The Institute of Textile Science

Incorporated, Canada 1956

Final Report

INVENTORY OF R&D ON TEXTILE TECHNOLOGIES AT UNIVERSITIES, GOVERNMENT CENTERS AND OTHER RESEARCH CENTERS IN CANADA

presented to

Ms. Nita Saville
Industry Canada

by

ITS Board of Directors

March 30th, 2009

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Executive Summary

- Forty-four researchers were known to be involved in research in textiles and/or related materials.
- Twenty-three researchers responded to the questionnaire.
- Almost one-half of the responding researchers are located in Quebec (43%) while Manitoba has 17% and Ontario and Alberta have 13% each.
- One-half of the responding researchers are working in Clothtech or Protech and about one-third in Medtech.
- Medtech generates the largest number of patents.
- The areas of textiles research carried out by academic institutions and non-profit research organizations are complementary.
- Areas of research correspond to the strategic directions identified by the Canadian textile industry in the document “Technology Roadmap for the Canadian Textile Industry**”**.
- There needs to be a forum for continuing dialog among government, industry, non-profit research organizations, and educational institutions.
- The boundaries for textile education in Canada should be re-assessed, using this inventory as a source of input.
- This inventory should be updated on a regular basis.

1. Introduction

The purpose of this report is to establish an inventory of Canadian researchers involved in the research and development of textile technologies. The report was commissioned by Industry Canada and was prepared by the Institute of Textile Science (ITS).

2. The Inventory

This inventory was developed to gather descriptive information on the types of textile or textile related research conducted by researchers. The inventory was developed collaboratively by the following members of the Institute of Textile Science:

- Dr. Lena Horne, Associate Professor of Textile Sciences at the University of Manitoba, Winnipeg, Manitoba.
- Dr. Patricia Dolez, Researcher, Chair in Protective Materials and Equipments for Occupational Health and Safety, École de Technologie Supérieure, Montréal.
- Dr. Jacek Mlynarek, President and CEO, CTT Group, Saint-Hyacinthe, Quebec.

A questionnaire was sent to a total of 44 researchers identified as active researchers in textiles or related materials. All but one of these researchers are affiliated with universities, research centers, and technical centers.

The questionnaire (Appendix B) comprised three sections. The first section gathered information on the respondent – name, institutional affiliation, and location of institution. To protect the respondents' privacy, they were given the option to remain anonymous. In the second section, respondents were asked to list the research projects they had been involved with from 2004 to 2008. In the third section, respondents were asked to place their research in 12 classifications of textile applications originated by the Messe Frankfurt Group which organizes textile trade fairs worldwide. The 12 classifications and their definitions are contained in Appendix A.

In early December, 2008, the questionnaire was sent to the 44 researchers by email. One reminder email was sent in January 2009. An individual follow-up by phone was carried out in February 2009 to those who had not responded. By March 2009, a total of 23 responses were returned. Of the 23 researchers who responded, one requested anonymity. Appendix C contains the names of the 22 researchers and their institutional affiliation. Although the projects of the anonymous researcher are not listed in Appendix D, this researcher's work is included when the discussion pertains to overall patterns.

3. Results

In this section, the following are reported:

- Distribution of researchers' institute affiliation and location.
- Grouping of researchers' work according to the 12 classifications of textiles.
- A summary of the researchers' scope of activity.

3.1 Researchers' Institute Affiliation and Location

As indicated in Table 1, the 23 textile researchers who responded to the inventory are located across Canada, with 10 researchers (43%) in Quebec, 3 (13%) in Ontario, 4 (17%) in Manitoba, 3(13%) in Alberta, 1 (4%) in Saskatchewan, and 2 (9%) in British Columbia.

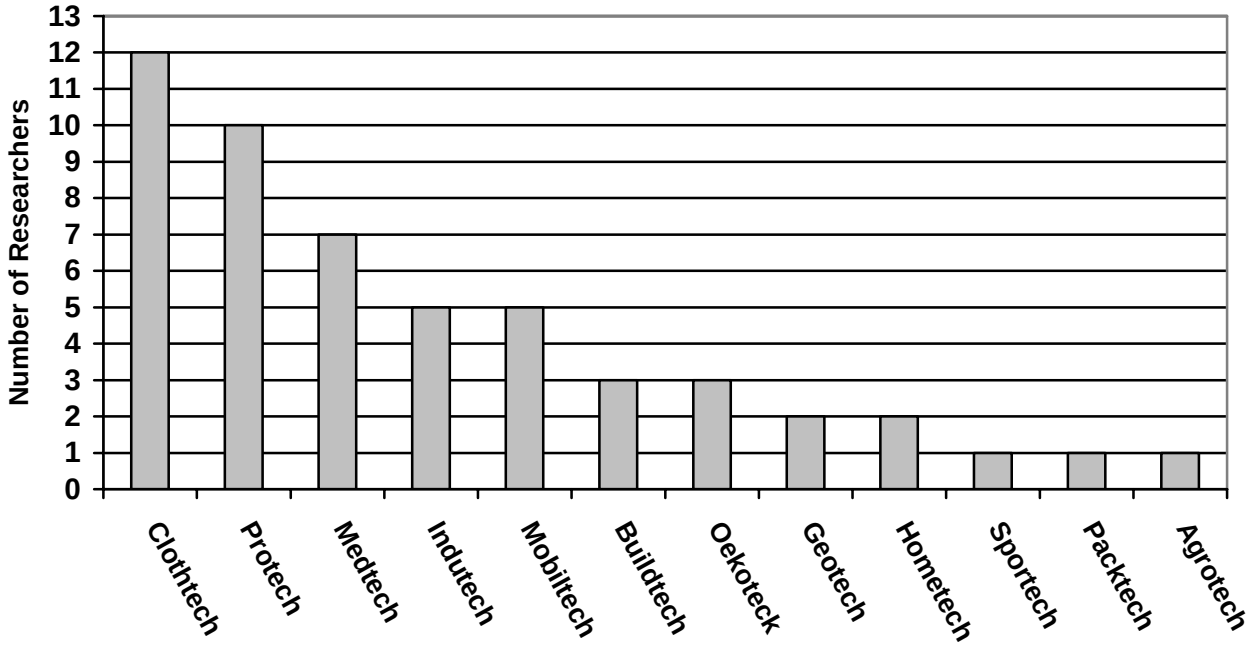
Table 1 - Researchers' Institutional Affiliation and Location

Province	Institution	Number of Researchers	Total Number of Researchers In Each Province
Quebec	CTT Group	4	10
	École de technologie supérieur	2	
	Concordia University	1	
	IRSST	1	
	École Polytechnique de Montréal	1	
	National Research Council Canada	1	
Ontario	Royal Military College of Canada	1	3
	University of Ottawa	1	
	No institutional affiliation	1	
Manitoba	University of Manitoba	4	4
Alberta	University of Alberta	3	3
Saskatchewan	University of Saskatchewan	1	1
British Columbia	University of British Columbia	2	2

3.2 Classification of Textile Research

Figure 1 shows the classifications of textile research conducted by the 23 responding researchers according to the Messe Frankfurt Group's classifications of textile applications. At least 12 of these 23 researchers reported conducting research in Clothtech or Protech classifications

Figure 1 – Number of Researchers by Textile Classification



Many researchers identified in this inventory conduct research in more than one textile classification. Table 2 shows that 15 of the 23 researchers work in one or two classifications of textiles. For the 7 researchers who indicate research activities in one textile classification, almost one-half are involved in research for clothing applications (Clothtech).

For the 8 researchers who conduct research in two classifications of textiles, Clothtech or Mobiltech are often one of the two classifications. Those who classify their work under Clothtech also conduct research in Protech, Medtech, or Indutech. For those who engage in Mobiltech research, they also conduct research classified as Protech, Buildtech, or Indutech. The prominence of research in Protech is notable among this cluster of researchers.

For the 5 researchers who conduct research in three textile classifications, the combination of Clothtech, Protech, and Indutech is more common than other combinations. Again, Protech is an area of research most frequently associated with these researchers' work.

For the remaining 3 researchers who conduct research in four or five classifications of textiles research, Medtech and Protech seem to be two classifications that are common to all of them.

Table 2 – Research in Areas of Textile Classification

Number of Textile Classification	Specific Classifications	Number of Researchers	Total Number of Researchers
1	Clothtech	3	7
	Indutech	1	
	Protech	1	
	Mobiltech	1	
	Geotech	1	
2	Clothtech + Protech	2	8
	Clothtech + Medtec	1	
	Clothtech + Indutech	1	
	Mobiltech + Protech	2	
	Mobiltech + Buildtech	1	
	Mobiltech + Indutech	1	
3	Clothtech + Protech + Indutech	2	5
	Protech + Buildtech + Hometech	1	
	Clothtech + Protech + Medtech	1	
	Medtech + Oekotech + Packtech	1	
4	Clothtech + Medtech + Oekotech + Hometech	1	1
5	Protech + Medtech + Buildtech + Geotech + Agrotech	1	2
	Protech + Medtech + Oekotech + Sportech + Clothtech	1	

3.3 Researchers' Scope Of Activities

The researchers in this inventory conduct various types of research within each textile classification. Table 3 shows that Clothtech and Protech are the predominant areas of publication. Although there are fewer researchers in Buildtech and Oekotech, the number of publications is comparable to Medtech and Indutech. Of the classifications where patents have been registered or applied for, Medtech has the highest number of patents. Note that for Medtech, all seven researchers report their work as related to medical or hygiene products. It seems that of Clothtech, Protech, Medtech, Indutech, and Mobiltech classifications, which have more researchers than other classifications, Medtech research shows a homogeneous pattern that is not present in the other classifications.

Table 3 – Scope of Activities

Classification	Specific areas within each classification	Number of researchers	Number of papers published by researchers	Number of patents applied for or registered by researchers
Clothtech	Footwear	12	35	2
	Clothing			
	Wet processing			
	Standard development			
Protech	Personal protection	10	43	2
	Property or object protection			
	Others			
Medtech	Medical or hygiene products	7	18	4
Mobiltech	Automobile construction	5	2	0
	Aircraft construction			
	Boat construction			
	Wide blade			
Indutech	Filtration or cleaning	5	14	0
	Mechanical engineering			
	Electrical industry			
Buildtech	Lightweight and solid structures	3	13	0
	Drainage			
	Heating, ventilation			
Oekotech	Waste disposal	3	15	0
	Recycling			
	Natural dyes			
Geotech	Civil engineering or drainage system	2	8	0
	Dam engineering			
	Road construction			
	Durability			
Hometech	Furniture	2	3	0
	Others			
Sportech	Active wear or sports outfits	1	3	0
Packtech	Protective cover systems	1	0	1
Agrotech	Drainage	1	0	0

Appendix D contains a brief description of the research projects conducted by the respondents. Note that some researchers requested that their projects not be included in the report. It can be observed that the researchers' work generally involves either engineering textiles for very specific end uses or developing methods to measure very specific properties of engineered textiles.

3.4 Academic Institutions and Non-Profit Research Organizations

The range of research being conducted at academic institutions and non-profit research organizations is very similar. Table 4 shows Clothech, Protec, Medtech and Indutech as areas of research that are being conducted in academic institutions and non-profit research organizations. They are also closely aligned with industry demands.

Table 4 - Classification of Textile Research in Academic Institutions and Non-Profit Research Organizations

Classification	Academic Institutions	Non-Profit Research Organizations
Clothtech	7	3
Protech	6	2
Medtech	3	3
Indutech	6	1
Mobiltech	4	-

4. Conclusions

In the document "Technology Roadmap for the Canadian Textile Industry"[1] released in 2008, Protech, Medtech, Mobiltech, and Buildtech were identified as growth markets for the Canadian textile industry (pages 50 to 53). This inventory provides evidence of a match between the research areas covered by Canadian scientists and the subjects of interest of the Canadian textile industry.

This inventory shows that research is being conducted in all 12 classifications of textile applications. Clothtech or Protech are two classifications in which at least 10 of the 23 researchers focus their attention. The highest number of publications is also found in these two areas. In most cases, Clothtech research is directed at protective clothing. Where researchers' works extend beyond one textile classification, the Clothtech and Protech combination is most noticeable. For Medtech, all researchers in this classification conduct research in medical or hygiene products. Buildtech researchers are publishing about the same number of papers as Medtech researchers. A cluster of researchers is working on Mobiltech.

[1] This document can be retrieved from:
http://www.gcttg.com/index.php?module=CMS&func=view&id=108&newlang=eng (English)
http://www.gcttg.com/index.php?module=CMS&func=view&id=108&newlang=fra (French)

This inventory also shows that both academic institutions and non-profit research organizations are conducting research in Clothtech, Protech, and Medtech. This has strategic implications because the growth of Protech and Medtech markets depends on the level of research conducted in these areas.

The range of innovative textiles research conducted by Canadian scientists who responded to this inventory results in the development of engineered textiles for specific end uses, some of which do not normally entail the use of textiles as a material. This ability to develop value added products for specific markets has far-reaching implications for the strategic direction of textiles research in Canada. From an industrial perspective, it also contributes to the development of competitive advantage.

5. Recommendations

This inventory documents extensive and innovative research being carried out by Canadian scientists in educational and industrial environments. As the number of textiles education programs are limited, the results of this inventory point to an urgent need to re-think the boundaries of textiles education in Canada. Dialog among educational institutions, the textile industry, the Textiles Human Resources Council, and government would help to discover ways for these stakeholders to work toward solutions.

Since there is evidence to suggest that both academic institutions and non-profit research organizations are conducting research in the same areas of textiles research that are of strong interest to the Canadian textile industry, opportunities need to be created to encourage academic institutions and non-profit research organizations in Canada to join forces to further pursue innovations in these areas. Furthermore, a global network should be established to align R&D efforts by researchers and the industry.

This inventory has provided an initial basis on which to generate stronger developments in textile. However, the process should not stop here. Ongoing efforts to identify and add new scientists to the inventory should be maintained in order to expand the current network. The Institute of Textile Science is willing to play a role in maintaining that inventory of research and researchers in textile

6. Immediate Benefit

An immediate benefit from conducting this inventory is to enable the Institute of Textile Science to invite the researchers who responded to the inventory to share their knowledge in future scientific sessions. As a matter of fact, three researchers in the inventory will be presenting their work in the 105th session in April 2009 (see program in Appendix E). At least four researchers have agreed to present their work at the 106th session scheduled for September 2009.

Appendix A

Definitions of Technical Textile Classifications by Techtextil

Source: http://www.techtextilna.com/visitorinfo.htm# ,downloaded on February 12, 2009

Agrotech - Horticulture and landscape, agriculture and forestry, animal husbandry, fences, etc...

Buildtech - Membrane, light-weight and solid construction, civil engineering and industrial construction, temporary construction, interior construction, earth, water and traffic route construction, agricultural construction, etc...

Clothtech - Clothing, shoes, etc.

Geotech - Civil engineering, earth and road construction, dam engineering, dump construction, ground isolation, drainage, systems, etc...

Hometech - Furniture, upholstery and room design, carpets, floor coverings, etc...

Indutech - Filtration, cleaning, mechanical engineering, chemical industry, electrical industry, seals, sound absorption products, etc...

Medtech - Hygiene, medicine, rescue organization equipment, etc...

Mobiltech - Automobile and shipbuilding, aircraft and space travel, rail vehicles, motorcycle and bicycle construction, etc...

Oekotech - Environmental protection, recycling, disposal, etc...

Packtech - Packaging, protective cover systems, sacks, big bags, storage systems.

Protech - Protection of persons and properties, etc...

Sportech - Sports and leisure, active wear, outdoors, sports, equipment and outfits, sport shoes, etc...

Appendix B

The R & D Questionnaire

The Institute of Textile Science

Incorporated Canada 1956

Inventory of Research on Textiles and Textile-Related Materials in Canada

Do you conduct research on textiles or related materials including composites, polymers, membrane systems, films, or fibre-reinforced materials?

☐ **No**
If this is your answer, please return the document to us so that you will not be contacted again. Thank you for your consideration.

☐ **Yes.**
If this is your answer, please continue.

Information on Respondent

Name: _____

Institutional affiliation: _____

Location of institution (city and province): _____

☐ **Yes, I authorize the Institute of Textile Science to include my name and institutional affiliation in the report of this inventory.**

☐ **No, I do not authorize the Institute of Textile Science to include my name and institutional affiliation in the report of this inventory.**

Record of Research in Textiles or Related Materials

Please list the research projects that you have been involved with in the last 5 years.

Please indicate on the following page to which categories of technical textiles or related materials that your research pertain, the number of papers you have published in the last five years, and the number of patents registered or applied for in the last five years.

Categories	Specific Areas Within Each Category	Research Projects (✔)	Number of Papers	Number of Patents
Agrotech	Animal husbandry			
	Forestry			
	Horticulture			
	Landscape			
	Others, please specify			
Buildtech	Industrial construction			
	Temporary construction			
	Interior construction			
	Lightweight and solid structures			
	Others, please specifiy			
Clothtech	Footwear			
	Clothing			
	Others, please specify			
Geotech	Civil engineering or drainage system			
	Dam engineering			
	Dump or membrane construction			
	Road construction			
	Others, please specify			
Hometech	Furniture			
	Upholstery			
	Floor coverings and carpets			
	Others, please specify			
Indutech	Filtration or cleaning			
	Mechanical engineering			
	Chemical industry			
	Electrical industry			
	Others, please specify			
Medtech	Medical or hygiene products			
	Rescue organization equipment			
	Others, please specify			
Mobiltech	Automobile construction			
	Aircraft construction			
	Boat construction			
	Railway vehicles			
	Others, please specify			
Oekotech	Environmental protection			
	Waste disposal			
	Recycling			
	Others, please specify			
Packtech	Packaging			
	Protective cover systems			
	Storage systems			
	Others, please specify			

Categories	Specific Areas Within Each Category	Research Projects (✔)	Number of Papers	Number of Patents
Protech	Personal protection			
	Collective protection			
	Property or object protection			
	Others, please specify			
Sportech	Sport shoes			
	Active wear or sports outfits			
	Outdoor outfits			
	Equipment			
	Others, please specify			

☐ **Yes, send a summary of the inventory.**

☐ **Yes, contact me for future communications.**

☐ **Do not send a summary of the inventory.**

☐ **Do not contact me for future communications.**

If you choose to return this document by fax, please direct your fax to any of the following ITS members:

Jacek Mlynarek	**450 778-3901**
Patricia Dolez	**514-396-8530**
Lena Horne	**204-474-7592**

Appendix C

Respondents

	Name		Institutional Affiliation
	Surname	First Name	
1	Begriche	Aldjia	CTT Group
2	Crown	Elizabeth	University of Alberta
3	Denault	Johanne	National Research Council
4	Dickson	Eva	Royal Military College
5	Dolez	Patricia	École de Technologie Supérieure
6	Fannin	Jonathan	University of British Columbia
7	Harrabi	Lofti	CTT Group
8	Horne	Lena	University of Manitoba
9	Jayaraman	Raghavan	University of Manitoba
10	Layne	Barbara	Concordia University
11	Lan	André	Institut de recherche Robert-Sauvé en santé et en sécurité du travail
12	McQueen	Rachel	University of Alberta
13	Milani	Abbas	University of British Columbia
14	Mlynarek	Jacek	CTT Group
15	Oktem	Tulin	No institutional affilation
16	Robitaille	François	University of Ottawa
17	Song	Guowen	University of Alberta
18	Skorobogaty	Maxim	École Polytechnique
19	Tessier	Dominic	CTT Group
20	Torvi	David	University o Saskatchewan
21	Vu-Khanh	Toan	École de Technologie Supérieure
22	Zhong	Wen	University of Manitoba
23	Anonymous		

Appendix D

Research Projects

Researcher	Domains of Research
A	1. Modeling of heat and moisture transfer in protective clothing system. 2. Development of a light weight fire fighter turnout system to meet the new multi-threat environment facing the fire fighting and first responder communities.. 3. Development of standard and method for measuring thermally stored energy in protective clothing system (NFPA 1971 and ASTM F-23 on protective clothing evaluation). 4. Investigation and analysis of firefighter turnout system failure mechanism. 5. Numerical model development for moisture transport in fire fighter clothing system under flash fire conditions. 6. Performance evaluation of cold weather protective clothing. 7. Military clothing system performance study. 8. Development of a numerical model for predicting the degree of thermal stress associated with protective clothing.
B	1. Development of conductive textiles, textiles embedded with optical fibres, and mechanical textile sensor. 2. Thermographic analysis of heating textile. 3. E-broidery (electronic textiles). 4. ECG knitted textile sensor.
C	1. Retention of body odour on apparel knit fabrics – examining the effect of fibre type and fabric structure. 2. Effectiveness of antimicrobial treatments against odour-causing skin bacteria. 3. Moisture management in underwear fabrics.
D	1. Development of natural fibre textile for aerospace, automotive, boat and wind blade energy applications.
E	1. Chemical-biological protective combat uniform technology. 2. Filtration and biocidal capabilities of electrospun materials. 3. Evaluating chemical protective performance of protective clothing systems containing novel barrier materials.
F	Étude sur le vieillissement, la dégradation et la durée de vie des équipements de protection contre les chutes – Cordes d'assurances
G	1. Geotextile filtration in civil engineering applications.
H	1. Development of a new firefighter's protective garment. 2. Study of non linear mechanical behaviour of elastomer and knitted fabric reinforcement. 3. Prediction of non linear mechanical behaviour of composite protective materials. 4. Characterization of coefficient of friction of protective glove materials. 5. Development of a dynamometric method for determining coefficients of friction that takes into account hand-glove interactions. 6. Characterization of biomechanical constraints caused by the use of protective gloves. 7. Validation of a method for measuring flexibility of gloves based on surface electromyography.
I	1. Identifying user and use situation demands associated with textile products. 2. Evaluating users' response to textile products.
J	1. Development of intelligent cloth structures for the creation of artistic, performative and functional textiles. 2. Weaving natural materials alongside microcomputers and sensors to create surfaces that are receptive and responsive to external stimuli.

Researcher	Domains of Research
K	1. Advanced methods to identify modern textile fibres. 2. Alternative eco-friendly methods in wool finishing. 3. Ecofriendly dyeing of synthetic fibres by natural dyes. 4. Using naturally coloured cotton for good quality, attractive and ecological textile products. 5. Chitosan and its uses in textile industry. 6. Atmospheric pressure plasma and its applications on textile surfaces. 7. Metal ion implantation technique (MEVVA) to textile surfaces 8. Sun protection of cotton fabrics by UV absorbers. 9. Problems in dyeing and washing processes in textile plants. 10. The effect of light-perspiration on reactive dyed textile materials. 11. Microencapsulation in textiles. 12. Naturally coloured cotton production and its importance for textile industry. 13. Effects of enzymatic treatment on silk fibres. 14. Comparative properties of compact yarn based and conventional ring yarn based knitted fabrics. 15. Antimicrobial applications on textile fabrics.
L	1. A multi-scale modeling and identification tool for multi-objective design optimization of woven fabrics. 2. Comparison of different weighting methods in modeling non-repeatabilities in the response of woven fabrics. 3. A layout-based, rapid method to compute the temperature distribution in textile composites. 4. Finite element simulation and optimization of a multi-stage roll forming process. 5. An adaptive one-factor-at-a-time (OFAT) methodology for cost optimization of laminated structures under manufacturing errors. 6. An intelligent inverse method for characterization of textile reinforced thermoplastic composites using a hyperelastic constitutive model.
M	1. Geotextiles in drainage 2. SMART Textiles 3. Nanotechnologies for textiles
N	1. Mold Filling during fabrication of fibre-reinforced composite. 2. Antibacterial N-95 respirators for biodefence. 3. Transport properties of fibrous materials and structures. 4. Electrospun nanofibres for biomedical applications. 5. Biocompatible and biodegradable biopolymers and their application in drug (anti-cancer drugs or antibiotics) delivery. 6. Skin-fabric interactions and their impact on skin lesions and ulcers.
O	1. Clothing systems for protection from high pressure steam and condensate 2. Flammability of cotton pyjama tops. 3. Development and evaluation of fire shelter materials. 4. Effect of quantity and distribution of oily contaminants on flammability and combustion characteristics of thermal protective clothing. 5. Efficiency and effectiveness of cleaning process - firefighters' protective clothing. 6. Evaluating firefighters' protective clothing and equipment, flame resistant clothing for defense sectors, and protective clothing systems for radiant protection and thermal stress.

Researcher	Domains of Research
P	1. Modelling mechanical behaviour of textiles and coated textiles. 2. Rupture mechanics. 3. Aging of high performance synthetic fibres. 4. Non-linear time-dependant mechanics for textiles. 5. Development of testing methods for protective equipments.
Q	1. Nanofabrication of textiles. 2. Camouflage materials. 3. Heat barrier for firefighters clothing with temperature control. 4. Processing of textiles with plasma. 5. Development of antimicrobial fabrics and a double density 3D fabric.
R	1. Photonic textiles for illumination, camouflage, sensing and information transmission. 2. Development of specialty optical fibres, metal/plastic composite fibres, piezoelectric /plastic fibres, biodegradable fibres for advanced textile applications.
S	1. Evaluating the performance and durability of protective clothing. 2. Modeling heat transfer in thermal protective clothing and human skin . 3. Correlating small and full-scale fire test results of mattresses. 4. Developing novel energy exchangers for use in buildings
T	1. Development of methods for measuring stiffness and adherence of protective gloves. 2. Resistance of protective gloves to puncture by medical needles. 3. Aging of high performance textiles used for protection against heat and flame. 4. Dynamic behaviour of textiles at high deformation and various strain rates. 5. Mechanism and mechanics of tearing in textiles. 6. Aging of synthetic fibres used in protective equipment against fall. 7. Blow-out and explosion of truck tires.

Appendix E

Program of the Institute of Textile Science 105th Scientific Session

January 14th, 2009

52nd ITS Annual General Meeting
and
105th ITS Scientific Session

In partnership with: CRSNG NSERC Industry Canada Industrie Canada

Date: Friday, April 17th, 2009

Location: Quality Engineering Test Establishment
National Printing Bureau, National Defence
45, Boul. Sacré-Coeur
Gatineau, Québec, Canada
Conference Room A, 2nd Floor

The Institute of Textile Science will be holding its 52nd Annual General Meeting and 105th Scientific Session on Friday, April 17th, 2009 at the Quality Engineering Test Establishment of National Defence, in Gatineau, Québec. The agenda for the AGM and this scientific session are attached.

Yours truly,

Kasper Van Veen
President

PLEASE ADVISE PATRICIA DOLEZ IF YOU PLAN TO ATTEND

T: 514-396-8800 #7820 F: 514-396-8530
E: patricia.dolez@etsmtl.ca
W: www.textilescience.ca

The Institute of Textile Science

Incorporated, Canada 1956

52nd Annual General Meeting and 105th ITS Scientific Session:
"We've Come a Long Way - Textile Research in Canada in the 21st Century"

Date: **Friday, April 17th, 2009**

Location: **Quality Engineering Test Establishment**
National Printing Bureau, National Defence
45, Boul. Sacré-Coeur
Gatineau, Québec, Canada
Conference Room A, 2nd Floor

AGENDA

8:00 – 9:00 **Registration**

9:00 – 9:15 **Introduction to AGM and Scientific Session**

9:15 – 9:45 ***Report on ITS Inventory of Textiles R&D in Canada***
Dr. Lena Horne, U. of Manitoba, Dr. Patricia Dolez, ETS Montréal, and Dr. Jacek Mlynarek, CTT Group, St-Hyacinthe

9:45 –11:00 **52nd ANNUAL GENERAL MEETING**

AGENDA

1. **Call to order.**
2. **Acceptance of the Minutes of the 51th AGM.**
3. **Business arising from the minutes.**
4. **Treasurer's report.**
5. **President's report.**
6. **Proposition of new fee structure policy**
7. **Discussion on new ITS By-laws**
8. **Ratification of acts of Directors for 2008.**
9. **Report of the Nominating Committee.**
10. **Election of Directors.**
11. **Appointment of Auditor for 2009.**
12. **Announcement of future meetings.**
13. **Other Business.**
14. **Adjournment of 52th Annual General Meeting**

11:00 – 11:30 ***Research on Intelligent Textiles: CTT Group's Facilities and Research Program***
Dr. Olivier Vermeersch and Miss Aldjia Begriche
CTT Group, St-Hyacinthe

11:30 – 12:00 ***Research on Personal Protective Equipment***
Dr. Patricia Dolez and Pr. Toan Vu-Khanh
École de technologie supérieure de Montréal

12:00 – 13:15 **Networking Lunch & Discussion Forum**

Vision for the development of a Consortiun Materials and Technical Textiles for Protec in Québec
Dr. Jacek Mlynarek, Pr. Toan Vu-Khanh and Dr. Patricia Dolez

C/MT²P
Consortium on Materials and Technical Textiles for Protection

13:15 – 13:40 ***Antibacterial polyethylene terephthalate***
Miss Nan Zhao, Graduate Student, University of Manitoba

13:40 - 14:00 ***Biopolymer nanofibers for the immobilization of bioactive molecules***
Miss Beth Zhou, Graduate Student, University of Manitoba

14:00 – 15:00 **Tour of the National Defence Quality Engineering Test Establishment in Gatineau**

15:00 – 16:00 **Meeting of the New ITS Board of Directors for 2009-2010**