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Lateral Behaviors of Nested Tube Systems Under Quasi-Static Condition

TrongNhan Tran[*,†,††], Arameh Eyvazian[‡], Quirino Estrada[§], DucHieu Le[¶], NhatTan Nguyen[‖] and HuuSon Le[**]

[*]*Division of Computational Mechatronics*
Institute for Computational Science, Ton Duc Thang University
Ho Chi Minh City, Vietnam

[†]*Faculty of Electrical and Electronics Engineering*
Ton Duc Thang University, Ho Chi Minh City, Vietnam

[‡]*Mechanical and Industrial Engineering Department*
College of Engineering, Qatar University
P. O. Box 2713, Doha, Qatar

[§]*Institute of Engineering and Technology*
Autonomous University of Juarez City (UACJ)
Ciudad Juarez, Chihuahua, Mexico

[¶]*Faculty of Automobile Technology*
Hanoi University of Industry, HaNoi, Vietnam

[‖]*Vietnam - Japan Center, Hanoi University of Industry*
HaNoi, Vietnam

[**]*Faculty of Automobile Technology*
Van Lang University, Ho Chi Minh City, Vietnam
[††]*trantrongnhan@tdtu.edu.vn*

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A study is made to investigate the compression behavior of different nested tube systems made of mild steel under lateral compression. The nested tube systems including stacked groups of circular, rectangular and square tubes are built for application in narrow compressive zones. The deformation mode of these systems is observed and their lateral compression behavior are identified. The desirable stepwise energy absorption is obtained by designing the nested tube system. The load response revealed that there is no appearance of the peak compressive load in the case of a circular-circular tube (CCT) system, while a circular-rectangular tube (CRT) system offers bigger peak compressive load compared with that of a circular-square tube (CST). The energy absorptions of CCT and CRT systems are smallest and greatest, respectively. This study also estimates the energy absorption capacity of these system. By implementing the "plastic hinge line" concept of the modified simplified super folding element (MSSFE) theory and superposition

[††]Corresponding author.