

## 1 PHAST FLAT TERRAIN DISPERSION MODELLING RESULTS

Table 1.1 presents the results of the flat terrain dispersion modelling using the PHAST software. PHAST is the world's most comprehensive process industry hazard analysis software tool for flat terrain dispersion modelling. The software examines the progress of a potential incident from the initial release to far-field dispersion including modelling of pool spreading and evaporation, and flammable and toxic effects. PHAST software contains DNV's proprietary discharge and dispersion model, Unified Dispersion Model (UDM), which could simulate dispersion of flammable and toxic gas releases.

Based on the results in Table 1.1, Figure 1.1 and Figure 1.2 are generated showing the relationship between the chlorine hazard range and release rate/ quantity of chlorine.

**Table 1.1 PHAST Flat Terrain Dispersion Modelling Results**

| Release Case             | Weather Class | Downwind Distance to LD90 (m) | Downwind Distance to LD50 (m) | Downwind Distance to LD03 (m) |
|--------------------------|---------------|-------------------------------|-------------------------------|-------------------------------|
| 1.4 kg/s continuous      | B3            | 192                           | 221                           | 266                           |
|                          | D2            | 265                           | 319                           | 398                           |
|                          | D4.5          | 172                           | 205                           | 256                           |
|                          | F1.5          | 329                           | 446                           | 636                           |
| 4.2 kg/s continuous      | B3            | 318                           | 361                           | 428                           |
|                          | D2            | 440                           | 523                           | 647                           |
|                          | D4.5          | 292                           | 342                           | 429                           |
|                          | F1.5          | 608                           | 857                           | 1265                          |
| 1 tonne instantaneous    | B3            | 282                           | 339                           | 420                           |
|                          | D2            | 330                           | 397                           | 498                           |
|                          | D4.5          | 294                           | 363                           | 464                           |
|                          | F1.5          | 303                           | 375                           | 498                           |
| 57 kg instantaneous      | B3            | 103                           | 120                           | 146                           |
|                          | D2            | 114                           | 133                           | 164                           |
|                          | D4.5          | 102                           | 123                           | 154                           |
|                          | F1.5          | 95                            | 113                           | 148                           |
| 4.2 tonnes instantaneous | B3            | 469                           | 538                           | 647                           |
|                          | D2            | 597                           | 696                           | 858                           |
|                          | D4.5          | 473                           | 557                           | 692                           |
|                          | F1.5          | 577                           | 705                           | 960                           |

Figure 1.1 Downwind Distance to 3% Fatality v.s. Continuous Release Rate (Aerosol Releases)

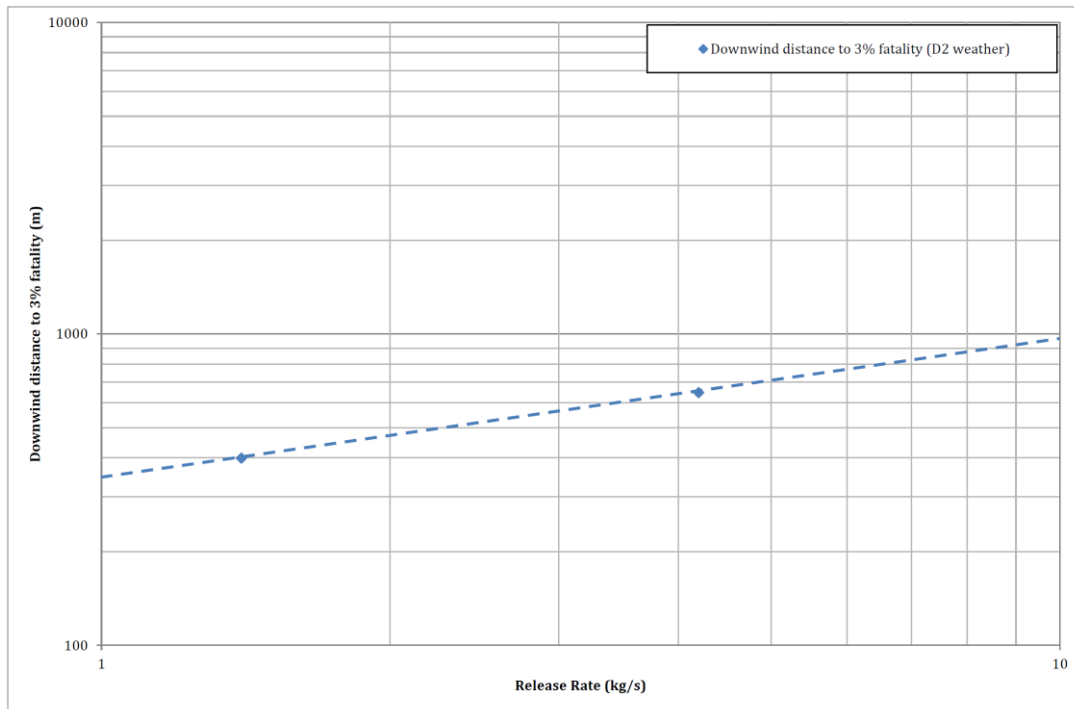


Figure 1.2 Downwind Distance to 3% Fatality v.s. Instantaneous Release Quantity

