

LETTER TO THE EDITOR

Comments on “Commentary on Performance Criteria for Fire Safety in Enclosures” by J.C. Jones

In the most recent issue of this Journal [1], Dr. J.C. Jones comments on a recent paper by Hadjisophocleous and Bénichou [2]. He takes issue with the authors’ use of the term “spontaneous ignition” in the context of the pre-flashover fire.

There are three terms which are closely related, auto-ignition, spontaneous ignition and spontaneous combustion. Auto-ignition is the commonly accepted term for the spontaneous, runaway reaction that occurs in a flammable vapour/air mixture subjected to high temperature, either as a result of compression or simply by a heating process. Spontaneous ignition and spontaneous combustion have been used rather loosely and almost interchangeably. The phenomenon to which Dr. Jones refers is spontaneous ignition/combustion following self-heating of a bulk solid such as coal.

In the “fire” context, we have to make a distinction between piloted ignition and the phenomenon in which a surface is exposed to a high level of radiant heating and flame appears spontaneously where hot fuel vapours and air are mixing. Apparently, Dr. Jones has not considered this scenario. This form or “radiation induced” spontaneous ignition of solids involves the same processes as occur in both “auto-ignition” and the bulk phenomenon to which he refers. The key is that it is a gas phase process which produces flame spontaneously without the need of a “pilot” in the form of a small flame or a spark.

Correct terminology is important. Perhaps fire scientists should use the term “radiation induced

spontaneous ignition”, but I suspect that they would not adopt such circumlocution. In context, it is always clear what is meant, but I have a suggestion to make. Dr. Jones’ “spontaneous ignition” of bulk solids leads initially to a smouldering reaction. On the other hand, auto-ignition and “radiation induced spontaneous ignition” both lead directly to flaming. Would it not be economical to refer to the latter as “spontaneous ignition” and reserve “spontaneous combustion” for the phenomenon associated with bulk solids?

REFERENCES

1. J.C. Jones, “Commentary on performance criteria for fire safety in enclosures”, *International Journal on Engineering Performance-Based Fire Codes*, Vol. 3, No. 3, pp. 130-131 (2001).
2. G.V. Hadjisophocleous and N. Bénichou, “Development of performance-based codes, performance criteria and safety engineering methods”, *International Journal on Engineering Performance-Based Fire Codes*, Vol. 2, No. 4, pp. 127-142 (2000).

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