

Book Review

W. E. Baker and Min Jun Tang, *Gas, Dust and Hybrid Explosions*, Fundamental Studies in Engineering Series No. 13, Elsevier Science Publishers, Amsterdam, Netherlands, 1991, xx + 256 pp. \$110.00.

“Extremely useful” are the words that characterize this book. This monograph provides an excellent entrée to the subjects of dust explosions, reactive gas explosions, explosions of reactive gas-dust mixtures or hybrid explosions, nonreactive gas explosions, and liquid propellant explosions. As such this monograph will probably become required reading for anyone having to deal with the analysis, assessment or damage prediction of such explosions.

The treatment of each topic begins with a description of the fundamental processes involved followed by discussions of scaling laws, testing methods, methods of controlling or alleviating the effects of explosions, and a presentation of results of experiments or case histories. The presentation is concise but with numerous citations to the literature for the reader who requires more detail.

The inclusion of much explosive data and of results of tests and analysis, usually in dimensionless form, is a valuable feature of the book. Some knowledge of combustion fundamentals and gas dynamics on the part of the reader is assumed by the authors.

Careful perusal of this monograph also provides an indication of the large gaps in the understanding of explosion phenomena. For

instance, while scaling is discussed extensively, the authors usually conclude with the caveat that scaling does not seem to work in many cases. Knowledge of hybrid and liquid propellant explosives is still only rudimentary, and as the authors explain, accounts for the very brief treatment of these topics.

Chapter III, dealing with reactive gas explosions, is the longest and might well have been split into several chapters. Diagrams illustrating the discussion of transverse wave structure of detonations in this chapter would have been helpful as would a somewhat more detailed and quantitative discussion of the fundamental processes involved. The range of citations to the extensive literature dealing with reactive gas explosions is relatively narrow.

There are practically no citations to the extensive Russian literature on explosion phenomena. An irksome feature of the book, easily corrected in a later edition, is that cited references are missing from the bibliography in a number of cases. While there is some discussion of numerical simulations of explosion phenomena, it is relatively limited. With the advances in computational power such simulations will become an indispensable tool for dealing with explosion phenomena and may well be the subject of a future monograph.

Overall the book by Baker and Tang is a valuable addition to the literature.

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