COMSOL® Heat Transfer Module And Safe Siting Distances For Burning Propellant

C. Guymon[1]

[1]Safety Management Services, Inc., West Jordan, UT, USA

Abstract

Energetic materials that can readily burn are used throughout both private and government industries in manufacturing of, among other things, small arms ammunition and rockets. Collections of that material when ignited can pose a risk of burns for people in the immediate vicinity. The Heat Transfer Module of COMSOL Multiphysics® was used to simulate barrels of propellant burning and then determine the radiative heat flux at various distances. That modeled heat flux result was used to determine a safe distance. Such an approach can be used to help in issuing guidance for safe distances from Division 1.3 hazardous materials.

Figures used in the abstract

Figure 1 : Heat flux versus distance for the COMSOL model result versus the point source approximations for a cylindrical flame. The model matches the 1/r expected result at close range and 1/r^2 at long range.