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**Submission to the  
Productivity Commission Inquiry**

**The Post 2005 TCF  
Assistance Arrangements**

**The Technical Textiles & Nonwoven  
Association**

**March 2003**

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## **1: Introduction**

The Technical Textile and Nonwoven Association (TTNA) is proud to present this submission to the Productivity Commission's inquiry into post 2005 assistance arrangements for the Textile, Clothing and Footwear (TCF) industry sector

The TTNA is the industry organisation representing the Australian technical and nonwoven textile industry. This submission provides a range of information that is reflective of the TTNA members' views and is intended to assist the Commission in developing its findings about the current and post 2005 assistance arrangements.

Given that little is documented about the Australian technical and nonwoven textile industry the Appendix is designed to educate the reader.

The technical and nonwoven textile industry is part of the broader TCF industry sector. Firms in the industry operate many exclusive and/or inter-dependent supply chains that bring goods to the market place that may be for retail or midstream manufactured components for an end use in a diverse range of industrial applications.

Trade liberalisation and, thus, increased competition across all global economic activities has produced comprehensive changes to markets worldwide as the process of globalisation has taken hold. The TTNA acknowledges that the external circumstances affecting the Australian TCF industry are a global phenomenon. Indeed, the most influential factor in shaping Australian manufacturing has been the process of opening Australia to the influence of international market forces through the reduction of tariffs. The impact of lowering tariffs is a transitional force across products in all targeted tariff chapters and has resulted in considerable change to the industry, its products, their competitiveness and the way by which business is done.

For the Australian technical and nonwoven textile industry, critical issues include a stable investment environment, market access, re-investment in plant and equipment given the global nature of the industry, innovation, an appropriately skilled workforce and environmental regulations. All of these will affect the competitiveness of the Australian technical and nonwoven industry in both the domestic and global markets.

The recommendations articulated in this submission provide a framework to encourage greater investment in productive capacity and innovation needed to enhance the future competitiveness of the industry in order to supply the needs of the Australian market and the greater global market.

The Australian technical and nonwoven textile industry stands at the threshold of a period of sustainable growth. Whilst the industry accepts this responsibility and is striving for excellence, it is of the opinion that realising this growth will not be easy and is dependent on a stable investment environment and industrial landscape. Indeed, the continuance of the Strategic Investment Programme (SIP) is absolutely critical for carrying the technical and nonwoven textile industry to the next level required for competitively positioning the industry in 2010.

Further progress by the industry, especially continued export growth, will help to support economic growth resulting in a stronger and more vibrant technical and nonwoven textile industry to the benefit of domestic manufacturing and, thus, metropolitan and regional communities by sustained employment.

### **1.1: Summary of Recommendations**

- *TTNA recommends the Government continue to stimulate the uptake of Research and Development and Innovation through investment, for the betterment of the technical and nonwoven textile industry.*
- *TTNA recommends the introduction of a new Strategic Investment Program (SIP mark 2) with appropriate program funding to extend from 2006 to 2010.*
- *TTNA recommends that SIP mark 2 should be modified to*
  - *increase capital expenditure from 20% to 35%.*
- *TTNA recommends the EOAP scheme should be extended to include additional products.*
- *TTNA recommends the perpetuation of the Market Access Team for the TCF industries until 2010 with additional funds and its activities intensified for the betterment of the Australian TCF industry.*
- *TTNA recommends the introduction of a new Market Development Program with appropriate program funding to extend from 2006 to 2010.*
- *TTNA recommends that any further tariff reductions other than those scheduled in 2005 should be in parallel with reforms undertaken by other countries.*

## 2: The TTNA

The Technical and Nonwoven Association (TTNA) was incorporated in 2000 for the purpose of nurturing and promoting technological innovations for the textile and textile related sectors in Australasia. The association formation was driven by industry and its membership now reflects the diverse and dynamic nature of this growing industry sector. It now represents over 80% of the industry.

Globally, the sector is growing rapidly and now represents a significant proportion of world textile manufacturing and trade. Innovative technology and ingenuity are providing high quality and functional products for markets outside the traditional world textile market. The Australian technical and nonwoven textile market is developing in parallel with this global market. It embraces a wide range of materials, processes, products and applications which have a vast list of end uses in a broad range of industries.

TTNA's primary objectives are:

- to promote the growth and profitability of the industry
- to encourage an internationally competitive and innovative industry
- to act as a conduit through which information on international trends in manufacturing, research and development and education within the global textile and nonwoven industry, is communicated to members
- to foster the growth of an appropriately skilled and sustainable workforce in the Industry through training

TTNA acts as a forum that:

- provides opportunities to identify, discuss and respond to members' issues and needs
- advocates the common interests of the industry
- generates and disseminates relevant industry information
- fosters the development and exchange of technical information
- promotes the significance of the technical textiles and nonwoven sector within wider industry
- represents members' interests to government bodies

The TTNA has five active committees to ensure the interests of the members are met and carried out professionally, including:

- Events Committee
- Education Committee
- Policy Committee
- Standards Committee
- Marketing Committee

### **3: The Australian Technical & Nonwoven Textiles Industry Profile**

The Australian technical & nonwoven textile industry is highly capital intensive, requiring large investments in product development and production facilities and is comparable to the global industry. Once seen as colourless, the sector has emerged united as a viable and vibrant industry. Indeed, over the past decade, the industry has made substantial improvements and institutional and attitudinal changes. The adoption and refinement of lean manufacturing techniques has delivered operating efficiencies and lower inventory costs. There has been significant investment to upgrade plant and equipment, and in process and product development in line with global trends. Indeed, the results of the survey conducted by TTNA for this submission confirm that the industry invested A\$66M in 2000/01, A\$57M in 2001/02, and an estimated A\$84 in 2002/03 on capital expenditure.

The competitiveness of the industry has increased as evidenced by the healthy growth in exports in the last few years. Indeed, the TCFL Strategic Plan released in June 2002 stated: *“Australia has a leading role already in this sector due to a range of performance and lifestyle based new products. This is (also) the supply chain which has the most potential for the export of both products and intellectual property”*.

A recent report by the Centre for Strategic Economic Studies of Victoria University calculated that *“technical textile manufacturing employs an estimated 10,000 people in Australia, pays something like \$310 million in wages and salaries and produces around \$530 million in industry value add. The value of sales and transfers of technical textiles in 1997-98 was around \$1.2 billion.”* The survey conducted by TTNA for this submission confirms the turnover in 2002 to be around \$1.7 billion. A list of Australian-based enterprises in the technical and nonwoven textiles industry that were contacted for this review is included as attachment 2.

One indicator of the nature of the technical and nonwoven textiles industry is its turnover per employee. This reveals something about labour productivity, capital intensity, the level of value adding and skills levels. The same study by the Centre for Strategic Economic Studies of Victoria University calculated the TCF&L industry's average of \$127,000 and the textile industry's average of \$156,000. However upon surveying industry for this survey, the Australian technical and nonwoven textile industry's average turnover per employee is between \$250,000 and \$400,000.

Most companies interviewed report a turnover in the range \$5 million to \$20 million and have 10 to 100 employees involved in the manufacture of technical and nonwoven textiles. However there are a few large companies employing over 300 personnel.

The Australian technical and nonwoven textile industry's linkages to the global industry are inherent and will, over time, provide it with a range of evolving opportunities.

The welfare of the Australian technical and nonwoven textile industry is highly dependent on other manufacturing sectors such as the building and construction and automotive industries. Whilst it is difficult to quantify the value, there are significant linkages between the technical and nonwoven textile industry and the rest of the economy. An exception is healthcare which, with an ageing population, will grow despite the economy.

Once an isolated industrial sector, the industry has developed a new set of powerful linkages with the services sector as specialist expertise such as IT and electrical engineering is increasingly out-sourced. The industry is drawing upon a wide range of information management and problem solving services that support its drive to continuously improve its performance and competitive position. These linkages are often intangible; however the effect on surrounding business communities cannot be underestimated particularly in regional areas.

One of the distinguishing features of the evolving technical and nonwoven textiles industry is the emergence of traditional textiles and fibre producers into technical textiles. Hence, technical textiles provide an important avenue for structural adjustment within the textiles and broader TCF industries. The Strategic Investment Program (SIP) is also progressively aiding the Australian technical and nonwoven textile companies to prepare themselves for the post 2005 period.

There is no doubt that there are challenges confronting the Australian technical and nonwoven textiles sector. There has been considerable pressure on expenditure arising from the increasingly expensive costs. As with all manufacturing enterprises the increased cost of remaining competitive encourages firms to realise economies of scale and to strive for global volume through export over which capital investment and product development costs can be diffused. There is no doubt that the complexities in the operating environment are increasing.

The development of state-of-the-art manufacturing facilities, often turn-key projects funded by agencies such as the World Bank, in developing countries will continue to put pressure on the industry. The Australian technical and nonwoven textile industry acknowledges that continued innovation, research and development and a highly skilled workforce will dilute this threat and, in time, will underpin the industry's viability.

### **3.1: Exports**

The Australian technical and nonwoven industry has proven that it can successfully enter a wide array of international markets. The increase in exports over the last two decades illustrates that those companies in the industry producing premium specialty products can compete against the best in the world in an equitable environment.

In surveying the Australian technical textile and nonwoven industry for this submission, technical and nonwoven textile companies exported from zero to 35% per cent of their production, the value of which is reported to be approximately \$200 million. In surveying the Australian technical textile and nonwoven industry for this submission, all respondents saw their company expanding through exports, global collaboration and earnings from technology licensing.

Given the limited Australian population, a feature of the local operating market is flexibility and a capacity to supply niche markets, characteristics which are a proven formula for success in developing export markets.

Exports of the Australian technical textile and nonwoven industry characterise the diverse range of products created by the sector. Automotive, filtration, medical, acoustic and geotextiles products are among the principal goods sold overseas. Exports are viewed as a foil against imports eroding conventional markets and to achieve appropriate sales volumes and overall growth to support equipment purchases which are customarily designed to produce capacities suitable for larger markets. Additional volumes also assist companies sourcing ability, thus reducing the overall cost of production.

The Australian technical and nonwoven textile industry is of the view that the future is tied to exports and access to overseas markets. However, it must be noted that the cost of developing export markets is considerable. Demonstrating capability to customers and developing the linkages necessary to sustain viable business takes considerable time and money.

### **3.1.1: Market Access**

The process of trade liberalisation, and the industry's subsequent and ongoing transition, has necessitated that companies assume a global perspective from that of the industry's traditional domestic only focus. Additionally, Australian companies have been encouraged to export goods, services and intellectual property particularly in sectors or niche markets where there is an Australian competitive advantage in order to counter the effects of an open market. Indeed, the very heart of the World Trade Organisation's (WTO) liberalisation policy, and the subsequent process, is an attempt by governments to make the global business environment stable and predictable thereby assisting industries extend their capabilities beyond their borders. To this end, there is an increasing responsibility to both Australian industry and its Government to ensure equitable and straightforward access to markets other than our own.

As a signatory to the WTO, coupled with a commitment to free and equitable trade, the TTNA acknowledges that the Australian Government is dedicated to the principles of the WTO's Agreement on Textiles and Clothing (ATC) and thus does not maintain quotas on imports of textiles and clothing and is supportive of WTO members fully implementing the ATC. Indeed, the Australian technical and nonwoven industries fortunes will be greatly enhanced by the realisation of the WTO's intentions that would provide greater market access to other markets.

With the scheduled progressive removal of international tariff barriers the Australian Government must ensure that Australia's trading partners do not seek to replace tariff barriers with equally restrictive non-tariff barriers (NTM) to trade. Indeed, the range of NTMs that can and do block legitimate trade is on the increase as countries adjust conditions in the face of trade liberalisation. Attachment 1 includes a comprehensive list of the United Nations Conference on Trade & Development (UNCTAD) acknowledged non-tariff trade control measures. Non-tariff barriers do, in effect, present the same restriction to trade as tariffs and have the potential to reduce or remove potential benefits from multilateral tariff reductions. Indeed, the main issue for Australian products in relation to trade liberalisation in the next decade is ensuring that Australia's remaining tariff barriers are only adjusted in acknowledgment of, and parallel with, international reductions of our trading partners' trade control measures (both tariff and non-tariff barriers) and entering into beneficial preferential trade agreements with markets larger than our own.

In surveying the Australian technical textile and nonwoven industry for this paper, a number of companies recorded both a number of tariffs and NTMs that have impeded the development of export earnings.

Exports of Australian goods to both NAFTA and the EU countries have not enjoyed the growth that some would expect from regions where there are cultural similarities. Indeed, there have been reports that these forums are a "closed shop". Whilst they were originally welcomed as positive measures and a process through which to legitimise aid to developing countries through trade, bilateral & multilateral trade agreements and regional forums are often an impediment for Australian manufacturers as many are developed specifically as NTMs in order to control trade in the absence of quotas. By way of example, NAFTA is essentially a "fibre forward" agreement that allows duty free access into the U.S. for products manufactured from U.S. components. Products made from yarn and/or textiles produced from non U.S. fibre are subject to the 18-30% duties that are then carried forward upon entering the U.S., thereby imposing disincentive to non U.S. components.

The TTNA acknowledges that Australia is not subject to quantitative barriers (quotas) to its access to the EU or the U.S. However, technical and nonwoven textiles are often destined for assembly in developing countries to which quotas apply. In surveying the Australian technical textile and nonwoven industry for this paper, a number of companies recorded high duties in Asia. This response reinforced the findings of the "Market Access Industry Participation Programme" paper published by the Textile & Fashion Industry Australia (TFIA) in June 2002. The paper states as follows:

*"Automotive textiles: Manufacturers in the Australian automotive textile industry have reported high tariffs in a number of countries. By way of example, a man-made looped pile fabric (H.S. code 6001 22) attracts tariffs of 35% upon entering India, 22% upon entering South Africa, 22%*

*upon entering China, 20% upon entering Malaysia and 20% upon entering Thailand.*

*Industrial clothing: Manufacturers in the Australian industrial clothing industry have reported high tariffs in a number of countries. By way of example, mens/boys ensembles of synthetic fibres (fire suits, H.S. code 6203 23) attract tariffs of 60% upon entering Thailand, 50% upon entering Vietnam, 40% upon entering South Africa, 36% upon entering Israel and India and 30% upon entering Pakistan.*

*Manufacturers in the Australian industrial textiles industry have reported high tariffs in a number of countries. By way of example, woven "Nomex" (H.S. code 5512 99) attracts tariffs of 40% upon entering Vietnam, 30% upon entering Pakistan, China and India, 22% upon entering South Africa and 20% upon entering Malaysia and Thailand.*

*A number of Australian manufacturers reported a disadvantageous use of the maximum bound tariff rate with little or no notice, particularly for goods entering Vietnam."*

Additionally, there is also a strong belief within the Australian technical and nonwoven textiles industry that overseas suppliers (usually in low labour cost countries) that have exhausted their quotas to other countries often use Australia to offload excess capacity (and/or cancelled orders) to a quota free Australia. Whilst it may not technically be dumping, nevertheless it has the equivalent effect of pushing the price of domestic production down by allowing an increase in supply of low-cost goods.

In the face of liberalisation, international markets, particularly the U.S. and the E.U, are requesting additional product assurances including environmental and chemical characteristic requirements and definitions. These policy changes are an obvious tool to discourage imports in order to protect local industries. Regulations are undoubtedly increasing as countries position themselves for the future.

○ ***The Market Access Team***

In June 1998 the Department of Foreign Affairs and Trade (DFAT) established a sectoral-based Market Access Team for the TCF industries as part of a package of government measures designed to assist the industry through the transition to lower TCF tariffs in 2005. The team is entrusted with the task of addressing market access issues facing Australian TCF exporters and works collaboratively with the TCF industry to advocate the removal of tariff and non-tariff barriers identified by TCF companies or industry associations and to assist, as required, to facilitate trade.

The TCF Market Access Team is planned to continue operating until 2004. In recognition that the global trading environment is scheduled for dramatic changes in 2005, the TTNA supports the continuation of this initiative until 2010. The services and effectiveness of the Market Access team should also be expanded and intensified for the betterment of the Australian TCF industry.

The TTNA is also dedicated to working collaboratively with Government to lobby and negotiate access to markets that it considers important to its future.

*TTNA recommends the perpetuation of the Market Access Team for the TCF industries until 2010 with additional funds and its activities intensified for the betterment of the Australian TCF industry.*

### **3.1.2: Market Development**

With the dramatic changes that have taken place in the world economy and the globalisation of markets for goods, there should be an emphasis on greater market access and thus improvement of export market opportunities. Australia's location in the southern ocean and thus distance from Europe and North America has been reported by the TTNA members as a major obstacle to developing export markets. The cost of shipping, payment terms commensurate with delivery and shipping lead times and the cost of developing export markets in the Northern hemisphere are prohibitive. In contrast, our trading partners and competitors enjoy the assistance of Government funded TCF Market Access and Development Advocacy units.

Foreign Governments often fund Industry Associations to undertake market development strategies and promotional functions on behalf of industry. Exhibitions continue to be very important promotional vehicles and country pavilions are usually heavily subsidised by regional or federal government grants. By way of example, Gesamttextil is the umbrella organization of the textile industry in Germany, hosts a pavilion at Techtexil in four countries, in which over forty German technical textile companies are able to exhibit free of charge. The cost of these pavilions is in excess of A\$1.5 million. This form of assistance enables the German manufacturers to develop business and thus strengthen the industries and is in direct competition with Australian companies attempting to gain access in these markets unaided. The discontinuation of the Market Development Program, outlined in the next paragraph, will further disadvantage Australian TCF manufacturers in the face of international competition.

- ***The Market Development Program***

The Market Development Program (MDP) was a positive program under the "post 2000 arrangements" that was prematurely discontinued in 2002. Under this program, the Department of Industry, Tourism and Resources (DITR) provided funding for the TTNA to undertake the "Technical Collaboration Project" (TCP). This was a strategy to enter into collaborative arrangements with synergistic organisations around the world with the intention of obtaining knowledge on international trends in manufacturing, R&D and education within the global technical textile and nonwoven industry.

The results of the project are significant and of great benefit to the Australian technical and nonwoven textile industry. By way of example,

through this project the TTNA entered into a Memorandum of Understanding with the European Disposable & Nonwoven Association (EDANA) in Europe. This collaborative arrangement enabled the TTNA to obtain the specifications and the use of European standards for technical and nonwoven textiles. In addition, a licensing arrangement was negotiated to deliver of the EDANA nonwovens course in Australia in partnership with RMIT. It is also a forum through which TTNA members can associate with potential European business partners to disseminate the industry's capabilities and for the identification and adoption of innovation. This project has proved to be a significant catalyst for the advancement of the Australian technical and nonwoven textile industry and the TTNA is appreciative to DITR for the funding.

In light of the achievements of the TCP project and in acknowledgment of assistance awarded to the technical and nonwoven textile industry in competing countries, the TTNA proposes the reintroduction of the MDP.

***TTNA recommends the introduction of a new Market Development Program with appropriate program funding to extend from 2006 to 2010.***

### **3.2: Regional Enterprises**

The Australian technical and nonwoven textiles industries are located mainly in Victoria and NSW, although they employ a considerable amount of people in regional areas. In its 1997 report on the TCF industries, the Industry Commission revealed that: *"while metropolitan employment declined by close to 16,000 formal jobs between 1985 and 1997, 2,500 additional TCF manufacturing jobs were created in regional areas".*<sup>1</sup> By way of example:

- Melded Fabrics is based in Dandenong, VIC
- Albany International is based in Gosford, NSW
- Geofabrics Australasia is based in Albury, NSW
- Aunde Norwellan is based in Stawell, VIC
- Soil Filters Australia is based in South Port, QLD
- Kimberly-Clark Australia is based in Albury, NSW

These locations are very significant, in terms of regional development and employment in Australia.

Manufacturing activity in regional areas is particularly vulnerable to changes in the operating environment in view of transport costs and service inputs. In surveying the Australian technical textile and nonwoven industry for this submission, transport costs were reported to have escalated significantly over the last twelve months. By way of example, a respondent to the TTNA survey cited the cost of trucking a 40 foot container from Albury to Perth is around \$4,000 whereas the same container could be shipped from Hong Kong to Perth for approximately

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<sup>1</sup> Industry Commission 1997, *The Textiles, Clothing and Footwear Industries*, Report No 59, Volume 1, pxxxii.

\$1,500. Indeed, these increases coupled with the rises in utility costs are negating the benefits of operating in a regional location.

As mentioned previously, once an isolated industrial sector, the industry has developed a new set of powerful linkages with the services sector as specialist expertise such as IT and electrical engineering is increasingly out-sourced. The industry is drawing upon a wide range of information management and problem solving services that support its drive to continuously improve its performance and competitive position. These relationships are critical to the industry's operating environment and well-being in regional areas.

The shortage of skills and the inability of firms to attract sufficient numbers of top quality young people into the textiles industry act as major barriers to growth, particularly in regional areas. By way of example, companies contributing to this submission noted that it was difficult to employ laboratory assistants in the Albury-Wodonga area.

Any growth of the technical and nonwoven industry could be a significant catalyst for, and contributor to, the betterment of regional economies. However it must be acknowledged that operating in a regional area has some unique characteristics and needs, in addition to those of the metropolitan operating environment.

The concerns of the Australian technical and nonwoven textile industry have been confirmed by the initial findings of the current survey being undertaken by the Regional Business Analysis Panel and funded by the Department of Transport and Regional Services.

In recognition that there are cost imposts on manufacturing in regional areas, the TTNA recommends that suitable programs be developed to assist the industry accordingly. However these recommendations will be reserved until the above survey is published.

### **3.3: Research & Development**

An emphasis on research and development (R&D) in recent years, admittedly much of it inspired by SIP, has seen the Australian technical and nonwoven textile industry increasingly delivering refined and improved products and processes. Indeed, as an industry sector, the technical and nonwoven textile industry appears to have carried out more R&D than the broader TCF industry. By way of example, Geofabrics Australasia Pty Ltd is working collaboratively with the CSIRO's division of textile and fibre technology on R&D.

Whilst there is no doubt that industries benefit from R&D, it is costly and carries a high risk factor and also difficult to quantify in the short term. In surveying the Australian technical textile and nonwoven industry for this paper, all reported that the results and subsequent gains from R&D made as a result of SIP funds in addition to their own investment will take an average of three years until they will financially benefit.

In surveying the Australian technical textile and nonwoven industry for this paper the industry reported R&D expenditure of A\$18.6M in 2000/01, A\$20.4M in 2001/02 and an estimate of A\$19.8M in 2002/03.

By way of example, Albany International, the Gosford (NSW) based paper machine clothing and industrial filtration fabric manufacturer developed a new and original product in conjunction with one of Australia's largest power generating companies' part funded by SIP. A prototype of the product that is designed to filter exhaust gases from coal fired burners has been installed and the company has applied for a world wide patent.

○ ***Innovation & Technology Development***

The TTNA and its members acknowledge that innovation is a key strategic response to competition that must manifest itself throughout all business activities. Indeed, the TTNA agree with the Government's paper "Backing Australia's Ability - An Innovation Action Plan for the Future" that the key to Australia's future prosperity is by "*developing skills, generating new ideas through research, and turning them into commercial success. Innovation is not only the province of new or high tech industries, but also essential to the future of many of our traditional sectors such as agriculture, manufacturing and mining*".

Upon surveying the Australian technical and nonwoven textile industry for this submission, SIP has been a considerable incentive and catalyst for the purchase of capital equipment and parallel research and development activities in a quest to develop new products. The program has also been useful in innovating existing products production processes, techniques and intellectual processes to drive commercial outcomes.

By way of example, the Melbourne based technical textile producer has developed a structured process by which to manage its R&D program. In essence, the company's R&D management process was innovated to meet customer's needs. The challenge was to create an environment which would lead to ongoing economically sustainable developments that could be strategically launched into the marketplace in a logical and planned manner. The company subsequently identified specific market segments and created "Centres of Excellence", with global teams working to resolve their customers' immediate issues.

A paper presented by Madison Filter<sup>2</sup> at the TTNA 2002 conference notes: "*The structured methodology behind our Research & Development is now allowing us to correctly research and develop products in such a way that we can now plan logical launches to the marketplace to maintain continuous improvement for all concerned. We are finding we have more time to research the various developments and are developing strategic alliances with various Research Organisations, Suppliers and Original Equipment Manufacturers. We work closely with various departments of*

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<sup>2</sup> "From Customer Driven Developments to Market Leading solutions": Mr. Robert Bell, Madison Filter Pty Ltd.

*CSIRO, Universities (including the University of Melbourne), various associations (AMIRA, TTNA etc.) and have developed significant relationships with many of our customers' global research centres."*

### **3.4: Market Failure**

As mentioned in the introduction, the TTNA acknowledges that the external circumstances affecting the Australian TCF industry are a global phenomenon. The WTO agreement on textiles and clothing (ATC) is affecting signatory and non-signatory countries alike in addition to geopolitical and economic and social forces.

As far as investment is concerned, an uncertain future is a potent form of market failure as it stifles investment. The challenge is to manage successful structural adjustment that attracts investment. Indeed, without substantial structural adjustment further consolidation is much more likely than expansion, with all that implies for regional investment and employment.

Additionally, the intentions of the WTO's liberalisation policy to make the global business environment stable and predictable thereby assisting industries extend their capabilities beyond their borders have not been realised. It was clear by the findings of the "Market Access Industry Participation Programme" paper published by the Textile & Fashion Industry Australia (TFIA) in June 2002 that the global trading environment is not equitable and that there are considerable impediments to exporting Australian technical and nonwoven textiles to other markets. China's ascension to the WTO in particular has not delivered the expected outcomes.

The limited Australian population is also an area of market failure. Technical and nonwoven textile manufacturing is capital intensive. New plant and equipment and R&D initiatives are usually more attractive with greater economies of scale than what the limited Australian population offers. This is a cause of additional costs not faced by competing nations.

Isolation and the tyranny of distance are also market failures as the cost of developing export markets in the northern hemisphere is obviously considerably more expensive and less certain than competing companies in Europe and North America.

The recent report by the Centre for Strategic Economic Studies of Victoria University in 2000 also identified that the costs associated with launching major R&D programs in technical textiles as market failure. It stated: "*as technical textiles become increasingly reliant upon multiple technologies and increasingly related to technologies in other fields (eg. papers, metals, minerals, ceramics, glass, composites, plastics and foams), it becomes more difficult for individual firms to mount and carry off R&D programs successfully. Basically, the costs and risks are too high, and projects too complex for individual firms in Australia to sustain. No single company has the level of expertise necessary, nor the capital to invest over a multi-*

*year period. Large companies are often multi-product players, such that technical textiles make up a relatively small proportion of their activities. Both need to share the costs and risks associated with TT&F R&D.”*

There is no doubt that the proposed SIP Mark 2 will assist in addressing the above.

## **4: Threats to the Industry's Future Viability**

In surveying the Australian technical and nonwoven textile industry for this submission, it was clear that this industry has a number of concerns about the environment in which it operates and emerging threats to the industry's future viability including:

- Competition from emerging overseas producers
- Preservation of a critical mass of TCF companies
- Uncertainty about future policy and assistance for the industry
- Industrial relations/workplace environment
- Education and workforce skills
- A weakened economy that will no doubt affect demand
- Market access and development
- Support from the financial institutions
- An increase of input costs
- Extent of government support

Following is industry's view emerging threats to the industry's future viability.

### **4.1: Competition from Emerging Overseas Producers**

In surveying the Australian technical textile and nonwoven industry for this submission, competition from emerging overseas producers is a significant issue.

The construction of state-of-the-art technical and nonwoven manufacturing facilities in developing countries that are more than likely funded by agencies such as the World Bank at below market rates are a considerable concern to the Australian industry. China is a particular concern to the global technical and nonwoven textile industry as state owned enterprises often enjoy additional benefits and thus any production is produced and exported under market cost. The marketing term for this strategy is "discount market penetration" which has the effect of undermining whole industries based on market rates.

There is also a strong belief within the Australian technical and nonwoven textiles industry that overseas suppliers (usually in low labour cost countries) that have exhausted their quotas to other countries often use Australia to offload excess capacity (and/or cancelled orders) to a quota free Australia. Whilst it may not technically be dumping, nevertheless it has the equivalent effect of pushing the price of domestic production down by allowing an increase in supply of low-cost goods.

Despite the best of intentions, in these instances the "level playing field" is but a myth. It is clear that these two strategies effectively undermine and erode legitimate macro and micro economic management.

### **4.2: The Preservation of a Critical Mass**

As with all manufacturing sectors, the Australian technical textile and nonwoven industry relies on, and draws from, a varied and increasingly advanced skill set. This includes electronic and chemical engineering;

product and process research and development; IT and personnel placement, to name a few. Price, quality and reliability of local suppliers are a determining factor in productive output. These skills flow in and around the industry and also benefit the wider economy. Often processes are outsourced as the cost of vertical manufacturing is prohibitive in a limited market. The issue of “critical mass” is therefore very important to the overall operating environment in which the Australian technical and nonwoven textile manufacturers function.

A “critical mass” of companies also fuels competition, and thus efficiencies and product development capabilities, which are also healthy for the long term viability of the industry. A “critical mass” also encourages clusters which in turn generate the development of a larger advanced skill set.

Whilst this argument is a passionate one, it has been voiced loudly by all who have been involved in this submission. Companies revealed that further reductions in tariff rates after 2005 would have a significant negative impact on production, investment and employment in certain sectors of the industry that in turn would affect the technical and nonwoven textile industry. Further attrition of the industries will lead to erosion of the “critical mass” resulting in a vortex of lost jobs, skills and services that will be filled by imports alone.

### **4.3: A Desire for a Stable Environment**

As mentioned in the introduction, the Australian technical and nonwoven textile industry stands at the threshold of a period of sustainable growth. Whilst the industry accepts this responsibility and is striving for excellence, it is of the opinion that realising this growth will not be easy and is dependent on a stable investment environment and industrial landscape. Following are issues that are of particular concern to the industry.

- *An increase of input costs.*

The Australian technical and nonwoven textile industry is a considerable user of infrastructure inputs including electricity, gas, telecommunications, road, rail and air and sea freight.

By and large, these services have undergone many changes in structure, ownership and the way by which they do business over the last decade. Whilst some cost savings were delivered, regional enterprises, particularly in Albury have reported paying more per unit than what is charged in the metropolitan areas.

In surveying the Australian technical textile and nonwoven industry for this submission, transport costs were reported to have escalated significantly over the last twelve months. The cost of fuel and running costs such as tolls, spares and repairs have all increased significantly. Indeed these increases, coupled with the rises in utility costs, are negating the benefits of operating in a regional location.

Another example is non competitive pricing in the shipping industry where all the major carriers are members of the “conference” and that have quoted identical prices for freight services since joining the “conference”. The base service rate (BSR) charges on the wharfs for a 40 foot full container have risen from \$291.26 in 2002 to \$390.50 in 2003. It was reported that the price rises are as a result of all the major shipping lines joining the conference (with the exception MAERSK shipping).

Any additional price rises, particularly infrastructure inputs in regional areas, will have a negative impact on business and therefore are of great concern to the Australian technical and nonwoven textile industry.

○ ***Support from the financial institutions***

In surveying the Australian technical textile and nonwoven industry for this submission, 60% of respondents regarded ongoing support from the traditional financial institutions being critical to their futures. Their challenge is to overcome entrenched negative perceptions that their enterprises are part of the traditional apparel and apparel textiles manufacturing industries.

○ ***A weakened economy that will no doubt affect demand***

As mentioned previously, the welfare of the Australian technical and nonwoven textile industry is highly dependent on other manufacturing sectors such as the building and construction and automotive industries. In surveying the Australian technical textile and nonwoven industry for this paper, respondents were cognisant that an economic downturn or the loss of a significant sister industry such as automotive, will no doubt affect demand and thus the wellbeing of their employees.

A report by the Centre for Strategic Economic Studies of Victoria University in 2000 clearly illustrates the importance of the well-being of sister industries. It states: *“The largest end-use market for technical textiles in Australasia is transport, which is forecast to be worth US\$ 200 million by 2005 – accounting for 22 per cent of the total regional end-use market for technical textiles. Industrial, forecast to be worth US\$ 156 million by 2005, home (US\$ 146 million by 2005) and medical (US\$ 109 million by 2005) are the other major end-use markets for technical textiles in the Australasian region. The fastest growing end-use application market for technical textiles in Australasia is expected to be that for protective clothing and coverings, with a forecast compound annual growth rate of 7.2 per cent between 1995 and 2005. Building, with a forecast compound annual growth rate of 5.6 per cent over the decade 1995 to 2005, geological 5.2 per cent and packaging 4.8 per cent are the other end-use application markets set to experience strong growth.”* Clearly, any downturn in these industries would have a negative impact on the Australian technical and nonwoven textiles industry.

In *Investing for Growth*, its response to the 1997 Mortimer Report<sup>3</sup>, the Government noted the importance of investment to sustaining strong economic and employment growth and achieving improved living standards. In this context it emphasised its commitment to ensuring Australia's attractiveness as an investment location through maintaining a sound macroeconomic environment and pursuing labour market and other microeconomic reforms to raise productivity and lower cost structures across the economy.

In addition, to succeed in attracting productive investment, Australia's economy must be internationally competitive. A stable economic environment, with sustainable and broadly predictable economic policies in which business requirements for key, highly productive resources can be delivered quickly and reliably, is of critical importance. To this end, both macroeconomic and microeconomic conditions and policies are significant considerations in firms deciding whether to invest.

The TTNA acknowledges that the external circumstances and the influence of international market forces that are affecting Australian manufacturing are often difficult to control. However, one of the principles of Government is to provide a stable environment and an efficient infrastructure upon which business can operate and make sound decisions.

#### **4.4: Industrial Relations/Workplace Environment**

There is no doubt that enterprise bargaining has played a significant role in the welfare of the Australian technical and nonwovens textile industry over the last ten years. Enterprise bargaining has enabled progressive firms to minimise demarcation problems and to create skills based promotional structures. The reforms to the system in recent years have strengthened firms' abilities to put into practice workplace arrangements appropriate to the needs of individual enterprises.

As with all manufacturing, enterprise agreements are expiring continuously and there is the ever present possibility that disputes over wages and conditions will erupt. The consequences of a vulnerable workplace are often the result of agreements with a short duration which is not the industry's desired environment for a positive future. This is particularly so for export oriented firms as the process of meeting international deadlines is unforgiving and can be costly.

#### **4.5: Education and Workforce Skills**

The profile of a workforce has an identifiable effect on the direction and the health of an enterprise and on the industry as a whole. Certainly, a skilled workforce is a critical advantage.

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<sup>3</sup> Department of Industry, Science and Tourism 1997 Review of Business Programs, *Going for growth: Business programs for investment, innovation and export*.

Undoubtedly, there is an emerging skills shortage in a range of areas due to the pace at which both the domestic and global technical and nonwoven industries are progressing and the result of an ageing workforce and inadequacies of the traditional education system.

It has been a common complaint that manufacturing on the whole has failed to attract young people. Indeed, the Action Agenda paper for the TCF industry quoted an opinion as follows: “...*the lack of young people entering TCF has been a sleeper issue, but it is becoming critical...*” One of the most important realisations to emerge from the Action Agenda Board’s examination of the industry was the emphasis that must be placed on encouraging young people to be part of the industry. “*We need to ensure a continuing influx of skilled and competent young people. We need their energy and their sense of adventure, which are an invaluable resource to every enterprise..... It is not possible to achieve the extent of restructuring that is essential in this industry, or to meet the challenging targets the Board has recommended without a substantial infusion of young people into every aspect of the industry.*”

The TTNA plans to remedy emerging skills shortage by working collaboratively with RMIT to attract students to the technical and nonwoven textile sector by way of scholarships.

○ ***Inadequacies of the traditional education system***

The process of developing and bringing to market technical and nonwoven textile products for the applications areas, noted in the appendix A1, involves a range of both marketing and manufacturing related knowledge inputs at each development stage. The industry draws from a wide range of skills including trade skills, engineering, design, industrial chemistry, project management, finance, marketing and general management skills. A highly trained workforce is viewed by the industry as an indispensable ingredient to achieving world class products and performance levels.

In order to be ahead in international competition, the industry needs personnel with above average skills who are in a position to perform at world class levels. Efforts in this area are imperative in order to strengthen the force of innovation.

The industry requires for the future a rising number of skilled workers who are able to cover broad areas of employment with the support of flexible training. Rigid vocational training no longer does justice to the capital equipment and end-applications. A responsive educational and training system is crucial to all manufacturing industry sectors, as is ongoing dialogue between industry and training providers

In surveying the Australian technical textile and nonwoven industry for this submission, the general education streams such as engineering were deemed satisfactory; however the textile specific training which is focussed on apparel textiles falls short of industries needs. Indeed, the only textile course in NSW that was conducted at Sydney University was abandoned in 2000. To the industry’s knowledge there are no professional

Masters or Doctorate programs in technology for technical and senior industry managers. Nor are there Masters programs in innovation. In particular, the industry reported a growing shortage of skilled research scientists and technologists. Making funds available for post-graduate scholarships will no doubt help to produce a generation of research leaders who are at the cutting-edge of the technical textile and fibre research as well as research scientists with practical experience of the application of their discipline in the textile industry.

The Scenario Planning study on Technical Textiles undertaken for the TCF Action Agenda found that *“there exists a significant gap between the needs of the sector in the competencies of its people and the current state”*. Accordingly, it recommended that a *“long-term strategy be developed for appropriate education and training courses in technical textiles”*.

Upon installation of a new machine, international machinery suppliers usually commit to a training component as part of the purchase agreement whereby a technician is often brought in from Europe for a few months at a time. The industry is increasingly relying on this element for its training needs.

These systematic shortcomings extend to education and training in nonwoven technology. Until recently, there were no courses or even modules on offer for this vital industry sector. To address this, the TTNA collaboratively with RMIT and the IFC, obtained the licence to deliver the EDANA nonwoven course annually in Melbourne. Whilst only a three day event, it covers all aspects of nonwoven technology and production and has been a considerable success.

#### **4.6: Domestic Tariffs**

As outlined further in the appendix technical and nonwoven textiles can be produced by using knitted, woven or nonwoven technology. Each of these processes and subsequent end products come under a different tariff chapter heading and thus the industry has a varied history of applied tariff rates. However, the impact of lowering tariffs is a transitional force across all categories and has resulted in considerable change to the industry, its products, their competitiveness and the way by which business is done. Coupled with the liberalisation of the industry globally as a result of the World Trade Organisation’s Agreement on Textiles and Clothing (ATC), the Australian technical textile and nonwoven industry expects the transitional process to be ongoing for many years to come. Much of the process will be driven by access to other markets and the changes and shifts in production capacity around the world.

Indeed, the very heart of the World Trade Organisation’s liberalisation policy, and the subsequent process, is an attempt by governments to make the global business environment stable and predictable thereby assisting industries extend their capabilities beyond their borders. However, the findings of the “Market Access Industry Participation Programme” paper

published by the Textile & Fashion Industry Australia (TFIA) in June 2002 illustrated that the global trading environment is not yet equitable, stable or predictable. To this end, any further reduction in Australian tariffs, other than those scheduled by legislation, should be in acknowledgment of, and parallel with, international reductions of our trading partners' trade control measures (both tariff and non-tariff barriers).

Whilst the TTNA supports the scheduled fall in tariff rates in January 2005, any further reductions will no doubt adversely affect the entire Australian TCF industry including manufacturing and service and input industries. By way of example, in surveying the Australian technical and nonwoven textile industry for this submission, 70 % of respondents anticipate shifting a percentage of production offshore if tariffs were to fall after 2005 to say 5% in 2010.

***TTNA therefore recommends that any further tariff reductions other than those scheduled in 2005 should be in parallel with reforms undertaken by other countries.***

## 5: The Strategic Investment Program

The purpose of the Textile, Clothing and Footwear Strategic Investment Program (SIP) is *“to foster the development of sustainable, competitive TCF industries in Australia during the transition to a freer trade environment post 2005.....It provides grants to encourage investment and innovation to increase the competitiveness of Australias TCF industry.”*

While strong consumer demand, the exchange rate and a robust domestic economy have been potent influences on the Australian manufacturing sector, similar to the ACIS for the automotive industry, SIP appears to be delivering benefits to the Australian technical and nonwoven textiles industry and thus to the Australian economy. Indeed, the Australian technical and nonwoven textiles industry has responded well to the SIP scheme. The Government’s assistance has been a valuable aid in encouraging and accelerating the necessary investment. It would appear that the scheme is working as intended by the legislation. Investment in new plant and equipment and R&D expenditure has expanded considerably over the last two years and is set to continue for the next two years, providing a stable investment environment remains. In essence, the industry is on the way to becoming a smarter and more innovative industry than it once was.

It is apparent that the industry views the scheme as crucial to maintain competitiveness and to sustain investment. The importance of the scheme is reflected in high rates of utilisation among technical & nonwoven textile companies. The industry argues that the SIP is one of the industry’s strengths in competing for new business and a catalyst for securing the go ahead for investment and research and development.

Accurate quantification of the impact of the SIP scheme is difficult for a number of reasons. Firstly, the scheme has been in operation for only two of the scheduled five years. Secondly, the effects are combined with a range of other factors that influence performance including the general economic conditions, exchange rates and access to skilled labour to name a few. However in surveying the Australian technical textile and nonwoven industry for this paper, all reported that investment had increased as a direct result of SIP. Indeed, investments made utilising (for the most part) type 1 and 2 SIP grants resulted in an average productivity gain of 20%.

Textiles is a relatively competitive industry in which a significant proportion of the benefits from the new investment will flow through the value chain to customers in the form of employment, improved skills, improved products, and/or reduced prices. Be they end users or intermediate consumers of technical and nonwoven textiles in Australia or overseas, the benefits that flow through the value chain will be realised in Australia.

It must be noted that it takes time for firms to respond to changes in Government policies which directly affect their operating environment. Time is required to identify new opportunities, to plan for new capital expenditure, to innovate to meet market demand, to up-skill staff and find better ways for working and to allocate

and raise capital. As previously noted, in surveying the Australian technical textile and nonwoven industry for this paper, all reported that the results and subsequent gains from investments made as a result of SIP funds will take an average of three years until they will financially benefit.

There is no doubt that global demand for technical and nonwoven textiles will continue, however future growth in the Australian manufacturing sector is dependent on a stable investment environment for the time required to adjust to changes in Government policies.

The Australian technical and nonwoven textiles industry views investment, including R&D activity, as the principal drivers of growth beyond 2005 in anticipation of 2010. Product rollover and the renewal of ideas are constant; as is the reinvestment in technology/capital which has to occur every 10 years. Indeed, SIP is absolutely critical to carrying the technical and nonwoven textile industry to the next level required for competitively positioning the industry in 2010. The industry is therefore united in its support for a continuation of SIP mark 2 beyond 2005.

In surveying the Australian technical textile and nonwoven industry for this paper, 70% of respondents reported that any new scheme should consider changing payments from annual to quarterly in order to assist with cash flow needs. In addition, there should be a component of the scheme geared toward developing exports (as mentioned in section 3.1.2).

***TTNA recommends the Government continue to stimulate the uptake of Research and Development and Innovation through investment for the betterment of the technical and nonwoven textile industry.***

***TTNA recommends the introduction of a new Strategic Investment Program (SIP mark 2) with appropriate program funding to extend from 2006 to 2010.***

***TTNA recommends SIP mark 2 should be modified to***

- ***increase capital expenditure from 20% to 35%.***

## **6: The Expanded Overseas Assembly Provisions Scheme (EOAP)**

The EOAP scheme enables participants to assemble goods (contained in Chapters 42,43,61,62 and 64 of the customer tariff schedule 3) overseas from predominantly Australian fabric and/or leather. The assembled goods can then be imported for local consumption with duty payable only on the cost of overseas processing and content.

Whilst acknowledged as a worthy scheme, the Australian technical and nonwoven textile industry has not been able to take full advantage of it as many of products made by the industry, and also from technical and nonwoven textile products are excluded from the eligible import category chapters. By way of example, filtration bags (tariff number 5911.90.30 that currently attracts a 15% tariff) could quite possibly be made from Australian woven and/or nonwoven fabrics and assembled offshore and imported for local consumption with duty payable only on the cost of overseas processing and content.

***TTNA recommends the EOAP scheme should be extended to include additional products.***

## APENDIX:

### A: A Definition: The Technical & Nonwoven Textile Industry Sector

Technical and nonwoven textiles and fibres are widely regarded as the most thriving and fast changing sector of the global textile industry. Innovation in new materials, processes and applications is expanding non-traditional end uses for both new and existing textile products. In contrast to popular perception of the broader TCF industries, technical textiles and fibres is a high-technology and high value-adding activity.

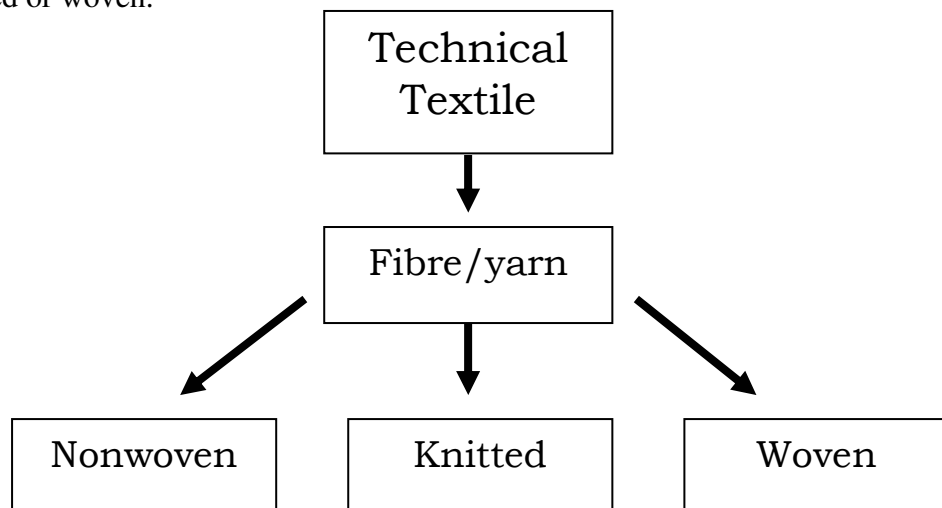
In short, technical and nonwoven textiles are about function rather than fashion.

Industrial textiles, the traditional term for the industry sector have been around since weaving began. Up until the sixties most cars supported water bottles and the coal cars of trains were covered by tarpaulins. Both products were made from canvas fabric woven from flax. Australian troops were sent to world wars in the same fabric permeated with oil and made into waterproof coats.

The line between a traditional textile and a technical/industrial textile may seem unclear to an outsider as many products could arguably fall into either division often depending on their end use or functional qualities. Of course, the broad range of products described as industrial or technical textiles adds to the complexity of defining exactly what an industrial or technical textile is, and thus individual firms identify themselves by their products' end use applications.

One of the distinguishing features of the evolving technical textiles industry is the emergence of traditional textiles and fibre producers into technical textiles. Hence, technical textiles provide an important avenue for structural adjustment within the textiles and broader TCF industries.

The process by which technical textiles are manufactured identifies the products further. For instance (as demonstrated in the figure below) a technical textile could be nonwoven or the result of more traditional textile making technologies such as knitted or woven.



More traditional fabrics, such as knits, can also be considered a technical textile if, for instance, they have some advanced characteristic or quality (i.e. UV resistance or reduced flammability) due to added chemicals or synthetic fibres used in the making of the fabric for a specific end use or application. By way of example, the raschelle knitting technique which was traditionally used for making shawls, scarves and babies' blankets is now used for making shade-cloth and fabric used to reinforce embankments.

Nonwoven technology is one of the conventional sectors of the "traditional" textile industry and was best known for making felt used in craft products such as stuffed toys, hats and shoe linings, to name a few. Indeed, felted fabrics were around for centuries before weaving of knitting technology were invented. This form of manufacturing has surpassed its humble beginnings and is classified by the American Textile Manufacturers Institute (ATMI) as:

*"A fabric formed of textile fibres that are held together by mechanical interlocking in a random web or mat, by fusing the case of thermoplastic fibres or by bonding with a cementing agent."*

Further, the Industrial Nonwovens & Disposables Association (INDA) of North America defines nonwovens by their properties and production process as follows:

1. *To distinguish nonwovens from papers, a material shall be defined as a nonwoven if:*
  - a) *More than 50% by mass of its fibrous content is made up of fibres (excluding chemically digested vegetable fibres) with a length to diameter ratio greater than 300; or*
  - b) *More than 30% by mass of its fibrous content is made up of fibres as in 'a' above and meeting one or both of the following criteria:*
    - (i) *Length to diameter ratio more than 600*
    - (ii) *The density of the fabric is less than 0.4 g/cc*
2. *Bonding methods may include any of the following means or any combination thereof, including but not limited to:*
  - a) *Adding an adhesive*
  - b) *Thermally fusing the fibres or filaments to each other or to other meltable fibres or powders*
  - c) *Fusing fibres by first dissolving then resolidifying their surfaces*
  - d) *Creating physical tangles or tufts among the fibres*
  - e) *Stitching the fibres or filaments in place*
3. *A nonwoven may be a structural component of a composite*
4. *Nonwoven structures may incorporate monofilaments or yarns*

Both synthetic and natural fibres are used in manufacturing technical and nonwoven textiles. The selection and combinations of fibres used determine the ultimate end product properties, cost and subsequent applications.

Furthermore, in order to create particular and/or additional performance and functional properties, secondary processes such as laminating, bonding, coating, surface treatments or the imprecations of chemicals are often used.

Unlike the woven or knitted manufacturing disciplines, nonwovens are often further categorised by durability of the chosen end use. That is, non-durable (single or short-life) and durable (long-life) products. Short-life, or disposable products dominate the nonwovens sector, the sub categories for which are as follows:

<b>Short-life</b>	<b>Long-life</b>
Hygiene	Interlinings
Wipes	Furnishings and bedding
Medical / Surgical	Shoe & Leather
Air Filtration	Coated / Laminates
Liquid Filtration	Floor coverings / carpet backings
Disposable Apparel	Building Construction
	Geotextiles / Civil Engineering
	Automotive
	Electronic Components
	Agriculture / Landscape

(Source: INDA 2002)

### **A.1: Applications and User Industries**

Whilst they play a much more important role than is commonly acknowledged, technical and nonwoven textiles often go unnoticed as they are produced for functional properties rather than aesthetic or decorative characteristics. They are frequently used in a range of downstream applications in other manufacturing and service industries and, thus, not highly visible at the retail level.

A non-exhaustive list of end-uses includes aerospace, industrial, marine, military, safety and transport textiles and geotextiles. It also shares a number of technologies and has overlapping interests with other materials industries such as glass, plastics, films, membranes, metals, composites and paper.

UK-based textile industry consulting firm, David Rigby Associates (DRA), broke new ground in 1997 when it released a major report on the world market for technical textiles and industrial nonwovens. It was the first time that someone had substantially sought to define the industry and collate data to measure its value and significance. A synopsis of the major applications for technical textiles is listed below in alphabetical order rather than that of importance:

**Agriculture (Agrotech):** agricultural textiles used in horticultural, forestry and fishing applications, such as nets, screens, ropes and cordage;

***Building and construction (Buildtech):*** a wide range of construction and architectural textiles, such as sound proofing, damp courses, heat resistance and insulation, pipe linings, reinforcements and facades as well as composite structural materials;

***Clothing (Clothtech):*** technical and functional textile components of garments and footwear, such as interlinings, insulating fill and waddings, and waterproofing;

***Environment (Envirotech):*** environmental and safety textiles, such as filtration and insulation products for such uses as mopping up oil spills, etc;

***Geological (Geotech):*** a range of geotextiles and geomembranes used for such things as erosion control through reinforcement and stabilisation, materials separation, filtration and drainage in civil engineering applications;

***Household (Hometech):*** technical components and functional textiles used in furnishing and floorcoverings, such as carpet and curtain backings, and fibre fill products such as pillows, duvets and cushions;

***Industrial (Indutech):*** industrial textiles used for such things as filtration, cleaning and in a wide range of products including hoses and belts for drives and conveyors;

***Medical and hygiene (Medtech):*** including textiles used for bandaging and dressings, hygiene products such as wipes, diapers and pads;

***Transport (Mobiltech):*** textiles used in road, rail and seas transport, such as tyre cord, hoses, belts, linings and seat fabrics in automobiles;

***Packaging (Packtech):*** a wide range of textiles used in sacking, packaging, wrapping and tying;

***Protection (Protech):*** including protective clothing including stab and bullet proof clothing

***Sports (Sporttech):*** including a wide range of composite materials used in boats, clubs, rackets, bicycle frames, as well as sail cloth, balloon fabrics, and artificial turf and playing surfaces.<sup>4</sup>

There are many cross overs in the sectors named above. Additionally, the market for technical and nonwoven textiles and fibres is growing as the industry continues to innovate and develop products for old applications and new end uses. For example, filtration products are used in the manufacture of food products including milk products processing (ie.

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<sup>4</sup> This list of applications is derived from DRA 1997, *The World Technical Textile Industry and its Market Prospects to 2005*, Techtextil, Messe Frankfurt GMBH, other sources and the CSIRO CRC paper.

yoghurt, cheese and skinny milk); they are also used in manufacturing steel and aluminium. Whilst they often replace a traditional product which is the case for nonwoven disposable medical gowns, they increasingly forge new ground for products such as shade sails for school grounds. Indeed, in the food processing industry, as new processed food products are developed to satisfy the time-poor customer, so too are the filtration techniques and thus the filtration mediums.

The above list illustrates the diversity of the industry sector, however it must be noted that Australia does not make products in all the sectors listed. Products within these sectors may also be low value and thus made in low labour cost markets, however they may also be high-tech, high value products that make a significant contribution to the industry and a given supply chain. To demonstrate further, following are more detailed profiles of six of these industry sectors.

#### **A.1.1: Agrotech**

This sector has been driven by an increasingly risk averse legislative and insurance industry attempting to mitigate the damaging effects of hail, blight and severe weather on agricultural crops. Additionally, over the past 15 years, there has been an increasing awareness of UV rays and their damaging effects on people and property. Australia and South Africa have been at the forefront of the development of these applications, hence the growth of the industry in the Southern Hemisphere. It has also given us a “head start” on the rest of the world, which in turn has given a competitive advantage for developing international markets.

Growth is in the more specialised textile applications in agriculture such as woven, nonwoven covers (incl tarps), netting, crop covers, frost protection, insect protection, capillary matting, landscaping and related geotextile applications on-farm.

Farmers may use textiles for dam liners, on-farm erosion control measures through to tree guards and other landscaping applications. In the wake of foot and mouth disease anxiety, these fabrics are also used for their separation and drainage characteristics. For instance, separating gravel from a soil layer, preventing mixing of the layers and these areas becoming muddy and unhygienic for livestock.

The feedlot industry is another area with an increasing use of shade cloth materials to protect cattle from extremes of weather and improve productivity. Materials can be used in a number of ways including as a ground cover to prevent weed growth or soil erosion. More commonly they are used as crop cover to protect crops from frost, wind, hail, sun and insects.

#### **A.1.2: Buildtech**

The market for technical textiles in this sector is directly dependent on the state of the construction industry, especially the housing market which is highly cyclical. However in recent years there has been an obvious turn of fortunes in the Australian building and construction industry which is a

major driver of the Australian economy. The residential housing sector of the industry has recently experienced a strong period of growth. In the year 2000-01, total turnover was over \$51 billion, of which:

- 41% was residential buildings (houses, flats),
- 24% non-residential buildings (offices, shops, hotels) and
- 35% engineering construction (roads, bridges, water, sewerage).

This intense activity, in addition to an ever changing and increasing regulatory environment, has led to the development and usage of woven and nonwoven textile solutions for the building industry. Home improvement stores such as Bunnings and Homewarehouse have flourished with products for the do-it-yourself handyman/person. In essence the building and construction market is enormous and growing and the opportunities for technical textiles in this sector will continue to expand.

The types of products used in this industry sector are as broad as the buildings that are being constructed. The technical products developed can be used in replacement of more traditional building materials for their acoustic, strength and weight properties. Technical textiles can provide sound and thermal insulation with minimal weight added to the construction. The use of fire retardants on furniture, carpets, electronics and other materials for clean air control are on the increase. Bituminous roofing and water proofing is a large proportion of the Buildtech industry.

### **A.1.3: Geotech**

Australia's dry climate results in a very low sediment supply for our coastline and in most places this volume is insufficient to offset the threat of storm surge or sea level rise. The majority of our population chooses to live as close as possible to the coast. This coupled with the evolving responsible and environmentally aware current generation has contributed to the growth of this industry sector. Varying terrain and climate mean that environmental protection concerns vary greatly. The Environmental Protection Agency (EPA) sets the Federal environmental minimum standards. State and local rules further develop these laws. These laws are then expanded on by municipalities' private policy or consumer group suggested guidelines. The nature of the geotextile industry also insists materials have extended or infinite lifetimes. This industry therefore has extensive research needs to substantiate the product's active useful lifetime and to satisfy an ever changing and increasing regulatory environment.

As one of the fastest growing of the 12 end-use application areas for technical textiles and nonwovens, DRA (2002) estimates growth in the Geotech sector worldwide to be over 5 percent in the period 2005 to 2010. The Geosynthetics Research Institute (GRI) estimates that there are at least 80 specific application areas for geotextiles that have been developed; but that the fabric always performs at least one of five distinct functions including:

- Separation
- Reinforcement

- Filtration
- Drainage
- Moisture barrier (when impregnated)

Geotextiles are manufactured by both woven and nonwoven technology and are predominantly used in the civil engineering construction industry.

Federal and state environmental laws on stabilisation and erosion control are forcing both public and private developers to be more careful about the off-site impacts of their construction activities and are thus contributing to the growth of this sector. Legislation covering pollutant discharge requires developers to control stormwater runoff and developers are increasingly requested to produce a formal erosion and sedimentation certification.

Geotextiles are used in a variety of ways for road construction, typically to separate layers in a road base, beneath foot-paths and parking lots and between old and new asphalt layers.

The engineers, councils and other regulatory bodies are held accountable for the structures developed and thus the industry sector is heavily regulated.

#### **A.1.4: Indutech**

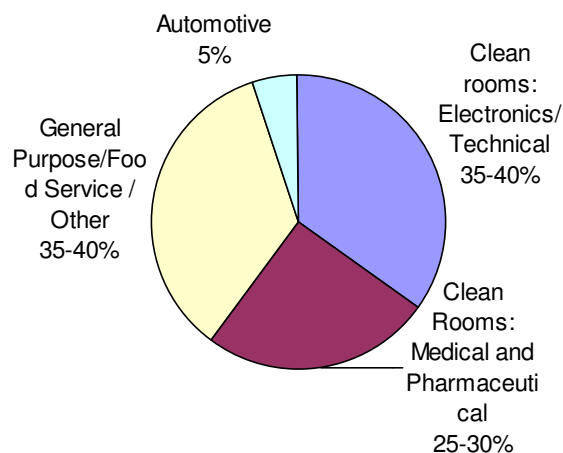
As mentioned previously, an industrial textile was once the term for what is now known as technical textiles. It included the traditional woven canvas fabrics that were used for a myriad of applications, however DRA's (1997) definition includes:

- industrial belting,
- hoses,
- conveyor fabrics,
- abrasive materials,
- filtration media,
- papermaking felts,
- industrial wipes and cleaning materials,
- ropes,
- nets, and
- tarpaulins and covers not falling into transport or other specific end use applications.

The end use for these products is primarily mid-stream manufacturing rather than retail. A general rule is that the market for these products is sensitive to the surrounding industrial manufacturing industry.

Industrial wipes were traditionally woven, however nonwoven materials have overtaken in recent years. INDA (2002) estimates of consumption of wipes in these industrial segments is summarised in the chart below.

## Industrial Wipes Segments



(Source: INDA 2002)

Filtration is also a considerable and growing sub-sector of this market.

Conveyer belting used in both heavy and light manufacturing for producing a gamut of products is also a technical textile of woven technology. Belts are also the main method of power transmission in a factory. Polyester has become the fibre of choice for belt products. Industrial hoses are also produced using technical textile technology and can be found on a variety of equipment and products especially as related to combustion engines or hydraulic machinery.

To demonstrate an overlap with other industry sectors, products specific to use in vehicles or mobile transportation generally fall into the Mobiltech sector and those products designed to improve the air or water quality for human beings are often listed under Envirotech.

Product design and safety standard requirements for particular products, and environmental and occupational safety and health legislation in relation to the impacts of industrial processes on the natural environment and workers dictate a vast range of regulations governing these products.

### A.1.5: Mobiltech

The scope of Mobiltech embraces all woven and nonwoven textile applications used in the construction and furnishing of passenger and commercial, civil and military transportation including air, sea and land and is considered the largest sectors by value for technical textile and nonwovens according to DRA (2002).

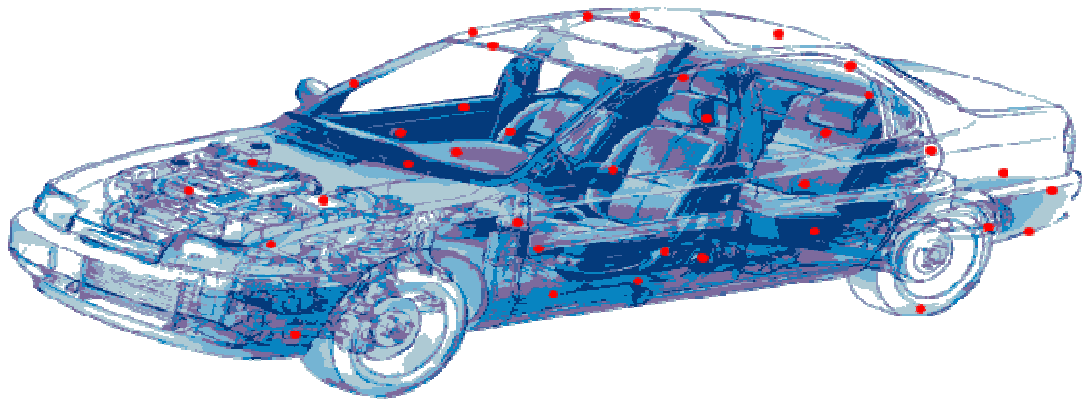
The automotive manufacturing industry is highly competitive and price driven. There has been considerable pressure on suppliers to reduce costs to keep cars affordable and to reduce weight. Both of these requirements are driving a considerable amount of innovation within the technical and

nonwoven textile industry. For example, “Smart textiles” are those that anticipate and satisfy needs such as climatic control. Product features now being sought include fabrics that will aid in passenger comfort (eg heating & cooling) be more durable and resistant to moisture, stains and odour retention.

Logistical efficiency also dictates that the Australian automotive manufacturers should source from domestic suppliers. Innovation, locality, service and price are all paramount.

In addition to cost and lower weights, another trend for the automotive industry is the push for greater recyclability of car parts including interiors, which are often nonwovens (Wubbe, 2001).

According to INDA, more than 40 automotive parts (as detailed below) are made from engineered fabrics from seat covers and seat belts to tyre reinforcement, headliners, insulation, trunk liners, carpets to fuel and air filters.



(Source: INDA)

A feature of the automotive industry is long lead times between development of new models and supplying components. Australian suppliers into this market often have to make substantial R&D investment often up to 3 years in advance of any returns.

#### **A.1.6: Medtech**

Medtech includes “*textiles used for bandaging and dressings, hygiene products such as wipes, diapers and pads.*” Nonwoven technology dominates short life medical textiles however woven and knitted products are also used. Products include bacteria-impermeable barrier fabrics for gowns and drapes using either microporous membranes or microfilament yarns with carbon fibre woven-in. Additionally, sophisticated composites have been developed for the prevention of infection transmission.

*“The health and hygiene market represents one of the most basic needs of mankind, fuelled at one end by the massive and growing populations and standards of living in the developing world, and at the other by the increasing high technology and diverse needs of a wealthy but ageing population in the developed world.....The nature and scale of a large*

*part of this market has resulted in the mergence of a technical textiles supplying industry with some very specific characteristics. More than any other sector, it sells a large proportion of its products directly to consumers. The industry has had to develop the skills of creating and marketing brands and of operating in what is, in some product segments, a classic Fast Moving Consumer Goods Market.”<sup>5</sup>*

#### **A.1.7: Protech & Clothtech**

In recognition that the Australian market is finite due to its limited population, this industry sector is best viewed coupled with the sister sector of Clothtec.

Given the current threats to global security, global defence forces including Australia have increased expenditure on protective apparel which includes specialist clothing that provides protection from a wide range of hazards, such as radiation, heat and flame, chemicals, molten metals, ballistic impact, cut, stab and foul weather. Additionally, with increasing awareness of occupational health and safety the end-use market for protective clothing is among the more rapidly growing. The world market for technical textiles used in protection applications, including protective apparel, is reported to be worth US\$ 1.6 billion, and is growing at a compound annual rate of more than 6 per cent.

Clothtech includes “*technical and functional textile components of garments and footwear, such as interlinings, insulating fill and wadding, and waterproofing*”. Together, these industry sectors will increasingly cater for the ageing population and its intensified needs for functional hygiene and incontinence products.

The value of end-use consumption of technical and nonwoven textiles in these two industry sectors is forecast to increase at a very healthy rate over the next 20 years.

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<sup>5</sup> DRA: The World Technical Textile Industry & Its Markets: Prospects to 2005.

## B: A Global Overview

A report by the Centre for Strategic Economic Studies of Victoria University in 2000 states: “*Worldwide consumption of technical textiles grew from around US\$ 33 billion in 1985 to almost US\$ 50 billion in 1995, and it is predicted that it will reach US\$ 72 billion by 2005. The worldwide market for technical textiles grew at a compound annual rate of 4.2 per cent over the decade 1985 to 1995, and is forecast to grow at a slightly slower compound annual rate of 3.8 per cent over the decade 1995 to 2005.*”

*The largest end-use application markets are transport, forecast to be worth US\$ 14.4 billion by 2005, industrial (US\$ 11.6 billion), home (US\$ 9.7 billion), medical (US\$ 9.5 billion) and clothing (US\$ 7.6 billion). Sport, forecast to be worth US\$ 2.5 billion by 2005, protection (US\$ 2.2 billion) and environmental (US\$ 1.6 billion) are smaller, but nevertheless significant and growing markets.”*

In May 2002, DRA released an updated version of the original report referred to in a previous section. It estimates the world market for technical textiles and industrial nonwovens to have been 16.7 million tons in 2000, almost 50 percent greater than the 11.3 million tons forecast in the DRA’s 1997 report. According to DRA, this larger industry estimate is the result of several factors including:

- more technical textile products being included, particularly in agricultural, building, clothing and sports applications;
- recognition of more jute products;
- an improved understanding of the Chinese market.

The new report forecasts that the world market for technical textiles and industrial nonwovens will continue to grow by 3.5 percent per year in volume terms to reach 23.8 million tons with a value of US\$126 billion by 2010. It has been predicted that overall consumption of technical textiles and industrial nonwovens will continue to grow strongly in the Asian region relative to other parts of the world.

Technical and nonwoven textiles forecasts of final consumption by region:  
Volume (‘000 tonnes)

Region	Years				CAGR%*		
	1995	2000	2005	2010	95-00	00-05	05-10
Americas	4,288	5,031	5,777	6,821	3.2%	2.8%	3.4%
Europe	3,494	4,162	4,773	5,577	3.6%	2.8%	3.2%
Asia	5,716	6,963	8,504	10,645	4.0%	4.1%	4.6%
ROW	473	558	628	730	3.3%	2.4%	3.1%
Totals	13,971	16,714	19,683	23,774	3.7%	3.3%	3.8%

\*CAGR – Compound Annual Growth Rate  
(Source: DRA 2002)

The DRA report notes that “*Most end use market sectors are expected to experience good growth up to 2010. Geotech, Buildtech and Medtech will lead the*

way with growth rates between 2005 and 2010 forecast at 5.3 percent, 5 percent and 4.4 percent respectively.”

Technical and nonwovens textiles forecasts of final consumption by application area: Volume (‘000 tonnes)

Application Area	Years			CAGR%	
	2000	2005	2010	00-05	05-10
Agrotech	1,381	1,615	1,958	3.2%	3.9%
Buildtech	1,648	2,033	2,591	4.3%	5.0%
Clothtech	1,238	1,413	1,656	2.7%	3.2%
Geotech	255	319	413	4.6%	5.3%
Hometech	2,186	2,499	2,853	2.7%	2.7%
Indutech	2,205	2,624	3,257	3.5%	4.4%
Medtech	1,543	1,928	2,380	4.6%	4.3%
Mobiltech	2,479	2,828	3,338	2.7%	3.4%
Packtech	2,552	2,990	3,606	3.2%	3.8%
Protech	238	279	340	3.3%	4.0%
Sporttech	989	1,153	1,382	3.1%	3.7%
<b>Total</b>	<b>16,714</b>	<b>19,683</b>	<b>23,774</b>	<b>3.3%</b>	<b>3.8%</b>

\*CAGR – Compound Annual Growth Rate  
(Source DRA 2002)

### B.1: Drivers of Growth

The market for technical textiles and fibres is growing as the industry continues to innovate and develop products for old applications and new end uses.

*“Developments within the technical textile sector have been characteristic of high added value (products), high technology and performance, and a niche market orientation. ...Technical textiles are expected to continue to grow at a higher rate than any other segment of the textile market. Apparel and household textiles are already at, or approaching the saturation level and in many countries may not even be expected to grow with per capita income. This is decidedly not the case with technical textiles and the constant search for textile based solutions to problems in industry, civil engineering and leisure applications will ensure the continued growth of the sector.”<sup>6</sup>*

Growth in the technical textiles sector in developed countries, including Australia, is being driven by:

- environmental concerns and increasingly stringent environmental regulations;
- the need for increased energy efficiency and utilisation of waste leading to a wider search for materials for use in manufacturing and construction;

<sup>6</sup> Werner International 1994, *Review of the Textile, Clothing & Footwear Industries Development Strategy*, October 1994; cited by ABED 1999, *Scenario Planning for the Technical Textiles Sector of the TCF&L Industries*, Australian Business Foundation, Sydney, p9.

- high performance/whole of life cost factors encouraging the use of innovative materials;
- increasing wealth and focus on healthcare and personal protection
- an increased focus on leisure and sports activities
- an increased awareness of occupational health and safety issues.<sup>7</sup>

Technical textiles now represent a significant proportion of world textile manufacturing and trade. In 1997, UK-based consultants DRA suggested that at least 40 per cent of fibre consumption within developed countries was in the manufacture and consumption of technical textiles<sup>8</sup>.

The manufacturing technology for the modern nonwoven industry is high tech and supplied by relatively few machinery companies. Most of the modern nonwoven plants are turnkey projects installed in all global regions and, thus, production of nonwoven products is easily tracked. Figures on woven and knitted technical textiles are more illusive as they are often integrated in well established production facilities and, thus, production and turnover statistics, particularly those from old family owned companies are difficult to measure. To this end, the following snapshot of world growth in nonwoven markets is an illustration of the whole industry.

- ***World Growth in Nonwoven Markets***

The modern nonwoven industry had its early growth in North America, Europe and Japan. The rapid growth that occurred in the 1970s and '80s has moderated during the 1990s to an average of 6.4% per year. Some of the end-markets in these three regions are considered fairly mature. But consistently, the industry has developed new fabrics and products requiring nonwovens, and INDA's forecast is that the combined growth in these three regions will exceed 6% per year for the five-year period to 2006.

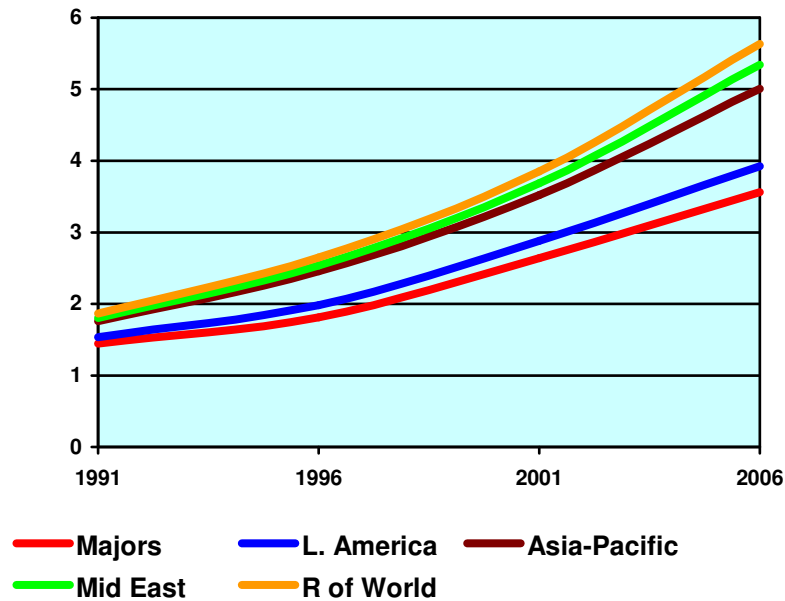
INDA forecast of investment requirements is as follows: *“World nonwoven production is forecast to rise from 3.85 million tonnes in 2001 to 5.63 million tonnes in 2006. This represents an increase of 1.78 million tonnes of nonwoven material. This figure is slightly overstated as there is some nonwoven over capacity in some markets due to recent major production lines that are just coming on-stream. But, to sustain industry growth, theoretically about \$4 billion in US dollar equivalents will be the capital required to meet the forecast production volume. This figure includes estimates for the prime machinery, erection, material supply systems, machine servicing equipment and electrical and gas hook-ups. It does not include peripheral costs associated, such as employee training, power supply to the site, material handling equipment, start-up waste, working capital and similar.”*

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<sup>7</sup> ABED 1999, *Scenario Planning for the Technical Textiles Sector of the TCF&L Industries*, Australian Business Foundation, Sydney, p1.

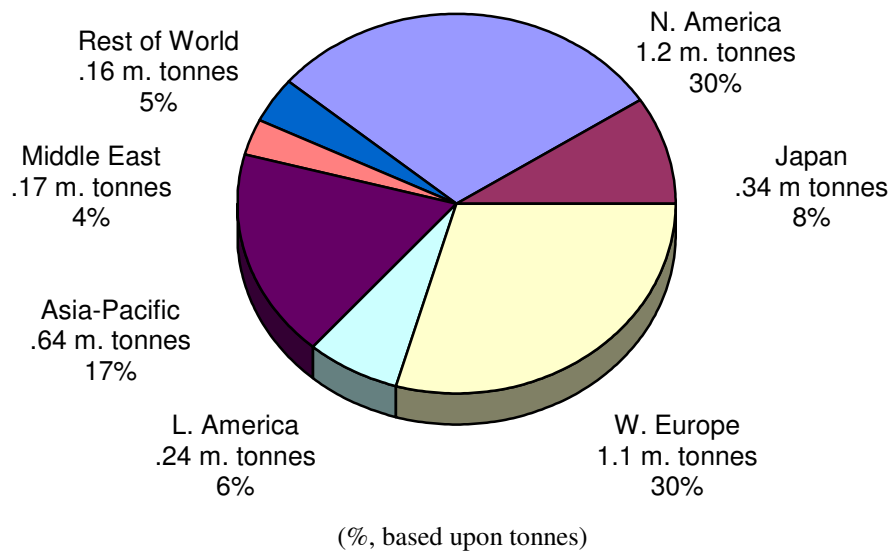
<sup>8</sup> DRA 1997, *The World Technical Textile Industry and its Market Prospects to 2005*, Techtexil, Messe Frankfurt GMBH.

The following chart produced by INDA graphically illustrates the worldwide nonwoven growth over the 10 years previous to 2001 and provides a forecast to 2006.

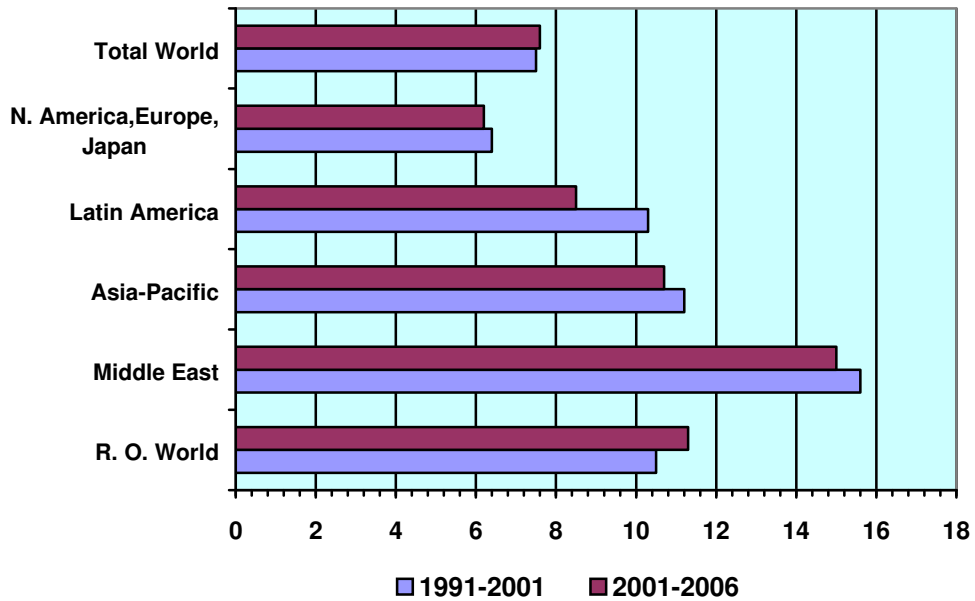


The combined volume of North America, Europe and Japan, the regions with the most developed nonwovens industry and markets, currently accounts for 68% of the world's nonwoven roll goods production. North America (U.S. and Canada) and Europe both produce about the same quantity of nonwovens with each having about a 30% share of the world volume.

2001 Nonwoven Production By Region  
(3.85 million tonnes)



INDA further forecasts: *“The other four geographic regions, Latin America, Asia-Pacific, Middle East and Rest of World have all experienced growth that exceeded 10% per year during the past decade. There is no doubt that nonwoven production will continue to rise as these regions industrialize”.*



Growth of Nonwovens by World Region: 1991-2006, (millions of tonnes)  
Source: INDA 2002

It must be noted that the growth of woven technical textiles is in parallel with nonwovens, however the figures are difficult to obtain for reasons stated previously.

## ATTACHMENT 1

### United Nations Conference on Trade & Development (UNCTAD) Coding System for TRADE Control Measures

#### 1000 Tariff Measures

- 1100 Statutory Customs Duties
- 1200 MFN Duties
- 1300 GATT Ceiling Duties
- 1400 Tariff Quota Duties
  - 1410 Low Duties
  - 1420 High Duties
- 1500 Seasonal Duties
  - 1510 Low Duties
  - 1520 High Duties
- 1600 Temporary Reduced Duties
- 1700 Temporary Increased Duties
  - 1710 Retaliatory Duties
  - 1720 Urgency and Safeguard Duties
- 1900 Preferential Duties under Trade Agreements
- 1910 Interregional Agreements
- 1920 Regional and Subregional Agreements
- 1930 Bilateral Agreements

#### 2000 Para-Tariff Measures

- 2100 Customs Surcharges
- 2200 Additional Charges
  - 2210 Tax on Foreign Exchange Transactions
  - 2220 Stamp Tax
  - 2230 Import Licence Fee
  - 2240 Consular Invoice Fee
  - 2250 Statistical Tax
  - 2260 Tax on Transport Facilities
  - 2270 Charges for Sensitive Product Categories
  - 2290 Additional Charges N.E.S.
- 2300 Internal Taxes and Charges Levied on Imports
  - 2310 General Sales Taxes
  - 2320 Excise Taxes
  - 2370 Charges for Sensitive Product Categories
  - 2390 Internal Taxes and Charges Levied on Imports
- 2400 Decreed Customs Valuation
- 2900 Para-Tariff Measures N.E.S.

#### NON-TARIFF MEASURES (NTMS)

##### 3000 Price Control Measures

- 3100 Administrative Pricing
  - 3110 Minimum Import Prices

- 3190 Administrative Pricing N.E.S.
- 3200 Voluntary Export Price Restraint
- 3300 Variable Charges
  - 3310 Variable Levies
  - 3320 Variable Components
  - 3330 Compensatory Elements
  - 3340 Flexible Import Fees
  - 3390 Variable Charges N.E.S
- 3400 Antidumping Measures
  - 3410 Antidumping Investigations
  - 3420 Antidumping Duties
  - 3430 Price Undertakings
- 3500 Countervailing Measures
  - 3510 Countervailing Investigations
  - 3520 Countervailing Duties
  - 3530 Price Undertakings
- 3900 Price Control Measures N.E.S.
  
- 4000 Finance Measures
  - 4100 Advance Payment Requirements
    - 4110 Advance Import Deposit
    - 4120 Cash Margin Requirement
    - 4130 Advance Payment of Customs Duties
    - 4170 Refundable Deposits for Sensitive Product Categories
    - 4190 Advance Payment Requirements N.E.S.
  - 4200 Multiple Exchange Rates
  - 4300 Restrictive Official Foreign Exchange Allocation
    - 4310 Prohibition of Foreign Exchange Allocation
    - 4320 Bank Authorisation
    - 4390 Restrictive Official Foreign Exchange Allocation N.E.S.
  - 4500 Regulations Concerning Terms of Payment for Imports
  - 4600 Transfer Delays, Queuing
  - 4900 Finance Measures N.E.S.
  
- 5000 Automatic Licensing Measures
  - 5100 Automatic Licence
  - 5200 Import Monitoring
    - 5210 Retrospective Surveillance
    - 5220 Prior Surveillance
    - 5270 Prior Surveillance for Sensitive Product Categories
  - 5700 Surrender Requirement
  - 5900 Automatic Licensing Measures N.E.S.
  
- 6000 Quantity Control Measures
  - 6100 Non-Automatic Licensing
    - 6110 Licence with No Specific Ex-Ante Criteria
    - 6120 Licence for Selected Purchasers
    - 6130 Licence for Specified Use
    - 6131 Linked with Export Trade
    - 6132 For Purposes other than Exports
    - 6140 Licence Linked With Local Production

- 6141 Purchase of Local Goods
- 6142 Local Content Requirement
- 6143 Barter or Counter Trade
- 6150 Licence Linked with non-Official foreign exchange
- 6151 External Foreign Exchange
- 6152 Importers' own Foreign Exchange
- 6160 Licence Combined with/or Replaced by Special Import
- 6170 Prior Authorization for Sensitive Product Categories
- 6190 Non-Automatic Licensing N.E.S.
- 6200 Quotas
  - 6210 Global Quotas
  - 6211 Unallocated
  - 6212 Allocated to Exporting Countries
  - 6220 Bilateral Quotas
  - 6230 Seasonal Quotas
  - 6240 Quotas Linked with Export Performance
  - 6250 Quotas Linked with Purchase of Local Goods
  - 6270 Quotas for Sensitive Product Categoriesú
  - 6290 Quotas N.E.S.
- 6300 Prohibitions
  - 6310 Total Prohibition
  - 6320 SU pension of Issuance of Licences
  - 6330 Seasonal Prohibition
  - 6340 Temporary Prohibition
  - 6350 Import Diversification
  - 6360 Prohibition on the Basis Of Origin (Embargo)
  - 6370 Prohibition for Sensitive Product Categories
  - 6390 Prohibitions N.E.S.
- 6600 Export Restraint Arrangements
  - 6610 Voluntary Export Restraint Arrangements
  - 6620 Orderly Marketing Arrangements
  - 6630 Multifibre Arrangement (MFA)
  - 6631 Quota Agreement
  - 6632 Consultation Agreement
  - 6633 Administrative Cooperation Agreement
  - 6640 Export Restraint Arrangements on Textiles outside MFA
  - 6641 Quota Agreement
  - 6642 Consultation Agreement
  - 6643 Administrative Cooperation Agreement
  - 6690 Export Restraint Arrangements N.E.S.
- 6700 Enterprise-Specific Restrictions
  - 6710 Selective Approval of Importers
  - 6720 Enterprise-Specific Quota
  - 6790 Enterprise-Specific Restrictions N.E.S.
- 6900 Quantity Control Measures N.E.S.
- 7000 Monopolistic Measures
  - 7100 Single Channel for Imports
    - 7110 State Trading Administration
    - 7120 Sole Importing Agency

- 7200 Compulsory National Services
  - 7210 Compulsory National Insurance
  - 7220 Compulsory National Transport
- 7900 Monopolistic Measures N.E.S.

8000 Technical Measures

- 8100 Technical Regulations
  - 8110 Product Characteristics Requirements
  - 8120 Marking Requirements
  - 8130 Labelling Requirements
  - 8140 Packaging Requirements
  - 8150 Testing, Inspection & Quarantine Requirements
  - 8190 Technical Regulations N.E.S.
- 8200 Pre-Shipment Inspection
- 8300 Special Customs Formalities
- 8900 Technical Measures N.E.S.

The measures for sensitive product categories, with codes ending in 7, are further subdivided according to specific purpose if appropriate:

- (1) to protect human health (71);
- (2) to protect animal health and life (72);
- (3) to protect plant health (73);
- (4) to protect environment (74);
- (5) to protect wildlife (75);
- (6) to control drug abuse (76);
- (7) to ensure human safety (77);
- (8) to ensure national security (78);
- and for purposes n.e.s. (79).

**ATTACHMENT 2: The Technical & Nonwoven Textile enterprise list.**

<b>Company</b>	Huyck Australia Pty Ltd
Air International Seating Pty Ltd	INC Engineered Materials
Albany International Pty Ltd	J Inverarity Pty Ltd
Apex-Enerka	Kenneth Brown Pty Ltd
Aunde Norwellan Ltd	Kimberly-Clark Australia Ltd
Austex Bonded Waddings	Lectra Australia Pty Ltd
Australian Defence Apparel Pty Ltd	LincLab Australia
Autex Pty Ltd	Macquarie Textiles Group Ltd
AutoFab Pty Ltd	Madison Filter Pty Ltd
AWTA	Melba Industries Pty Ltd
Bekaert (Aust Pty Ltd)	Ozone Shade & Net
Bradmill Textiles	Peter Law
Cartigny Pty Ltd	Plastyne Products Pty Ltd
Colan Products Pty Ltd	RMIT
CSIRO	Sleep Master
CTS Group	Smith Family Industries
Deakin Uni	Soil Filters Australia Pty Ltd
Defab Weavers Pty Ld	Sportwool
Excel Nonwovens	Tapex Pty Ltd (and Hatbands Pty Ltd)
Filter Tex Media Pty Ltd	Textor Textile Technology Pty Ltd
Foss Australasia	The Specialty Group
Freudenberg Pty Ltd	Tontine Fibres
Gale Pacific Limited	United Bonded Fabrics Pty Ltd
Geofabrics Australasia Pty Ltd	Upholstering Distributors
George Black Textile Gp	
George Norman Pty Ltd	