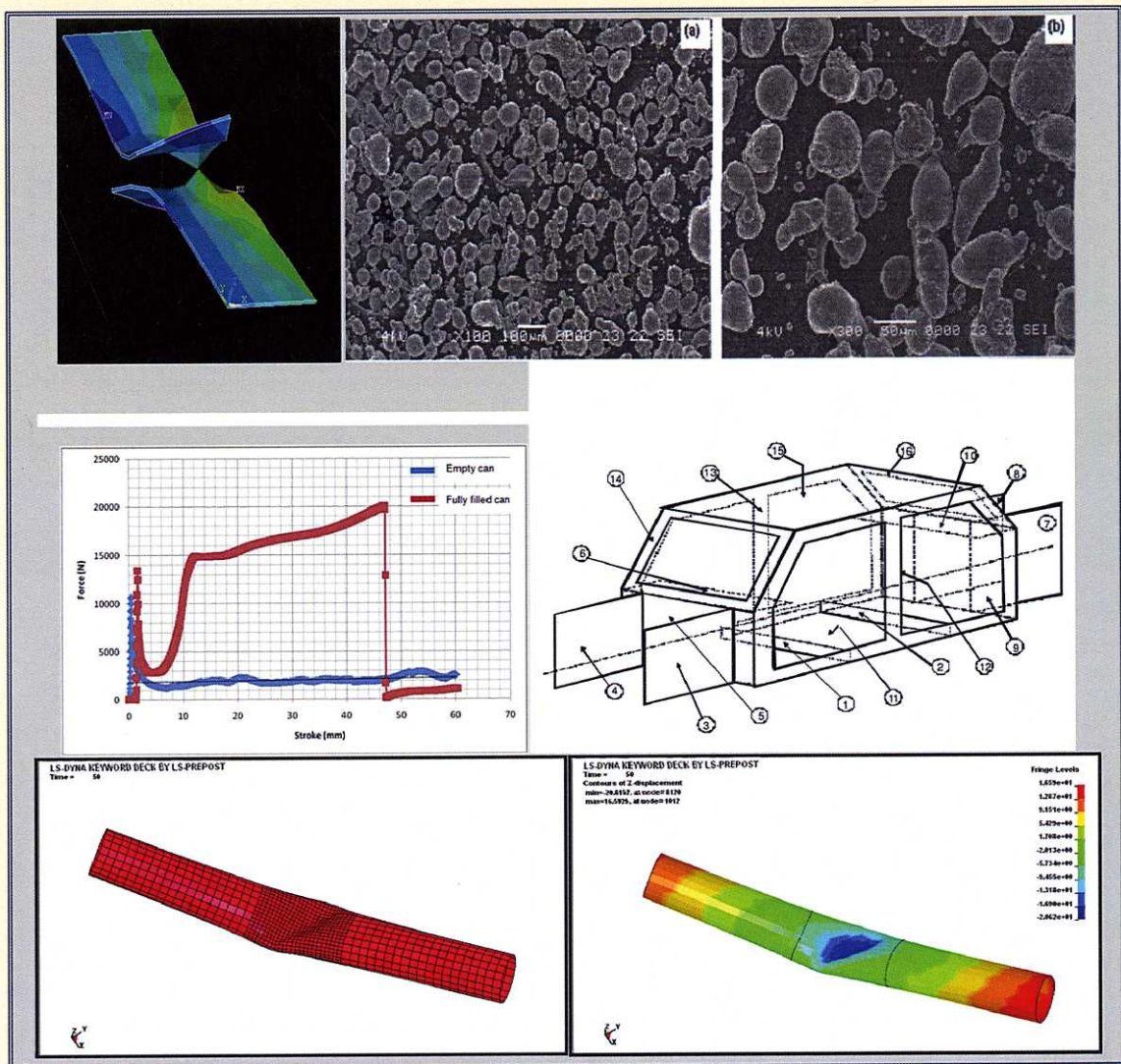


# ADVANCED TOPICS IN MECHANICAL BEHAVIOR OF MATERIALS



Edited by

**Meftah Hrairi**



IIUM PRESS

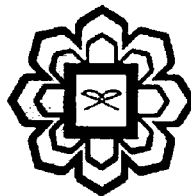
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

ADVANCED TOPICS IN MECHANICAL BEHAVIOR OF MATERIALS

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Edited by

Meftah Hrairi



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**FINITE ELEMENT TO PREDICT DAMAGE OF A POLYCARBONATE ARMOR PLATE  
SUBJECTED TO IMPACT**

*Qasim H. Shah, Hasan M. Abid, Adib B. Rosli*

**1. INTRODUCTION**

Numerical studies on the response of armor systems made up of PC and PMMA were reported [1] where smooth particle hydrodynamics (SPH) was used to simulate the response of PC and PMMA layers and it has been found that many existing material models can reproduce a close range results at the initial stage of simulations. Further numerical results based upon the experiments [2] have been reported by [3] where the effects of varying support configurations have been investigated on the plastic failure of the circular steel plates. Circular plates subjected to dense fragment cluster impact [4, 5] investigates the failure process of armor plates subjected to a fragment cluster consisting of many projectiles impacting the plate simultaneously. Test results indicate that the impulse and the rate of energy deposition on the target and the impacting duration of the fragment cluster are the most important factors.

Although various research works taken up until present have been reported briefly as above, there has never been an attempt made to investigate the effect of a bullet impact at various locations of a rectangular armor plate. Therefore in the current work the effect of projectile impact at varying locations on a rectangular polycarbonate plate has been investigated using the finite element method package LS-DYNA.