherein the sample support comprises an outer shell comprising a material having a greater rigidity than the pliable material.
- 20 6. An x-ray inspection system according to any of the preceding claims wherein the outer shell comprises carbon fibres or aramid fibres.
7. An x-ray inspection system according to any of the preceding claims, wherein the sample support comprises a first portion and a second portion, the first portion being moveable relative to the second portion between an open position in which the sample support can receive a sample and a closed position in which the sample support clamps
25 the sample between the first portion and the second portion of the sample support.

8. An x-ray inspection system according to any of the preceding claims, wherein the sample support positioning assembly comprises a base and a frame attached to the base to which the sample support is connected.
9. An x-ray inspection system according to claim 8, wherein the frame is movable
5 about a pivot fixed relative to the base.
10. An x-ray inspection system according to any of the preceding claims, further comprising an x-ray filter between the x-ray source and x-ray detector.
11. An x-ray inspection system according to any of the preceding claims, wherein the sample support positioning assembly comprises a rotational drive configured to rotate the
10 sample support about a rotational axis.
12. An x-ray inspection system according to any of the preceding claims, further comprising a vertical positioning mechanism for moving the sample support in a vertical direction, towards or away from the x-ray source.
- 15 13. An x-ray inspection system according to any of the preceding claims, further comprising a first horizontal positioning mechanism for moving the sample support in a first horizontal direction and a second positioning mechanism for moving the sample support in a second horizontal direction.
- 20 14. An x-ray imaging accessory for an x-ray inspection system comprising:
a sample support comprising a pliable material; and
a sample support positioning assembly comprising a rotational drive configured to rotate the sample support about a rotational axis;
- 25 wherein the sample support is configured to removably clamp a sample for inspection in a fixed position with respect to the sample support and configured so that, in use, at least one surface of the sample is in contact with the pliable material.
15. An x-ray imaging accessory assembly according to claim 14, wherein the pliable material is a resilient material such as a compressible foam.
- 30 16. An x-ray imaging accessory according to claim 14 or 15, wherein the sample support is configured to completely surround the sample in use.

17. An x-ray imaging accessory according to any of claims 14 to 16, wherein the sample support comprises an outer shell comprising a material having a greater rigidity than the pliable material such as carbon fibres, aramid fibres, PEEK or a low density metal such as aluminium.
- 5 18. An x-ray imaging accessory according to any of claims 14 to 17, wherein the sample support positioning assembly comprises a base and a frame attached to the base to which the sample support is connected.
19. An x-ray imaging accessory according to any of claim 18, wherein the frame is movable about a pivot fixed relative to the base.
- 10 20. A sample support for an x-ray inspection system, the sample support comprising:

a pliable material; and

a mechanical interface for connection with a rotational drive;

wherein the sample support is configured to removably clamp a sample for inspection in a fixed position with respect to the sample support and configured so that, in use, at least
15 one surface of the sample is in contact with the pliable material.
21. A sample support according to claim 20, wherein the mechanical interface comprises a protrusion or axle connectable to the rotational drive.
22. A kit for an x-ray inspection system comprising a plurality of samples supports, each sample support according to claim 20 or 21;
- 20 wherein each of the plurality of sample supports has a different diameter.
23. A kit according to claim 22, further comprising a sample support positioning assembly comprising a rotational drive and wherein each of the plurality of sample supports is removably couplable to the rotational drive.
24. A method of using an x-ray inspection system comprising an x-ray source, an x-ray
25 detector and a sample support comprising a pliable material, the method comprising:

- clamping a sample to be inspected in the sample support such that the sample is in a fixed position with respect to the sample support and at least one surface of the sample is in contact with the pliable material;
- positioning the sample support between the x-ray source and the x-ray detector;
- 5 recording an x-ray image of the sample;
- rotating the sample support with respect to the x-ray source; and
- recording a second x-ray image of the sample.
25. A method according to claim 24, wherein the sample support comprises a first portion and a second portion, the first portion being moveable relative to the second portion, and wherein the step of clamping the sample to be inspected comprises:
- 10 moving the first portion of sample support relative to the second portion of sample support and into an open position;
- placing a sample in the sample support; and
- moving the first portion of sample support relative to the second portion of sample support and into a closed position in which the sample is clamped by the sample support.
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