

Investigating the SAFER/SciPan Kinetic Energy/Mass Bin Concept

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ABSTRACT

The concept of a series of well-defined kinetic energy bins to characterize debris information can be traced to the original formulation of the SAFER (Safety Assessment For Explosive Risk) quantitative risk assessment tool. In this concept, all impact kinetic energies are sorted or binned into one of ten kinetic energy intervals. From these kinetic energies and some assumptions regarding the shape, velocity, and type of debris, corresponding mass ranges for each bin can be derived. Since their introduction, the use of these mass bins has been international in scope, in both modeling and testing, especially after they were used in the SciPan test series. However, the history of the concept's development and the origin and significance of the assumptions involved have been clouded and in some cases misunderstood. Furthermore, although no data existed when the concept was developed, recent testing has provided the information needed to begin to validate some of the parameters involved. Establishing the original purpose and usage of the concept is important, as is comparing the theoretical elements of the concept to test data.

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Mr. Tatom is the Manager for Explosives Effects Modeling and Testing at APT Research in Huntsville, AL. He serves as the algorithm coordinator for the SAFER project, participates in the DDESB Science Panel, and has developed original technical routines for use by SAFER. He has played a similar role in the development of IMESA FR. He is the author of numerous US DoD papers concerning explosives safety modeling and testing. He holds a Bachelor of Electrical Engineering degree from Auburn University.



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