



FLAME SPREAD INDEX

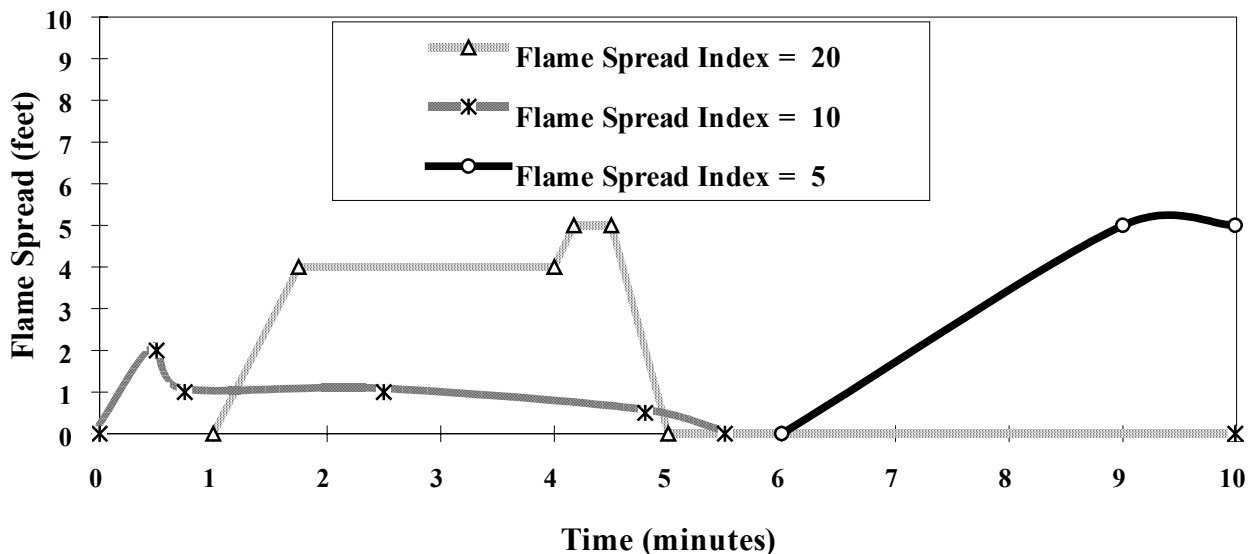
There is a common misconception about the flame spread index (FSI). In common usage, materials are classified by range of the flame spread index, such as “25 or less”, “76-200”, etc. However, we sometimes see cooling tower specifications requiring very specific values or ranges for flame spread, such as “10 or less”. This requirement is deceptively stringent.

The flame-spread test is performed using a 25-foot tunnel with a flame applied at one end as described in ASTM E84. The results of the test indicate surface burning characteristics of the material in a particular shape and mounting configuration. For example, samples may be flat or formed, thick or thin, held in place by various fasteners or wire mesh, mounted on non-combustible material, mounted loosely so they melt and drop away from the fire, etc., all of which can greatly influence reported FSI. Obviously, FSI does not necessarily represent fire behavior of the component in service.

Furthermore, calculated test results can be highly variable, depending on the judgment of the lab technician. ASTM E84 states “... the measurement is influenced by the method of test to a very considerable degree.” Because of this variability, materials should only be referred to as having a flame spread within a particular classification range. In the words of ASTM E84, “*It should be emphasized however that it is the intent of the method to provide only comparative classifications.*”

The graph below shows data from actual tests on cooling tower plastic materials. FSI is the area under the spread-vs.-time graph, not allowing for flame recession, multiplied by 0.515. It is evident from the examples in the graph that the difference between the 5, 10, and 20 FSI can easily be insignificant.

Flame Spread Index Comparison derived from actual ASTM E84 tests



Flame Spread Index should be specified by classification only, such as “25 or less”, or “26 to 75”. Reports of low FSI for like materials are the result of inadvertent or intentional test variables. No advantage is gained by specifying unusually low FSI for plastic materials for cooling towers.