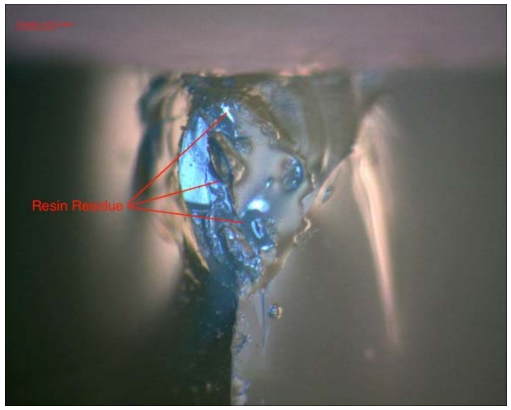

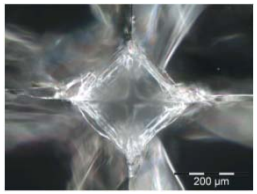

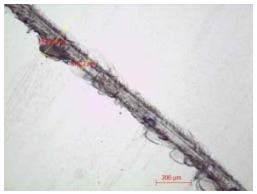

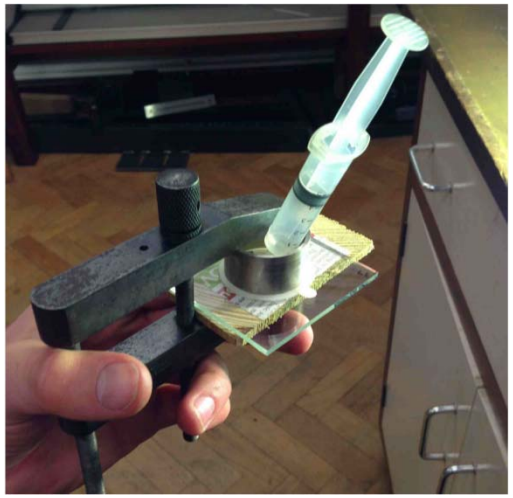

Glass Repair

MEng Student | *Tom Poole*
Supervisor | *Dr. Mauro Overend*

Overview | *Glass repair is an area with little research or application. The are a few companies offering their repair services but little is reported on the strength increase gained through repair. Further little is known about the durability of the repairs. This project aims to quantify the performance of resin-filling repairs for soda-lime silica glass. Three types of flaw have been investigated: Natural weathering flaws and artificially induced indents and linear scratches. Durability was also tested by immersing the repaired specimens in water for a week.*

Main Outcomes | *304 specimens have been damaged, repaired and strength tested to destruction. The main conclusions to the investigation are that the inert strength increase from the resin repairs is minimal, compared to the undamaged strength. However, visually the initial flaws become almost invisible. The durability of the repairs is such that the strength of the glass after being repaired and stored in water for a week is less than if the glass was repaired and stored in air. This suggests that the previously reported strength increases after repair are primarily the result of supressed critical crack growth rather and healing or bridging of the flaws I sonly responsible for relatively small increase in strength.*

Future Work | *To ascertain the mechanism of strength increase, further investigations are needed to confirm the strength increase is indeed caused by the bridging of the resin over the flaw, as suspected. To investigate further the effect of water on the repairs, tests could be carried out with repairs exposed to water after different time periods after the repair. This would test if the resin needs a longer time to set, and harden to block the ingress of water. It would be interesting to run tests using industry standard repair equipment and replicate on-site rather than laboratory conditions. For a comprehensive investigation into glass repair, polishing should also be examined as a repair technique and compared to the use of resins.*