

GRAHAM HEARN B.Sc C.Eng MIEE

Professional experience

Present position: Independent Consulting Engineer.

Previous position: Technical Director of Wolfson Electrostatics in the Department of Electronics & Computer Science at the University of Southampton (1981-2006).

Chartered Engineer and Corporate Member of the Institution of Engineering & Technology.

Consultant to industry in the fields of electrical & electrostatic hazards, electrostatic applications and explosion prevention and protection (see below for details). Experience in the following industries:

Aerospace/avionics, agricultural, automotive, chemicals, construction, electronics, energy production, explosives & pyrotechnics, fine chemicals, food production, fuel handling, marine, military, mining, packaging, paint manufacture and application, petrochemicals, pharmaceuticals, printing and coatings, textiles.

Professional consulting in 35 countries including Europe, North & South America, Asia, Gulf States, Pacific rim & Australia.

Expert Witness in cases of electrostatics, fire and explosion in Europe, USA and Canada.

Specific expertise

Electrostatic charge generation in industrial processes. Electrical and electrostatic ignition sources, explosion prevention & protection, assessment of flammable media, gas & vapour ignition, dust explosions, electrical ignition of pyrotechnics, classification of materials for fire & explosion hazard, flammability tests, hazardous area classification, electrical safety audits.

Electric shock hazards, electrical properties of materials, electrical interference, electrostatic damage to semiconductors, health & safety issues, implementation of Standards.

Electrostatic application of powder & liquid coatings, atomisation, precipitation, plastics identification by electrostatics, electrostatic measurement, antistatic materials & treatments.

Clients include...

3M, Agfa Gevaert, Airbus, AkzoNobel, Alcoa, Anglo American, Areva, Atochem, Astra Zeneca, Autoliv, AWE, BAE Systems, Bechtel, BHP Billiton, Bombardier, British Airways, British American Tobacco, BICC, British Nuclear Fuels (BNFL), British Aerospace, BP, BSKyB, Ciba Geigy, Cobham Mission Systems, Courtaulds, Danisco, DERA, Dow Chemicals, Durapipe, Dyson, Dupont, Dunlop Oil & Marine, EADS, Eaton Aerospace, Elida Faberge, Estee Lauder, Esso, ExxonMobil, Firestone, Fluor, Ford, GKN, GlaxoSmithKline, Health & Safety Executive, Henkel, Höganäs, Ilford, Inco, ITW, Jaguar Land Rover, Janssen Pharmaceuticals, Kvæner, Kraft Jacobs Suchard, Mars, Monsanto, Motorola, Mulox, Onyx, Pilkington, Pall Filters, Pirelli, Proctor & Gamble, Raytheon, Reckitt Benckiser, Rexam, Sainsburys, S C Johnson, Shell, Smith Kline & Beecham, Shanks, Snamprogetti, Sun Chemical, Texaco, Tioxide, Unilever, UKAEA, United Biscuits, Vale, Xstrata.

Professional Committees

Past member of British Standards Technical Committee GEL/601 concerned with rewriting of BS 5958 Parts 1 and 2 'Control of Undesirable Static Electricity'.

Past member of CENELEC European Technical Committee (CLC/TC31/WG20) to develop new European Standard on control of static electricity hazards R044-001.

Publications (Refereed Journal Publications marked*)

1. G.L. Hearn and S. Singh 'Development of a novel instrument for use in electrostatic powder coating', J. Electrostatics 16 (1985) 267-275.*
2. S. Singh and G.L. Hearn 'Development and application of an electrostatic microprobe', J. Electrostatics 16 (1985) 353-361.*
3. G.L. Hearn and S. Singh 'Hazards from electrostatics in the manufacture of infra-red decoy flares', Inst. Phys. Conf. Ser 85 – Oxford (1987).
4. G.L. Hearn 'The electrostatic hazard', Bulk Handling (1988).
5. J.M. Smallwood and G.L. Hearn 'Measurements on sensitive materials using low energy discharge techniques', XIVth Int. Pyrotechnics Seminar – Jersey (1989).
6. G.L. Hearn and S. Singh 'The application of electrostatics in forensic science', J. Electrostatics 23 (1989) 169-178.*
7. R.T. Jones, J.F. Hughes and G.L. Hearn 'Airless applications of liquids and powders - A new direction'. Coating & Finishing, October 1990.
8. R.T. Jones and G.L. Hearn 'Electrostatic hazards from fuels in plastic pipes', Petroleum Review, May 1991.
9. G.L. Hearn 'Coping with electrostatic hazards', Chem. Eng. (New York) (1991).
10. R.T. Jones and G.L. Hearn 'Electrostatic hazards of water deluge systems', Offshore Research Focus 114 (1995).
11. R.T. Jones and G.L. Hearn 'Electrostatic hazards associated with water deluge and explosion suppression systems', Health & Safety Executive Information Services Open Report (1995).
12. G.L. Hearn, P.E.R. Mucci, A. Evers and J. Amner 'The Triboelectric Pen: An electrostatic method for the identification of plastics in recycling', Proc. IEEE IAS 31st annual meeting (1996).
13. G.L. Hearn 'May the force be with you', IEE Review July 1997.*
14. G.L. Hearn and K.L. Gandhi (University of Huddersfield) 'Use of electrostatic techniques to distinguish between fibres', Textile Monthly, November 1997.
15. G.L. Hearn, 'Identification of plastics using electrostatics – the development of the Tribopen', APME Identiplast Conf. (1999).

16. J.L. Davidson, T.J. Williams, A.G. Bailey and G.L. Hearn, 'Characterisation of ESD from insulating surfaces', J. Electrostatics 51&52 (2001) 374-380.*
17. G.L. Hearn, 'Electrostatic ignition hazards from flexible intermediate bulk containers (FIBCs) with materials of minimum ignition energy down to 0.12 milliJoules', IEEE Trans. Ind. Appl., Vol. 37, No. 3, May/June (2001) 730-734.*
18. G.L. Hearn, 'Electrostatic ignition hazards arising from fuel flow in plastic pipes', J. Loss Prev. in the Proc. Ind., 15 (2002) 105-109.*
19. G.L. Hearn, 'Investigation into the Role of Electrostatics in a Vapour Ignition Incident during Refuelling....', J. Assoc. Petroleum & Explosives Admin. Vol. 39 Nov. (2001).
20. G. L. Hearn, J. M. Smallwood, '*Comparison of ESD from metal sphere electrodes and tribocharged insulators of both polarities using two ESD probes*', Proc. Electrostatics 2005. J Electrostatics (2005) 63 6-10 pp 577-582.*
21. P. Pekkala, J. Paasi, G. L. Hearn and J. M. Smallwood, 'The characteristics of electrostatic discharges from intermediate bulk containers'. Proc. Electrostatics 2005. J Electrostatics (2005) 63 6-10 pp 489-494.
22. R. Phillips, J. A. Ogilvy, G. L. Hearn and R. Mills. 'Investigation of Fundamental Aspects of Fuel Filling', Int. Conf. on Lightning & Static Electricity (2015).
23. F. Ahmed, J. A. Kohler and G. L. Hearn, 'Monitoring of Electrostatic Activity during Refuelling of a Transport Category Aeroplane with Carbon Fibre Composite Fuel Tank Structure', Int. Conf. on Lightning & Static Electricity (2015).

Patents

1. A solvent extraction process (Day, Hearn, Wedderburn & Wroblewski) Worldwide patent no. WO 2004092426 A1 (2004).
2. Ion wind insect trap (Hearn, Hughes & Howse). Worldwide patent (1996-1999). (European patent no. 0835053).
3. Plastics identification (Hearn, Mucci & Eyres), University and Ford Motor Company. European patent no. 94904284.0 (1997).
4. Apparatus for coating substrates with inductively charged resinous powder particles (Williams, Harpur, Hearn & Hughes), Southampton University and eNexus Corporation. US patent no. 5,518,546 (1996).
5. Asbestos identification device (Hearn & Amner), Southampton University and Ford Motor Co.

Awards

Winner 1st Venables Award (1984) for original paper on electrostatic powder coating.

UK 'Millennium Products' award for the 'Tribopen' plastics identification instrument developed in the Wolfson Laboratories. (University development team: Hearn, Mucci and Eyres with Ford Motor Company). Millennium Products Award granted in 1999.

European Technical Achievement Award (2001) from Ford Motor Co. & Trust Mark companies.

Product Development

1. Tribopen being marketed and further developed through Wolfson Electrostatics.
2. Asbestos Identifier developed by Wolfson Electrostatics for Mannesmann Sachs in Germany and used to separate clutch plates containing asbestos from 'Aramide' plates in recycling.
3. Polyethylene/polypropylene discriminator unit based on the above technology developed for recycling industry.
4. PolyAna spectroscopic plastic identification system developed by Prototype Design and Development Group in the Mechanical Engineering Department at the University of Southampton. Collaboration with Ford Motor Company.
5. A range of specialist instrumentation to meet the requirements of European Standards on preventing electrostatic hazards. These include: Liquid Conductivity Meter, Surface Resistance Meter, Footwear/Flooring Evaluation Equipment, and Electrostatic Charge Decay Meter.
6. Electrostatic spraying equipment previously developed by Wolfson Electrostatics (European Patent No. 344985) further developed to meet specific requirements.