

FLASH

Flexible Laser-Based Manufacturing

Newsletter 2

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Adaptation of optical head for waterjet guided laser

The FLASH project brings together three different interchangeable optical heads: nozzle, waterjet guided, and galvo scanner based. These three optical heads are to be substituted automatically using robotic arms in a short time frame of 10-15 seconds, which currently takes several hours. This provides a rapidly customisable solution to suit a variety of materials and applications. This rapid changeover of heads poses various challenges including retaining the high precision of the optical-laser system.

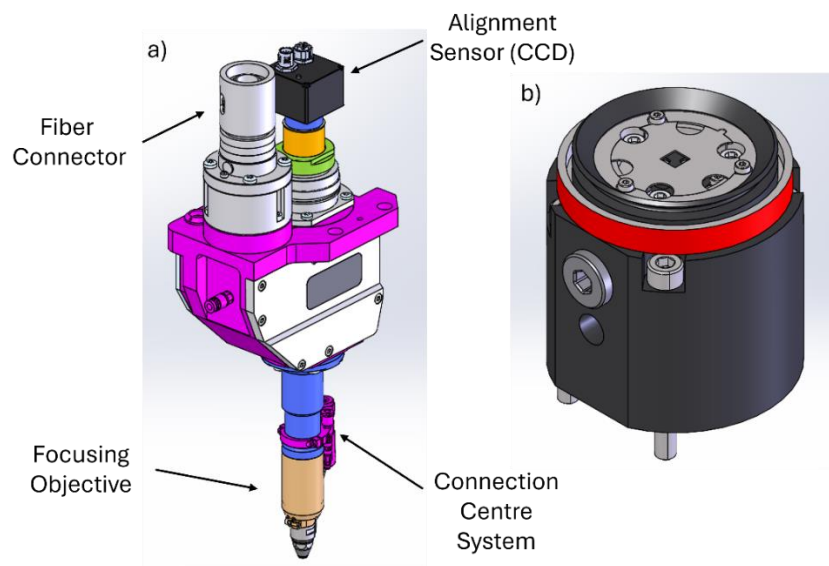


Figure 1 - a) Schematics of Synova optical head with the fixation system and connection centre system highlighted in pink b) Jet angle correction system

The integration of the Synova waterjet guided laser optical head provides its own unique challenge of protecting other optical heads and processes from the inherent water present in the waterjet guided laser process. This aims to be resolved using a jet catcher and drainage system, which are currently in development.

The external envelope of the Synova waterjet guided laser optical head can be seen in Figure 1a, along with its fibre connector, alignment sensor system and the focusing objective. The parts under redesign for the FLASH project can be identified in Figure 1b:

- The fixation system in the optical head will be enlarged to allow manipulation by the robotic arm
- The connection centre system, that includes the high-pressure water supply, helium and clean air line, in its standard version, will be modified to accommodate the jet catcher system
- To make jet angle corrections, a standard Synova jet angle correction system will be added to the FLASH machine, thus ensuring the laser microjet is perfectly perpendicular