

September 19, 2023

2nd Additional comments to the Confidential Attachment

reference number: **5d11eae4-2d11-4b4c-9a24-c50d348bc1a0**

The purpose of this additional comment is to emphasize the fact that manufacturers of fiber lasers cannot compromise on the need for a very low RI.

The current standard cladding material for specialty fibers used for fiber lasers is 1.36. Ideally the laser manufacturer will prefer even a lower value but the coatings with a lower index in the range of 1.32-1.35 quickly lose mechanical strength (low elastic modulus) with reduction of the refractive index. This is a limitation brought by the soft perfluoro polymer.

Moving from fluoro polymers to the next best, silicone based polymers, means going to a range of RI of 1.42-1.44. The manufacturers of lasers that we talked to say:

Regarding the possibility to incorporate polymer coating material with a refractive index higher than 1.4: This coating is not applicable for fiber laser systems, since the power occupancy of the fiber is lower than fibers with the standard coating (refractive index of 1.36), which imply that the overall system efficiency will be much lower and the power consumption of the laser system will markedly increase, as well as heat evacuation requirements will limit it to a very low power. In addition, the laser reliability will be lower and its cost will rise tremendously. Such lasers shall not be useful for cutting tools.