

# Comparison of Flame / Smoke Suppression of Busan 11-M1, Flamebloc 428, Zinc Borate and Antimony in Plasticized PVC

## Heat and Visible Smoke Release Rates of Plasticized PVC

### Test Results:

#### ASTM 1354

#### Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

Heat Flux: 35 kW/m<sup>2</sup>

Exhaust Flow Rate: 24.0 l/s

| Sample   | A     | Q     | N     | K     | H     | B     | D     | E     | G     | K     |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Initial Mass (g)                               | 13.4  | 14.0  | 13.2  | 12.6  | 12.0  | 12.3  | 11.0  | 9.9   | 9.8   | 11.3  |
| Final Mass (g)                                 | 2.9   | 3.5   | 3.1   | 3.3   | 2.8   | 3.3   | 3.3   | 2.6   | 2.6   | 3.6   |
| Avg. % wt. Loss (g)                            | 78.4  | 75.0  | 76.5  | 70.0  | 76.7  | 73.2  | 70.0  | 73.7  | 73.4  | 68.1  |
| Time to Sustained Ignition (s)                 | 19    | 18    | 18    | 17    | 16    | 20    | 15    | 16    | 28    | 36    |
| Time to Flame-out (s)                          | 112   | 171   | 139   | 148   | 122   | 104   | 98    | 89    | 96    | 99    |
| Peak Rate of Heat Release (kW/m <sup>2</sup> ) | 244.1 | 178.9 | 215.0 | 196.9 | 204.9 | 198.0 | 185.3 | 173.2 | 174.7 | 199.6 |
| Total Heat Released (MJ/m <sup>2</sup> )       | 10.89 | 10.58 | 10.32 | 10.03 | 9.85  | 9.40  | 8.88  | 7.48  | 6.71  | 7.02  |
| Total Smoke Released (m <sup>2</sup> )         | 10.88 | 9.34  | 10.14 | 9.95  | 9.62  | 6.65  | 7.70  | 5.87  | 5.10  | 6.55  |

#### Legend:

|                           |  |                                     |
|---------------------------|--|-------------------------------------|
| A – Control               |  | B – Antimony (10phr)                |
| Q – Flamebloc 381 (10phr) |  | D – Flamebloc 428 (10phr)           |
| N – Zinc Borate (10phr)   |  | E – Flamebloc 428/Antimony /5/5phr) |
| K – Flamebloc (10phr)     |  | G – Busan 11-M1/Antimony (5/5phr)   |
| H – Busan 11-M1 (10phr)   |  | K – Flamebloc/Antimony (5/5phr)     |