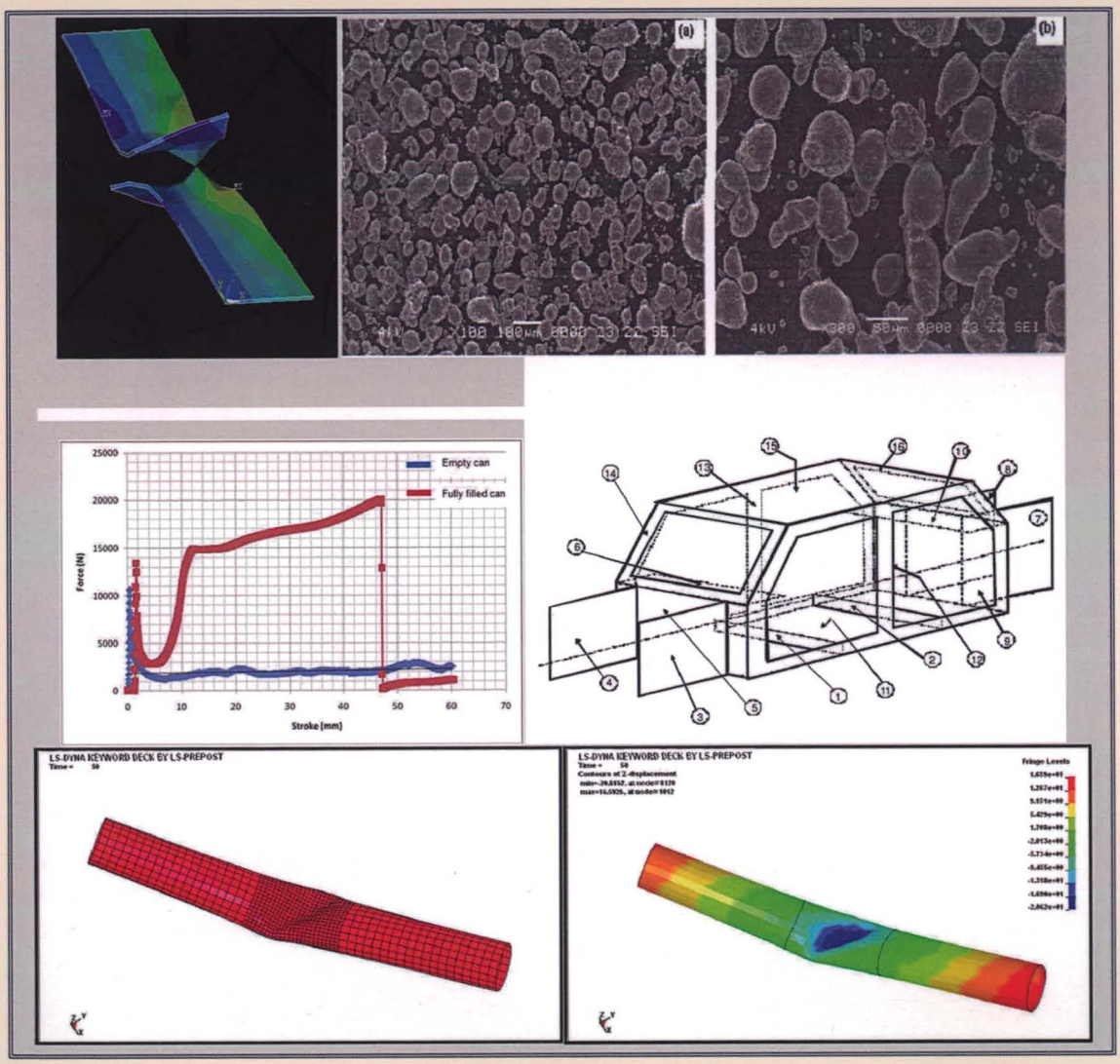
ADVANCED TOPICS IN MECHANICAL BEHAVIOR OF MATERIALS



Edited by

Meftah Hrairi

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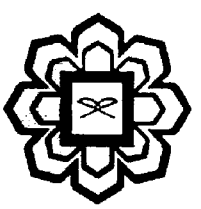

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SIMULATION RESULTS OF EMPTY AND WATER FILLED CYLINDRICAL SHELL BUCKLING

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

1. INTRODUCTION

The cans were designed using ANSYS Software. The compression tests were edited and numerically solved using LS-DYNA explicit finite element code. Quarter model with symmetry boundary condition was used for the simulation. The simulations were done for empty and fully-filled cans to see the distinction of deformation under axial compression load. From the simulation, we also observed the difference of internal energy for the empty and fully filled cans in the circular cylinder and for the whole structure.

2. SIMULATION RESULTS

The simulation was successfully done and the structural damage for the empty and fully filled cans due to the axial compression were observed and recorded. Since LS-DYNA cannot be simulated at lower speed, the loading rate used for the simulation was approximately 30 times higher than experimental loading rate which is about 17000mm/min.

2.1 Empty can

Some figures in different time intervals were provided to view the changes of stress when the simulation started and a graph of the material internal energy for the cylinder circular shell was also plotted. The simulation was done in 10.497 ms to achieve a 50 mm stroke.