Professor Kim J. R. Rasmussen

Figure 2.30. I304_500_1 and I304_500_2: Failed Shape

From: Becque, J., Rasmussen, K. (2009). Experimental Investigation of the Interaction of Local and Overall Buckling of Stainless Steel I-Columns. Journal of Structural Engineering, 135(11), 1340-1348.

See:
http://sydney.edu.au/engineering/people/kim.rasmussen.php
http://sydney.edu.au/research/opportunities/supervisors/246
http://sydney.edu.au/engineering/civil/news/2009/kim-rasmussen-awarded-the-challis-professorship.shtml

School of Civil Engineering
Chairman, Centre for Advanced Structural Engineering
Materials and Structures
The University of Sydney

Biography:
Professor Kim Rasmussen is our Associate Dean (Research and Research Training). He obtained his Masters of Science in Engineering from the Technical University of Denmark in 1982 and his PhD from the University of Sydney in 1988. He joined the lecturing staff of the School of Civil Engineering in 1989, and served as Head of School for 11 years between 2004 and 2015. He is also head of the Structures Group and Chairman of the Centre for Advanced Structural Engineering which operates within the School and supports its research and consulting activities in the area of structural engineering. He is member the Engineering, Mathematics and Informatics (EMI) Panel of the College of the Australian Research Council, and an active consultant to industry, nationally and internationally. Kim Rasmussen's main research areas are theoretical and experimental structural mechanics with particular expertise in steel structural members and systems, cold-formed steel structures, stainless steel structures, aluminium structures, and structural stability and analysis. He teaches advanced structural steel design to undergraduate and postgraduate students. He is member or chairman of numerous Standards Australia committees and a member of the editorial boards of most of the leading journals in his field. He was awarded the 2016 Shortridge Hardesty Award by the Structural Engineering Institute for his

contributions to the development of practical design provisions and advanced analysis guidelines in the field of structural stability.

Research Interests:
A fascination with structures buckling under pressure has led to a distinguished career in the design, analysis and testing of metal structures for stability for Professor Kim Rasmussen. A world-leading researcher in the field, Professor Rasmussen's work is making the metal structures that surround us - from high-rise office buildings to houses to industrial shelving and scaffolding - safer, more efficient and more economical. "I've always been fascinated by buckling. The notion that something can be geometrically perfect but then when you put a small additional load on it the whole thing suddenly buckles is just fascinating to me. And we can now analyse and predict this behaviour with a great degree of confidence. "I research efficient ways of designing metal structures. These include the steel 'skeletons' of buildings, which need to carry the weight of the building as well as bearing the load of wind, earthquakes and so on. I also work with structures such as scaffolding and steel storage racks used in warehouses. Racks are challenging to design because they're built as lightly as possible but are very heavily loaded, and they can and do collapse for a range of reasons. My research aims to determine the forces leading to these collapses and better design these structures accordingly. "I came to the University of Sydney in the early 1980s as a PhD student and joined the staff straight afterwards, and I've enjoyed every minute of it. There's a lot going on in buckling here, which is pretty exciting for me. My main challenge is finding the time to do it all!"

Selected Publications:
Book Chapters:
Rasmussen, K. (2005). High Strength Steel Structures. In J. Rondal & D Dubina (Eds.), Light gauge metal structures: recent advances, (pp. 120-141). Vienna: Springer.
Rasmussen, K. (2005). Stainless Steel Structures. In J. Rondal & D Dubina (Eds.), Light gauge metal structures: recent advances, (pp. 67-119). Vienna: Springer.
Journal Papers:
Wang, R., Han, L., Zhao, X., Rasmussen, K. (2016). Analytical behavior of concrete filled double steel tubular (CFDST) members under lateral impact. Thin-Walled Structures, 101, 129-140.
Rasmussen, K., Zhang, X., Zhang, H. (2016). Beam-element-based analysis of locally and/or distortionally buckled members: Theory. Thin-Walled Structures, 98, 285-292.
Zhang, X., Rasmussen, K., Zhang, H. (2016). Experimental investigation of locally and distortionally buckled portal frames. Journal of Constructional Steel Research, 122, 571-583.
Zhang, X., Rasmussen, K., Zhang, H. (2016). Second-order effects in locally and/or distortionally buckled frames and design based on beam element analysis. Journal of Constructional Steel Research, 122, 57-69
Trouncer, N., Rasmussen, K. (2015). A rational procedure for modelling imperfections in advanced analysis of frames with locally unstable members. Thin-Walled Structures, 96, 183-201.
Zhang, X., Rasmussen, K., Zhang, H. (2015). Beam-element-based analysis of locally and/or distortionally buckled members: Application. Thin-Walled Structures, 95, 127-137.
Niu, S., Rasmussen, K., Fan, F. (2015). Local-Global Interaction Buckling of Stainless Steel I-Beams. Part I: Experimental Investigation. Journal of Structural Engineering, 141(8), 1-13.
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Niu, S., Rasmussen, K., Fan, F. (2014). Distortional-global interaction buckling of stainless steel C-beams: Part II - Numerical study and design. Journal of Constructional Steel Research, 96, 40-53.
Trouncer, A., Rasmussen, K. (2014). Flexural-torsional buckling of ultra light-gauge steel storage rack uprights. Thin-Walled Structures, 81, 159-174.
Abambres, M., Camotim, D., Silvestre, N., Rasmussen, K. (2014). GBT-based structural analysis of elastic–plastic thin-walled members. Computers and Structures, 136, 1-23.
Becque, J., Rasmussen, K. (2013). Stability of Z-Section Purlins Used as Temporary Struts during Construction. Journal of Structural Engineering, 139(12), 1-12
Yao, Z., Rasmussen, K. (2012). Inelastic local buckling behaviour of perforated plates and sections under compression. Thin-Walled Structures, 61, 49-70.
Yao, Z., Rasmussen, K. (2011). Material and geometric nonlinear isoparametric spline finite strip analysis of perforated thin-walled steel structures - Numerical investigations. Thin-Walled Structures, 49(11), 1374-1391.
Rossi, B., Jaspart, J., Rasmussen, K. (2010). Combined Distortional and Overall Flexural-Torsional Buckling of Cold-Formed Stainless Steel Sections: Design. Journal of Structural Engineering, 136(4), 361-369.
Rossi, B., Jaspart, J., Rasmussen, K. (2010). Combined Distortional and Overall Flexural-Torsional Buckling of Cold-Formed Stainless Steel Sections: Experimental Investigations. Journal of Structural Engineering, 136(4), 354-360.
Lindgaard, E., Lund, E., Rasmussen, K. (2010). Nonlinear buckling optimization of composite structures considering "worst" shape imperfections. International Journal of Solids and Structures, 47, 3186-3202.
Becque, J., Rasmussen, K. (2009). A numerical investigation of local-overall interaction buckling of stainless steel lipped channel columns. Journal of Constructional Steel Research, 65(8-9), 1685-1693
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Ye, J., Rasmussen, K. (2008). Compression strength of unstiffened elements in cold-reduced high strength steel. Journal of Structural Engineering, 134(2), 189-197.
Rasmussen, K. (2006). Bifurcation of Locally Buckled Point Symmetric Columns - Analytical Developments. Thin-Walled Structures, 44, 1161-1174.
Rasmussen, K. (2006). Bifurcation of Locally Buckled Point Symmetric Columns - Experimental Investigations. Thin-Walled Structures, 44(11), 1175-1184.
Lecce, M., Rasmussen, K. (2006). Distortional buckling of cold-formed stainless steel sections: Experimental investigation. Journal of Structural Engineering, 132(4), 497-504.
Lecce, M., Rasmussen, K. (2006). Distortional Buckling of Cold-Formed Stainless Steel Sections: Finite-Element Modeling and Design. Journal of Structural Engineering, 132(4), 505-514.
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Rasmussen, K., Burns, T., Bezkorovainy, P., Bambach, M. (2005). Recent Research on the Local Buckling of Cold-formed Stainless Steel Sections. International Journal of Steel Structures, 5, 87-100

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Rasmussen, K., Hasham, A. (2001). Tests of X- and K-joints in CHS Stainless Steel Tubes. Journal of Structural Engineering, 127(10), 1183-1189.
Rasmussen, K., Young, B. (2001). Tests of X- and K-Joints in SHS Stainless Steel Tubes. Journal of Structural Engineering, 127(10), 1173-1182.