CLAIMS

1. A holder for aligning optical endcaps each connected to an optical fiber, comprising:

    a body comprising:

    at least one row of bores, each being dimensioned to receive a single optical endcap;

    at least one adhesive channel, crossing at least one row of bores and configured to deliver and hold an adhesive material for fixating each optical endcap to a corresponding bore; and

    an array of cooling channels connected to at least one inlet and at least one outlet for circulating a cooling fluid, wherein the array of cooling channels is arranged to encompass at least a portion of outer walls of each bore.
2. The holder of claim 1, wherein each bore is dimensioned to receive the single optical endcap at a diameter tolerance up to 50 microns.
3. The holder according to claim 1 or claim 2, wherein each row of bores comprises at least 2 bores.
4. The holder according to any one of claims 1 to 3, a central axis of each bore deviates from being parallel to a reference optical axis by at most 0.05°.
5. The holder according to any one of claims 1 to 4, wherein a location of the central axis of each bore deviates from a reference point on the body by at most 0.007 mm.
6. The holder according to any one of claims 1 to 5, wherein the body is made from an alloy, selected from aluminum alloy, copper, titanium alloys, tungsten-based metal composites, carbon base composites.
7. The holder according to any one of claims 1 to 6, wherein the array of cooling channels is arranged to encompass at least a portion of the outer walls of each bore such that any direct contact of the endcaps with the cooling fluid is avoided.
8. The holder according to any one of claims 1 to 7, further comprising at least one pump in fluid connection with the at least one inlet and at least one outlet for circulating the cooling fluid.

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9. The holder according to any one of claims 1 to 8, wherein the cooling fluid is selected to be fluid between -40 °C to +70 °C.
10. An optical system comprising:
    a holder according to any one of claims 1 to 9; and
    an array of optical fibers, each welded to an endcap,
    wherein each endcap is inserted into a corresponding bore of the holder and fixated using an adhesive material.
11. The optical system of claim 10, wherein all the endcaps are aligned with the same plane of the holder.
12. The optical system of claim 9 or claim 10, wherein all the optical fibers and the endcaps are aligned to provide the same polarization.
13. The optical system according to any one of claims 10 to 12, wherein a viscosity of the adhesive material is between 500K to 20K cP.
14. The optical system according to any one of claims 10 to 13, wherein a thermal coefficient of the adhesive material is between 1 to 200 [ppm°C].
15. The optical system according to any one of claims 10 to 14, wherein a thermal conductivity of the adhesive material is between 0.1 to 2.5 [W/m²K].
16. The optical system according to any one of claim 10 to 15, further comprising at least one pump in fluid connection with the at least one inlet and at least one outlet for circulating the cooling fluid.
17. The optical system of claim 16, further comprising a chiller, and wherein the at least one pump is configured to circulate the cooling fluid between the array of cooling channels and the chiller.
18. A method of operating an optical system, comprising:
    providing an optical system according to any one of claims 10 to 16;
    introducing the cooling fluid to the array of cooling channels; and
    circulating the cooling fluid in the array of cooling channels.
19. The method of claim 17, wherein circulating the cooling fluid is by operating the at least one pump.
20. The method of claim 18, wherein circulating the cooling fluid is between the array of cooling channels and the chiller.

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