International Specialised Skills Institute

Evaluating Sustainability of Textiles in Europe – Relevance to the Australian Textile Industry

Trudie Orchard

Skills Victoria (TAFE)/Italy (Veneto) ISS Institute Fellowship

Fellowship funded by Skills Victoria, Department of Innovation, Industry and Regional Development, Victorian Government

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Executive Summary

The Skills Victoria (TAFE)/Italy (Veneto) ISS Institute Fellowship provided Trudie Orchard an opportunity to undertake a review of European legislation covering harmful substances in textiles. The Fellow used this opportunity to assess the European textile sustainability environment, laboratories and retailers to determine how the legislation was applied and what specialist laboratory equipment is required for analysing harmful substance concentrations.

The continued reviews in the Australian textile marketplace over the past three decades have led to significant restructuring of the industry. These changes (such as removal of protection in the form of tariffs) have seen a significant reduction in manufacturing and as a consequence an increase in imported Textile Clothing and Footwear (TCF) goods into Australia.

As Australia moves deeper into the global textile markets the application of international specifications and testing regimes will be demanded. Australia needs to develop knowledge of European Union (EU) and United States of America (USA) requirements by visiting and encouraging open discussion. In addition, Australian retailers need to develop a strategy to manage the growing public awareness of the harmful substances applied to textiles, such as formaldehyde.

Currently, Australian textile laboratories have a limited analytical analysis of textiles to detect harmful substances. The changing international textile markets have brought new challenges to Australian textile testing laboratories – requiring more sophisticated equipment and a higher analytical skill base. The Fellow visited laboratories and associated organisations to observe testing techniques to formulate a quantitative-based approach to textile sustainability and to consider how to apply this broad-based understanding of sustainability in Australia.

In addition, the Fellowship provided an opportunity for the Fellow to compare apparel retailer quality control systems by visiting both retailers and laboratories to discuss systems and view testing procedures. Both the benefits and limitations of European retail apparel and commercial textile Quality Assurance (QA) systems were compared to the current systems applied by Australian apparel retailers. The Fellow gained an insight into how the retailers and laboratories collaborated to meet textile material quality and labelling standards specified by EU legislation.

The Fellow travelled to Italy, Germany, Sweden and the United Kingdom (UK) visiting a diverse range of textile-related organisations. This included visits to five accredited laboratories in Italy, Germany, Sweden and the UK; four apparel retailers in Italy, Sweden and the UK; an Italian linen fabric manufacturer/exporter, a representative from an Italian textile industry association; an internationally recognised swimwear supplier and a conference held by Society of Dyers and Colourists in London.

This overseas experience has provided a valuable insight into the European approach to textile sustainability when focussing on the potential contamination of textiles with substances harmful to humans. The Fellowship has led Orchard to develop the view that the Australian textile industry must develop legislation to regulate the importation of textiles that may contain harmful substances.

The knowledge gained must now be distributed to the Australian industry, exporters, the Australian Government and education providers in order to empower Australian stakeholders.

A number of recommendations have been identified that could lead the way for the development of an Australian textile label leading system, which could lead to more informed consumers. The relevant Australian Government, education and training organisations, retailers and testing laboratories must review the textile chemical legislation being applied in Europe, China and the USA. This should be undertaken to determine the benefits of application to Australia.

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Abbreviations/Acronyms

ACASPA	Australian Canvas and Synthetic Products Association
ACCC	Australian Competition Consumer Commission
AOX	Absorbable Organic Halogens
AWI	Australian Wool Innovation
AWTA	Australian Wool Testing Authority
BSCI	Business Social Compliance Initiative
BTTG	British Textile Technology Group
CAS	Chemical Abstracts Service
CIA	Carpet Institute of Australia
Coin	Gruppo Coin SpA
CPSIA	The US Consumer Product Safety Improvement Act
CSIRO	The Commonwealth Scientific and Industrial Research Organisation
CTC	Centro Tessile Cotoniero e Abbigliamento SpA
ECHA	European Chemicals Agency
EEA	European Economic Area
EU	European Union
FTIR Spectroscopy	Fourier Transform Infrared Spectroscopy
GOTS	Global Organic Textile Standard
HPLC	High-Performance Liquid Chromatography
IFC	International Fibre Centre
ITF	Italian Textile Fashion association
NATA	National Association of Testing Authorities
ppm	parts per million
QA	Quality Assurance
RAPEX	Rapid Alert Program Exchange
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals

Abbreviations/Acronyms

RMIT	Royal Melbourne Institute of Technology
RSL	Restrictive Substances List
SDC	Society of Dyers and Colourists
SMI	Sistema Moda Italia (Italian textile federation body)
SINAL	Systema Italiano Nazionale per L'Accreditamento di Laboratori
SIT	Servizio di Taratura in Italia (Italian Calibration Service)
STR	Specialised Technology Resources (UK) Ltd
SVHC	Substances of Very High Concern
TAFE	Technical and Further Education
TFIA	Council of Textiles and Fashion Industries of Australia
TTNA	Technical Textiles and Non-woven Association
UK	United Kingdom
USA	United States of America
UV	Ultra Violet
WHO	World Health Organisation
WRONZ	Wool Research Organisation of New Zealand

Definitions

CE mark
CE marking (also known as CE mark) is a mandatory conformance mark on many products placed on the market in the European Economic Area (EEA). With the CE marking on a product the manufacturer ensures that the product is in conformity with the essential requirements of the applicable EC directives. The letters 'CE' stand for 'Conformité Européenne' ('European Conformity').[1]

CTC
Centro Tessile Cotoniero e Abbigliamento SpA is a European Network of Textile Research Organisations.

Design
Design is problem setting and problem solving. Design is a fundamental economic and business tool. It is embedded in every aspect of commerce and industry and adds high value to any service or product—in business, government, education and training, and the community in general.[2]

Innovation
Creating and meeting new needs with new technical and design styles. (New realities of lifestyle).[3]

ITF
The Italian Textile Fashion association is an association of the Italian Chambers of Commerce.

RAPEX
Rapid Alert Program Exchange is an EU program for dangerous consumer products.

REACH
Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) is a European Union Regulation of 18 December 2006. REACH addresses the production and use of chemical substances, and their potential impacts on both human health and the environment. Its 849 pages took seven years to pass, and it has been described as the most complex legislation in the Union's history and the most important in 20 years. It is the strictest law to date regulating chemical substances and will affect industries throughout the world. REACH entered into force in 1 June 2007, with a phased implementation over the next decade.

When REACH is fully in force, it will require all companies manufacturing or importing chemical substances into the European Union in quantities of one tonne or more per year to register these substances with a new European Chemicals Agency (ECHA) in Helsinki, Finland.[4]

SINAL
Systema Italiano Nazionale per L'Accreditamento di Laboratoriis the Italian National Laboratory Accreditation System.

Skill deficiency
A skill deficiency is where a demand for labour has not been recognised and training is unavailable in Australian education institutions. This arises where skills are acquired on-the-job, gleaned from published material or from working and/or studying overseas.[5]

There may be individuals or individual firms that have these capabilities. However, individuals in the main do not share their capabilities, but rather keep the intellectual property to themselves. Over time these individuals retire and pass away. Firms likewise come and go.

Sustainability
The ISS Institute follows the United Nations for Non-Governmental Organisations' definition on sustainability: *"Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".*[6]

Acknowledgements

Trudie Orchard would like to thank the following individuals and organisations who gave generously of their time and their expertise to assist, advise and guide her throughout the Fellowship program.

Awarding Body – International Specialised Skills Institute (ISS Institute)

The International Specialised Skills Institute Inc is an independent, national organisation that for over two decades has worked with Australian governments, industry and education institutions to enable individuals to gain enhanced skills and experience in traditional trades, professions and leading-edge technologies.

At the heart of the ISS Institute are our Fellows. Under the **Overseas Applied Research Fellowship Program** the Fellows travel overseas. Upon their return, they are required to pass on what they have learnt by:

1. Preparing a detailed report for distribution to government departments, industry and educational institutions.
2. Recommending improvements to accredited educational courses.
3. Delivering training activities including workshops, conferences and forums.

Over 180 Australians have received Fellowships, across many industry sectors. In addition, recognised experts from overseas conduct training activities and events. To date, 22 leaders in their field have shared their expertise in Australia.

According to Skills Australia's 'Australian Workforce Futures: A National Workforce Development Strategy 2010':

> Australia requires a highly skilled population to maintain and improve our economic position in the face of increasing global competition, and to have the skills to adapt to the introduction of new technology and rapid change.
>
> International and Australian research indicates we need a deeper level of skills than currently exists in the Australian labour market to lift productivity. We need a workforce in which more people have skills, but also multiple and higher level skills and qualifications. Deepening skills across all occupations is crucial to achieving long-term productivity growth. It also reflects the recent trend for jobs to become more complex and the consequent increased demand for higher level skills. This trend is projected to continue regardless of whether we experience strong or weak economic growth in the future. Future environmental challenges will also create demand for more sustainability related skills across a range of industries and occupations.[7]

In this context, the ISS Institute works with Fellows, industry and government to identify specific skills in Australia that require enhancing, where accredited courses are not available through Australian higher education institutions or other Registered Training Organisations. The Fellows' overseas experience sees them broadening and deepening their own professional practice, which they then share with their peers, industry and government upon their return. This is the focus of the ISS Institute's work.

For further information on our Fellows and our work see http://www.issinstitute.org.au.

Fellowship Sponsor

The Victorian Government, Skills Victoria is responsible for the administration and coordination of programs for the provision of training and further education, adult community education and employment services in Victoria and is a valued sponsor of the ISS Institute. Orchard would like to thank them for providing funding support for this Fellowship.

Supporters

- Dale Carroll, Manager, The Commonwealth Scientific and Industrial Research Organisation (CSIRO), Consulting Services – Materials Science and Engineering
- Keith Cowlishaw, Head of School, School of Fashion and Textiles, Royal Melbourne Institute of Technology (RMIT) University
- Julie Hughes, Quality Assurance Textile Officer, Designworks Clothing Co Pty Ltd
- Jo Kellock, Executive Director, Council of Textiles and Fashion Industries Australia Limited (TFIA)
- Joseph Merola, CEO, International Fibre Centre (IFC), Geelong
- Charles Potter, Managing Director, Time Frame Clothing Pty Ltd

Employer Support

- School of Fashion and Textiles, RMIT University

Organisations Impacted by the Fellowship

Government

- CSIRO – Materials Science and Engineering
- IFC
- Skills Victoria

Industry

- Australian Retailers Association
- Council of Textiles and Fashion Industries of Australia (TFIA)
- Major retailers of imported garments:
  - Country Road Australia
  - Target Australia Pty Ltd
  - Myer Australia
  - Kmart Australia
  - Spotlight Australia
- Other Textile Testing Laboratories:
  - Australian Wool Testing Authority (AWTA)
  - CSIRO – Materials Science and Engineering
- RMIT University – Textile Testing Services
- Technical Textiles and Non-woven Association (TTNA)

Professional Associations

- National Association of Testing Authorities (NATA)
- Society of Dyers and Colourists (SDC)
- Standards Australia – Textile committee members
- The Textile Institute – Southern Section

Education and Training

- Box Hill Institute TAFE
- Gordon Geelong TAFE
- Kangan Batman TAFE
- RMIT University – School of Fashion and Textiles
- Victorian TAFE Institutions:

Community

- Individual consumers

About the Fellow

Name: Trudie Orchard

Employment

- Manager, RMIT Textile Testing Services, School of Fashion and Textiles, RMIT University

Qualifications

- Graduate Diploma Manufacturing Operations (Textiles), RMIT University, 2007
- Full Textile Certificate, New Zealand Textile Industry Training Board, 1985

Professional Organisations

- National Association of Testing Authorities (NATA) Technical Assessor
- Standards Australia Committee member (TX-20 Textiles, TX-09 – Carpets)

Industry Memberships

- Licentiate Member, The Textile Institute

Brief Biography

As the manager of RMIT Textile Testing services, Trudie Orchard has many links to the textile industry, primarily within Australia. She has developed her knowledge over a period of 30 years in New Zealand and Australia.

Her first role as a laboratory technician exposed her to a global icon, the Woolmark symbol, and the international specifications behind that label. The role provided the impetus to study further via a correspondence education program resulting in her obtaining the Full Textile Certificate.

When the New Zealand Wool Board laboratory equipment was relocated to the Wool Research Organisation of New Zealand (WRONZ), Orchard's role included assisting research specialists in all facets of wool textiles, as well as conducting textile tests for the commercial laboratory servicing both the New Zealand Wool board and the New Zealand textile industry.

After two years Orchard took up the position of Quality Control Officer at a vertically integrated woven carpet mill that provided her with a solid overview of carpet production and provided the opportunity to develop her people management skills. After moving to Australia, she took up a similar role in a carpet mill before joining the AWTA. During a period of 15 years she moved roles from supervising non-routine tests for industry clients to developing more efficient workflow systems, to her last position as textile technologist which involved building up strong relationships with industry clients to meet their unique requirements.

Orchard currently leads a team of up to 14 staff in the RMIT Textile Testing Services. The business has seen strong growth in volume of testing and revenue in the past five years. As a NATA accredited laboratory, technical expertise and accuracy are key aspects to this business. During this period the Fellow has seen a significant growth of imported garment testing. Associated with the increase in imported garment evaluation there has been an increase in enquiries regarding international chemical regulations and sustainability issues.

Aims of the Fellowship Program

The planned outcome of the Fellowship program was two-fold. The first aim was to study the European trends in textile assessment for environmental legislation and sustainability and to understand how and what specialist laboratory equipment is required to conduct the assessments. This aim was fulfilled by:

- Appraising the methods called up in European Union (EU) regulations in relation to sustainability of textile materials.
- Visiting laboratories and associated organisations to observe testing techniques.
- Formulating a quantitative-based approach to textile sustainability and to add value to the broad-based understanding of sustainability.

The second general aim of the Fellowship was to compare international apparel quality systems against the current Australian industry requirements. This aim was fulfilled by:

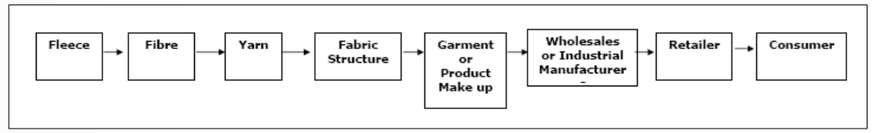
- Analysing the various quality assurance systems applicable to European retail markets by visiting retailers and laboratories to view systems and testing procedures.
- Surveying testing authorities and retailers to ascertain how they collaborate to meet textile material quality and labelling standards specified by EU legislation.
- Evaluating the benefits and limitations of European retail apparel and commercial textile QA systems compared to current systems in Australia.

The Australian Context

A Brief History of the Industry

The continued reviews that took place over the past three decades have led to significant restructuring of the industry. These changes (particularly the removal of protection) have seen a significant reduction in Australian manufacturing and as a consequence an increase in imported TCF goods into Australia.

The industry in the early 1990s can be described as following a standard supply chain schematic with a series of stand-alone sectors.



Standard supply chain schematic

Industry policy in the form of reduced protection led to the closure of much of the early stages of these supply chains. By 2005 most of this restructuring had taken place and there are only a few yarn producers and knitters/weavers left in Australia today. The industry has followed the value-add model that predicts first world TCF countries will exit labour-intensive commodity early-stage production and move towards value adding through brand and innovation.

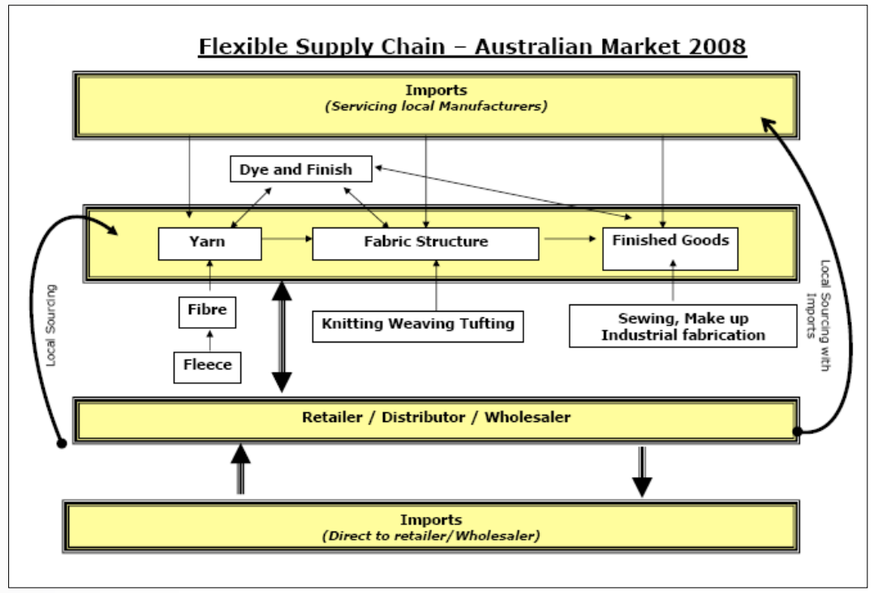


Image taken from Flexible Supply Chain – Australian Market 2008, *Flaneur, Melbourne*

However, the industry is still adapting to significant change, both in terms of offshore cost competition and continuing product and production innovation. Against this environment of high change, the Australian industry is dominated by small and medium sized enterprises with consequent limits to their individual capacity to invest in innovation and change. This fragmented industry structure is central to both near-term responsiveness (through the actions of individual enterprises), but it also restricts concentrated investment in industry-wide collaboration for long-term thinking, research, innovation and change.

Quality control of textiles though testing laboratories has been affected by these structural changes. Whilst we have seen direct manufacturing decline, the volume of textile and clothing product within the market has continued to grow, albeit using imported goods. The major impact on testing laboratories has been the change of customers from manufacturing enterprises to retailers/wholesalers and the relocation of testing to the point of manufacture, such as China. However, there remains an increased market need for local testing and, indeed, a need for Australian testing authorities to be able to provide leadership around testing of raw materials coming into Australia and adapting to changes in testing regimes. The impact of sustainability is an example of a need for textile testing services to provide industry leadership.

The changing international textile markets have brought new challenges to Australian textile testing laboratories. In 2009 the Australian Competition Consumer Commission (ACCC) introduced guidelines for formaldehyde content in textile products. These guidelines were based on the World Health Organisation (WHO) guidelines for the maximum amount of detectable formaldehyde. This recommendation (not mandatory at this stage) was an outcome of testing of imported hotel blankets that were causing some skin disorders on consumers. Other products that The Commonwealth Scientific and Industrial Research Organisation (CSIRO) have conducted tests on include work wear, bed linen, leather and flame retardant clothing.

Subsequent confusion arose as different testing laboratories applied different test methods for the detection of formaldehyde, resulting in misleading test results.

Europe has imposed bans on textile products if they exceed the maximum regulated levels of chemical impurities, such as formaldehyde, heavy metals, pesticides, and asbestos. Oeko-Tex® Standard 100 labelling is one example and now Registration, Evaluation, Authorization and restriction of Chemicals (REACH) is applicable. The two most important aims are to improve the protection of human health and the environment from the hazards of chemicals and to enhance the competitiveness of the EU chemicals industry.

Europe in particular has developed a number of testing regimes aimed at ensuring textiles and related products conform to environmental legislation. These regimes are well established and are being referred to as an overall 'sustainability' approach to textiles and clothing. Globally there has been a growth in the demand for environmentally friendly textiles. Australia is well behind the international legislation in this area.

As Australia moves deeper into the global markets for textiles the demand for application of international specifications and testing regimes will be required. We need to develop knowledge of European and USA requirements by visiting and encouraging open discussion.

Some retailers in Australia have developed their own set of minimum performance criteria for fabrics and garments but appear to have selected tests at random due to a lack of knowledge or understanding. Some garments are subject to government mandatory safety regulations, such as children's nightwear and limited daywear, but no such scheme has been introduced to cover content of harmful substances.

A recent review 'Building Innovation Capacity review of the Australian Textile, Clothing and Footwear Industries 2009'[8] by Professor Roy Green resulted in a series of recommendations to encourage the industry to become more dynamic and competitive. The following two recommendations highlight some of the issues raised earlier in this report:

"TCF review recommendation 7: 'Operation criteria for the TCF ICP should be developed by the Australian Government on advise from the TCF Innovation Council in the following categories: (1) innovation, research and design capacity; (2) collaboration, networks and supply chain participation; (3) accessing global market opportunities: (4) new business models and strategic repositioning; (5) high performance work and management systems; (education, skills and employment services; and (7) environmentally sustainable and ethical practices')."

"TCF review recommendation 9: 'A new Australian Ethical Quality Mark should be devised, with a budget allocation of $8 million, to reflect the incorporation of defined ethical standards relating to labour conditions, animal welfare and environmental sustainability in TCF production and supply chains. This will enhance consumer choice and confer competitive advantage on firms that achieve certification'."

The Australian emphasis on sustainability relating to energy, water and non-renewable resources and carbon monitoring now need to take into account how textiles can be quantitatively measured. This Fellowship will provide the opportunity to review the international (European approach) to assessing textiles for sustainability quantitatively.

SWOT Analysis

Strengths

- Internationally accredited testing laboratory
- Sustainability captured in RMIT study programs
- Willingness to learn and adapt knowledge
- Sustainability/Research laboratory on site
- Quality focused approach by major retailers
- Willingness to adapt new test methods when appropriate
- Accredited commercial testing laboratories in Australia

Weaknesses

- Lack of collaboration between industry and research
- Limited knowledge of international testing practices
- No current system for verifying textile product sustainability quantitatively
- No legislation for sustainability
- No push from retailers – not seen as important
- Inconsistent quality requirements for similar level products
- Inappropriate test methods currently included in specifications
- Out-of-date test methods currently included in specifications
- Excessive or under testing

Opportunities

- Adapt international methods of sustainability analysis in Australia
- Develop links with international textile labelling and testing authorities
- Develop a quantitative approach to textiles sustainability e.g. 'green label'
- Product life cycle analysis
- Include sustainable testing regimes
- Develop a 'green label' for verifiable promotion of green textiles

Threats

- Global markets unattainable due to lack of certification
- Lack of certification, leading to misleading promotion of sustainable textiles
- Ignorance of international chemical regulations
- Retailer suppliers confused regarding regulations

Australia has established networks within education and training providers, and industry connections, but, historically, the TCF industries have been reluctant to collaborate. An independent body/ organisation would be well placed to facilitate such collaboration.

The industry needs to invest in capital and skilled personnel in research and technology to provide a competitive edge as called up in the 'Building Innovation Capacity review of the Australian Textile, Clothing and Footwear industries 2009'.

Identifying the Skills Deficiencies

Definition of Skills Deficiencies

As already established, a skill deficiency is where a demand for labour has not been recognised and where accredited courses are not available through Australian higher education institutions. This demand is met where skills and knowledge are acquired on-the-job, gleaned from published material, or from working and/or study overseas. This is the key area targeted by ISS Institute.

Defining the Skills Deficiencies

This Fellowship has provided an opportunity for knowledge to be shared on how to improve current skills through the development of testing and legislation in Europe. The following activities were undertaken during the Fellowship to gain the necessary skills, knowledge and underpinning insights to enable change:

(1) Investigate and Analyse systems and methods of evaluating sustainability of textile materials in the European marketplace

- Become knowledgeable about the European regulations and applicable test methods for evaluating sustainability of textile materials in the Australian market.
- Appraise the methods required by European requirements to determine sustainability of textile materials.

  Aim: to develop an understanding of instrumental evaluation used in sustainability testing laboratories.

(2) Understand the relationship between textile environmental legalisation and textile testing providers.

- Survey testing authorities/retailers to determine how they work together to meet quality standards on textile materials as specified by the EU.

  Aim: to gain knowledge of international textile environmental legalisation and assess the impact of those policies on Australian suppliers and laboratories.

(3) Become skilled and knowledgeable in European-based quality assurance systems and the procedures of textile evaluation used in local and competitive overseas markets, such as Oeko-Tex® Standard 100.

- Analyse the various quality assurance/control systems applied to European retail markets by visiting both retailers and laboratories.

  Aim: to gain knowledge of current test systems/methods utilised in European textile evaluation systems.

(4) Compare Australian and European retail garment and fabric quality assurance systems.

- Evaluate the benefits and limitations of European retail apparel and commercial textile QA systems.
- Compare the current European systems to the existing systems in Australia in order to identify weaknesses requiring attention.

  Aim: to gain knowledge of EU quality assurance systems to identify the limitations of the existing Australian systems so that appropriate recommendations for improvement can be made.

(5) Build links with European textile testing institutions and appraise relationships between apparel retail suppliers and testing authorities.

- Survey testing authorities and retailers to ascertain how they collaborate to meet textile material quality standards specified by EU legislation.

  Aim: to derive a detailed understanding of the relationship between retail suppliers and textile testing authorities in the European marketplace.

The global textile industry restructuring that has taken place over the past 30 years has developed the ongoing need to become knowledgeable in sustainability and in particular textile sustainability analysis. Whilst there is a recognised need for Australian textile testing services to provide industry leadership for the increasing level of imported raw and manufactured materials, a certain amount of apathy still exists in the local industry.

As Australia moves further into the global textile market, it needs to draw on the knowledge of overseas institutions and progressive governments' sustainability policies in relation to textile manufacture and production to assess the benefits of their application within Australia. The current climate change and carbon credit debate highlights the emphasis on proper sustainability assessment. It is expected that this emphasis will flow through to the textile industry. This is recognised as an area of skills weakness.

By researching and conducting interviews with the leading organisations overseas that have addressed this question, the information can be collated, reviewed, analysed and distributed to organisations and educational institutions that will benefit from such knowledge. This information can be relayed to Australian importers to develop understanding of international environmental labelling to promote testing in the Australian marketplace.

Exporters will have the opportunity to meet the international regulations if testing is offered within Australian textile laboratories. Lack of this information and, therefore, skills, leads to lost opportunities.

Nationally Accredited Courses

Currently there are no nationally accredited courses that cover sustainability of textiles. Nor is there any nationally accredited course that covers apparel quality testing systems.

Recommendations have been made in the 'Recommendations' Chapter of this report regarding the introduction of such units/modules into appropriate courses within the Australian TAFE system.

The International Experience

The study tour was structured so that the Fellow could visit both European commercial testing laboratories and retailers to gain knowledge on how both aspects of the market operated and how they worked together to meet internal, European and international textile regulations.

By reviewing the European approach to textile sustainability in laboratories, major apparel retailers and associated industry associations the Fellow was able develop a European perspective on textile apparel sustainability.

Destination: Australian Wool Innovation (AWI)

Location

Biella, Italy

Contact

Pier Giorgio Minazio, Country Manager, Italy

Objective

The objective was to develop knowledge of how the Woolmark labelling scheme links in with retailers.

Left: Pier Giorgio Minazio (AWI) and Trudie Orchard. Image courtesy of AWI.

Outcomes

The Woolmark[9] symbol is synonymous with quality and durability. Since the 1950s the label has been one of the most recognised symbols worldwide. This laboratory is one of three main laboratories worldwide (the other two are located Australia and China) that conduct a comprehensive range of tests required to ensure the licensed products meet the minimum requirements. Pier Giorgio Minazio explained that the licensees' apparel programs include knitted apparel, merino extra fine and Australian merino. In addition, Woolmark licensing includes details on detergents, softeners, bleaches moth-proofing products and stain removers.

This laboratory is part of the process of marketing wool to ensure it is fit for purpose. Equipment moved from the Ilkley laboratory in the United Kingdom (UK) into the Biella facility has provided an opportunity to broaden the range of tests to encompass the wider textile industry, and in doing so, provide additional commercial income. As well as conducting more than 10,000 Woolmark licensee tests per annum, this laboratory manufactures reference fabrics for washing machine performance analysis.

The laboratory now conducts tests for retailer customers such as Zegna and non-woolmark industry segments such as defence departments. The Australian-developed CSIRO 'Siro_FAST' system of analysing fabrics is applied to lightweight fabrics by companies that must meet reduced turnaround times for retailers. Zegna rely on this information to make rapid decisions regarding fabric finishing.

AWI has embraced sustainability by including the assessment of domestic washing machines for dimensional stability and cleaning efficiency. When results meet dimensional stability and appearance requirements, the licensee may label the machine with an approval plaque indicating Silver, Gold or Platinum level. Note: in 2010 AWI decided to discontinue the Gold and Platinum sub-brand for washing machines and dryers and offer them through a new 'premium' tier. Tumble dryers also have a Silver level plaque.

Minazio remarked that the high profile positioning of the Woolmark symbol has provided an opportunity to expand but there are also challenges for AWI. In the current climate of reducing the impact on the environment, the most pressing challenge is the need to find an alternative to Chlorine, which is used in the pre-treatment for shrink-proof garments allowing a machine washable care label. European regulations for AOX (Absorbable Organic Halogens) are restricting the use of this process.

Water spotting test conducted at AWI. Image courtesy of the Fellow.

Destination: Crespi 1797 SpA

Location

Novara, Italy

Contacts

- Federico Quario, Sales Manager
- Francesca Crespi, Owner

Objectives

The objectives were to review linen processing and ascertain how this international supplier of high quality linen and cotton fabrics manages textile sustainability issues.

Outcomes

Crespi 1797 SpA is the second oldest textile company in Italy and a member of a 200-year-old textile association. The business is owned by an eighth-generation member of the Crespi family.

Linen weaving loom at Crespi 1797. Image courtesy of the Fellow.

Federico Quario (Crespi 1797) in weaving area. Image courtesy of the Fellow.

Linen fibre is sourced from France, Holland and Belgium and yarn is spun in Asia, Eastern Europe and is due to be sourced from Northern Africa in the future.

The on-site visit included a factory tour that reinforced why high quality linen cloth demands premium prices. The process can take up to three weeks to produce as it incorporates many wet treatments (such as pre-treatment, bleaching, or dyeing). At each wet treatment stage the fabric is wet out and rotated on a beam for up to 24 hours to distribute the moisture evenly throughout the roll. This ensures even take-up of dyestuffs. The premium linen and linen blend fabrics manufactured and finished on site are exported worldwide.

Federico Quario explained that Crespi 1797 SpA is proud of their history of sustainability in the form of hydro-electric power plants owned by the company that are certified as ‘Zero Emission’. Energy not required for fabric procession is sold back to the grid. In addition, their organic collection of fabrics is certified by the Global Organic Textile Standard (GOTS).

A small range of production testing is conducted on site (e.g. pH) as the company outsources testing to a local testing house Centro Tessile Cotoniero e Abbigliamento SpA (CTC) for the international marketplace. Both Chinese and American regulations must be met before further importing into either country – China for garment manufacture and America for sale.

Crespi 1797 SpA is proud of its heritage and tends to operate independently from textile associations that could reduce the prestige that the Crespi name has built up over the generations.

Supply of Reference fabrics at Crespi 1797 SpA. Image courtesy of the Fellow.

Close-up of linen fabric undergoing wet treatment at Crespi 1797 SpA. Image courtesy of the Fellow.

Rolls of sealed Linen fabric undergoing wet treatment at Crespi 1797 SpA. Image courtesy of the Fellow.

Destination: Sistema Moda Italia (SMI)

Location

Milan, Italy

Contact

Dr Guido Bottini, Technological Department

Objective

The objective was to meet with Dr Bottini to discuss how SMI works with the Italian textile industry to promote Italian fabrics to the world.

Outcomes

SMI is part of the European Federation of Textile and Clothing (Euratex[10]). Euratex has the role of promoting and protecting the interests of the textile industry – primarily the manufacturers, by representing the industry in institutions, governments and business organisations. SMI assists the textile industry by providing technical, legal, economic and commercial problem-solving support.

SMI members are manufacturers, fibre producers, weavers and finishers who pay a joining fee based on annual turnover. Retailers are not current members – they have their own trade association.

The main activities of SMI are to:

- *"Assist the industry in defining commercial and industrial strategy, which takes into account the International Trade Regulatory framework, the WTO Negotiations, the Bilateral Trade Agreements and the EU Internal Markets provisions.*
- *Voice the T&C Industry positions to the European Commission, European Parliament and Member States.*
- *Provide information on a regular basis to Euratex members about the latest developments on EU/ International Trade Policy and EU Internal Market decisions with potential impact on companies strategies: trade agreements, market access problems, WTO provisions implementation, rules of origin, state aids.*
- *Coordinate joint actions and efforts with the national and branch members.*
- *Establish potential Partnership Agreements with organisations outside the sector or with third countries industries and sectors whenever positive synergies can be accomplished."* [11]

Dr Bottini advised that the EU has asked SMI to develop a strategy for textile sustainability in Italy by:

(a) Reviewing the energy and resources used in production.

(b) Setting the criteria for sustainable fibres.

(c) Developing strong relationships with the produces.

(d) Working with retailers and in turn the consumers.

Members of SMI benefit from a reduced testing fee when they test at CTC, an independent laboratory certified to conduct the series of tests called up in Oeko-Tex® Standard 100.[12] Whilst the Oeko-Tex® Standard 100 testing is not mandatory, suppliers are committing to it to ensure their garments do not contain harmful chemicals.

SMI members also benefit as they do not pay Ginetex[13] (the international association for textile care labelling) for the use of care labelling symbols on garments. It should be noted that it is not mandatory for all garment producers to have symbols attached to their garments and fabrics, but if they are applied a commission is paid to Ginetex.

Dr Bottini explained that not all the test methods are available in the public domain and SMI would prefer that laboratories were mutually recognised for the performance of recognised test methods (as is the case for NATA accredited laboratories). A body is to be set up by SMI to advise the Italian Health Minister on sampling plans and controlling test methods and is likely to be based in Biella.

The main challenge facing SMI members is REACH. This legislation requires companies in Europe to register the chemicals they import into Europe. Currently there are 33 chemicals that must be registered and the list will grow to over 100 in 2011. In addition to registering the chemicals with the European Chemicals Agency (ECHA) they must also inform the customers if the textiles contain any of the listed substances. Included in the list are chemicals of 'very high concern'. REACH has not yet started audits in the field of textiles but is known to have conducted investigations and to have fined companies in the health product field.

As a result of this legislation, each retailer has developed their own list of restricted substances. The various Restrictive Substances Lists (RSLs) provide a problem for the retail suppliers and further discussion will occur between these retailers and suppliers on the issues faced and the need for training and rigorous auditing of suppliers.

Destination: Centro Tessile Cotoniero e Abbigliamento SpA (CTC)

Location

Busto Arsizio, Italy

Contact

Marta Lualdi, International Department

Objective

The objective was to review the methods and apparatus used in evaluation of textiles for textile sustainability, Oeko-Tex® Standard 100, and retailer Restrictive Substances Lists (RSLs).

Left: Marta Luandi (Centro Tessile Cotonierio). Image courtesy of the Fellow.

Outcomes

Established in 1987, CTC's mission is to provide a central technological centre for textile and clothing sector companies. The English translation is Central Textile Cotton and Garment Centre.

Apart from the textile testing laboratory, CTC offers the following services:

- Certifications and marks
- Research and technological development programs
- Technological transfer activities
- Specialist training services
- Consultancy services
- Internationalisation services.

The laboratory services include conducting tests for Oeko-Tex® Standard 100, Ecolabel, CE mark for personal protective equipment, calibration of colour measuring equipment for SIT (Italian Calibration Service) Certification.

The laboratory has a range of over 1200 tests, of which approximately 300 are accredited. The main income source is testing textiles against Oeko-Tex® Standard 100 requirements. The USA has accredited CTC for both ecological and flammability testing.

The comprehensive tour included both chemical and physical testing areas. The laboratory has a range of analytical techniques for determining the presence and amount of harmful substances as called up by Oeko-Tex® Standard 100 or the retailer's RSL. The equipment is extremely specialised and assessment is based on considerable experience in analytical analysis. Analytical techniques include both gas chromatography and liquid chromatography. The Oeko-Tex® Standard 100 certification testing is governed by strict adherence to sample preparation, equipment calibration, round trials between certified laboratories and marketplace spot checking.

Marta Lualdi explained that the Azoic dyestuffs that may be found in polyester carriers and phalates can cause foetal problems and are found in PVC and buttons. Phalates make the PVC smooth and soft. Most countries and some retailers have their own series of regulations and it is Luindi's role to keep abreast of the Chinese, Russian, Korean, USA, and other regulations for textiles. Australia is not the only developed country in the world that is behind Europe in developing and recognising the need to reduce harmful stances in textiles. REACH is continually assessing and reviewing tests to add.

Customers include defence departments, police departments and department stores such as Benneton, Gucci and Coin. The Italian customs department rely on CTC's laboratory to audit articles of clothing imported into Italy as directed by the Chamber of Commerce.

CTC has also worked with the Italian Textile Fashion association (ITF) to develop a 'Made in Italy' label. Eighty companies now have the label, which incorporates around 300 components. The process is verification of component supply.

Their main competitors are Intertec (based in Florence) and a laboratory based in Como – Centro Tessile Serico; however, Centro Tessile Serico does not include environmental testing, which is the main series of tests conducted at CTC. In order to expand the services to the source of the majority of textiles CTC proposed to introduce a testing service in China. Unfortunately, an international laboratory based in China offered a more competitive price structure that rendered CTC's proposed laboratory uneconomic.

Lualdi believes image plays a key role in keeping the retailers honest and stops retailer 'green-washing' claims of sustainability. 'Green-washing' is a term used by companies to promote a misleading perception that the product is sustainable or environmentally friendly. Retailers acknowledge that the increased consumer demand for eco-labelling is based on a greater awareness of the effects of chemical substances in textiles.

Hydro-extraction of test samples at Centro Tessile Cotonierio. Image courtesy of the Fellow.

Colourfastness test specimens drying at Centro Tessile Cotonierio. Image courtesy of the Fellow.

Destination: Benetton

Location

Ponzano, Treviso, Italy

Contacts

- Biagio Charolanza, CEO
- Fabio Sartori, Operations Director
- Riccardo Del Pol, Quality & Process Assurance
- Flavio Simonette, Quality Manager – Benind
- Pietro Pin, Material Research and Development Manager, Bencom

Objective

The objective was to develop knowledge of the relationship between the Benetton organisation and testing laboratories.

Benetton headquarters, Villa Minelli. Image courtesy of the Fellow.

Trudie Orchard, Flavio Simonetti, Riccardo De pol and Pietro Pin. Image courtesy of Benetton.

Outcomes

This visit provided an opportunity to view how a long established retailer and manufacturer manages the demands of current regulations. Benetton has a strong quality team who were very open and welcoming.

The focus of Benetton has changed considerably from wool. Today only 20 million units out of approximately 150 million units are wool. Fifty per cent of garments are now sourced from Europe (North Africa, Croatia and Romania) and the remaining from Asia (Hong Kong, China, Cambodia and now India). Africa is likely to be the next source country due to increased production costs in China.

Logistics are an issue at Benetton as they cannot afford to produce in Italy anymore and importing and shipping costs are increasing. Quality has a strong focus and the team must keep abreast of the American, Asian and European regulations. This means more money is spent on quality than in the past, yet Benetton cannot risk increasing their prices significantly due to the global economic situation.

Benetton has the same problem as Australian retailers and suppliers – the need to be aware of and keep abreast of international textile chemical regulations. In order to meet their high quality focus, Benetton conduct their own internal audits or arrange for Intertec or SGS to audit them. This includes social responsibility audits.

They have a strong focus on training suppliers to work in a safe way. For example, when using specific dyes they train dyers not to cross contaminate dyestuffs by using different scoops for different dyestuffs.

It was interesting to learn that whilst Benetton requests checking against Oeko-Tex® Standard 100 regulations and makes a point to verify all Oeko-Tex® Standard 100 certificates with the delivery of goods, they do not use the Oeko-Tex® Standard 100 label as it is expensive.

Whilst they want to be sure the product is chemical free, they feel this additional label distracts from the Benetton label with no marketing advantage.

Destination: Gruppo Coin SpA

Location

Mestre, Italy

Contact

Giordano Artuzzi, Quality Assurance Department Manager

Objective

The objective was to develop an understanding of the relationship between Gruppo Coin SpA (Coin) and testing laboratories.

Outcomes

As a sub-committee member of an organisation that contributes to the development of ISO standards, Giordano Artuzzi understands the need for regulation and adherence to strict testing protocol. Coin requires that testing laboratories in Italy are members of System Italiano Nazionale Accreditamento Di Laboratri (SINAL), an association equivalent to NATA in Australia. Other laboratories used by suppliers must be ISO 17025 accredited such as Intertek in Florence.

In addition to supplying apparel to the local market, Coin exports to America and China, sourcing 25% of fabrics from Italy and 60–70% of fabrics from China, India and Taiwan. As with Benetton, Coin has found the biggest issue with sourcing from these regions is the need to train the supplier to understand the regulations. Emphasis in this area has increased significantly in the past two years.

Initially Coin accepted signed documents that stated the goods did not have any harmful substances, however, this is no longer acceptable. Coin has developed a package of tests that incorporate the requirements of China, India and the EU regulations. There is a greater emphasis placed by Coin on the chemical tests for adherence to their RSL. If a component fails the chemical test, the whole order must be replaced by the supplier.

At Coin Oeko-Tex® Standard 100 labels are applied to children's wear only as Artuzzi believes that only 20% of Italians understand or require Oeko-Tex® Standard 100 labelling so it is not as important for Coin at this stage. In addition the quantity of labels in the marketplace is confusing for consumers.

Coin is concentrating on the requirements set out by REACH as new chemicals are being introduced into the regulations. Coin is a retailer not dissimilar to the large Australian retailers, that also stocks and sells many non-textile products that may include chemicals outlined in the substances list put together by REACH.

Destination: Hohenstein Institute

Location

Boennigheim, Germany

Contacts

- Professor Dr Stefan Mecheels, CEO
- Elisabeth Weisheit, Head of Test Centre Oeko-Tex® Standard 100
- Hans-Peter Fleischmann, Head of Sales Department

Objective

The objective was to review the methods and apparatus used in the evaluation of textile sustainability, Oeko-Tex® Standard 100 standards, and retailer RSL.

Bank of front loading washing machines at Hohenstein Institute. Image courtesy of the Fellow.

Outcomes

The Hohenstein Institute is one of two institutes that are responsible for developing the Oeko-Tex® Standard 100 label, now the most widely accepted labelling for ensuring substances harmful to humans are not found on textiles. The Oeko-Tex® Standard 100 RSL has formed the basis for most of the European and international RSLs.

With 320 staff based in Germany and 120 overseas staff only five per cent of Hohenstein Institute's income is based on research. The remaining 95% is derived from testing for harmful substances listed by REACH, retailer and supplier RSL testing and Oeko-Tex® Standard 100. Whilst Oeko-Tex® Standard 100 covers most of the harmful substances, requirements between EU countries and retailers will differ.

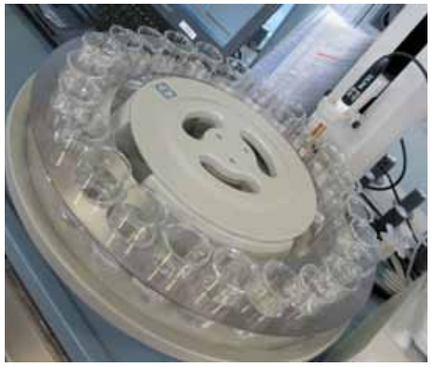
The initial demand for harmful substance testing came from consumers. Now the two strongest (low cost) German retailers, Aldi and Lidl, require Oeko-Tex® Standard 100. Lidl stores are present in 25 European countries. The current regulations set out by REACH will soon include over 100 chemicals, which are Substances of Very High Concern (SVHC).

As part of the regulations put out by REACH, the EU has made it mandatory for companies to register with the ECHA.

It is important to note that, *"…the harmful substances within the context of the Oeko-Tex® Standard 100 standard refer to substances which may be present in a textile product or accessory and exceed a maximum amount or which evolve during normal and prescribed use and exceed a maximum amount, and which may have some kind of effect on people during normal and prescribed use and may, according to current scientific knowledge, be injurious to human health".*[14]

"The mark, 'Confidence in Textiles - Tested for harmful substances according to Oeko-Tex® Standard 100' is not a quality label. The mark relates only to the as-produced state of the textile and says nothing about other properties of the product such as e.g. fitness for use, reaction to cleaning processes, physiological behaviors in respect of clothing, properties relating to use in buildings, burning behaviour etc. Furthermore the mark does not declare anything regarding other quality or legal aspects, such as product safety, and other characteristics (construction, cords, electrical wiring)." [15]

Sample extraction prior to chemical analysis testing at Hohenstein Institute. Image courtesy of the Fellow.



PH testing at Hohenstein Institute. Image courtesy of the Fellow.

The documented testing regime ensures each sample is compared against reference samples of known concentration. A calibration check is conducted before each sample even though Oeko-Tex® Standard 100 only requires a calibration check once each day. Multiple colours may be tested together; however, sometimes each colour must be retested individually. For example, if 8 ppm (parts per million) is detected on four colours (maximum individual colour requirement is 30 ppm), each must be retested individually.

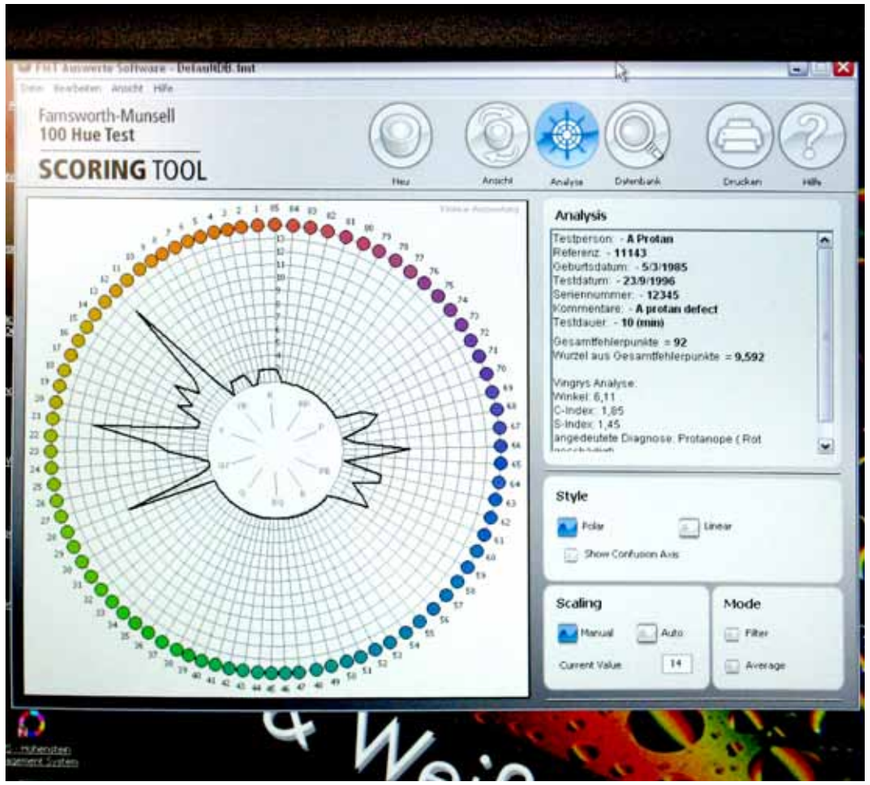
Hans-Peter Flecischmann, who conducted a tour of the facilities, explained that the Hohenstein Institute is part of a group of organisations that want to promote Oeko-Tex® Standard 100 as the foremost label for textile confidence in the world. Hohenstein Institute plan to have a laboratory in China by 2011 with all German staff to test the most critical chemicals—Azo dyestuffs, pH, and other allergic substances.

The chemical laboratory housing the High-Performance Liquid Chromatography (HPLC) analytical equipment has a temperature and humidity controlled atmosphere, with 7,000 cubic metre airflow per hour and glass panels between each laboratory bench to reduce contamination without sacrificing visibility.

Other areas of work conducted at the institute included compression testing of medical socks, compliance testing for quality labels for bedding, laundries, Ultra Violet (UV) protection, personal protective clothing, sleeping bags and flammability tests.

A close-up of the permeable membrane on sweating guarded hotplate at Hohenstein Institute. Image courtesy of the Fellow.

Colour aptitude test kit at Hohenstein Institute. Image courtesy of the Fellow.



Data summary of Colour aptitude at Hohenstein Institute. Image courtesy of the Fellow.

Destination: Swerea IVF

Location

Molndal, Sweden

Contacts

- Stefan Posner, Director Energy and Environment
- Anna Karin Jonbrink, Manager, Energy & Environment
- Anne-Charlotte Hanning, Manager, Testing, Analysis & Certification
- Simonetta Granella, Textile Engineer, Comfort

Objective

The objective was to review the methods and apparatus used in the evaluation of textile sustainability, Oeko-Tex® Standard 100, and retailer RSL.

Outcomes

Swerea IVF is part of the Swerea Group of Research and Development institutes, which encompass industrial manufacturing, environmental energy and materials and technology. The materials and technology development area has a team of staff dedicated to working with all facets of the textile supply chain.

Dr Posner explained that environmental issues in the Nordic countries are driven by consumers. Requests for textile testing may come from community authorities for example the Swedish environmental authority or Swedish chemical inspection authority.

Dr Posner explained the philosophy behind REACH and it's regulations to the Fellow. He explained that by knowing the amount of chemicals and their intrinsic properties, the authorities can assess the level of exposure and emissions to the environment. If companies import more than 1,000 tonnes of a substance, they must provide basic data and put together a dossier in standard form on these chemicals so REACH can influence companies to consider which chemicals they want to use.

Companies can register the chemicals at ECHA based in Helsinki and ECHA verifies the data and issues a registration number. The receiver of chemicals or goods containing chemicals can be fined if information is not provided within 30 days from receipt.

Swerea IVF has developed a user-pays database that allows clients access to more information about particular chemicals. A combination search of 'cotton' plus 'pesticides' resulted in a list of 58 chemicals. The follow explanation is sourced from their website:

"In contrast to most other chemical databases it does not demand of the user to know the exact substances names or CAS [Chemical Abstracts Service] registry numbers. The substances are sorted by the function they add to a product, which materials they can be used in, which processes they are used in etc. and can be search for this way. The information is based on observations made in literature and in the industry among the users of chemicals.

The database contains information about test methods, alternatives, legal restrictions, restrictions in voluntary committments such as Oeko-Tex std 100 etc. and also information related to the new chemicals legislation REACH, e.g. which substances that are pre-registered, on the candidate list and much more." [16]

Dr Posner suggested that there are a number of factors when choosing the right chemicals in the textile industry, such as the purity of a substance. He gave the example of rubber, which is quite pure, whereas a synthetic polymer may have 15 to 20 additives, plus subsequent treatments that may result in hundreds of harmful substance issues. Dr Posner suggests that it is important to consider whether the chemical is in a harmful state, rather than just the presence of a chemical i.e. to separate the impurity from the functionality. For example, formaldehyde is found in various forms and concentrations. The determination of the actual percentage of harmful formaldehyde present is more critical than the fact that it is present as, over time, the percentage will reduce due to the ageing process.

A comprehensive tour of all the facilities was conducted by the Fellow, this included the common tests conducted on textiles; the comfort analysis of furniture and mattresses, for spread of pressure, moisture and heat; research work on the bacteria in rinse water of washing machines (the aim was to reduce washing temperatures to less than 60 degrees Celsius); detergent performance for labelling (Nordic Swan labels) and research on the performance of resistance to knife stabbing.

The chemical analysis process may be explained as follows: Chemical analysis of textile takes the same basic process whether the testing is for Oeko-Tex® 100, government authorities or retailers. The sample must be received in a state that does not contaminate the sample. For example Swerea IVF laboratory required samples to be double wrapped in foil. The sample is extracted, a minute amount of extraction is sub-sampled and this substance is forced through a wire column in a gradual process which can take up to half an hour. The gas heat-vaporises the substances. A Mass spectrometer provides a read-out of peaks that indicate substance. Significant skill is required to correctly interpret the data.

For Dr Posner, the greatest issue is developing repeatable and reliable methods in order to validate data. Where no official standard test method exists, critical information must be reported so that the results can be interpreted accurately and are meaningful. This information includes, but is not limited to, information regarding sample preparation (e.g. weight, size, extraction procedure), instrumental performance (e.g. detection limits, standard deviation in analytical results), clear calculations (e.g. Converting from g/kg to ug/m2) and the detection limit of the instruments (i.e. < 'x' mg/kg, not n/d).

Analytical chemist holding column used in Fourier Transform Infrared (FTIR) Spectroscopy chemical analysis. Image courtesy of the Fellow.

Destination: Björnkläder

Location

Hisings Backa, Sweden

Contact

Elisabeth Linden, Quality and Environmental Manager

Objective

The objective was to review how a work wear supplier and retailer manage the regulations imposed by the EU.

Elisabeth Linden at Björnkläder. Note the protective clothing on display on the wall. Image courtesy of the Fellow.

Outcomes

This company is the second largest retailer of work wear, with 24 stores in Sweden. Björnkläder, which translates to 'Bear Clothes', employs around 185 staff in Sweden (with 60 to 70 in the warehouse and head office). Founded on the laundry industry, Björnkläder's main income is from specialist companies who sew, launder and mend uniforms.

Elisabeth Linden explained that Björnkläder must adhere to the strict safety and environmental testing required in their major markets—electricity, pulp, auto-parts, mines, aluminium smelters and marine equipment. Garments were traditionally sourced from Italy, Northern Europe and England but, due to increased labour costs in these countries, the garments are now sourced from China and Vietnam. However, the transport logistics associated with sourcing internationally adds a further complexity to the business.

In terms of harmful substance labelling, Oeko-Tex® Standard 100 is applicable to a limited range of garments due to the multiple components found in many garments for work wear. As found in many Nordic countries, the Swedish have a strong history of addressing environmental issues and encouraging environmental sustainability. Linden pointed out that environmental standards such as ISO 14000 Environmental ensure that a companies comply with local laws but these standards are not internationally prescriptive.

In 2008 Björnkläder became a member of the Business Social Compliance Initiative (BSCI),[17] BSCI offers a comprehensive monitoring and qualification system covering all products sourced from any country worldwide. In order to encourage suppliers to be part of BSCI, the member organisations commit to pay for part of the process when their suppliers sign an agreement to conduct a self-assessment and a pre-audit prior to becoming an accredited supplier. The next step is for an external assessor to conduct an audit and grade – acceptable or not. The BSCI has a database shared by its members, and the 'approved' companies can be sourced from this database.

An American standard (SA 8000) developed and overseen by SAI (Social Accountability International[18]), this initiative is an alternative approach but the difference is that the companies that supply the customer do not hold a certificate.

In a discussion with the Fellow regarding the issues facing the work wear industry, Linden agreed with the Swerea IVF approach used to determine which chemicals are used in production and their effects on the environment. Linden believes there are too many symbols in the marketplace and that consumers are overwhelmed or confused. For Björnkläder, there are not many chemicals used in the limited range of textiles they imported so achieving the objectives set out by REACH is not difficult for them. As a retailer, they have a RSL and can prove (by testing) that harmful chemicals are not present. Linden pointed out that not all chemicals listed by REACH have a specific test method, therefore, the supplier needs to request specific information be provided on the test report, e.g. sample preparation, apparatus used, units tested.

When setting up a new supplier Björnkläder sends out two major documents: the BSCI and a chemical restriction list. In addition a fabric sample is tested in their on-site laboratory against the suppliers' specification. Often a supplier is rejected because a basic test, such as weight, does not meet the specification. As Linden points out, *"If a supplier cannot meet that basic requirement, how can they approach meeting chemical restrictions?"*

Retro-reflective safety garments on display at Björnkläder. Image courtesy of the Fellow.

Destination: NEXT

Location

Liecester, United Kingdom

Contacts

- Joanne Poyner, Product Legislation & Environmental Manager
- Dr Philippa Dalton, Product legislation & Environment

Objective

The objective was to develop an understanding of the relationship between NEXT, textile testing laboratories and EU regulations.

Outcomes

NEXT was established in 1982, starting out as a women's wear supplier and adding children's wear in the late 1980s. Today a significant amount of merchandise is purchased via their website.

NEXT accredits their suppliers' laboratories and conducts round trial testing to ensure each laboratory obtains the same results. They have the advantage of access to an unlimited supply of reference fabrics for the purpose of round trials. In addition to suppliers' laboratories they have nominated Intertec and SGS for external testing.

In order to meet regulatory requirements NEXT meets with community bodies (e.g. UK trading standards based in Leicester) on a quarterly basis to discuss issues and new products. NEXT's RSL is based on Oeko-Tex® Standard 100; however, if a supplier provides an Oeko-Tex® Standard 100 test certificate, it can be verified online to speed up compliance processes.

Safety of children's wear is a key issue for this company. The website Rapid Alert Program Exchange (RAPEX[19]) provides a valuable source of information on items that do not meet regulations in Europe. The majority of non-compliances are toys but often garments are found with excessive harmful chemicals. NEXT also works closely with REACH to ensure compliance.

Joanne Poyner, Trudie Orchard and Rod Goldberg at NEXT. Image courtesy of NEXT.

Destination: Speedo International Ltd

Location

Nottingham, UK

Contact

Rebecca Bennett, Materials Development Manager

Objective

The objective was to develop an understanding of the relationship between Speedo and textile testing laboratories.

Outcomes

'Speedo' is a brand name familiar to all Australians. It is now a subsidiary of Pentland Group Pty Ltd, UK. At the time of the Fellow's visit the premises was being vacated and as the staff were in the final stage of moving premises the meeting was restricted to a brief discussion.

Rebecca Bennett explained the development process in terms of sustainability. Speedo International is constantly seeking improvement in order to have a competitive edge in the marketplace. Fabric sourcing, development and testing forms an integral part of the process. Once a brief has been created the product development commences, incorporating commercialisation, evaluation and specifying fabric, before fabric performance testing. Most tests are developed in conjunction with a local university then outsourced to testing facilities such as, Specialised Technology Resources, UK Ltd (STR) or British Textile Technology group (BTTG). Common tests conducted by these facilities include strength and modulus, tensile strength, weight, width, and colourfastness to chlorine. However Speedo International considers the real test to occur when athletes wear the garment hour after hour whilst training. Wear trials of four hours a day, over 10 days provide valuable data on how the fabric and garment performs.

Destination: Society of Dyers and Colourists (SDC) 2010 Conference: Wool – the Cloth of Kings

Location

London, UK

Speaker

Peter Duffield, Global Textile Association

Objectives

The Fellow attended the conference to meet with representatives of the textile supply chain in the UK to derive an understanding of the relationship between retail suppliers and textile testing authorities in the European marketplace.

Outcomes

The conference speakers represented a wide range of speakers, with a diverse range of subjects from wool marketing to the future of fashion.

Peter Duffield delivered a presentation focusing on the wool perspective, however, he reinforced the conviction that there are too many labels in the marketplace and consumers are confused. There are two main streams of labelling: environmental standards and human ecology standards.

British retailers' have adopted Oeko-Tex® Standard 100 because it deals with human ecology i.e. directly affecting humans but Oeko-Tex® Standard 100 does not address the environmental issues associated with textile/garment production.

Oeko-Tex® Standard 1000 is one of many other labels that address environmental issues. The European ecology label, 'the flower', is the outcome of an amalgamation of a number of environmental labels. There is currently no universally adopted organic standard however GOTS is the most popular standard that includes the whole textile supply chain.

The Fellow also met with Dr John Easton, Ecology Solutions Manager for Dyestar Textile Services. Dr Easton explained that Dystar receives many queries relating to harmful substance on fabrics. Dr Easton advised that one of the biggest challenges is to train operators to follow documented practices during dyeing and finishing and to understand the result of not doing so.

SDC 2010 Conference: Wool – the Cloth of Kings. Image courtesy of the Fellow.

Display case showing teasels and modern card wire. Image courtesy of the Fellow.

Destination: Marks & Spencer (M&S)

Location

London, UK

Contacts

Ian Morris, Technical Manager – Technical Services Group

Objective

The objective was to develop an understanding of the relationship between M&S and textile testing laboratories.

Outcomes

The regulations put out by REACH are not a new concept for M&S. Over 10 years ago M&S made it a condition of business that supplies meet an environmental code of practice that includes a RSL based on EU legislation. M&S have a long history of accreditation laboratories and auditing suppliers and laboratories. Intertek laboratories are responsible for accrediting individuals and laboratories and arrange for inter-laboratory round trials. M&S currently accredit 300 laboratories—275 garment supplier laboratories and 25 Intertec laboratories.

In addition to chemical analysis M&S, like NEXT, apply considerable resources to ensure their children's wear garments meet safety regulations such as choking and strangulation standards, and sleepwear regulations.

Concluding Remarks

The overseas experience has provided a valuable insight into the European approach to textile sustainability as viewed from the potential contamination by harmful substances to humans. By interviewing laboratories and retailers the Fellow was given the opportunity to gain a perspective on how they are addressing the demands and concerns of consumers by developing their own standards and meeting legislative requirements.

European textile laboratories vary in their approach to testing. Some laboratories specialise in chemical analysis, whereas, others are focused on garment compliance. Some are more orientated to analytical research, whereas, others are more marketing focused. All of them are acutely aware of the legislation and regulations current and forthcoming in their field. Australian laboratories should benchmark themselves against the more technically competent laboratories in order to meet the demands of both current and forthcoming legislations.

It is interesting to note that suppliers to the major apparel retailers have to meet the same basic performance tests applied in Australia such as mass per unit area, colourfastness to washing, water rubbing, and seam slippage. Additional tests such as colourfastness to saliva (infant wear) and various choking hazard tests are not mandatory in Australian retailer specifications.

The initial scope of knowledge sought was ultimately too broad. The large number of companies/ laboratories visited in the short period meant the Fellow concentrated on the harmful substance aspect of retailer regulations rather than the analysis of textile quality systems in general.

Knowledge Transfer: Applying the Outcomes

The Fellowship has provided an opportunity for the Fellow to develop her personal skills and knowledge of the international textile testing standards and procedures, and this has enabled her to meet the overall aims and objectives originally stated. As Manager of RMIT Textile Testing Services, the Fellow is exposed to many facets of the textiles industry—importers, local manufactures, test methods committees within Standards Australia, other NATA accredited laboratories, teachers, students and consumers. The knowledge gained will now be distributed to Australian industry, exporters, and Australian Government and education providers to empower Australian stakeholders to keep abreast of developments in this area. The Fellowship has led Orchard to develop the view that the Australian textile industry, in conjunction with the ACCC and the Australian Government, must develop legislation to limit the level of harmful substances on textiles imported and within Australia.

Sustainability awareness often starts with fringe groups who raise consumer awareness. Retailers and suppliers pick up on the movement and start to promote specific goods via ‘green marketing’ with the aim of having a competitive advantage in the marketplace. This further enhances consumer awareness but some consumers may begin to questions the truth behind the marketing. In order to gain consumer credibility the retailers then must justify their claim, which leads to development of specific testing and verification of claims by independent laboratories.

Some Australian retailers are now seeking verification for aspects such as formaldehyde content or ‘carbon-neutral’ claims. After a period of self-regulation, legislation is likely to come into place.

To meet this evolving regulation environment the textile and clothing industry will need to develop a stronger chemistry background in conjunction with investment in analytical chemical equipment to assess textiles against the legislation. RMIT University, Brunswick, has invested in a sustainability-focused research laboratory to fulfill some of the expected testing requirements called up in legislation.

A series of recommendations has been identified:

- A review of the textile chemical legislation being applied in Europe, China and the USA should be undertaken to determine the benefits of application in Australia. This could lead to the development of an Australian label.
- Need to consider embracing an Oeko-Tex® Standard 100 type of labelling process as it is the most prominent and recognised label for textiles free of harmful substances.
- Introduction of units/modules covering apparel quality testing systems in appropriate courses within the Australian TAFE system (LMT-07 Training Package).
- Australian retailers to expand their supplier manuals to bring them in line with the EU and other international countries. In the future suppliers to major retailers will need to meet both chemical restrictions and an increased enforcement of ethical sourcing.
- Australian laboratories to develop knowledge of international chemical testing requirements in preparation for implementation in Australia once the Australian Government and industry has implemented new testing regimes, which will require support for the purchase of new sophisticated analytical equipment.
- The ISS Institute to invite experts to Australia to speak on the harmful effects of chemicals and to liaise with the Australian Government and professional industry associations to broaden our knowledge.

The above recommendations will be outlined during a seminar in conjunction with RMIT University, School of Fashion and Textiles to be held in conjunction with the a number of textile industry associations (Council of Textiles and Fashion Industries of Australia [TFIA], Technical Textiles and Non-woven Association [TTNA], Australian Canvas and Synthetic Products Association [ACASPA], Carpet Institute of Australia [CIA] and industry customers).

RMIT University Product Knowledge Short Course

RMIT University provides Industry training in the form of short courses. The participants are responsible for product quality, usually related to the importation of goods supplied for the major clothing retailers in Australia. Three Product knowledge workshops are held each year – two in Melbourne and one in Sydney. Knowledge gained as part of this Fellowship will be shared during the presentations on Day 5 of the workshop. Dates are: 15 April 2011, 19 August 2011 and 30 September 2011.

RMIT University, School of Fashion and Textiles

The Fellow is to work with RMIT to encourage the development of knowledge made available to TAFE teachers by conducting presentations to teachers in this field.

ACASPA – Next State Meeting

(Date to be advised)

The Fellow is to conduct a presentation to an audience of importers and fabricators of indoor and outdoor curtains, blind and shade-cloth suppliers.

TFIA Presentation

(Date to be advised)

Fellow to develop a presentation to TFIA members and interested parties to distribute the knowledge gained during the Fellowship.

Recommendations

The presence of harmful chemicals on textiles is a global issue. Consumers have a genuine interest in these issues and as awareness of the effects of these substances develops further they will demand action. The European response has been the development of many sustainability-linked textile labels. Each of these labels may address a different aspect of sustainability. Each of these labels may address a different aspect of sustainability. For example:

- Organic – the GOTS standard
- Child labour free – BSCI and SA 8000
- Air emission, water emission and occupational health and safety – Bluesign
- Entire life cycle – European Eco-label 'The flower'
- Harmful chemical impurities – Oeko-Tex® Standard 100.

None of these labels are mandatory by legislation. Yet, they all form part of the 'sustainability' story.

The EU also responded by implementing REACH legislation, which enforces mandatory disclosure of chemicals and volume of imported chemicals. The retailer response has been that retailers developed their own comprehensive RSLs, with these RSLs constantly being expanded. Retailer suppliers must engage independent laboratories to test for the presence of harmful chemical substances. In addition, countries within the EU may have specific restrictions of harmful chemicals on textiles.

One label cannot cover every aspect; however, voluntary labelling such as Oeko-Tex® Standard 100 has gone from strength to strength becoming well recognised by consumers in certain markets in addition for being the basis for restrictions on imported goods in China and the USA (the US Consumer Product Safety Improvement Act [CPSIA]).

The textile testing industry has grown as an outcome of labels linked to final product testing. As the reputation for Oeko-Tex® Standard 100 grows, the need to standardise test methods is essential before Australia moves to too far down the track of developing a label.

Both the USA and China have adopted the Oeko-Tex® Standard 100 approach and have implemented regulations based on Oeko-Tex® Standard 100. For China, this step shows the world that China is taking steps to be on a level global playing field. Australia is lagging behind the world, possibly due to our consumers not raising issues as strongly as the European marketplace.

Australia is lagging behind the global push for assessment of textile imports and needs to develop a series of strategies to meet the challenge of global requirements. A number of Australian retailers are incorporating some harmful substances requirements such as requirements placed on the use of lead and formaldehyde but these are not mandatory.

Government – Federal, State, Local Industry

Recommendations:

- A review of the textile chemical restrictions being applied in Europe, China and the USA should be undertaken to determine the benefits of application to Australia.
- Need to consider embracing Oeko-Tex® Standard 100 labelling as it is the most prominent and recognised label for textiles free of harmful substances.

Δ Fellow to provide input into the discussions on the development of Australian regulations for harmful substances on textiles, based on international knowledge gained.

Education and Training – University, TAFE, Schools

Recommendation:

- Introduction of units/modules covering apparel quality testing systems in appropriate courses within the Australian TAFE system. This would include the development of a series of specialist competencies for introduction into existing packages for example LMT-50407 – Diploma of Textile Technology and Product Management. Applicable core Units:

  – LMTGN4011A – Coordinate quality system and procedures

  – LMTGN4013A – Manage technical processes

  – LMTGN5011A – Develop and test textile clothing and footwear products or processes

  – LMTTX3005B – Organise and interpret tests

  These could be part of nationally accredited programs and could also be applied to industry training packages.

Nationally Accredited Courses

Recommendation:

- Currently there are no nationally accredited courses that cover the analysis of textiles for the presence of harmful substances. Nor is there any nationally accredited course that covers apparel quality testing systems. This can be achieved by having input into the review of the TCF training package LMT07. This report will be sent to the manager of LMT07 at Manufacturing Skills Australia to initiate this recommendation.

Apparel Retailers

Recommendation:

- Australian retailers are to expand their supplier manuals to bring them in line with the EU and other international countries. In the future suppliers to major retailers will need to meet both chemical restrictions and an increased enforcement of ethical sourcing.

Δ The Fellow is to work with retailers to develop a proactive approach to the effects of harmful chemicals associated with textiles when raised by consumers and, in doing so, reduce the potential risk of customer litigation.

Δ Develop a step-by-step procedure for retailers to action when customers claim reactions to textile articles. Include a recommendation that the retailer obtain a copy of the doctor's certificate and a medical history.

Australian Textile Testing Laboratories

Recommendations:

- Australian laboratories should develop knowledge of international chemical testing requirements in preparation for implementation in Australia once the Australian Government and industry has implemented new testing regimes.

- New sophisticated analytical equipment will be required along with specialist expertise in analysing the data output from this equipment.

International Specialised Skills Institute

Recommendations:

- The ISS Institute to invite experts to Australia to speak on the harmful effects of chemicals and to liaise with government and professional industry associations to broaden our knowledge.

- Skill and knowledge deficiencies remain throughout the Australian industry regarding the many certification labels and systems operating in international markets. These skill and knowledge deficiencies should be addressed by the ISS Institute through the provision of further Fellowship opportunities in partnership with Australian textile industry associations.

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Attachments

Attachment 1 – Sustainability and Quality Systems

Sustainability or Quality System	Description	Mandatory Y/N	Countries Where Recognised
REACH	Registration, Evaluation, Authorisation of Chemicals – over 33 chemicals require mandatory reporting	Y	EU
Oeko-Tex® Standard 100	Tests for harmful chemical on textiles. Over 30 chemicals on list. Not a quality system as only concerned with harmful chemicals on textiles	N	Predominantly EU countries, the USA also uses to some extent, laboratories in manufacturing countries such as China
Bluesign	Textile Environmental, health and safety labelling	N	Europe
European Ecolabel 'The Flower'	Environmentally friendly products labelling	N	Europe
Made In Italy label	Verification of garment component origin	N	Italy
Ginetex	Care labelling system for garments	N	Worldwide
BSCI (Business Social Compliance Initiative)	Monitoring and qualification system which approves suppliers	N	Worldwide
ISO 14000 Environmental	Family of International standards addressing environmental management	N	Worldwide
SA 8000	Social accountability – Social and Ethical	N	Worldwide
GOTS	Organic standard also requires socially responsible manufacturing in production countries	N	Europe
Oeko-Tex® Standard 1000	Testing, audit and certification system for environmentally friendly companies	N	Worldwide

Attachment 2 – Organisations Visited

Organisation	Business	Testing	Sustainability
Crespi 1797 SpA	Produce linen fabric	In house for their own products	Hydro electric plant – carbon neutral
SMI	Promoting Italian Fabric Internationally	SMI members have reduced fees at Centro Tessile Contoniero – mainly Oeko-Tex® Standard 100 testing	EU has requested SMI to develop a sustainability strategy for Italy
Centro Tessile Cotoniero	Textile testing, certification and marks, research and development of technology	1200 tests including Oeko-Tex® Standard 100	USA accredited for ecological testing
Gruppo Coin SpA	Retails products including garments and other textiles	Has developed packages of tests to cover regulations in many countries	Goods must pass chemical content tests
Hohenstein Institute	Co developer of Oeko-Tex® Standard 100, tests for over 100 REACH-listed substances	Oeko-Tex® Standard 100 tests, REACH testing, compliance testing for quality labels	Chemical testing, research
Swerea/IVF	Testing laboratory for Swerea Group	Oeko-Tex® Standard 100, REACH, ECHA registered chemicals	User pays data base listing substances found in textiles, test methods, alternatives, legal restrictions and legislation
Björnkläder	Laboratory for supplier and retailer of work wear	Basic testing of fabrics, collates REACH test reports as supplied	Has own list of restricted substances
NEXT	Retailer, including online sales	Conducts round trial testing to ensure supplier labs are accurate	Has developed list of restricted substances in line with EU regulations
Speedo International	Materials development for Speedo swimming products	Research and development of fabrics, test method development, fabric trials	Sustainability considerations within fabric development and sourcing
SDC	Peak international society for dyers. Provides courses in colour and dyeing.	Does not test	Develops knowledge about and advises on sustainability issues related to dyeing
Marks & Spencer (M&S)	Retailer	Developed product quality standards, accredits testing laboratories, audits suppliers	Has environmental code of practice
Benetton	Retailer	Suppliers test in accordance with Benetton requirements	Has developed list of restricted substances in line with EU regulations