A quick guide to understanding fire classifications

Fire protection is a fundamental consideration in building safety. A fire classification system has been established for barrier products such as curtains, doors, and glass to indicate their effectiveness in preventing the spread of fire. This system has been designed for universal comprehension, ensuring clarity regardless of the specific product. It simplifies the process of verifying a product’s suitability for a building’s requirements.

The three primary fire classifications are:

* E (integrity rating)
* EW (integrity and radiation rating)
* EI (integrity and insulation rating)

Each classification is expressed as a time in minutes, reflecting the product’s performance under defined test conditions.

E (Integrity)

The most common fire classification is the E rating, or integrity rating. This measures the ability to withstand fire exposure on one side without permitting flames to pass through to the unexposed side.

There are three key criteria which determine whether flames have penetrated the barrier:

* The appearance of cracks or openings exceeding a specified dimension.
* Ignition of a cotton pad placed on the unexposed side.
* Sustained flaming occurring on the unexposed side.

The test concludes when any of these conditions are met. Alternatively, manufacturers may terminate the test before flames breach the product if the intended performance level has been achieved.

It is important to note that integrity tests do not measure heat transfer through the product; this aspect is evaluated under the other classifications.

EW (Integrity and Radiation)

The EW classification extends the E rating by also assessing the product’s capacity to limit the heat radiating from the unexposed side. This feature is crucial in maintaining safe conditions, allowing occupants sufficient time to use designated escape routes.

During testing, two heat flux meters are positioned one metre from the unexposed side of the product to measure the thermal energy radiated across a specified area over a given period. One meter is aligned with the centre of the product to determine an average value, while the second measures the expected maximum heat flux.

The test concludes when integrity fails or when the measured heat flux exceeds 15 kW/m², whichever occurs first.

EI (Integrity and Insulation)

In addition to fire integrity, this rating evaluates the product’s ability to resist the conduction of heat through its material to the unexposed side. This is particularly desirable, as it protects individuals standing near the unexposed side from extreme heat and prevents nearby materials from igniting, thereby reducing the risk of further fire spread.

The insulation rating is determined by the time taken for the unexposed surface of the product to reach a temperature of 140°C above the mean initial temperature recorded before testing. The test is concluded when this criterion is met or when integrity fails, whichever occurs first.