



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

Fire performance of metal-free timber connections

Citation for published version:

Brandon, D, Maluk, C, Ansell, MP, Harris, R, Walker, P, Bisby, L & Bregulla, J 2015, 'Fire performance of metal-free timber connections' Proceedings of the ICE - Construction Materials, vol. 168, no. 4, pp. 173-186.
DOI: 10.1680/coma.14.00055

Digital Object Identifier (DOI):

[10.1680/coma.14.00055](https://doi.org/10.1680/coma.14.00055)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Peer reviewed version

Published In:

Proceedings of the ICE - Construction Materials

General rights

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.



List of figures

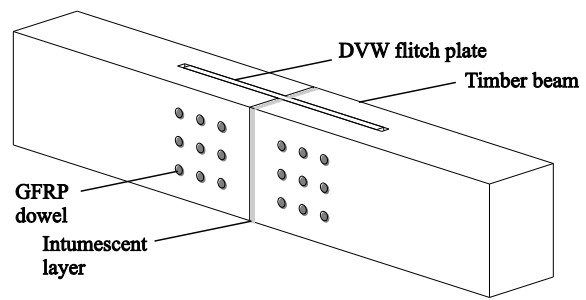


Figure 1: Non-metallic DWV flitch plate connection

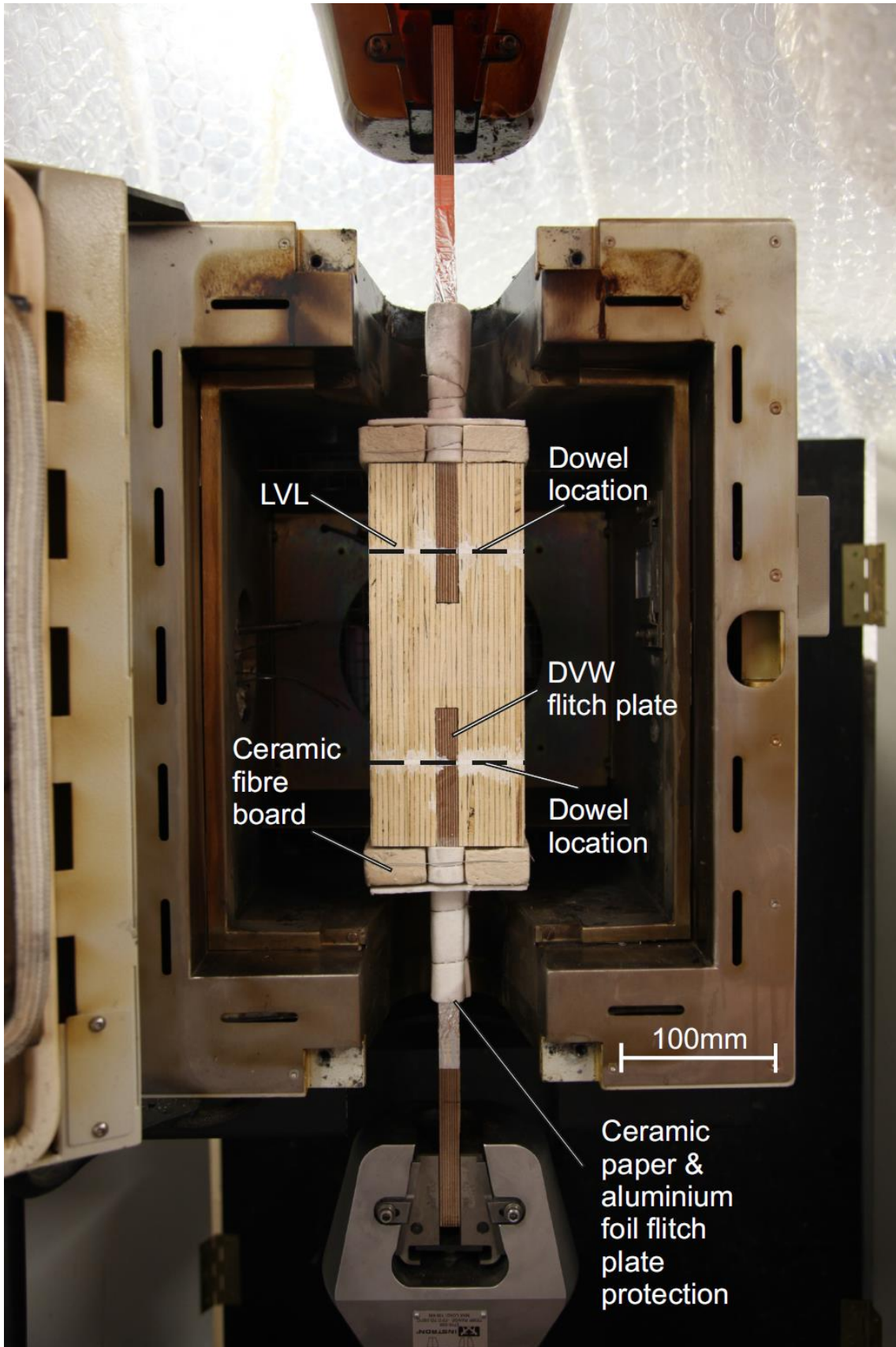


Figure 2: Setup of tensile connection test in an environmental chamber

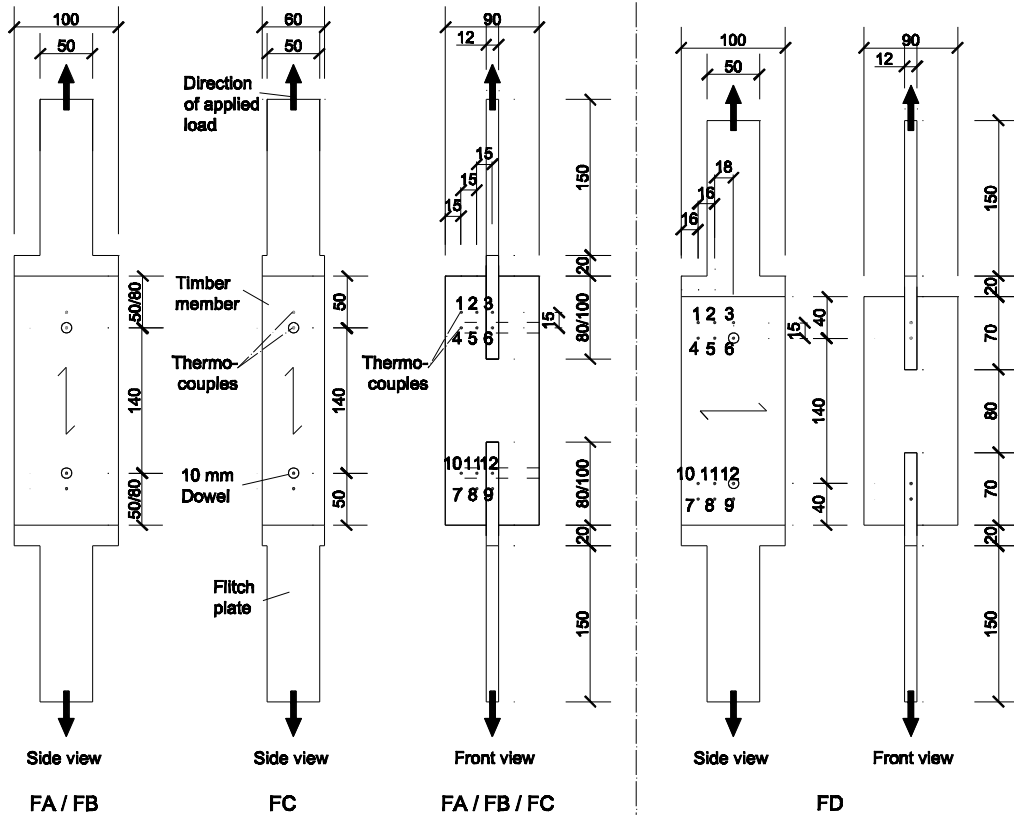


Figure 3: Dimensions of the tested specimens and locations of thermocouples (dimensions in mm)

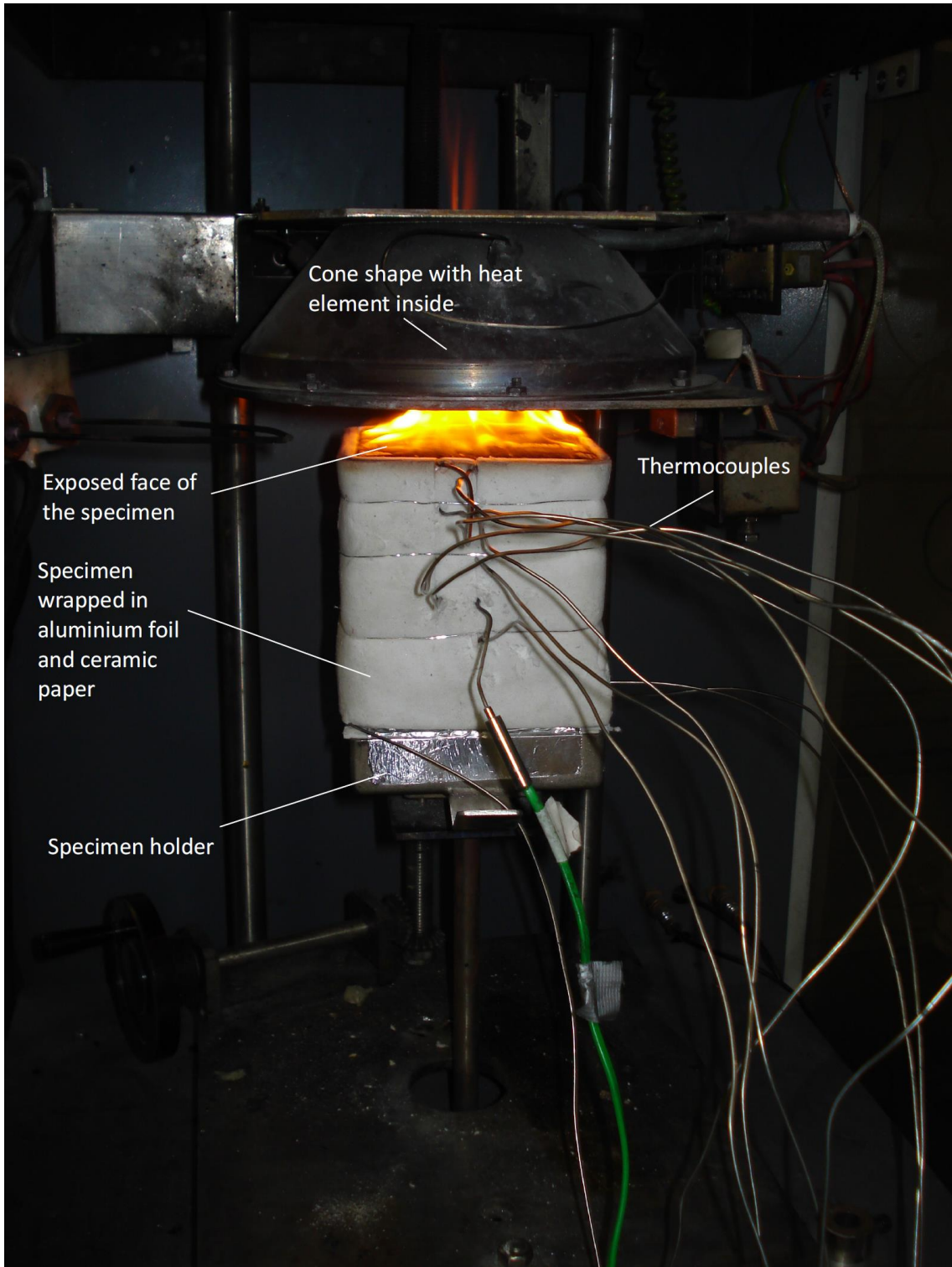


Figure 4: Cone calorimeter test

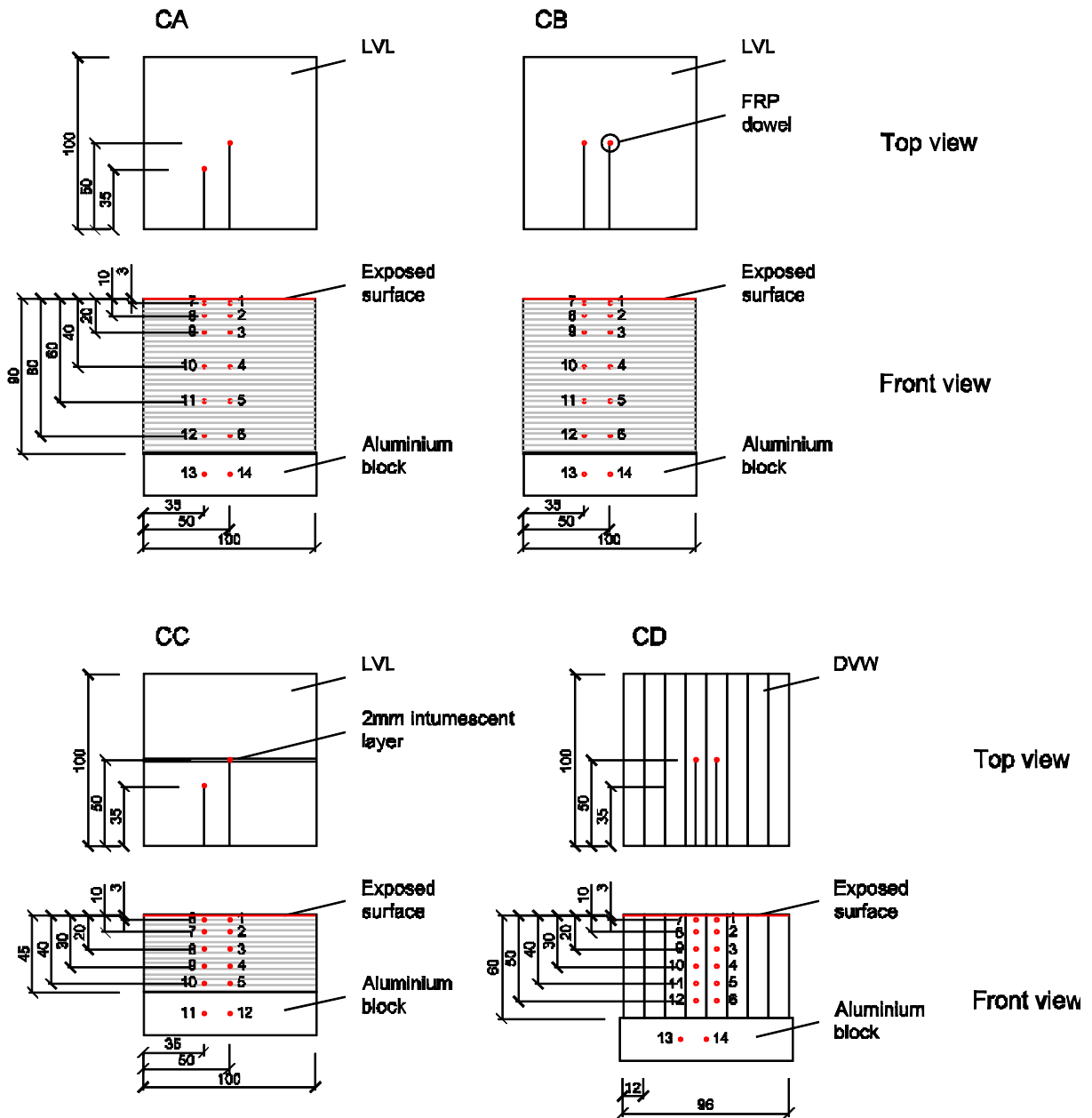


Figure 5: Location of thermocouples in constant heat flux tests (dimensions in mm)

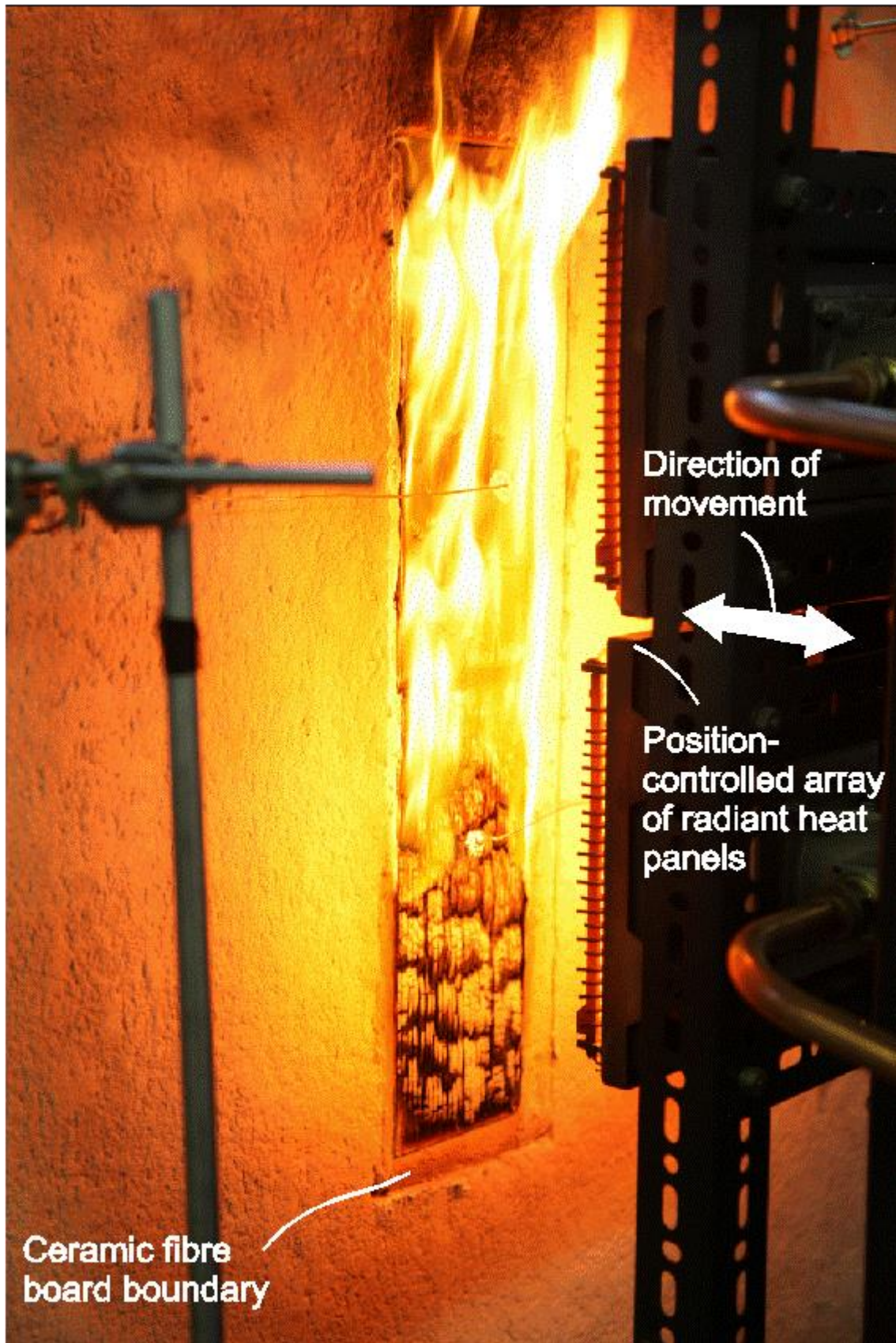


Figure 6: H-TRIS fire test apparatus Mk I (Maluk, 2015)

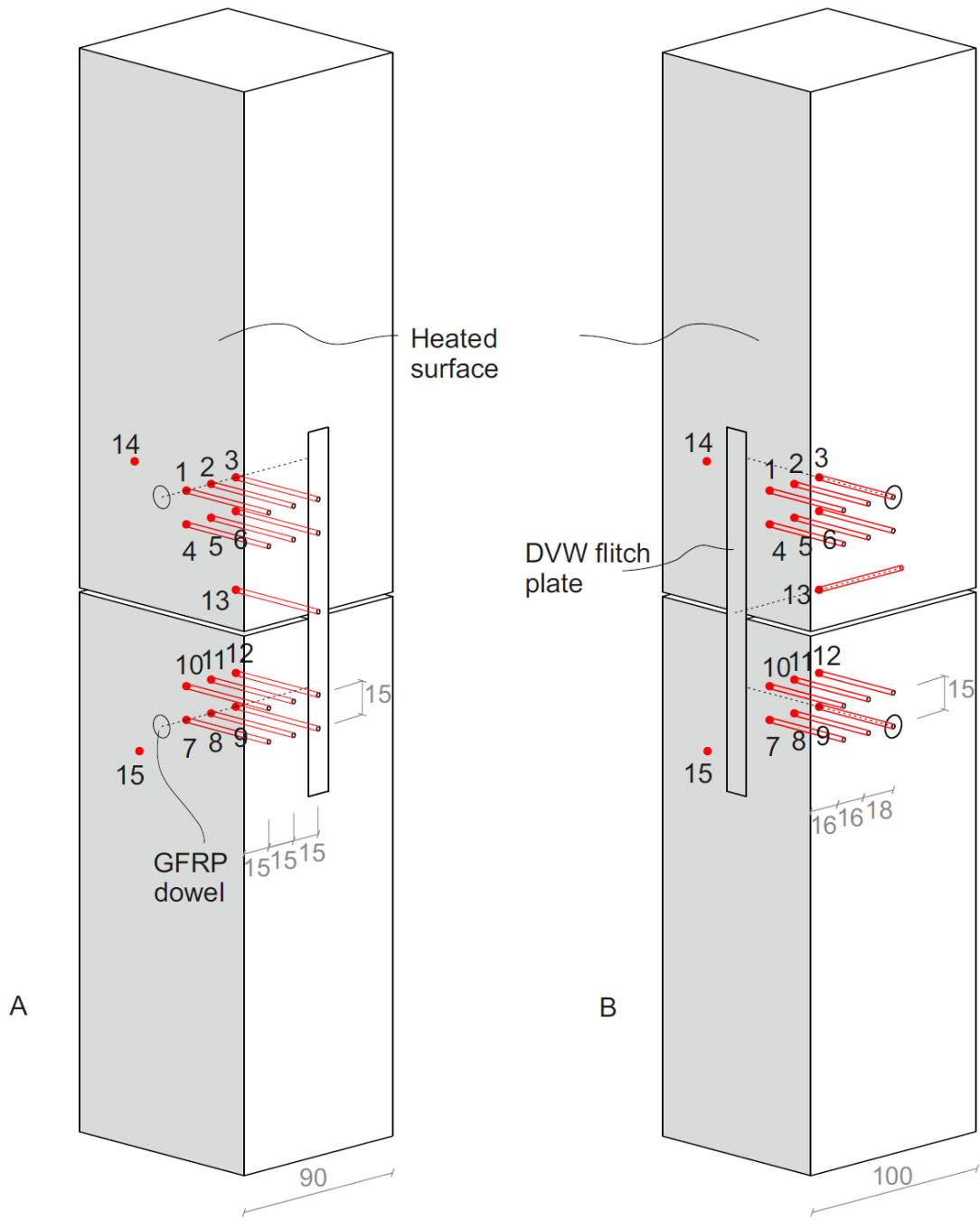


Figure 7: Locations of thermocouples in H-TRIS tests (dimensions in mm)

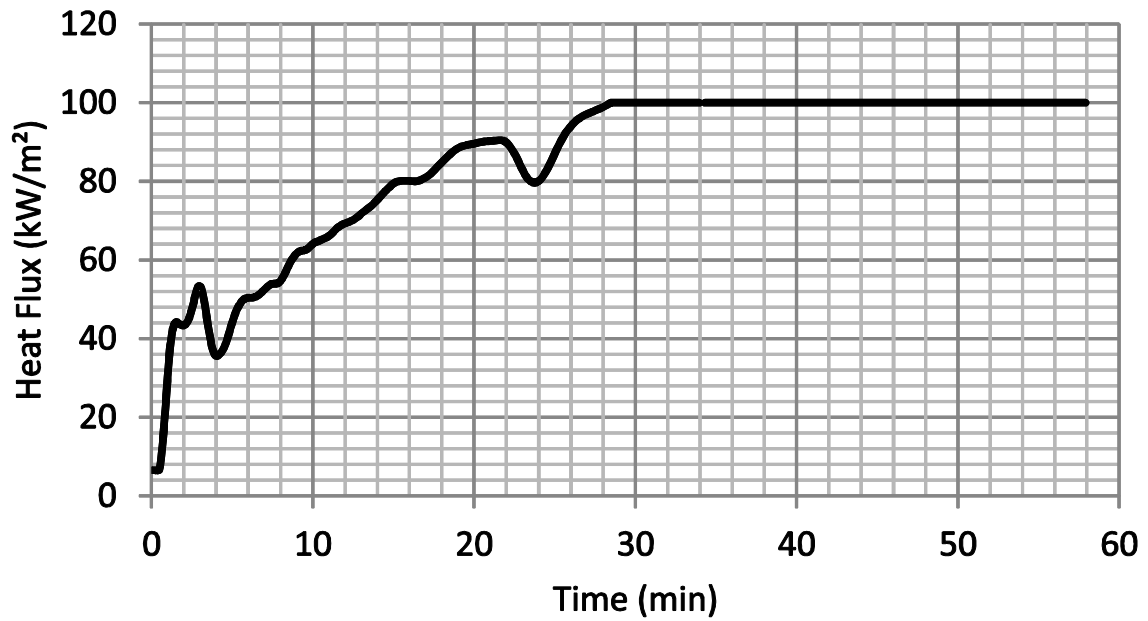


Figure 8: Time-history of incident heat flux imposed using H-TRIS

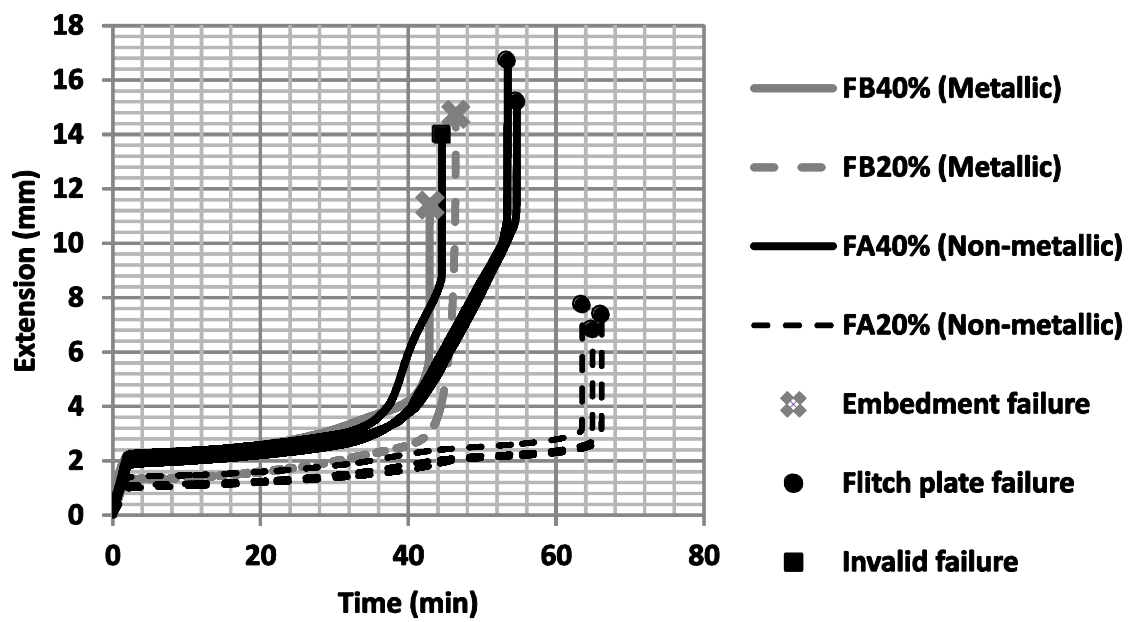


Figure 9: Crosshead displacement versus time of test for Series FA and FB

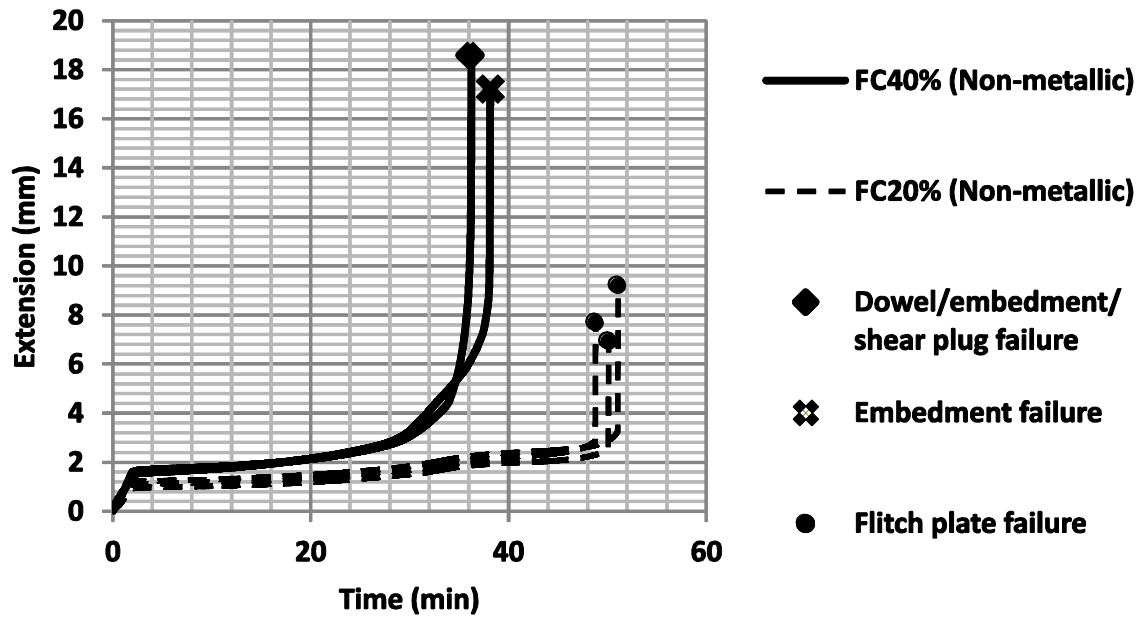


Figure 10: Crosshead displacement versus time of test for Series FC

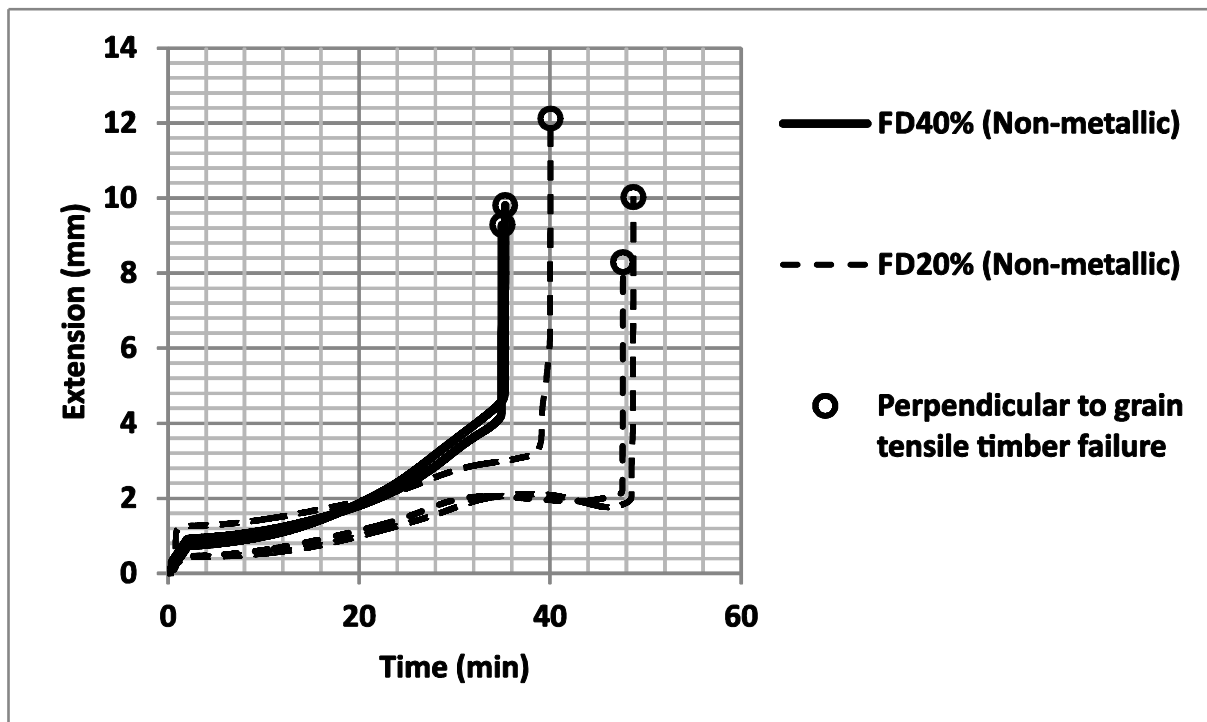


Figure 11: Crosshead displacement versus time of test for Series FD

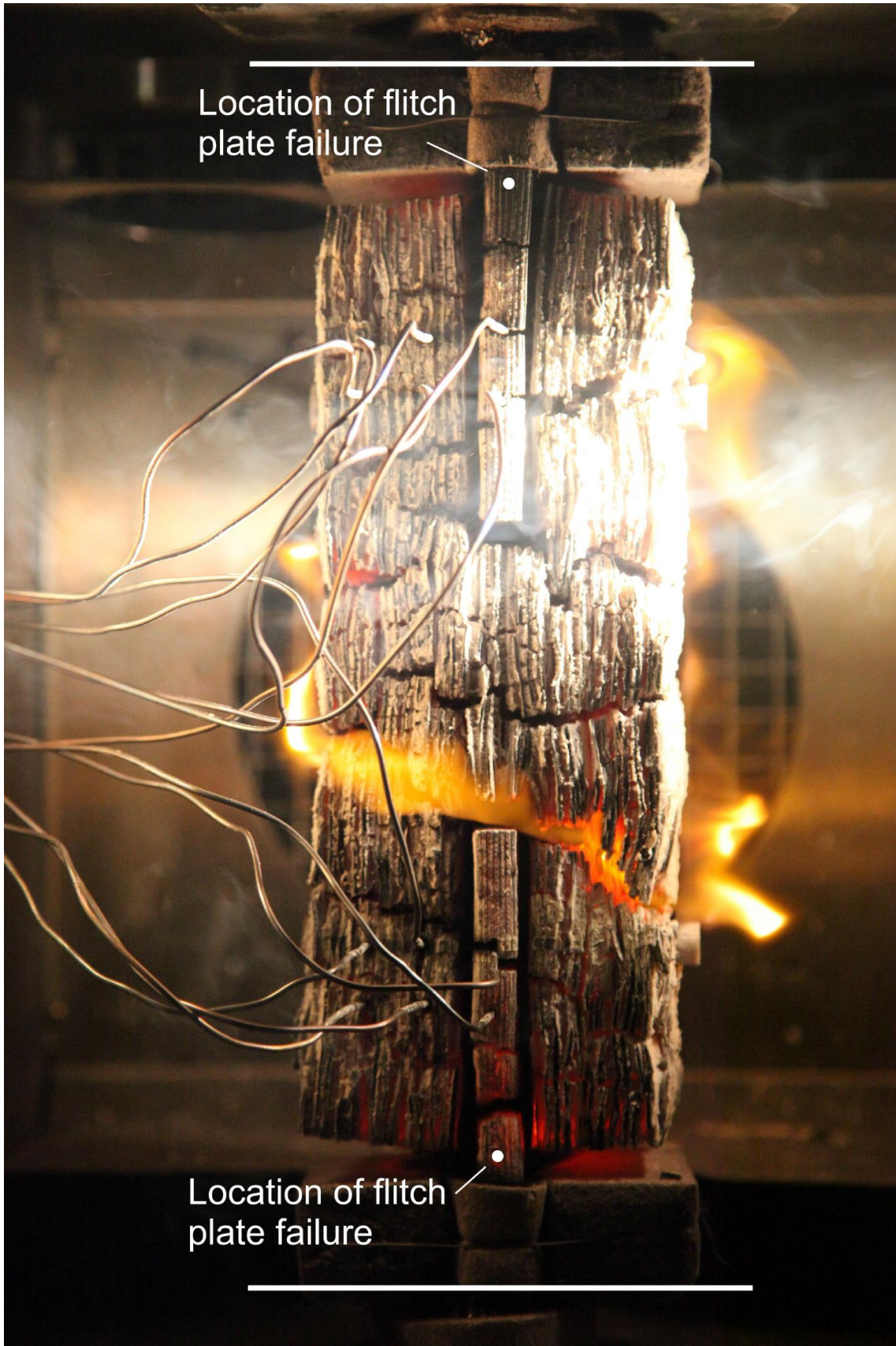


Figure 12: Specimen of series FA after 50 minutes of heating

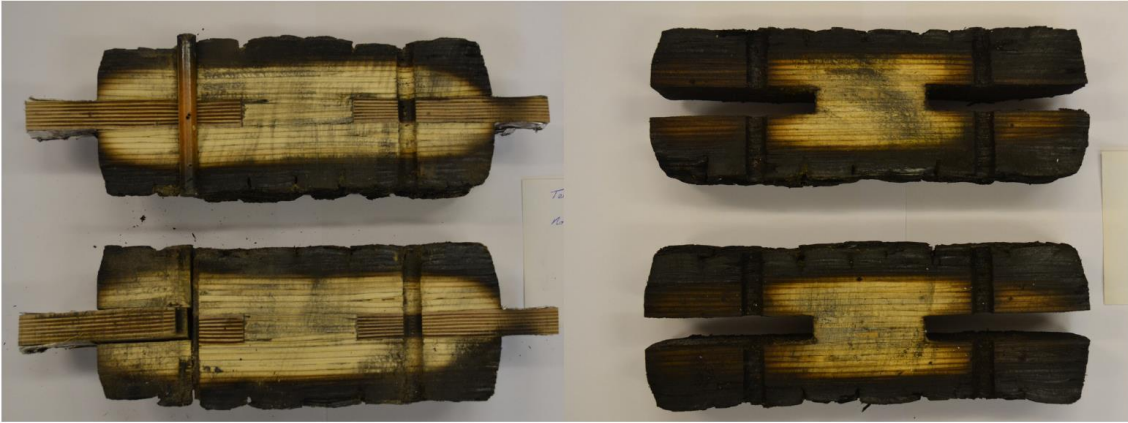


Figure 13: Longitudinal section of typical non-metallic (left) and metallic (right) connections after 50 minutes of heating

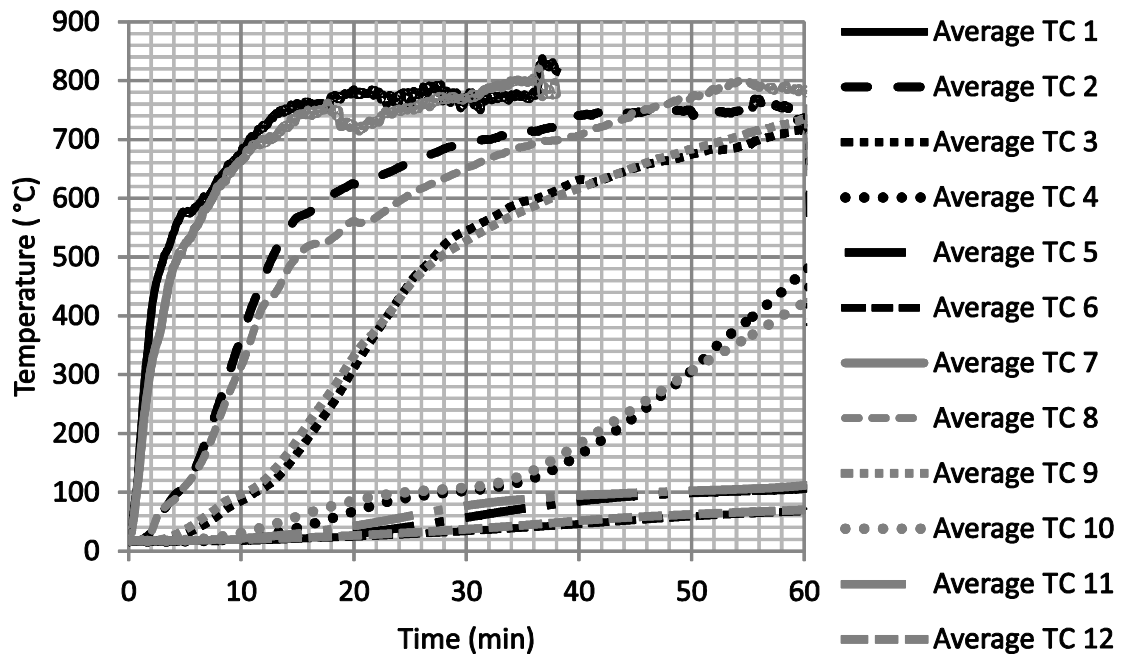


Figure 14: Average temperature results of Test Series CA

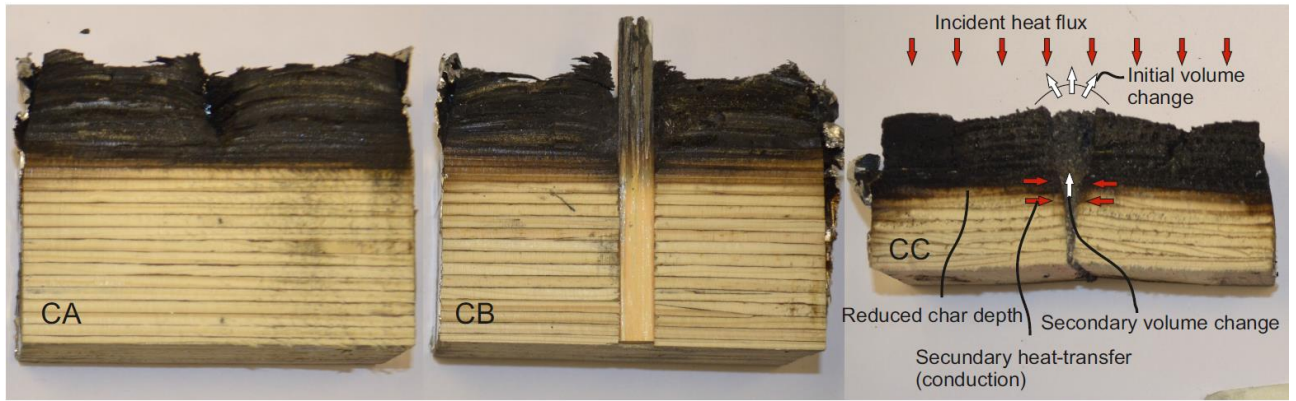


Figure 15: Section of specimens after testing

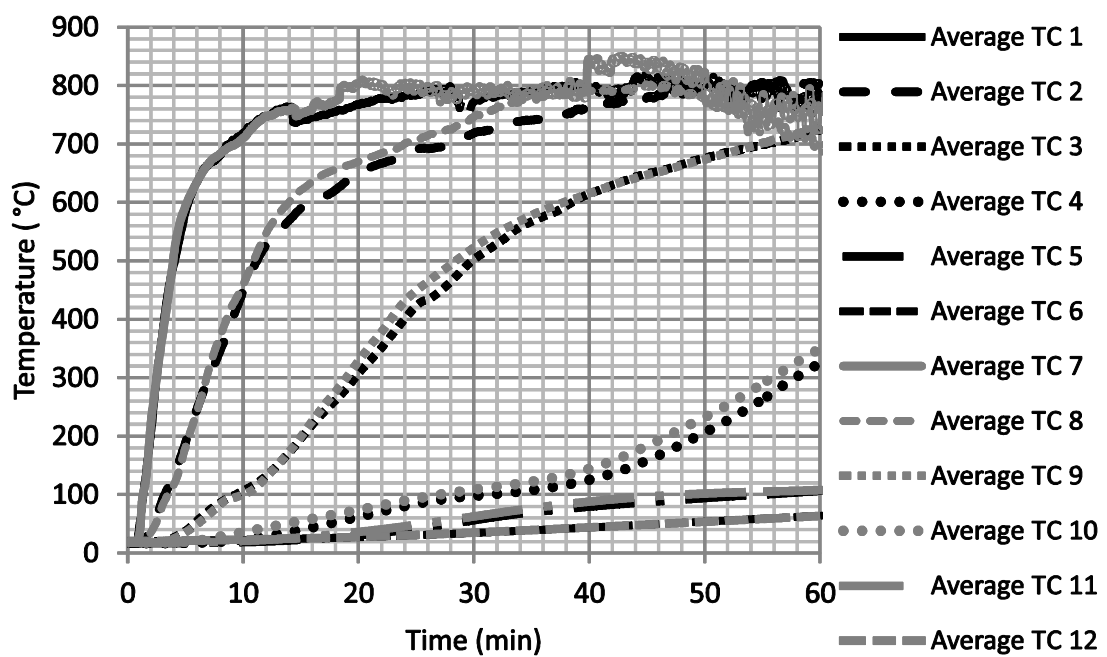


Figure 16: Average temperature results of Test Series CB

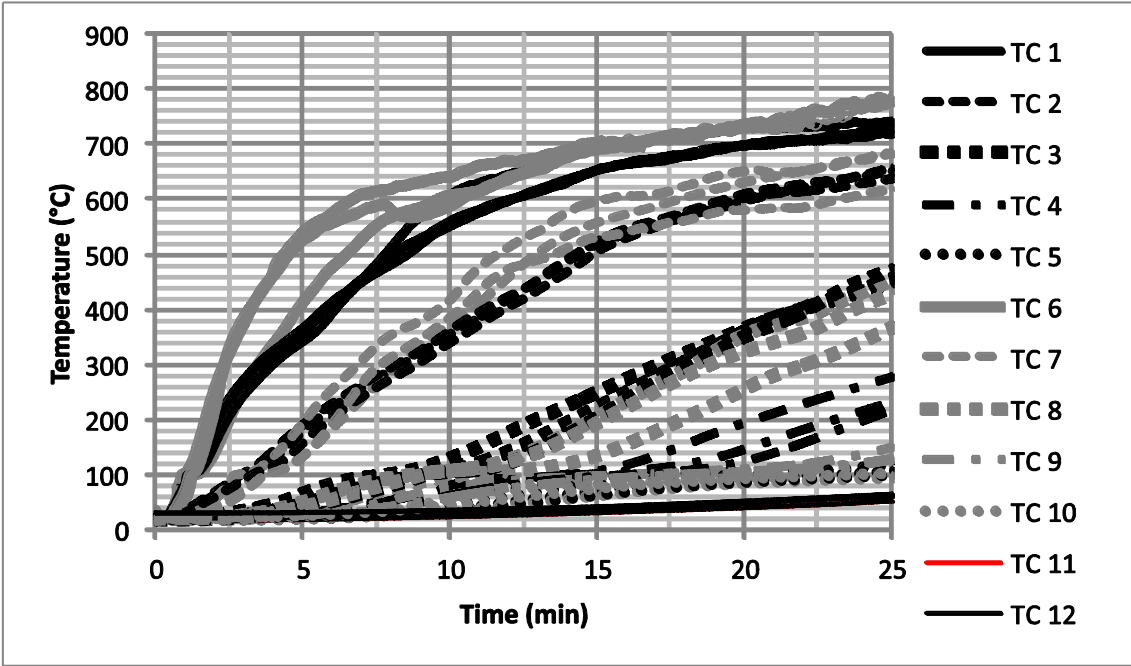


Figure 17: Temperature results of Test Series CC

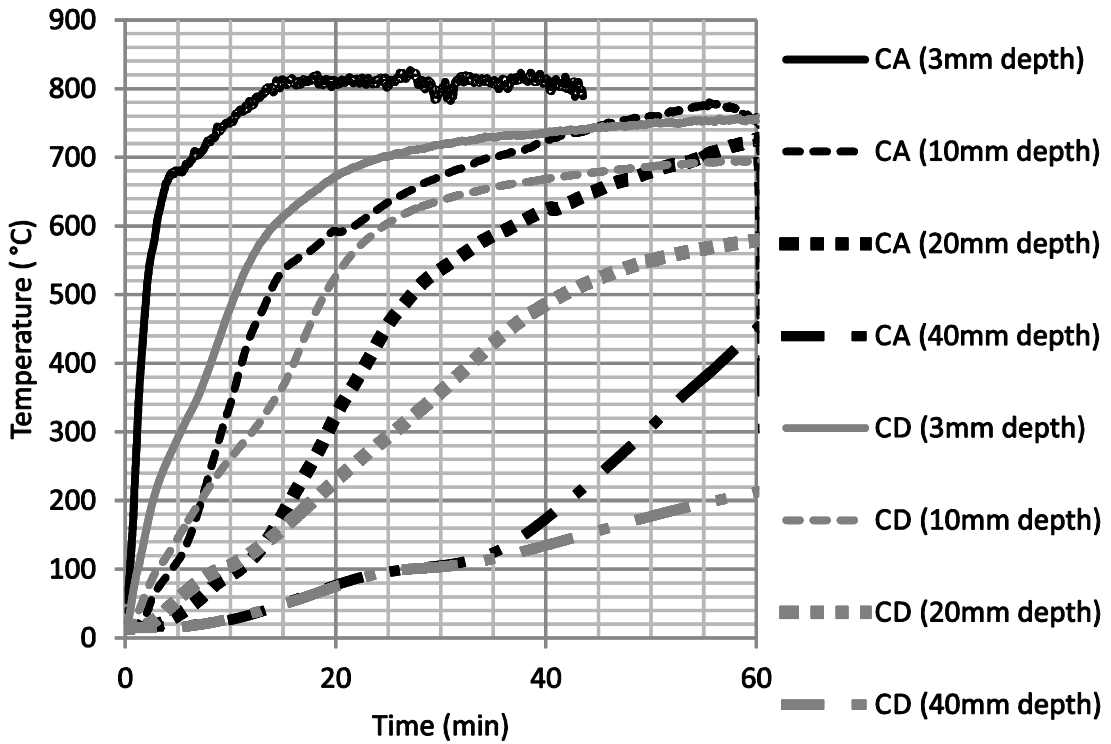


Figure 18: Average temperature results of test series CA and CD

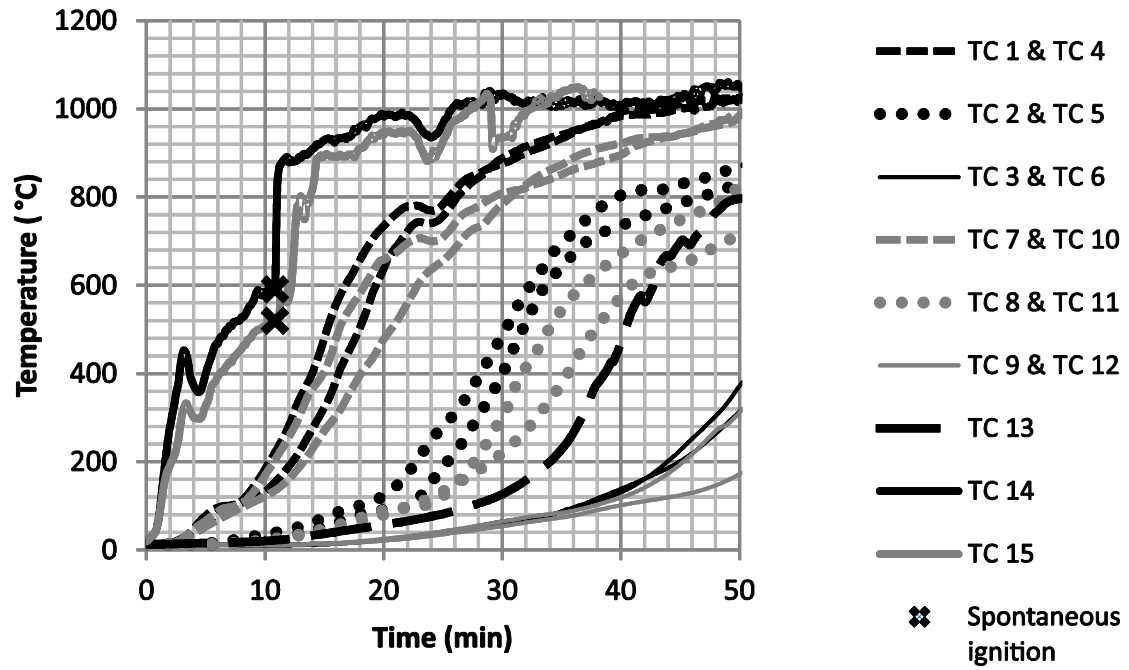


Figure 19: Temperature results of H-TRIS Test HA

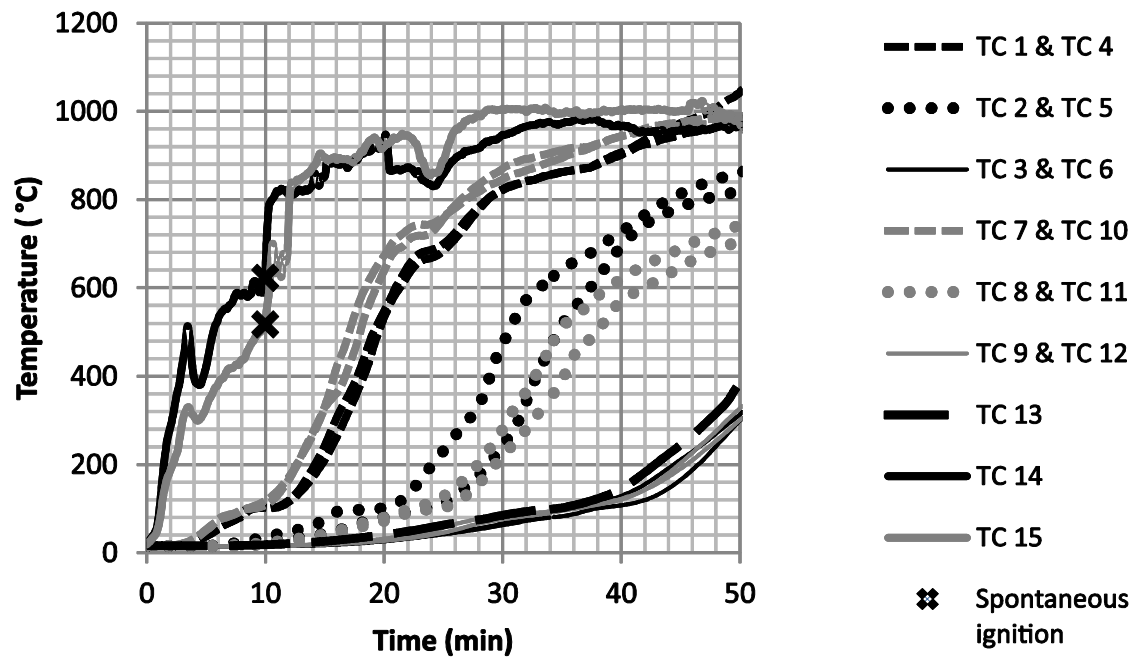


Figure 20: Temperature results of H-TRIS Test HC

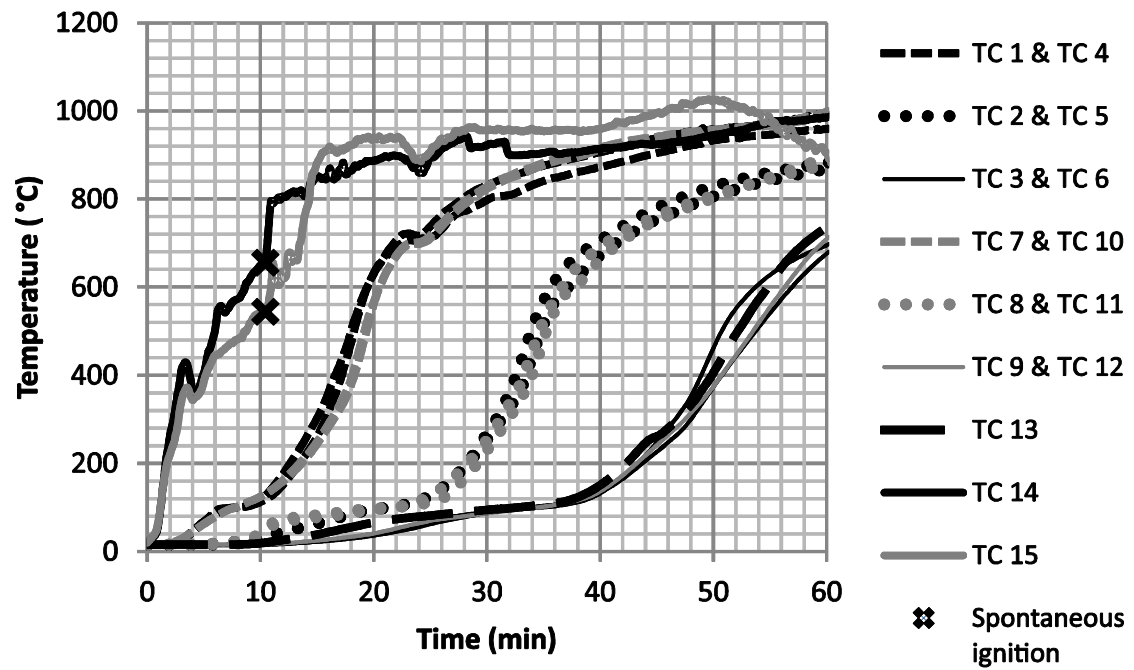


Figure 21: Temperature results of H-TRIS Test HB

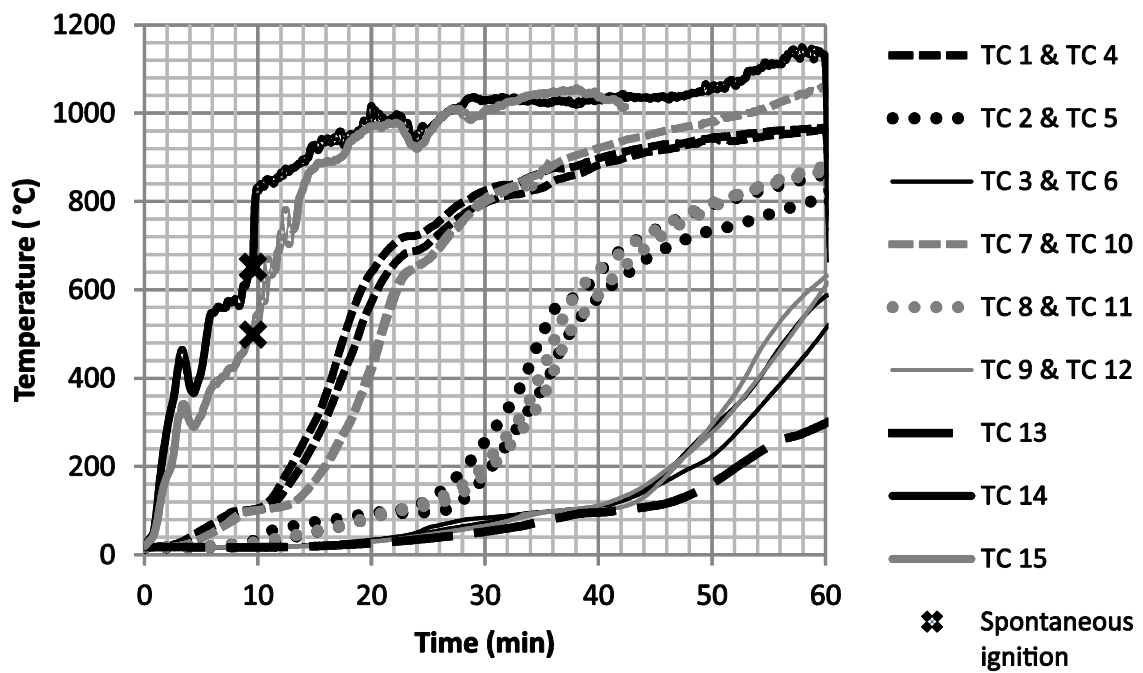


Figure 22: Temperature results of H-TRIS Test HD