

Highlight

Aachen,
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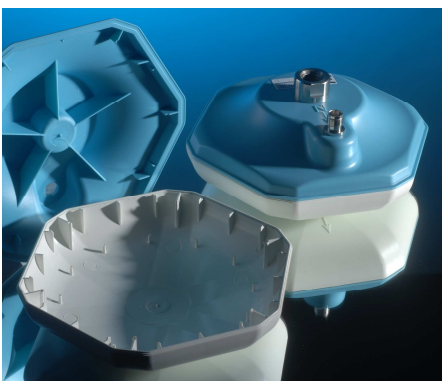


Figure 1: G3-C Antenna housing (navXperience, ASA polymer), welded with 1,5 μ m fiber laser radiation in REMOTE and TWIST overlap welding configuration

Polymer Welding unit for 3G-C Antenna housing using 1,5 μ m high-brilliance fiber laser radiation.

Most polymers have high light absorption at long wavelengths in the infrared spectral range above 1,5 μ m and don't need to be furnished with absorbing additives to achieve laser overlap welding. Within the frame of the collaborative European POLYBRIGHT research project, IPG Laser GmbH, Burbach (Germany) who is involved in POLYBRIGHT, has been developing fiber lasers with an optical output power of 120 W emitting at 1567 nm (Erbium fiber laser ELR-120) and 1940 nm (Thulium fiber laser TLR-120). This laser beam source, together with an infrared-adapted scanner from POLYBRIGHT partner ARGES, Wackersdorf (Germany) have been applied to weld a 3G-C Antenna housing, consisting of ASA polymer, coloured blue (upper dish) and white (lower dish). ASA Masterbatch was provided by POLYBRIGHT partner Treffert, Bingen (Germany).



Figure 2: Welding facility including ARGES-Scanner, IPG 1,5 μ m fiber laser and antenna adapted clamping.

Setting up the welding unit including fiber laser, scanner, antenna clamping has been carried out by POLYBRIGHT partner Fraunhofer-Institut für Lasertechnik ILT, Aachen (Germany). Both antenna dishes are positioned in overlap configuration, where the upper blue dish has sufficient transparency of 50 % for 1,5 μ m fiber laser wavelength and the lower white dish is furnished with infrared absorbing pigments to compensate its high reflectance.

Laser welding for this application is carried out in Remote configuration, where the accessible working area due to the scanner lens (focal length 330mm) is 180 x 180 mm. To avoid laser radiation absorption in the upper blue dish, the laser beam is deflected along the welding contour with a superimposed circular TWIST movement (TWIST: Transmission Welding by an Incremental Scanning Technique). Summarized process parameters: Wavelength 1,5 μ m, Laser power 15 Watt, Welding speed 15 mm/s, TWIST scanning frequency 1000 Hertz, TWIST diameter 0,6 mm. On the occasion of November 2011 Productronica fair, Munich, the antenna welding setup is planned to be presented.



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More information about EU collaborative POLYBRIGHT project see
www.polybright.eu

For any further questions our experts will be pleased to provide you
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