CLAIMS:

1. A heat sink comprising:

a substrate; and

a plurality of fins, with a first layer of each fin being formed directly on the substrate using a laser powder-bed fusing (LPBF) or selective laser melting (SLM) process with a fin powder deposited on the substrate, with the plurality of fins being built up, layer by layer by laser fusion of the fin powder to reach a predetermined height wherein: each of the plurality of fins is configured with a parallelogram cross-sectional shape or geometry, and the plurality of fins is configured in rows, wherein a row spacing is substantially equal or greater than an oblique spacing between adjacent fins in a row.

2. The heat sink according to claim 1, wherein the fin powder is selected from the following: CuCrZr, pure copper, copper alloys, aluminium or aluminium alloy.

3. The heat sink according to claim 1 or 2, wherein the substrate is machined from a material selected from the following: copper; copper alloy, aluminium or aluminium alloy.

4. The heat sink according to any one of the preceding claims, wherein each of the plurality of fins has a height: thickness ratio range of substantially 4 to 20:1.

5. The heat sink according to any one of the preceding claims, wherein each of the plurality of fins has a height: spacing ratio range of substantially 4 to 35:1.

6. The heat sink according to any one of the preceding claims, further comprising a plurality of threaded holes for mounting a protective cover over or around the plurality of fins.

7. The heat sink according to any one of the preceding claims, further comprising a plurality of holes for mounting the substrate to a member that requires heat dissipation.

8. A laser powder-bed fusing (LPBF) or selective laser melting (SLM) method for hybrid 3D print fabrication of a heat sink, the method comprises:

forming a substrate using subtractive machining;

forming a powder-bed of a fin powder over the substrate;

operating a laser to melt and to fuse particles of the fin powder to build a first layer of the fins directly on the substrate;

adding the fin powder to increase a height of the powder-bed, layer by layer;

generating a pattern of the fin geometry from a computer-aided design (CAD) or computer system and outputting the pattern to a scanner to direct a laser beam from the laser onto the fin powder, layer by layer, wherein the pattern comprises rows of the fins, with each fin forming a parallelogram shape, and adjacent fins in a row are spaced apart at an oblique side of the parallelogram; and

operating the laser to fuse the fin powder to build up the fins, layer by layer, until the fins reach a predetermined height.

9. A heat sink according to any one of claims 1-7 being obtained by the hybrid 3D fabrication method of claim 8.