Professor Steeve Chung Kim Yuen

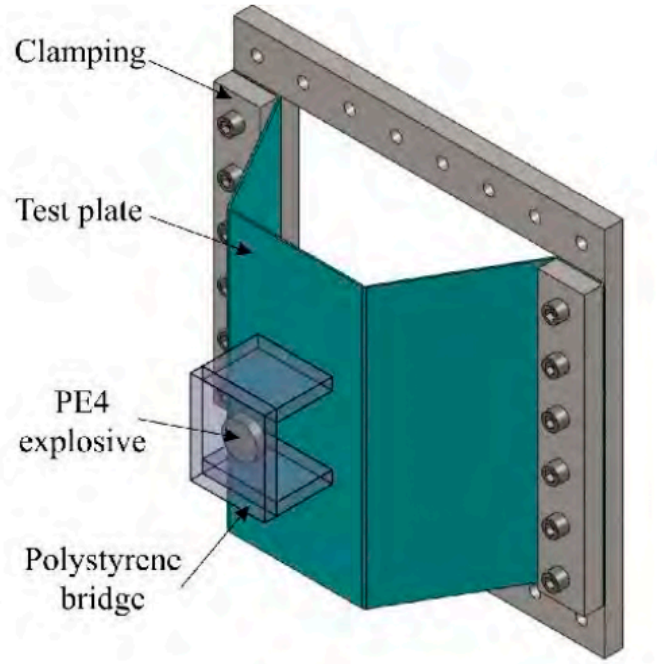

Fig. 4: Schematic of blast test arrangement, showing the polystyrene bridge for explosive location and the clamping along two edges

From: G.S. Langdon, S. Chung Kim Yuen, G.N. Nurick and K. Naidoo, "Some insights into the response of 'shallow V-shape' structures to air blast loading", Proc. Indian Natn Sci Acad., Vol. 79, No. 4, Special Issue Part A, pp 695-703

See:
http://www.bisru.uct.ac.za/bisru/groupmembers/staff/drsteevecky
https://scholar.google.com/citations?user=edQqVVQAAAAJ&hl=en
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Biography:
Associate Professor Steeve Chung Kim Yuen is the Deputy Director of the BISRU Centre. He is a graduate of the University of Cape Town. He obtained his BSc in Engineering (Mechanical) in 1997 before completing a Masters degree in Engineering in the field of Structural Impact (looking at deformation and tearing of quadrangular stiffened plates subjected to uniform blast load) in 2000. He completed his PhD in the field of crashworthiness in 2006. He is an NRF rated researcher (C1) and is currently employed as an Associate Professor in the Department of Mechanical Engineering. Steeve's research interests focus mostly on the response of structures to blast loading (both in air and buried charges (towards developing blast protection structures) and impact loading (crashworthiness).

Current Research (Crashworthiness):

Thin-walled structures have been widely used for their energy absorption capabilities, particularly in the petro-chemical and nuclear industries as well as in crashworthiness design of vehicles (cars, buses, trains, and aeroplane) where the life of passengers is at risk in the event of a collision.

An understanding of energy absorption of structures and materials is important in, for example, calculating the damage to structures caused by accidental collision, assessing the residual strength of structures after initial damage, and designing containers to protect its contents in the event of impact. There has been a great amount of research carried out in the area over the last few decades; nevertheless the topics are gaining more eminence in the research community with the demand for increased safety. Thin-walled structures are efficient energy absorbers provided they failed in the "right" mode of failure. Progressive buckling mode, in this case, is a more efficient mode of failure compared to the Euler mode. Nevertheless, thin-walled structures failing in the progressive buckling mode do not necessarily mean lives saved because of its high first peak load. A mean to decrease the first peak load is the introduction of geometric imperfection which can be of several natures, dent, holes, blast and any of the above in any combinations. The objectives of the research are primarily to assess how to improve the crashworthiness of tubular structures by reducing its first peak load when dynamically compressed in the axial direction and absorbing the maximum energy. The investigations are conducted both experimentally and numerically.

Selected Publications:

Chung Kim Yuen, S., Nurick, G.N., 2000. The significance of the thickness of a plate when subjected to localised blast load. 16th International Symposium on Military Aspects of Blast and Shock, MABS 16 , 491-499.

N. Jacob, S. Chung Kim Yuen, G.N. Nurick, D. Bonorchis, S.A. Desai, D. Tait, Scaling aspects of quadrangular plates subjected to localised blast loads – experiments and predictions, Int. J. Impact Eng., 30 (8–9) (2004), pp. 1179–1208

S. Chung Kim Yuen, G.N. Nurick, Experimental and numerical studies on the response of quadrangular stiffened plates. Part I: subjected to uniform blast load, Int. J. Impact Eng., 31 (1) (2005), pp. 55–83

G.S. Langdon, S. Chung Kim Yuen, G.N. Nurick, Experimental and numerical studies on the response of quadrangular stiffened plates. Part II: subjected to localised load, Int. J. Impact Eng., 31 (1) (2005), pp. 85–111

Karagiozova, D., Nurick, G. N., and Yuen, S. C. K., 2005, "Energy Absorption of Aluminium Alloy Circular and Square Tubes Under an Axial Explosive Load," Thin-Walled Struct., 43 , pp. 956–982.

S. Chung Yuen and G. N. Nurick, "The Energy-Absorbing Characteristics of Tubular Structures With Geometric and Material Modifications: An Overview", Applied Mechanics Reviews, Vol. 61, No. 2, 020802 (15 pages), March 2008, DOI: 10.1115/1.2885138

G.N. Nurick and S. Chung Kim Yuen., The crushing characteristics of square tubes with blast-induced imperfections, Part II : Numerical Simulations, 2008

S. Chung Kim Yuen, G.N. Nurick and R.A. Starke, The energy absorption characteristics of double-cell tubular profiles, Latin American Journal of Solids and Structures, 5, 289-317, 2008

S. Chung Kim Yuen, G.N. Nurick, W. Verster, N. Jacob, A.R. Vara, V.H. Balden, et al., Deformation of mild steel plates subjected to large-scale explosions, Int. J. Impact Eng., 35 (8) (2008), pp. 684–703

S. Bodlani, S.C.K. Yuen, G. Nurick, The energy absorption characteristics of square mild steel tubes with multiple induced circular hole discontinuities—Part II: numerical simulations, J Appl Mech, 76 (2009), p. 041013

Nurick, G., Chi, Y., Langdon, G., Bartle, S., Yuen, S., Karagiozova, D.. Response of flexible sandwichtype panels to blast loading. Composites Science and Technology 2009; 69(6): 754–763.

S. Chung Kim Yuen, G.N. Nurick and H.L. Witbeen, “The response of sandwich panels made of thin-walled tubes subjected to axial load”, International Journal of Protective Structures, Vol. 2, No. 4, pp 477-498, December 2011, DOI: 10.1260/2041-4196.2.4.477
D. Kakogiannis, S. Chung Kim Yuen, S. Palanivelu, D. Van Hemelrijck, W.Van Paepegem, J. Wastiels, J. Vantomme and G.N. Nurick, “Response of pultruded composite tubes subjected to dynamic and impulsive axial loading”, Composites Part B: Engineering, Vol. 55, pp 537-547, December 2013
G.S. Langdon, S. Chung Kim Yuen, G.N. Nurick and K. Naidoo, “Some insights into the response of ‘shallow V-shape’ structures to air blast loading”, Proc. Indian Natn Sci Acad., Vol. 79, No. 4, Special Issue Part A, pp 695-703
S. Chung Kim Yuen, G. Cunliffe and M.C. du Plessis, “Blast response of cladding sandwich panels with tubular cores”, International Journal of Impact Engineering, Vol. 110, pp 266-278, December 2017
S. Chung Kim Yuen, A. Butler, H. Bornstein and A. Cholet, “The influence of orientation of blast loading on quadrangular plates”, Thin-Walled Structures, Vol. 131, pp 827-837, October 2018.