# IGNITION OF HIGH-ENERGY SOLIDS WITH NONIDEAL SURFACES BY CONSTANT HEAT FLUX

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**Abstract:** Ignition characteristics of a high-energy solid with nonideal (rough) surface by constant heat flux were studied. The geometry of surface was represented by a set of identical protrusions having a shape of wedge based on the block of reactive solid. Depending on the ratio of the protrusion height and the depth of the heated layer formed in course of ignition process, several regimes of ignition were found: (*i*) when the substance is ignited as a massive block and the effect of roughness is negligible; (*ii*) when ignited are the individual protrusions; and (*iii*) the intermediate region between the previous two. Critical ignition conditions, ignition time and ignition criterion were determined for the three regimes. The results are compared with the results for the one-dimensional (1D) ignition of the semi-infinite body. It is shown that the effect of geometry on ignition results in the considerable reduction of the ignition time or the amount of energy required for the successful ignition is less compared to the 1D case.

**Keywords:** mathematical modeling; high-energy solids; ignition; nonideal surface; constant heat flux

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