

**Table S1: Supplementary data of Building materials and their density, flame test temperature, thermal conductivity, material failure time, rate of fire spread and condition of material after heating. The data below were obtained from laboratory experiments for different building materials and their rate of fire spread.**

S/N o.	Building material description with density	Temperature (°C) in Flame test equipment compartment before material was entirely or partially consumed	Heat flux / Thermal Conductivity of Material W/(m <sup>2</sup> K)	Material failure time (in minutes)	Rate at fire spread via linear metre or m <sup>2</sup> of materials per minutes (metre sq. / minute)	Condition of building material after heating
1	<b>Brick/Block</b>					
i	Clay bricks (Density -1,700 kg/m <sup>2</sup> )	500 - 600 °C	0.528	Partial failure after	00:35:00	Material bond substantially weakened in area
ii	sandcrete block - 2,300 kg/m <sup>3</sup>	350 - 400 °C	0.501	Partial failure after	00:47:00	Material bond substantially weakened in area
iii	Concrete (Density - 2,000 kg/m <sup>2</sup> )	500 - 600 °C	0.710	Partial failure after	00:55:00	Material bond substantially weakened in area
2	<b>Insulation materials</b>					Entirely consumed to ashes
i	Celotex insulation (Density - 25 kg/m <sup>2</sup> )	100 - 150 °C	0.211	3 minutes	00:15:13	Entirely consumed to ashes
ii	Fiberglass insulation (Density - kg/m <sup>2</sup> )	350 - 400 °C	0.412	17 minutes	00:25:04	Partially consumed; Melts and Drop formation
iii	Polyurethane Foam (Density - 52 kg/m <sup>2</sup> )	100 - 150 °C	0.222	5 minutes	00:04:05	Entirely consumed to ashes
iv	Polystyrene Insulation (Density - 1060 kg/m <sup>3</sup> )	100 - 150 °C	0.298	7 minutes	00:02:08	Melts, and consumed to ashes
3	<b>Long span Aluminium cladding</b>					
i	Reynobond PE ACM cladding coil-coated aluminium sheets fusion bonded to both sides of a polyethylene core (Density - 10 kg/m <sup>2</sup> up to 35 kg/m <sup>2</sup> )	100 - 200 °C	0	13 Minutes	00:09:10	Soften, Melts and Drop formation
ii	Reynolux aluminium sheets (Density = 2,750 kg/m <sup>2</sup> )	350 - 400 °C		24 Minutes	00:10:08	Soften, Melts and Drop formation
iii	Aluminum (2,739 kg/m <sup>3</sup> )	350 - 400 °C	235	31 Minutes	00:35:10	Soften, Melts and Drop formation
4	<b>Wall and floor tiles</b>					
i	Polymer-Sand Tiles PE-158 (Density	350 - 400 °C	1.455	28 Minutes	00:17:12	Partially consumed
ii	Ceramic tiles (2790 - 3070 kg / m <sup>3</sup> )	350 - 400 °C	1.782	41 Minutes	00:25:10	Partially consumed
iii	1/2 inch Plywood (6.93 kg/m <sup>2</sup> )	100 - 200 °C	1.802	9 Minutes	00:07:03	Entirely consumed to ashes
5	<b>Other materials</b>					
i	Wooden skirting (Density - 900 kg/m <sup>2</sup> )	100 - 150 °C	1.452	11 Minutes	00:10:00	Entirely consumed to ashes
ii	Plastic trunking (Density - 930 kg/m <sup>2</sup> )	100 - 150 °C	0.411	3 minutes	00:04:17	Melts; completely deformed
iii	Wooden doors (Density - 420 kg/m <sup>2</sup> )	100 - 150 °C	1.651	11 Minutes	00:12:18	Entirely consumed to ashes
iv	Plastic door (Density - 970 kg/m <sup>2</sup> )	100 - 150 °C	0.621	9 Minutes	00:10:19	Entirely consumed to ashes
v	Glass window (Density - 2579 kg/m <sup>2</sup> )	350 - 400 °C	1.722	23 Minutes	00:11:02	Shattered into pieces
vi	Framing Steel (7,849 kg/m <sup>3</sup> )	100 - 150 °C		No Failure after 45	00:39:21	No visible changes to material