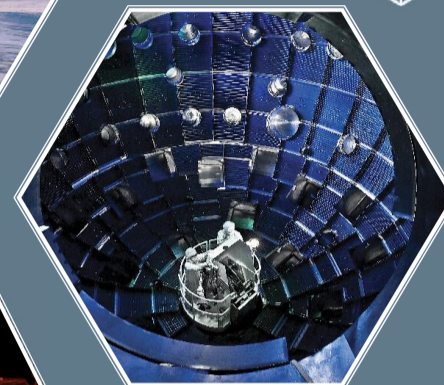
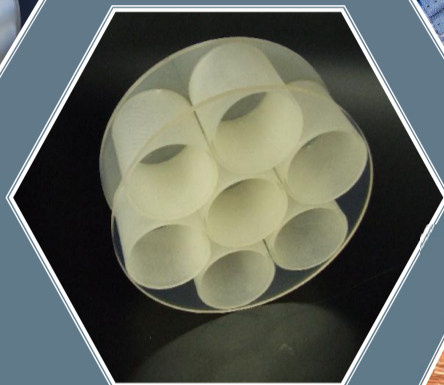
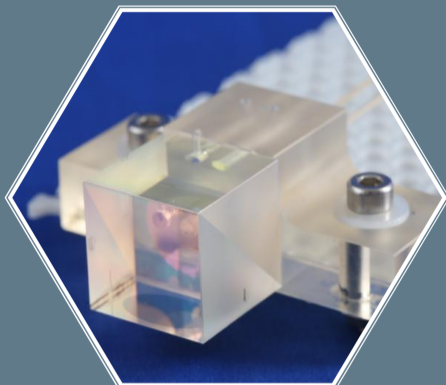
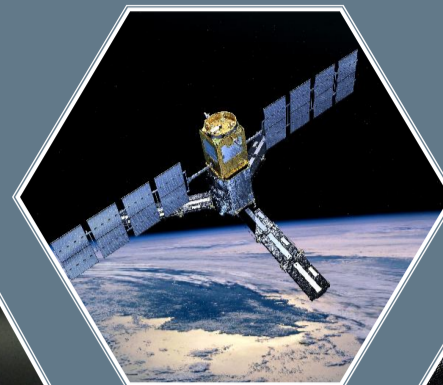
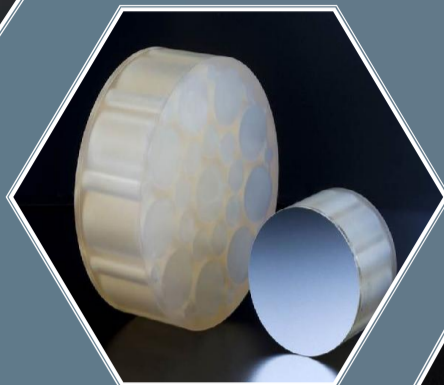
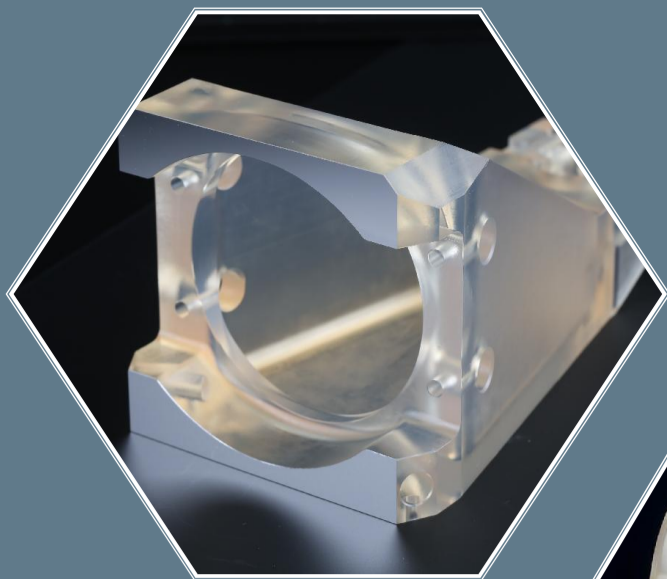


Hy-Per Bonding



Hy-Per Bonding is Gooch & Housego's proprietary process for bonding glass, glass-ceramic and crystal components. Hy-Per Bond combines the accuracy of optical contacting with the permanence and strength of epoxies.

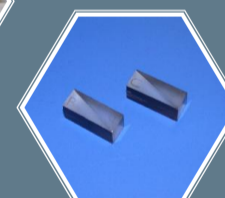
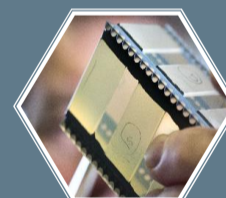
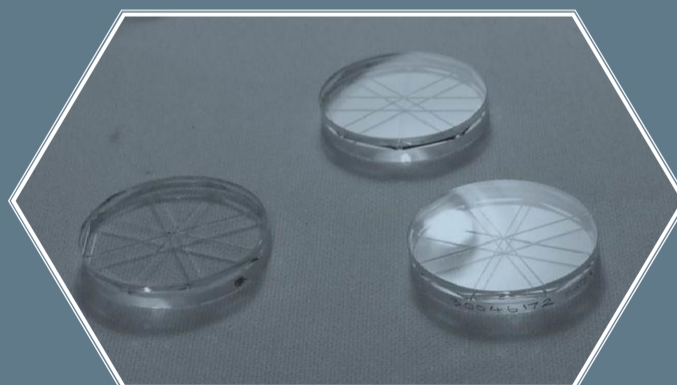
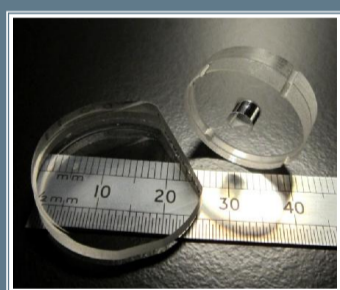
By activating precision optical surfaces prior to joining them, permanent bonds are formed between the components that are resistant to humidity and cryogenic temperatures. There are no organics involved in the process so no outgassing to worry about. When bonding low expansion ceramics the bond line is so thin that thermal distortion is negligible.

Bond strength is sufficient such that, in trials, the parts shear across, rather than along, the bond line. (see photo below)

The CEI funded a successful project in collaboration with Surrey Satellite Technology Ltd. which looked at novel methods of fabricating a lightweight mirror structure in Zerodur. Some D150mm flat mirrors were constructed that showed negligible distortion when heated.

Large area polarisations scramblers have also been assembled from wedge crystal quartz plates for space applications.

Another application is in life sciences where one application required a strong bond which is transparent to UV light and another where the aggressive test chemicals were destroying cuvettes made with standard epoxy bonds.



Research Pedigree

The process was originally developed under the auspices of a KTP with the University of Glasgow's Institute for Gravitational Research. During the program the process was developed from a purely mechanical joint to one that was optically clear, as well as being able to survive harsh post processing such as drilling and polishing of wedges.

We have a number of new developments currently underway looking at varying applications of the process. These include the bonding of crystal quartz components to make segmented waveplates. These parts have to survive intense laser beams used in laser cutting (4kW beams at 1030nm). This work is undertaken under the HALO program, funded under the European Commission's 7th Framework Programme.

www.halo-project.eu

Potential Applications

- True zero order waveplates
- Sectored waveplates
- Fabrication of lightweight composite structures
- Prism assemblies
- Precision air-spaced etalons
- Beamsplitters

The process can be applied to a wide range of materials and situations. Please contact us with your specific assembly problems to see if we can assist.



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