

CURRICULUM VITAE FOR ROLF K. ECKHOFF

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Academic degrees

Master of Science (Chemical engineering), University of Trondheim, 1961
Master of Philosophy (Dust explosions), University of London, 1971
Doctor Technicae (Dust explosions), University of Trondheim, 1976
Doctor of Science (Eng.) (Gas and dust explosions, Powder technol.) Higher doctorate, University of London, 1992

Honours

Honorary member of WPMPs (powder mechanics), of Europ. Feder. Chem. Engineer. from 1985
Concurrent professor of North Eastern University, Shenyang, P.R. China, from 1990
Member of the Committee of Honour of EuropEx, Belgium, from 1991
Recipient of the W. Cybulski medal for 1992 (Polish Academy of Science) in 1993
Member of the Norwegian Academy of Technical Sciences, 2008
Member of Academia Europaea, 2011
Recipient of the Process Safety Prize for 2017. Prize established by the PS Group AB, Malmö, Sweden

Career

Eckhoff was appointed at Chr. Michelsen Institute (CMI), Bergen, Norway, in 1962, where he established powder technology (1963), accidental dust explosions (1968), and accidental gas explosions (1976) as new research areas. From 1973 to 1988 he was CMI's chief scientist in powder technology, and dust and gas explosions, and from 1988 to 1996 senior scientific adviser to CMI/CMR/GexCon. He was appointed part-time professor at University of Bergen in Process Safety Technology in 1992 and full-time professor in 1996. At UoB he has been central in the building up of the general study programme process technology, as well as his own special sub programme in process *safety* technology. In 2008 he became professor emeritus at UoB but up to the end of 2017, when he passed 80, he kept on teaching regular courses and supervising students.

Eckhoff has advised industry and public agencies in many countries on powder technology and explosion protection. From 2004 till about 2010 he was a part time scientific adviser to Öresund Safety Advisers, Malmö, Sweden. He has lectured on courses, conferences and seminars in a number of countries in Europe, and in USA, Canada, Israel, Bahrain, Singapore, Malaysia, Thailand, India, China, Australia and Brazil. He has also been an expert witness in connection with

court cases on accidental fires and explosions in the process industries in USA. In 2005 he participated, as the only invited expert from outside USA, in the U.S. Chemical Safety and Hazard Investigation Board (CSB) public hearing in Washington DC, on how to deal with the increasing number of serious dust explosion accidents in US industries.

Eckhoff is a member of the editorial board of "Journal of Loss Prevention in the Process Industries", and of several Norwegian and international working groups on process-safety-related topics related to the Internat. Electrotech. Comm. (IEC) and the European CEN/CENELEC.

Publications

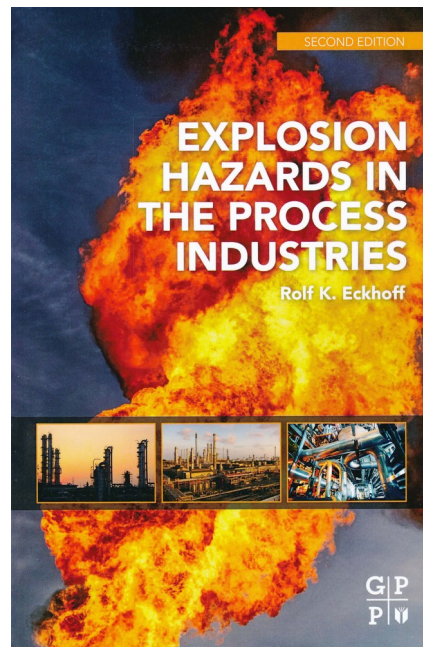
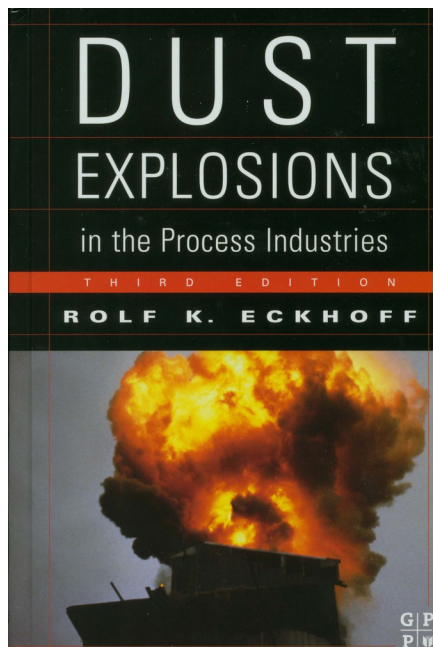
Books and special issue of international journal

R. K. Eckhoff (Guest Editor): *Safety on offshore process installations: North Sea*. Special issue (Vol. 7, No. 4, July 1994) of Journ. Loss Prev. Process Ind., Butterworth-Heinemann, Oxford, UK

R. K. Eckhoff: *Electrical equipment for hazardous areas (explosive atmospheres)*. Tapir Forlag, Trondheim, Norway (1996), 160 pages. ISBN 82-519-1211-3 (In Norwegian)

R. K. Eckhoff: *Dust explosions in the process industries* 3rd edition, 720 pages, Gulf Professional Publishing/Elsevier, Boston (2003) ISBN 0-7506-7602-7. (First and second editions published by Butterworth-Heinemann, UK in 1991 and 1997)

R.K. Eckhoff: *Explosion hazards in the process industries*. 2nd edition (2016), 550 pages, Gulf Publishing Company, an imprint of Elsevier, ISBN 978-0-12-803273-2.



Papers from 2004 and later

Eckhoff, R.K.: Partial inerting – an additional degree of freedom in dust explosion protection, *J. Loss Prev. Proc. Ind.*, Vol.17 (2004) pp. 187-193

Randeberg, E. and Eckhoff, R.K.: Initiation of dust explosions by electric spark discharges triggered by the explosive dust cloud itself, *Proc. 5th Internat. Symp. Hazards, Prevention and Mitigation of Industrial Explosions*, Cracow, Poland, 11-14 Oct (2004) pp.87-97, published by Central Mining Institute, Katowice, Poland.

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Eckhoff, R.K.: *Current status and expected future trends in dust explosion research*, Invited keynote review paper given at the International Conference on the Bhopal Tragedy and its Effects on Process Safety, 1-3 December 2004, Indian Institute of Technology Kanpur, Kanpur, India.

Eckhoff, R.K.: Current status and expected future trends in dust explosion research, *J. Loss Prev. Process Industries* Vol.18 (2005) pp. 225-237

Eckhoff, R.K. and Randeberg, E.: A plausible mechanism for initiation of dust explosions by electrostatic spark discharges in industrial practice, *VDI-Berichte 1873 "Sichere Handhabung brennbarer Staube"* (2005) pp. 185-197, published by VDI Wissenforum IWB GmbH, Düsseldorf, Germany

Eckhoff, R.K.: *ATEX in relation to dusts. A critical evaluation*, Proc. 2nd International Industrial Security Seminars: "ATEX: A Reality", Barcelona 16-17 November 2005, Organized by Expoquimia International Chemical Exhibition.

Randeberg, E. and Eckhoff, R.K.: Initiation of dust explosions by electric spark discharges triggered by the explosive dust cloud itself. *J. Loss Prev. Proc. Ind.*, Vol. 19 (2006) pp. 154-160

Randeberg, E., Olsen, W., Eckhoff, R.K.: A new method for generation of synchronized capacitive sparks of low energy *J. Electrostatics*, Vol. 64 (2006) pp. 263-272

Skjold, T., Arntzen, B.J., Hansen, O.R., Storvik, I., Eckhoff, R.K.: Simulating dust explosions with the first version of DESC, Trans IChemE, Part B, March (2005) *Process Safety and Environmental Protection*, 83 (B2) pp. 151-160

Skjold, T., Arntzen, B.J., Hansen, O.R., Storvik, I., Eckhoff, R.K.: Simulation of dust explosions in complex geometries with experimental input from standardized tests, *J. Loss Prev. Proc. Ind.*, Vol. 19 (2006) pp. 210-217

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Eckhoff, R.K.: Differences and similarities of gas and dust explosions: A critical evaluation of the European 'Atex' directives in relation to dusts, *J. Loss Prev. Proc. Ind.*, Vol.19 (2006) pp. 553-560

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Eckhoff, R.K. & Randeberg, E.: (2006): Electrostatic spark ignition of sensitive dust clouds of MIE < 1 mJ. Paper presented at the 6th ISHPMIE conference in Halifax, Aug./Sept. (2006)

Eckhoff, R.K. & Randeberg, E.: (2007): Electrostatic spark ignition of sensitive dust clouds of MIE < 1 mJ. *J. Loss Prev. Proc. Ind.*, Vol. 20 (2007) pp. 396-401

Skjold, T., Eckhoff, R.K., Arntzen, B.J., Lebecki, K., Dyduch, Z., Klemens, R., Zydak, P.: Simplified modelling of explosion propagation by dust lifting in coal mines, *Proc. 5th Int. Seminar on Fire and explosion hazards*, April 23-27 (2007) pp. 302-313, Edinburgh, UK. Published by School of engineering and electronics, The university of Edinburgh, Edinburgh EH93JL

Eckhoff, R.K.: Status and trends in dust explosion prevention and mitigation, *Fire & Safety Magazine*, Spring (2008) published by Fire & Safety Group, Cedar Grove, NJ 07009 USA. Online address: www.fs-world.com.

Skjold, T., Wingerden, K. van, Hansen, O., Eckhoff, R.K.: Modelling of vented dust explosions. Empirical foundation and prospects for future validation of CFD codes. *Proc. Hazards XX*, Manchester, UK, April 15-17 (2008)

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Eckhoff, R.K., Olsen, W., Kleppa, O: Influence of spark discharge duration on the minimum ignition energy of premixed propane/air, *Proc. 7th ISHPMIE, St. Petersburg*, July 7-11 (2008) Volume I, pp. 44-53. Published by prof. Sergey Frolov, N.N. Semenov institute of chemical physics, Russian academy of science, Moscow.

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Castellanos, D., Skjold, T., Wingerden, K.van, Eckhoff, R.K.: *Simulating dust explosion venting through ducts*. Paper presented at 23rd ICDERS, Irvine, USA, July 24-29, 2011

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Skjold, T., Castellanos, D., Olsen, K.L., Eckhoff, R.K.: *Experimental and numerical investigations of constant volume dust and gas explosions in 3.6 metre flame acceleration tube*. Paper presented at the 9th ISHPMIE, Cracow, Poland, 22-27 July 2012 and included in the electronic conference proceedings.

Iarossi, I., Amyotte, P.R., Khan, F.I., Marmo, L., Dastidar, A.G., Eckhoff, R.K.: *Explosibility of polyamide and polyester fibres*. Paper presented at the 9th ISHPMIE, Cracow, Poland, 22-27 July 2012 and included in the electronic conference proceedings.

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Eckhoff, R.K.: Testing of dust clouds for the electrostatic-spark ignition hazard in industry. Need for a modified approach? **Possibly to be published in *J. Loss Prev. Proc. Ind.***

Eckhoff, K. and Eckhoff, R.K.: Gas proof enclosures – an unexplored safe and cost effective alternative approach for enclosing potential electrical ignition sources for use in areas containing explosive gas atmospheres. (Possible paper on the planning stage only)

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