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Commentary on: Chi JH. Metallographic analysis and fire dynamics simulation for electrical fire scene reconstruction. J Forensic Sci 2012;57(1):246–9.

Sir,

During my review of this article, I found the use of an unreliable methodology that would produce unreliable results. More specifically, the authors calculated the *total heat released per unit area* (see Table 1) and used it as an input to the fire dynamics simulator (FDS) to generate the simulation. While the *total heat released* is a common result associated with the measurement of the growth rate of fires, FDS requires the *heat release rate per unit area* as an important input variable used to specify the growth rate of the fire. The *total heat released* and the *heat release rate* are two different variables, which are readily apparent by inspection of the units used to characterize the two variables. The *total heat released* is measured in units of *joules*, and the *heat release rate* is measured in *watts*, which is equivalent to *joules per second*.

The calculated value for the *total heat released* was 236.29 MJ/m^2. The authors incorrectly used this value as 236.29 MW/m^2 for the *heat release rate per unit area* as input to FDS. For comparison, a gasoline pool fire has a peak *heat release rate per unit area* of approximately 2 MW/m^2. Thus, even if the calculated *heat release rate per unit area* was obtained through a reliable methodology, the estimated value is two orders of magnitude too large for such a fire in an electrical cabinet. This unreliable methodology and result used in this paper should have provided an indication to any knowledgeable reader that there are significant problems with the analysis presented.

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