



I-CORP INTERNATIONAL Inc.



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SHORT BIOGRAPHY OF IAN D. PEGGS



geosynthetic materials science
failure and forensic analyses
construction quality assurance
nondestructive testing
durability assessment
leak location surveys
workshops/seminars

SUMMARY

Founder and President of **I-CORP INTERNATIONAL, Inc.** for 22 years
Over thirty years experience in polymer, geosynthetics, and composite research
Geosynthetics Consultant and Instructor
Previously President and co-founder of GeoSyntec, Inc., USA (now Geosyntec Consultants)
Former Vice-President and Principal of GeoServices, Inc. (now Geosyntec Consultants)
Former Manager of Polymer Engineering, Hanson Materials Engineering (now Acuren), Canada
Active in international standards development and geosynthetics education
Performed more than 200 liner integrity surveys and failure analyses on lining systems
Author of more than 250 papers and presentations on geosynthetics
Registered Professional Engineer, Alberta, Canada
Registered Professional Engineer, Maine, USA
Special Recognition IGS Award 1994
Nominated for IGS Award 1998
Awarded composite liner patent 1998
Clients in more than 40 countries

EDUCATION

Sheffield University, UK: Ph.D., Physical Metallurgy 1967
Imperial College of Science & Technology, London University: B.Sc. (Eng.), First Class (Honors),
Fabrication Metallurgy, 1963

PROFESSIONAL HISTORY

March 1991 - present

I-CORP INTERNATIONAL, Inc., President, Principal, Ocean Ridge, Florida, USA

1986 - 1991

GeoSyntec, Inc., (President) and GeoServices Inc./Geosyntec Consultants (Principal, Vice-President, and Manager, Materials Testing Laboratory), Florida, USA

1985 - 1986

Geosyntech Ltd., Director, Joint Venture between Hanson Materials Engineering and EBA Engineering, Alberta, Canada

1981 - 1986

Hanson Materials Engineering, Manager, Polymer Engineering Division, Alberta, Canada

1967 - 1979

Atomic Energy of Canada Limited, Whiteshell Nuclear Research Establishment, Head, Thermophysical Properties Laboratory, Pinawa, Manitoba, Canada

ACHIEVEMENTS

Introduced geomembrane CQA to Canada in 1983.

Introduced transmission microscopy microstructural analysis to geosynthetics.

Identified stress cracking phenomenon in HDPE geomembranes.

Developed advanced geomembrane seam specifications, published in 1987.

Introduced infrared thermography for the nondestructive measurement of geomembrane seam strength, 1994.

Awarded IGS Award (1994) for contributions to the Influence of Polymer Microstructure on the Performance of Geomembranes. Nominated for IGS Award of Excellence (1998) for paper "HDPE Geosynthetics – Premature Failures and Their Prediction".

Awarded United States Patent 5,788,413 for Geocomposite Membrane (1998).

Initiated Industry Insight newsletter which became www.geosynthetica.net industry web site (1999).

Proposed protocol to assess remaining lifetime in exposed HDPE liners (2005).

Diplomate of the American Board of Forensic Engineering and Technology (2000).

Fellow of American College of Forensic Examiners Institute (2000).

EXPERIENCE

Dr. Peggs has been involved with the failure analysis, research and development, and testing of polymeric materials in bulk, composite, and coating form since 1977. He has had extensive experience with all geosynthetics since 1981 and has specific interest in the nondestructive examination, microstructure, and performance of geomembrane seams. He initiated the use of the multifrequency ultrasonic shadow technique for 100% nondestructive seam inspection and developed microtome techniques for the microstructural examination of seams. He has been involved with the preparation and management of construction quality assurance programs for geomembrane-lined impoundments and landfills in the U.S., Canada, Europe, South Africa, Australia, the Middle East and SE Asia. Dr. Peggs has also been involved in failure analyses for many clients throughout North America, Europe and Australia on high-strength geotextile seams, geotextiles, geomembranes, geomembrane seams, plastic pipe, fiberglass components, and GCLs. He is presently developing infrared thermography technology as the first technique for the 100% nondestructive measurement of geomembrane seam bond strength. He has performed survivability and durability studies on geomembranes and geotextiles and is Past-Convenor of the International Organization for Standardization (ISO) TC38/SC 21 Working Group on the Durability of Geotextiles. He is also past-chairman of the RILEM (TC-144-GMP) Technical Committee on Geomembranes.

He has presented more than 250 papers, seminars, and workshops on geosynthetics for manufacturers, installers, regulators, and users of geosynthetics worldwide.

Dr. Peggs became involved with the investigation, development, and testing of non-metallic materials, including polymers, during the time that he headed Atomic Energy of Canada's Thermophysical Properties Lab in its Materials Development Branch at Whiteshell Nuclear Research Establishment, beginning in 1967.

In 1981, Dr. Peggs became involved with geosynthetics when he initiated and managed the Polymer Engineering Division of Hanson Materials Engineering (now Acuren), a large materials consulting company in Alberta, Canada. His work there in failure analysis, consulting, specifications development, research and development, and quality assurance for geosynthetic lining systems, plastic pipe, and other polymeric materials led to a joint venture between Hanson Materials Engineering and EBA Engineering. Dr. Peggs then became director of the joint venture, Geosyntech Ltd., which provided specialized geosynthetics consulting and testing services to clients throughout Canada and the United States.

In 1986, Dr. Peggs joined with Joseph E. Fluet, Jr. and J.P. Giroud of GeoServices, Inc. Consulting Engineers (now Geosyntec Consultants) to establish GeoSyntec, Inc., an independent geosynthetics testing laboratory in Boynton Beach, Florida. This laboratory became one of the foremost, and most comprehensive, geosynthetics testing laboratories in the world, with clients throughout North America and in 13 countries around the world.

In 1991, Dr. Peggs formed his own geosynthetic materials performance consulting company, I-CORP INTERNATIONAL, Inc. which performs state-of-the-art international geosynthetics technology development, and teaches others how to perform state-of-practice projects in over 40 countries. The Industry Insight newsletter, with subscribers in 32 countries, was initiated in 1994. The newsletter was superseded by the www.geosynthetica.net technical resource web site sponsored by the geosynthetics industry. The site has been visited by approximately 500,000 visitors each year.

Typical projects that Dr. Peggs has managed include failure analyses of geomembrane liners, geosynthetic clay liners, and plastic pipes; stress cracking and microstructure investigations of geomembrane seams; curing and microstructure investigations of fiberglass laminates; aging and degradation studies of polypropylene geotextiles; leak surveys on geomembranes under soil and waste cover; interface friction and surface texture/profile studies; failures in HDPE sheet liners on concrete walls; developing a manufacturing and fabrication QC program for PP geomembranes; and investigation of rapid crack propagation in HDPE geomembranes and more recently PP liners and floating covers. These projects have been conducted on liners in ponds, vaults, landfills, covers, seams, and filters for a

variety of clients that include many utilities, international corporations, engineering consulting firms, hazardous waste firms, geomembrane manufacturers and installers, oil companies, mining companies, metals companies, marine surveyors, contractors, municipalities, insurance companies, and lawyers.

In 1996 Dr. Peggs organized the First US/Germany Geomembrane Workshop in Berlin, and a follow-up mini-workshop in Dallas in 2011.

In 2004 he partnered with TRI Environmental, Inc. to teach and certify others in the performance of liner integrity and leak location surveys. Well over 250 people have taken the course and over 20 have been certified.

In a nutshell, Dr. Peggs seeks new technologies applicable to geosynthetics lining systems, provides that technology as a service, teaches others how to use that technology, then looks forward to the next challenge.

AFFILIATIONS AND COMMITTEE WORK

Dr. Peggs has been heavily involved in committee work relating to the geosynthetics industry and organizations committed to education and development of testing standards, such as:

- International Geosynthetics Society
 - GeoAmericas Conferences
 - Geo MidEast Conferences
 - EuroGeo Conferences
 - GeoAfrica Conferences
- North American Geosynthetics Society
 - Geosynthetics Conferences
 - GeoFrontiers Conferences
- International Organization for Standardization
 - Working Group on Durability
- American Society for Testing and Materials
 - Committee D35 on Geosynthetics
 - Symposium on Microstructure and the Performance of Geosynthetics
 - Workshop on Geosynthetics Forensic Analysis & Remediation, 1993
 - Workshop on Textured & Structured Geomembranes, Phoenix, 1995
- National Sanitation Foundation
 - International Standard 54 Flexible Membrane Liners
- International Union of Testing and Research Laboratories for Materials and Structures (RILEM)
- Geosynthetics World magazine
- Geosynthetics magazine
- Society of Plastics Engineers
- NICET Geosynthetic Materials Installation Certification Program
- American College of Forensic Examiners, USA
- International Association of Geosynthetic Installers

- American Water Works Association
- IFAI International Achievement Awards Judge 2001 – 2006.
- Fabricated Geomembrane Institute

PUBLICATIONS AND PRESENTATIONS

In Dr. Peggs' 32 years of experience investigating and testing polymers, primarily geosynthetics, he has acquired a great deal of information concerning materials durability and how that characteristic corresponds to the success or failure of the application of a given material in its environment. Dr. Peggs shares this valuable information in his publications and presentations available at www.geosynthetic.com.