

## UQ Fire Project #2020.02

### TECHNIQUES FOR MEASUREMENT OF TIMBER REGRESSION

#### Advisory Team

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#### Background and motivation

The understanding of the response of timber in different fire environments requires an understanding of the charring rate as well as the rate of regression of the surface. A faster surface regression will result in a thinner char layer which will provide less insulation to the timber, resulting in a faster pyrolysis and charring rate; as well as a different thermal penetration of heat behind the char front.

To date, very little is known about the rate of this regression under different heat flux conditions and under different oxygen concentrations. The purpose of this project is to explore different means of measuring the regression rate under both the Fire Propagation Apparatus (FPA) and in the Mass Loss Calorimeter (MLC).

#### Research objectives

- 1) Identify different techniques for measuring the regression rate of timber samples tested in the FPA and the MLC
- 2) Evaluate some of these promising techniques
- 3) Recommend one technique which could be used in the future for more detailed studies of regression of timber in different environments

#### Methodology

The project will begin with a literature review to identify possible promising techniques. This will be accompanied by the researcher becoming familiar with the Fire Propagation Apparatus and the Mass Loss Calorimeter. Having identified possible techniques then these will be evaluated in a desktop study to determine their feasibility before they are implemented in a series of testing in the MLC and then in the FPA.

This project would suit a 4-unit thesis. However the scope could be extended to an 8-unit thesis.