



Performance Testing of Toolbox™ and Maxseal Fast cure adhesives when bonded to PCS Thermagard Closed Cell Thermally Efficient Wall Panel Systems



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Introduction

This report presents an evaluation of the bond strength developed by Toolbox™ adhesive and Maxseal Fast Cure and ThermaGard Closed Cell Thermally Efficient Wall Panel Systems

Test method

Samples of the ThermaGard Panels were supplied to HB Fuller. These were cut into 50mm squares section for testing. The cut samples were bonded to sections of standard galvanized aluminium top hat framing members with either Toolbox adhesive or Maxseal Fast Cure. To the second surface a section of timber was bonded using the same adhesive, to facilitate a screw hook to be embedded. The assemblies were placed at room temperature for seven days to cure. After curing the assemblies were mounted in a tensile testing machine, and a tensile test performed at a jaw separation rate of 50mm per minute. The force at failure and failure mode were recorded. The pretest photo is shown in figure one.

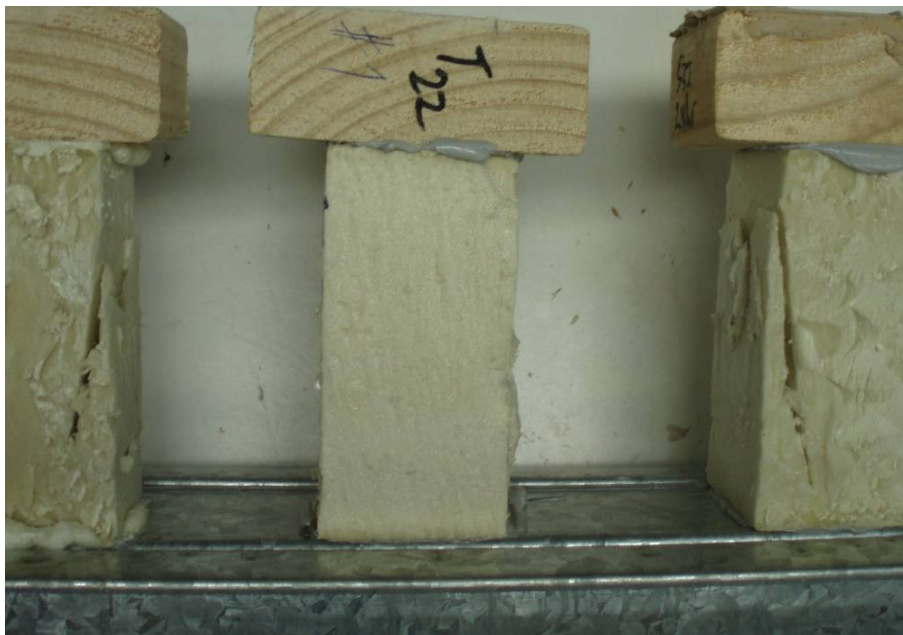


Figure 1: Initial test set up

Results

The results in the table below show the force required to break each sample, the type of failure mode, and the equivalent load the sample failed at in kilograms.

Sample substrate	Adhesive	Average Failure force (N)	Failure mode	Equivalent mass supported per block (Kg)
ThermaGard Panel	Toolbox	300	Substrate internal	30
ThermaGard Panel	Maxseal Fast Cure	290	Substrate	29

Each sample failed by the fracture of the ThermaGard panel near the surface of each bond line. The average force required to fracture was consistent with each adhesive and showed that the weak point of the system is the panel sheet itself. The equivalent mass

supported by the panel before failure was 30kg per 50mm x 50mm bonded section. The fracture surfaces after testing are shown below with Toolbox on the left and Maxseal Fast Cure on the right

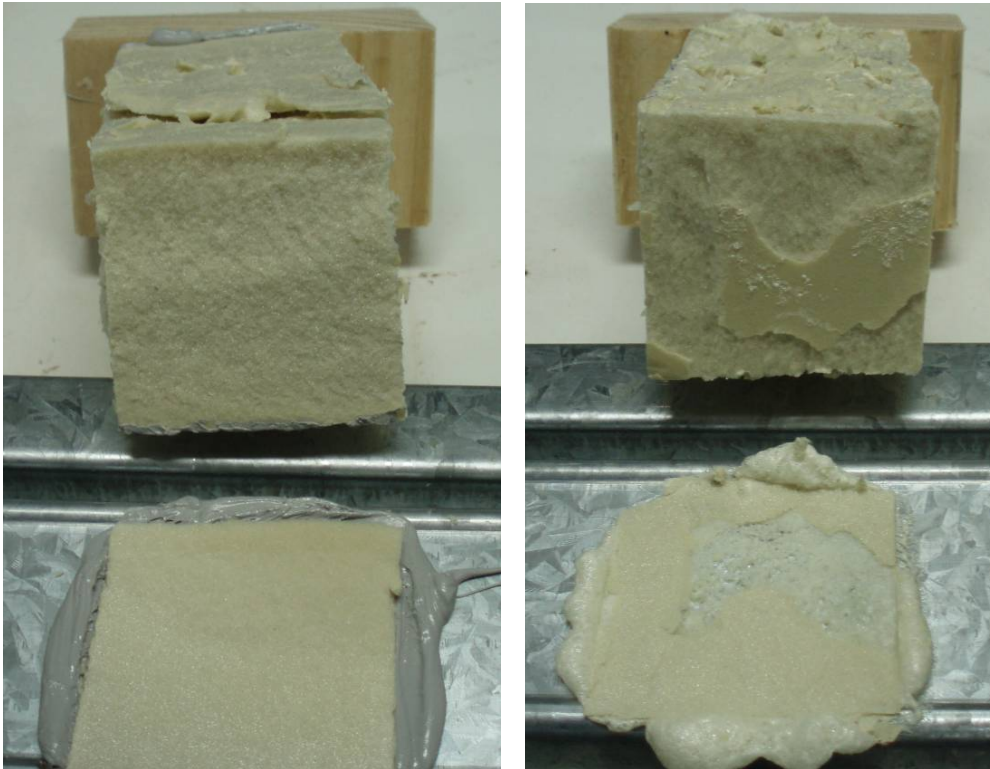


Figure 2 : Samples after tensile test

Conclusion

It is the opinion of HB Fuller that each adhesive when correctly used will offer optimum bonding of the ThermaGard Panel to either itself or other substrates.

Note when using Maxseal Fast Cure sufficient force must be applied to the sheets to ensure a tight bond line, as separation of the panels will lead to a foam, and therefore, weaker bond line.