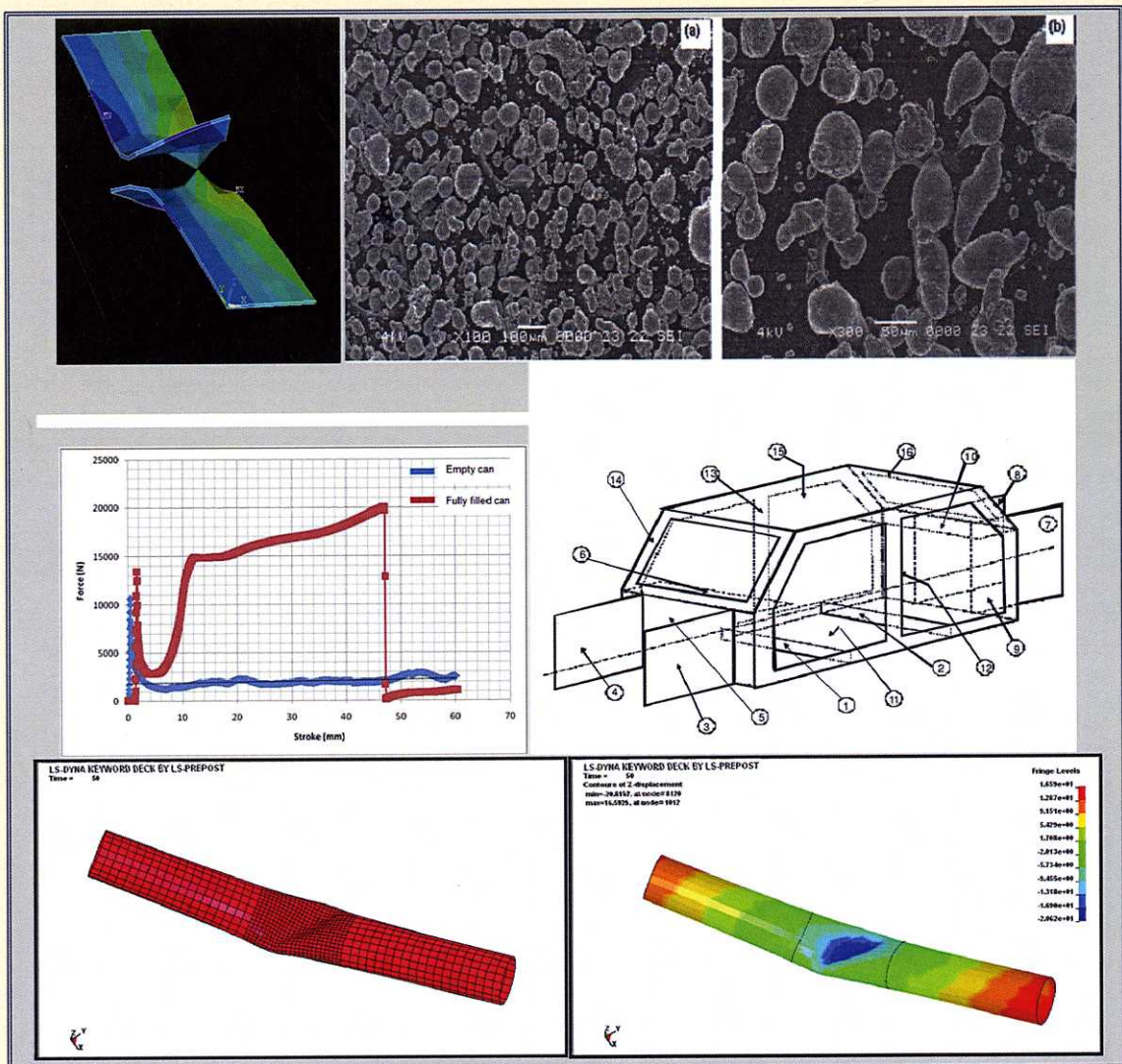


ADVANCED TOPICS IN MECHANICAL BEHAVIOR OF MATERIALS



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Meftah Hrairi



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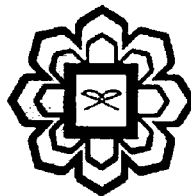
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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IIUM Press

Published by:
IIUM Press
International Islamic University Malaysia

First Edition, 2011
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Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

ISBN: 978- 967-418-174-1

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM
(Malaysian Scholarly Publishing Council)

Printed by :
IIUM PRINTING SDN. BHD.
No. 1, Jalan Industri Batu Caves 1/3
Taman Perindustrian Batu Caves
Batu Caves Centre Point
68100 Batu Caves
Selangor Darul Ehsan

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FAILURE MECHANISM OF PC ARMOR PLATES WITH PMMA SACRIFICIAL LAYER SUBJECTED TO IMPACT

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

1. INTRODUCTION

Polycarbonate is one of the important transparent polymers which due to its high ductility can undergo large deformation before failure providing high impact resistance. A large amount of energy on impact is transformed into heat energy and internal energy. Therefore to have a deep understanding of polycarbonate regarding its ability to absorb energy, mode of deformation, ballistic limitation, and projectile penetration mechanism is of significant importance [1,2].

The optimum thickness for layered armor plates comprising ceramic and metal plates was investigated in [3] using SPH simulations and this work was also validated through experiments however no change in ballistic limit was observed for the optimized thickness. Scaling the response of circular plates subjected to impact under spherical explosion loading has been reported in [4] and the spalling of circular plates subjected to impact is mentioned in [5]. Further investigation on polycarbonate armor is reported in [6] regarding the numerical analysis of bird strike on the aircraft canopy where the shape of the canopy is complex and it makes it necessary to use finite element to tackle the problem instead of costly and complicated experimentation. Back plane deformation of target plate is reported in [7] where numerical and experimental work has been reported. In [8] it has been shown that it is possible to use metal plasticity behavior for thermoplastics in numerical investigation.