

Curriculum Vitae for Graham Hearn (updated May 2000)

Name: Graham Leslie Hearn BSc CEng MIEE

Date of Birth: 18.1.53

Wolfson Electrostatics at The University of Southampton since June 1981.

Summary of qualifications

Honours degree in 'Physics and Technology of Electronics' from The University of North London (1975).

Chartered Engineer and Corporate Member of the Institute of Electrical Engineers. Companion Member of the Institute of Chemical Engineers. Participating member of the Electrostatics Society of America.

Registered with the Law Society Directory of Expert Witnesses.

Professional experience

Previous electrical engineering experience with Culham Laboratories (1974-1975), GEC Hirst Research Centre (1975-1978), Braathens S.A.F.E. - Norway (1978-1979) and Phillips Petroleum Co. - Offshore, North Sea (1979-1981)

Present position: Senior Consultant Engineer and Technical Manager of Wolfson Electrostatics, Department of Electrical Engineering, University of Southampton, SO17 1BJ.

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

Agricultural, aerospace/avionics, automotive, chemicals, construction, electronics, energy production, explosives & pyrotechnics, fine chemicals, food production, marine, military, paint manufacture and application, petrochemicals, pharmaceuticals, printing and coatings, textiles.

Professional consulting in 23 countries including Europe, North America, Gulf States, Pacific rim & Australia.

Specific expertise

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, safety requirements, electrical interference, electrostatic damage to semiconductors, ESD

Electrostatic application of powder & liquid coatings, atomisation, precipitation, plastics

identification by electrostatics, electrostatic measurement, antistatic materials & treatments.

Interpretation & application of International Standards & Codes of Practice - BS, CEN, IEC, DIN, NFPA etc.

Major clients include...

3M, Agfa Gevaert, Akzo Nobel, Alcoa, Atochem, Autoliv, British American Tobacco, BICC, BNFL, British Aerospace, BP, Ciba Geigy, Courtaulds, Danisco, DERA, Dow Chemicals, Durapipe, Dyson, Dupont, Dunlop Oil & Marine, Elida Faberge, Estee Lauder, Esso, Ford, Glaxo, Health & Safety Executive, Hognas, Ilford, ITW, Janssen Phamaceuticals, Kraft Jacobs Suchard, Monsanto, Motorola, Mulox, Pilkington, Pirelli, Reckitt & Colman, Rexam, Sainsburys, Shell, Smith Kline & Beecham, Snamprogetti, Texaco, Tioxide, Unilever, UKAEA, United Biscuits, Zeneca

Expert Witness

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

Examples:

Factory fire attributed to use of electrostatic spraying equipment (Kay-Metzeler v DeVillbiss 1990, solicitors - Pinsent & Co. London). Settled out of court.

Electrical ignition hazards and cancellation of unloading of Naptha from cargo vessel (Argironissos Shipping v Dow Europe 1997/1998, solicitors - Penningtons, London)

Transient electrical shock leading to post traumatic shock disorder (W M Hughes v Royal Liverpool Childrens NHS Trust, solicitors Bartlett & Son, Liverpool)

Factory fire (1990) involving spraying of glass fibre and styrene resin (Beauce Fibre de Verre & Insurance Co. v Venus Gusmer, Bombardier & Armkem, solicitors – Ogilvy Renault, Quebec).

Court appearance in Quebec Canada as Expert Witness 6th-30th March and 17th-20th April 2000.

Professional Committees

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

Member of British Standards Technical Committee PRI/25 responsible for BS 7506 Parts 1 and 2 'Measurements in Electrostatics'.

Member of Institute of Electrical Engineers Professional Group Committee S3 'Electron physics, discharges and applications'.

Publications/Conference Papers, etc.

1. G L Hearn and S Singh 'Development of a novel instrument for use in electrostatic

- powder coating*', J. Electrostatics 16 (1985).
2. S Singh and G L Hearn '*Development and application of an electrostatic microprobe*', J. Electrostatics 16 (1985).
 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 –Budapest (1989).
 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*', Chemical Engineering (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 Eyers 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, '*Electrostatic ignition hazards from flexible intermediate bulk containers (FIBCs) with materials of minimum ignition energy down to 0.12 milliJoules*', Proc. IEEE IAS 33rd annual meeting (1998).
 16. G L Hearn, '*Identification of plastics using electrostatics – the development of the Tribopen*', APME Identiplast Conf. (1999).

Numerous other small articles and seminar papers on the control of undesirable static electricity.

Patents

1. Ion wind insect trap (Hearn, Hughes and Howse). Worldwide patent 1996-1999. (European patent no. 0835053).
2. Plastics identification (Hearn, Mucci and Eyres), University and Ford Motor Company. European patent no. 94904284.0 (1997).
3. Apparatus for coating substrates with inductively charged resinous powder particles (Williams, Harpur, Hearn and Hughes), University and eNexus Corporation. US patent no. 5,518,546 (1996).
4. Asbestos identification device (Hearn and Amner), University and Ford Motor Company. Patent currently being filed.

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.

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. Two hand-held units sold. Industrial (bench top) version currently under development at University (Joint project between Wolfson Electrostatics and USITT).
3. Polyethylene/polypropylene discriminator unit developed for recycling industry. First unit sold to South Africa.
4. PolyAna spectroscopic plastic identification system developed by Prototype Design and Development Group in Mechanical Engineering Department now being further developed and upgraded. Collaboration with Ford Motor Company.
5. A range of specialist instrumentation under development to meet requirements of new European Standards on prevention of electrostatic ignition. Already developed: 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 and upgraded to meet special requirements of TechNova Imaging Systems (India).

Significant Research Projects (1996-present) resulting in commercial/technical reports

1. Assessment of electrostatic ignition hazards associated with buried HDPE fuel lines for PetroTechnic, Durapipe, Fusion Group, etc. *Wolfson Report Nos. 363/GLH, 369/GLH, 377/GLH, 378/GLH, 379/GLH, 388/RTJ, 389/RTJ, 397/RTJ, 415/RTJ, 416/RTJ, 417/RTJ, 434/RTJ, 1996-1998.*
2. Assessment of electrostatic hazards associated with industrial tank cleaning for Courtaulds Coatings. *Wolfson Report No. 374/RTJ, January 1997.*
3. Development of electrostatic safety audit test procedures for FIBCs for Rexam Mulox. *Wolfson Report Nos. 384/GLH (July 1997) and 418/GLH (February 1998).*
4. Research into the deployment of airbag systems in vehicles due to electrostatic discharge for Autoliv, Ford, MIRA (Motor Industries Research Assoc.). *Wolfson Reports (for Autoliv) Nos. 442/GLH, 448/GLH/JMS, 454/GLH/JMS, 462/GLH, 466/GLH/JMS, 476/GLH/RTJ, 491/GLH, 493/GLH, 497/GLH and 164/GLH, 203/GLH September 1998 – February 2000.*
5. Development of an electrostatic application technique for light emitting polymers to substrates for CDT (Cambridge Display Technology). *Wolfson Report No. 162/GLH, November 1999.*

Contact details

G L Hearn
Wolfson Electrostatics
Department of Electrical Engineering
University of Southampton
SO 17 1BJ England

Tel: +44 2380 592509/594995

Fax: +44 2380 593015

Email: glh@soton.ac.uk