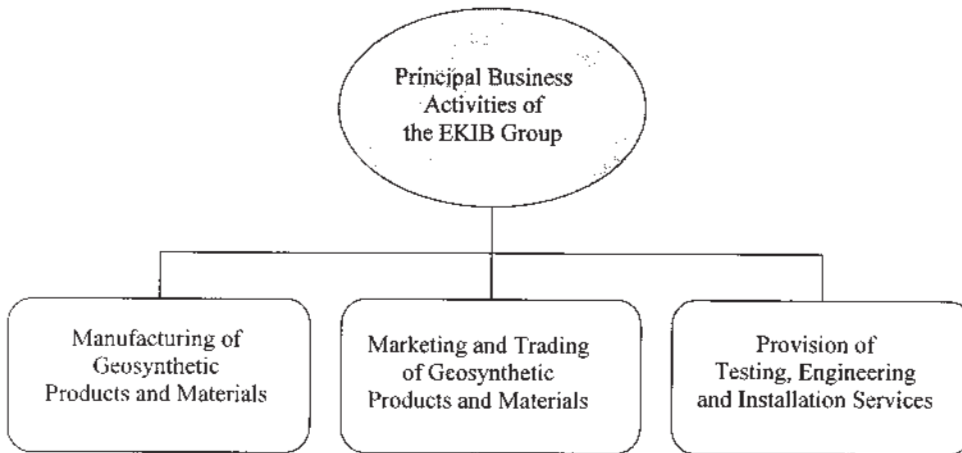


5. INFORMATION ON THE EKIB GROUP

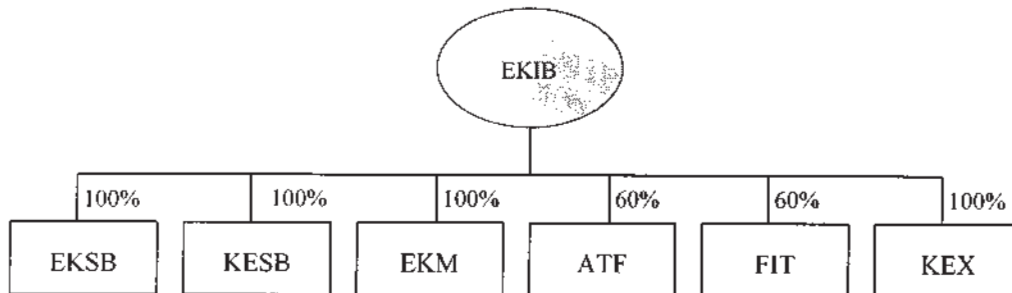
5.1 HISTORY AND BUSINESS

EKIB was incorporated in Malaysia under the Act on 7 June 1999 as a private limited company under the name of Emas Kiara Industries Sdn Bhd. It was subsequently converted into a public limited company on 17 June 2003 and assumed its present name.

EKIB is principally an investment holding company, whilst its subsidiary companies are principally involved in the business activities as depicted in the diagram below:



The existing group structure of EKIB is depicted in the diagram below:



The history of the EKIB Group can be traced back to 1992 with the establishment of Intan KL, one of the Promoters and substantial shareholders of EKIB, which was primarily involved in trading of geosynthetic products. It was also a sales and marketing agent in Malaysia for a number of overseas manufacturers of geosynthetic products. With the success of Intan KL, some of the owners of Intan KL acquired EKSB in 1993 to venture into the geosynthetics industry with the initial business activity of providing turnkey solutions for geosynthetic engineering services. EKSB's first major project was the slope rehabilitation of Pedu Lake which was completed in 1994. In view of the potential growth in the geosynthetics industry, in 1995 EKSB obtained pioneer status for the manufacturing of woven polyester geotextiles from the Malaysian Industrial Development Authority and in 1996, EKSB commenced manufacturing of woven polyester geotextiles.

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

Following the success of its woven polyester geotextiles and the EKIB Group's intention to expand its product range, the EKIB Group started manufacturing non-woven geotextiles through KESB in 1997. With the manufacturing arms of the EKIB Group under EKSB and KESB in place, the EKIB Group required a marketing arm to market its products. As a result, in 1997, EKM was established to focus on trading, sales and marketing of geosynthetic products, and provision of design, engineering and installation services of geosynthetic products mainly to cater for the infrastructure and construction sectors. In order to tap the overseas markets for geosynthetic products, KEX was incorporated in Singapore in 1998 to focus on sales and marketing of the EKIB Group's geosynthetic products overseas.

In 1999, EKIB acquired ATF for the purpose of undertaking the manufacturing and sale of industrial fabrics catered for specific industry use.

In 2001, in order to provide vertical integration of the EKIB Group's business, the EKIB Group expanded into upstream activities under FIT to undertake the manufacturing of polypropylene fibres which are the raw materials used for the EKIB Group's non-woven geotextiles.

Wong Kong Foo, the Managing Director of the EKIB Group, is one of the founders of the EKIB Group and has more than ten (10) years of experience in the geosynthetics industry. He has been instrumental in the development and growth of the EKIB Group.

5.2 LISTING SCHEME

In conjunction with, and as an integral part of the listing of and quotation for the entire issued and paid-up share capital of EKIB on the Second Board of the MSEB, the Company had implemented the Listing Scheme which has been approved by the SC and the FIC on 19 December 2003 and the MITI on 16 October 2003. The Listing Scheme consists of the following:

(i) Share Split

EKIB's share capital of 19,080,572 ordinary shares of RM1.00 was subdivided into 38,161,144 EKIB Shares. Effectively, the par value of ordinary shares of EKIB had been reduced from RM1.00 to RM0.50 per share.

The Share Split was implemented on 30 January 2004.

(ii) Dividends Declared By EKSB and EKM

EKSB and EKM declared and paid net dividends of RM13,500,072 and RM2,000,064 respectively to EKIB. The dividends paid increased the retained earnings reserve of EKIB which facilitated the capitalisation of reserves pursuant to the Bonus Issue to the existing shareholders of EKIB. The movement of the retained profits reserves of EKSB and EKM resulting from the Dividends Declared by EKSB and EKM is as shown below:

	Audited retained profits as at 31.12.2002 RM	Amount utilised for Dividends Declared by EKSB and EKM RM	Retained profits after Dividends Declared by EKSB and EKM RM
EKSB	15,586,832	(13,500,072)	2,086,760
EKM	2,513,172	(2,000,064)	513,108

The Dividends Declared by EKSB and EKM was implemented on 30 January 2004.

5. INFORMATION ON THE EKIB GROUP (cont'd)

(iii) Bonus Issue

Subsequent to the Share Split and payment of dividends by EKSB and EKM, EKIB implemented a bonus issue of 28,620,856 new EKIB Shares on the basis of three (3) new EKIB Shares for every four (4) EKIB Shares held after the Share Split. The Bonus Issue was effected through the capitalisation of RM8,608,327 from the retained profits reserve and RM5,702,101 from the share premium reserve of EKIB. The movement of the retained earnings reserve and share premium reserve of EKIB is set out below:

	Audited at 31 October 2003 RM	After the Share Split RM	After Dividends Declared by EKM and EKSB RM	Amount to be capitalised RM	After Bonus Issue RM
Share premium	5,702,101	5,702,101	5,702,101	(5,702,101)	-
Retained profits/ (Accumulated losses)	(722,310)	(722,310)	14,777,826	(8,608,327)	6,169,499

The 28,620,856 new EKIB Shares issued pursuant to the Bonus Issue rank pari passu in all respects with the then EKIB Shares except that they were not entitled to dividends declared or paid prior to the allotment of the said shares.

Pursuant to the Bonus Issue, the issued and paid-up share capital of EKIB increased from RM19,080,572 comprising 38,161,144 EKIB Shares to RM33,391,000 comprising 66,782,000 EKIB Shares.

The Bonus Issue was completed on 30 January 2004.

(iv) Public Issue and Offer for Sale

The Public Issue of 13,220,000 new EKIB Shares and Offer for Sale of 3,580,000 EKIB Shares at an issue/offer price of RM0.85 per share payable in full upon application which shall be allocated in the following manner:

(a) Malaysian Public

4,020,000 of the Public Issue Shares and 1,980,000 of the Offer for Sale Shares will be made available for application by Malaysian citizens, companies, societies, co-operatives and institutions, of which at least 30% is to be set aside strictly for Bumiputera individuals, companies, societies, co-operatives and institutions.

(b) Bumiputera Investors Identified and Approved by MITI

9,200,000 of the Public Issue Shares have been made available for application by the Bumiputera investors identified and approved by MITI.

(c) Eligible Directors, Employees, Suppliers and Customers

1,600,000 of the Offer for Sale Shares have been made available for application by the eligible directors, employees, suppliers and customers of the EKIB Group; and

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

(d) Listing

Admission to the Official List and the listing of and quotation for the entire enlarged issued and paid-up share capital of EKIB of RM40,001,000 comprising 80,002,000 EKIB Shares on the Second Board of MSEP.

The details of the Offerors are as follows:

Name	No. of Offer Shares	% of enlarged issued and paid-up share capital
Intan KL	1,985,400	2.48
See Chii Wei	555,900	0.69
Kam Tian Yan	371,500	0.46
Yap Lin Kiew	301,500	0.38
Neoh Cheng Aik	365,700	0.46
Total	3,580,000	4.47

5.3 SHARE CAPITAL

5.3.1 Existing Authorised and Issued and Paid-up Share Capital

Details of EKIB's existing authorised and issued and paid-up share capital as at 20 February 2004 are set out as follows:

	No. of EKIB Shares	Par value RM	Amount RM
<i>Authorised Share Capital</i>			
- Ordinary Shares	100,000,000	0.50	50,000,000
<i>Existing Issued and Paid-up Share Capital</i>			
- Ordinary Shares	66,782,000	0.50	33,391,000
<i>Issued and Paid-up Share Capital after Public Issue</i>			
- Ordinary Shares	80,002,000	0.50	40,001,000

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5. INFORMATION ON THE EKIB GROUP *(cont'd)*

5.3.2 Changes in Issued and Paid-up Share Capital

Details of the changes in the issued and paid-up share capital in EKIB since its incorporation are as follows:

Date of allotment	No. of Shares	Par value RM	Type of Issue	Total RM
07.06.1999	2	1.00	Subscribers' Shares	2
29.10.1999	4,723,100	1.00	Cash	4,723,102
25.11.1999	263,925	1.00	Cash	4,987,027
24.01.2000	1,977,000	1.00	Cash	6,964,027
03.02.2000	735,975	1.00	Cash	7,700,002
28.09.2000	1,800,000	1.00	Capitalisation of amount owing to shareholders	9,500,002
30.12.2000	2,000,000	1.00	Cash	11,500,002
18.03.2002	1,800,000	1.00	Capitalisation of amount owing to shareholders	13,300,002
24.03.2003	350,000	1.00	Consideration for acquisition of shares in subsidiary	13,650,002
28.03.2003	3,667,850	1.00	Consideration for acquisition of shares in subsidiary	17,317,852
30.03.2003	1,762,720	1.00	Consideration for acquisition of shares in subsidiary	19,080,572
30.1.2004	38,161,144	0.50	Share Split	19,080,572
30.1.2004	28,620,856	0.50	Bonus Issue	33,391,000

5.4 BUSINESS OVERVIEW

5.4.1 Principal Activity

EKIB is an investment holding company whilst its subsidiary companies are principally involved in the manufacturing, marketing and trading of geosynthetic products and materials and provision of testing, engineering and installation services of geosynthetic products and materials.

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

5.4.2 Type of Products and Services

The EKIB Group's products are used in a diverse range of end-user industries including:

- infrastructure development
- building and construction
- general civil engineering construction
- bridge construction
- road and pavement construction
- irrigation and flood control system
- railway track construction
- soil stabilisation
- landscaping
- underwater construction work
- reclamation work
- airport construction
- waste containment system
- industrial applications (examples, industrial bulk bags, liquid filters and shoe lining)
- slope and coastal protection system

The breakdown of the EKIB Group's turnover by products and services for the ten (10)-month financial period ended 31 October 2003 is as follows:

	Revenue Contribution for the ten (10)-month financial period ended 31 October 2003	
	RM '000	%
Manufacturing¹		
Geotextiles		
- Woven	14,138	22.8
- Non-woven	14,211	23.0
- Knitted	996	1.6
	29,345	47.4
Geocomposites		
- Vertical geodrains	5,407	8.7
- Geomatresses	8,297	13.4
- Others	124	0.2
	13,828	22.3
Geogrids	5,267	8.5
Industrial fabrics	3,397	5.5
Polypropylene fibres	528	0.9
	52,365	84.6
Services		
Engineering and installation*	7,020	11.3
Trading²		
Geocells	2,386	3.9
Others	108	0.2
	2,494	4.1
Total	61,879	100.0

Notes:

EKIB Group's revenue contribution above excludes inter-company transactions.

1. *Revenue from in-house manufactured products.*

2. *Revenue from trading of products and materials that are sourced externally.*

* *Based on management estimations.*

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

For the ten (10)-month financial period ended 31 October 2003, the manufacture of geosynthetic products and materials accounted for approximately 78.2% of the EKIB Group's total revenue. The remaining 5.5%, 0.9%, 11.3% and 4.1% were from manufacturing of industrial fabrics, polypropylene fibres, geoservices and trading of externally sourced geosynthetic products and materials respectively.

The manufacture of geotextiles is the highest revenue contributor at 47.4% of total EKIB Group's total revenue for the ten (10)-month financial period ended 31 October 2003. This is followed by geocomposites and geogrids accounting for 22.3% and 8.5% respectively.

The breakdown of revenue contribution by local and export markets for the ten (10)-month financial period ended 31 October 2003 were as follows:

Markets	Revenue Contribution for the ten (10)-month financial period ended 31 October 2003	
	RM'000	%
Local	58,281	94.2
Export	3,598	5.8
Total	61,879	100

For the ten (10)-month financial period ended 31 October, the local market contributed approximately 94.2% of the EKIB Group's total revenue. The remaining 5.8% were contributed by direct exports to overseas customers.

5.4.2.1 Manufacturing Activities

Geosynthetic product refers to a product in planar structure made from polymeric materials and used with foundations, soil, rock, earth or any other geotechnical engineering related materials as an integral part of human-made project, structure or system. Generally, geosynthetic products have the following functions:

- Separation;
- Reinforcement;
- Filtration;
- Drainage;
- Fluid blockage; and
- Protection.

The EKIB Group manufactures the following geosynthetic products and materials:

- Geotextiles;
- Geocomposites (vertical geodrains and geomattresses);
- Geogrids; and
- Polypropylene fibres.

The EKIB Group essentially manufactures two (2) categories of products:

- Final end-products such as geotextiles, geocomposites and geogrids; and
- Semi-finished products such as polypropylene fibres used for further manufacturing for example, as raw material for the manufacturing of woven geotextiles.

All the geosynthetic products and materials manufactured are mainly sold through the EKIB Group's subsidiary companies, namely EKM, ATF and KEX.

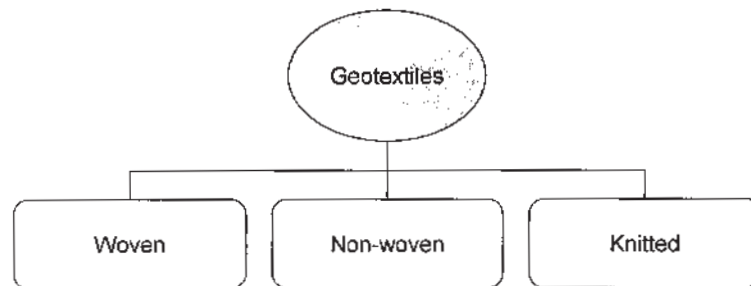
5. INFORMATION ON THE EKIB GROUP *(cont'd)*

5.4.2.2 Manufacture of Geotextiles

Geotextiles refer to any permeable textile made of geosynthetics used with foundations, soil, rock, earth or any other geotechnical engineering related materials as an integral part of human made project, structure or system. Geotextiles can be used as:

- filters to prevent soil migration;
- drains to allow transmission of water through low permeability materials;
- separators to prevent mixing of sub-grade and gravel in unpaved roads; and
- reinforcement to add shear strength to a soil.

The different processes for the manufacture of geotextiles undertaken by the EKIB Group can be depicted as follows:



Geotextiles generally comprise synthetic fibres that are made into a flexible and porous fabric through one of the following three (3) methods:

- weaving using standard machine;
- matted together in random in a non-woven manner; and
- knitted.

Woven Geotextiles

Woven geotextiles are made of monofilaments, multifilaments, staple yarn, single or multiple slit films or tapes, which are then used by weaving machines to create fabric through a series of alternately warping (machine direction) and wefting (cross-direction). Generally, woven fabrics exhibit high tensile strength, high modulus and low elongation. The EKIB Group uses polyester multifilament or polypropylene tape yarn for its woven geotextiles.

Non-Woven Geotextiles

Non-woven geotextiles use synthetic polymer fibres which are laid onto a moving belt. Then the mass of fibres are either:

- needle punched, a process in which the filaments are mechanically entangled by the rapid up-and-down movement of a bank of small needles with tiny barbs on the needle shaft; or
- heat bonded, in which the fibres are welded together using heat and/or pressure.

Non-woven geotextiles typically have high permeability and conformability because of their high elongation characteristics. EKIB uses polyester or polypropylene fibres for its non-woven geotextiles.

Knitted Geotextiles

Knitted geotextiles are formed by interlocking a series of loops of one or more yarn. The main process involves warp knitting, where the main and cross-direction yarn are placed over one another in an interlocking manner.

5. INFORMATION ON THE EKIB GROUP (cont'd)

Geotextiles in General

The EKIB Group manufactures a wide range of geotextiles with different properties and specifications to meet the needs of diverse applications. Some of these properties and specifications include:

- thickness
- tensile strength
- puncture resistance
- apparent opening size
- elongation
- permittivity
- mass per unit area
- texture
- tear resistance
- ultra violet (UV) resistance
- pore size
- seam strength
- transmissivity

Types of geotextiles provided by the EKIB Group are as follows:

Properties	Specifications
<i>Woven Geotextiles</i>	
Tensile Strength – Warp	20 kN to 800 kN
Tensile Strength – Weft	20 kN to 200 kN
Elongation at break - Warp	≤ 20%
Elongation at break – Weft	≤ 20%
Mass per unit area	150 to 1,500 gram/m ²
Width	5.4 m
<i>Non-Woven Geotextiles</i>	
Wide Width Tensile Strength	8 kN/m and 65 kN/m
Grab Width Tensile Strength	400 N to 3,800 N
Wide Width Elongation at break	40% to 120%
Grab Width Elongation at break	40% to 120%
Mass per unit area	120 and 1,200 gram/m ²
Thickness	0.5 mm to 10 mm
Tear Strength	100 N to 1600 N
Puncture Resistance	1,200 N to 9,000 N
Cone Drop	0 mm to 30 mm
Permeability at 100 mm head	18 to 270 litres/m ² /second
Permeability at 50 mm head	10 to 150 litres/m ² /second
Pore Size	45 to 300 micron

kN = Kilo Newton; N = Newton; mm = millimetre; m = metre; gram/m² = gram/metre square; litres/m²/second = litres/metre square/second

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

Non-woven geotextiles are the largest revenue contributor representing 23.0% of the EKIB Group's total revenue for the ten (10)-month financial period ended 31 October 2003. Woven geotextiles represented the next largest contributor accounting for 22.8% of the EKIB Group's total revenue for the ten (10)-month financial period ended 31 October 2003. Knitted geotextiles represented 1.6% of the EKIB Group's total revenue for the ten (10)-month financial period ended 31 October 2003. The EKIB Group's geotextiles are marketed under the brand name "KiaraTex".

5.4.2.3 Manufacture of Geocomposites

Geocomposites consist of a combination of materials including the following:

- Geosynthetic products including geotextiles, geogrids, geonets and geomembranes;
- Other geo-related products made of natural or organic materials; and
- Other materials including plastic sheets and pipes.

Some of the geocomposites, manufactured by the EKIB Group are as follows:

- Vertical Geodrains

The vertical geodrains, manufactured by the EKIB Group are made out of a sheet of non-woven geotextiles wrapped around a polymer core. The core is a long strip of polymer made of high-density polyethylene measuring approximately 100 mm in width and is profiled with regularly spaced studs on either one side or both sides of the polymer strip.

Vertical geodrains are used in construction sites to remove ground water to consolidate the ground before construction work begins. If an above ground structure was to be constructed without first removing the ground water, over time through natural process, the ground water would dissipate beneath it. This will cause the ground to subside unevenly and affect any structure resting on top of the ground.

In general, fine grained and compressible soils have low permeability and therefore take a long time to consolidate. As such, the advantages of the vertical geodrains manufactured by the EKIB Group are as follows:

- provide a shorter and easier drainage path through which the ground water can be discharged; and
- reduce the compression or settlement time required to complete the consolidation process.

- Geomattresses

EKIB Group's geomattresses comprises a composite structure of an upper layer of woven geotextiles and a lower layer of woven geotextiles. The upper layer is punched with green fibres and sewn to the bottom sheet at regular intervals to form tube-like structures. The continuous parallel stitches are positioned 350 mm apart with a stitch length of not exceeding 40 mm. The ends of the tubes are sealed by sewing or by other suitable methods. Geomattresses are commonly made of polypropylene. When the geomattress is installed, the tubes are commonly filled with sand to provide weight and also allow rainwater to seep through to the ground quickly. The weight will ensure that the geomattress stays in place. Geomattresses are primarily used for the protection of riverbanks or coastal shores. The green fibres are meant for aesthetic purposes.

5. INFORMATION ON THE EKIB GROUP (cont'd)

Some of the properties of geomattress are as follows:

Properties	Range
Tensile strength:	
- Upper layer (non-woven geotextiles)	35 kN/m
- Bottom layer (woven geotextiles)	> 55 kN/m
Pore Size	< 300 microns
Mass per unit area:	
- Upper layer (non-woven geotextiles)	550 gram/m ²
- Bottom layer (woven geotextiles)	320 gram/m ²
UV stability	80%
Seaming:	
- Tensile strength of sewing thread	1,000 N
- Elongation at break	20%

kN = Kilo Newton; N = Newton; mm = millimetre; m = metre; kN/m = Kilo Newton/metre

- Others Geocomposites

The EKIB Group also manufactures other types of geocomposites based on customer specifications or for specific applications. The composite structures would have a combination of woven and non-woven geotextiles, other geosynthetics, and other materials, such as plastic sheets and pipes.

For the ten (10)-month financial period ended 31 October 2003, geocomposites contributed 22.3% to the EKIB Group's total revenue, amounting to RM13.8 million.

5.4.2.4 Manufacture of Geogrids

Geogrids are a distinct group of geosynthetics that are characterized by a relatively high tensile strength and a uniformly distributed array of large apertures (openings). The apertures allow soil particles on either side of the installed sheet to come into direct contact, thereby increasing the interaction between the geogrids and the surrounding soil. The apertures also ensure unrestricted vertical drainage of a soil. Geogrids are used for reinforcement with foundations, soil, rock, earth or any other geotechnical engineering related materials as an integral part of a structure or system. For example, geogrids are used for the reinforcement of slopes and stabilisation of road base.

Geogrids manufactured by the EKIB Group are mainly used for the following applications:

- construction of new embankments;
- slope remedial works;
- road widening works; and
- basal reinforcements.

For the ten (10)-month financial period ended 31 October 2003, geogrids contributed RM5.3 million representing 8.5% of the EKIB Group's total revenue.

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

5.4.2.5 Manufacture of Polypropylene Fibres

The EKIB Group manufactures polypropylene fibres through its subsidiary FIT. The EKIB Group manufactures polypropylene fibres by using polypropylene resin, which is extruded through a spinneret to form long filaments or fibres, which harden when cooled. The fibres are then stretched, which reduce the diameter of the fibres and reorganises the molecular structure. The stretching causes increases in strength, breaking point due to elongation, and stiffness. Polypropylene fibres produced by FIT are mainly used by the EKIB Group for the manufacturing of geosynthetic products. Currently, EKIB Group has to supplement its output from FIT by purchasing polypropylene and polyester fibres from external suppliers. However, a small proportion of polypropylene fibres are sold to external customers.

For the ten (10)-month financial period ended 31 October 2003, the revenue from polypropylene fibres sold to external customers was approximately RM528,000 representing 0.9% of the EKIB Group's total revenue.

5.4.2.6 Marketing and Trading Activities

The EKIB Group has its own trading, sales and marketing arm for the following geosynthetic products:

- sales and marketing of in-house manufactured geosynthetic products and materials incorporating geotextiles, geocomposites, geogrids and polypropylene fibres; and
- trading of externally sourced geosynthetic products and materials incorporating geocells and bio-degradable erosion control products and turf reinforcement matrix.

The EKIB Group purchases external geo-related (primarily geosynthetic) products and materials for the following reasons:

- To supplement in-house manufactured products in view of supplying a comprehensive range of geo-related products and materials to customers;
- As geosynthetic products are so diverse, it is not economical for the EKIB Group to manufacture all or most of these geosynthetic products and materials in-house;
- The EKIB Group focuses on manufacturing geosynthetic products that provides a higher margin; and
- The EKIB Group's focused manufacturing approach enables it to achieve economies of scale through larger output per item.

The three trading, sales and marketing subsidiaries of the EKIB Group are as follows:

Subsidiary companies	Trading, Sales and Marketing Activities
EKM	Focuses on sales and marketing of all in-house manufactured products, and trading of externally sourced geo-related products and materials.
ATF	Focuses on manufacturing and marketing of in-house manufactured industrial fabrics.
KEX	Focuses on trading, sales and marketing of all in-house manufactured products and externally sourced geo-related products in international markets.

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

5.4.2.7 Provision of Geo-Services

The EKIB Group is also engaged in geo-services comprising engineering services, installation and testing of its geosynthetic products, which complement its wide range of products. The provision of geo-services together with its geosynthetic products enable the EKIB Group to provide total solutions to its customers. This represents a significant competitive advantage for the EKIB Group enabling the EKIB Group to provide convenience to its customers and to facilitate end-to-end quality control.

For the ten (10) month financial period ended 31 October 2003, the EKIB Group undertook engineering services, installation and testing which contributed approximately RM7.0 million, representing 11.3% of the EKIB Group's total revenue.

5.4.3 Patents, Trademarks and Franchises

The EKIB Group has submitted applications for the registration of the following trademarks to the Malaysian Trade Marks Registry:

Trademark	Products	Application Date
"KiaraTex"	Being General Trademark for EKIB Group's geosynthetics products	17 January 1997
"KiaraMat"	• Geomattress	1 September 1998
"KiaraMat GR"	• Geomattress	1 September 1998
"KiaraTex KT"	• Woven Geotextiles	1 September 1998
"KiaraTex KE"	• Non-Woven Geotextiles	1 September 1998
"KiaraGrid"	• Geogrids	10 November 1998

As at the date of this Prospectus, the approvals from the Malaysian Trade Marks Registry are still pending. The EKIB Group plans to build brand awareness through its trade marks to facilitate ease of market access, increased sales and customer loyalty.

Through a series of agreements, KESB holds the right, title and interests in the registered patent of "Studded Profile Vertical Geodrains". However, the patent is valid until 29 June 2004, which may be renewed. The summary of the agreements are as follows:

Agreement	Date	Summary
Sale and purchase agreement	11 June 1997	KESB entered into the sale and purchase agreement with Burcan Industries Ltd (Burcan) to acquire all of Burcan's worldwide assets relating to the Alidrain* system which included the new systems, existing manufacturing equipment, patents, trademarks and patents, applications and all other assets listed in Schedule A of the sale and purchase agreement for a sum of USD500,000
Letter of request	26 June 1997	KESB requested that all the intellectual property rights interests and titles to particularly, the patents and trademarks listed in section 2 of Schedule A of the abovementioned sale and purchase agreement to be conveyed to Alidrain (Asia) Sdn Bhd

5. INFORMATION ON THE EKIB GROUP (cont'd)

Agreement	Date	Summary
First Deed of Assignment	19 August 1997	The joint owners to the patents and patent application, Joseph Clement Brodeur, Vicko M Von Stedingk and Mark E Siemonsen, assigned all their rights, interest and benefits including any divisions, continuations, corresponding patent applications and patents to the issue therefrom including the right to validate or enter the national or regional phases of any international patent applications and including all rights to damages, accounting of profits and any other relief to which they may be entitled in respect of the unauthorised use by third parties of the patent rights to Alidrain (Asia) Sdn Bhd
Second Deed of Assignment	19 August 1997	The owner of the trademark and registration of the trademark "ALIDRAIN", Burcan, assigned and transferred all rights, title and interests to the trademark and the registration number therefore, together with the goodwill attaching to the said trademark, and the right to recover for past infringement of the said trademark to Alidrain (Asia) Sdn Bhd
Deed of Assignment	23 June 2003	The beneficial owner of the intellectual property rights and the trademark identified as "ALIDRAIN", Alidrain (Asia) Sdn Bhd, assigned all rights interest benefits under the abovementioned Deeds of Assignment to KESB including the intellectual property rights

Note:

* *Alidrain is the brandname of the product known as Vertical Drains*

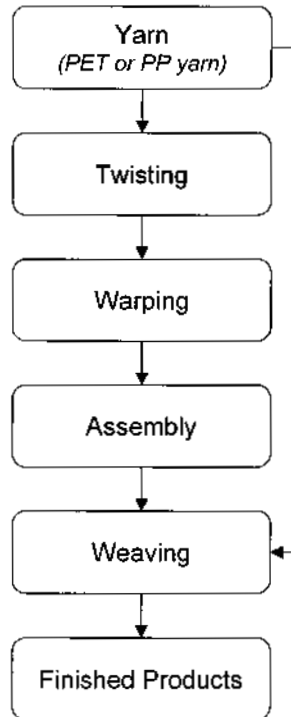
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5. INFORMATION ON THE EKIB GROUP *(cont'd)*

5.4.4 Flow Charts of Production

5.4.4.1 Manufacturing Woven Geotextiles

The process flow for the manufacturing of woven geotextiles by the EKIB Group is depicted in the following diagram:



PET=Polyester and PP=Polypropylene

The manufacturing process for woven geotextiles starts with polyester or polypropylene yarns. The multifilament yarn is either twisted for the first warping process or used directly for weaving or warp knitting.

Twisting is the process of combing a small number of lengths of yarn to form one twisted length of yarn. The number of yarns to be twisted will be based on product specifications and requirements.

The twisted yarns are channelled through a warping process, where the yarns are coiled into roll format according to the number of ends required. The number of ends will determine the types of woven geotextiles to be produced.

Prior to twisting or warping, a sample of the yarn is sent to the quality assurance department for testing. This quality assurance check is to ensure that the yarn meets the specification and required properties.

Warping is the process of laying many, possibly up to several thousands of lengths of yarns, lengthwise in a very large bobbin, called beam for weaving purposes.

The warping process goes through a number of steps, where a large number of bobbins with several hundred ends of yarns, are consolidated to a mid-sized beam. A number of these mid-sized beams are then further consolidated into one large-sized beam with possible many thousands of yarn ends.

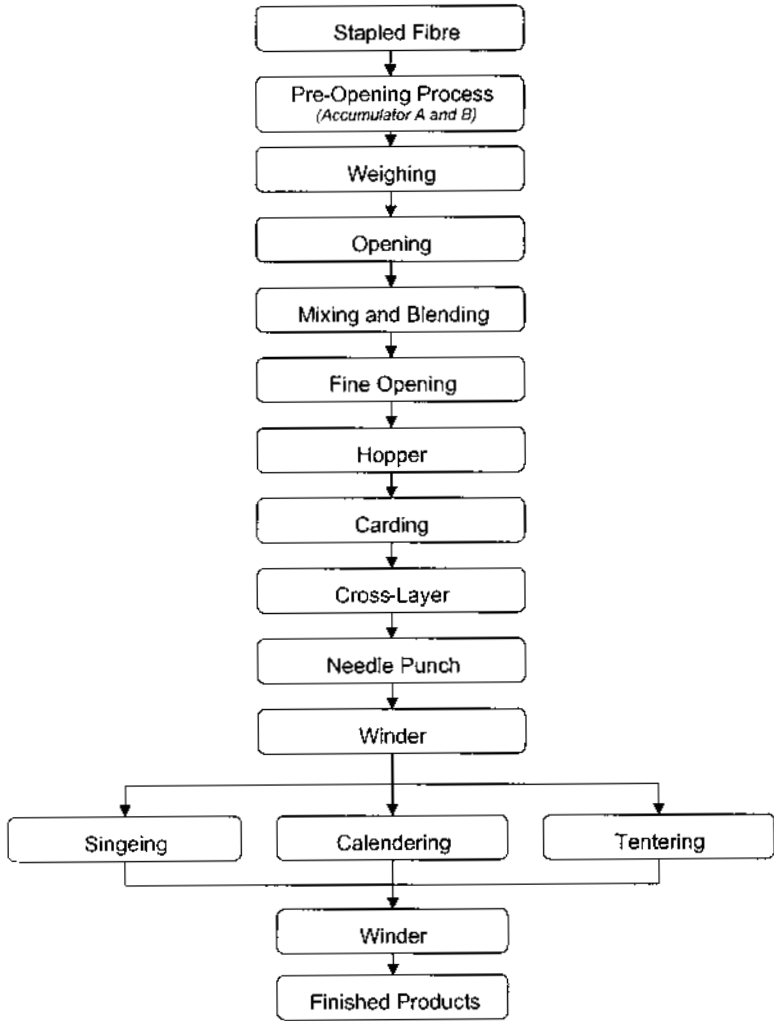
5. INFORMATION ON THE EKIB GROUP (cont'd)

The weaving process involves interlocking warp (vertical) and weft (horizontal) yarns in various combinations. For light and airy textiles the weft is woven loosely, and for dense and strong textiles, the weft is woven tightly.

The continuous interlocking action will produce a textile in the form of a planar structure.

Once the weaving process is completed, the final product will be wound into rolls and labelled for warehousing and despatched.

5.4.4.2 Manufacture of Non-Woven Geotextiles



The process flow starts with the feeding of staple fibres as raw material, which is either polypropylene or polyester fibres, into the pre-opening bin for the opening process.

As the initial staple fibres are tightly compressed, the purpose of the opening process is to loosen the fibres to ensure consistency and homogenous density of the final fabric.

Prior to the opening process, the fibres will be sent for weighing, which provides the required weight of fibres for the opening process.

5. **INFORMATION ON THE EKIB GROUP** *(cont'd)*

Then, the fibres are gathered in the accumulator bin and subsequently transferred to the mixing and blending bin by suction fans through normal and magnetic ducts. This mixing and blending process will optimise its uniformity.

The opened fibres are further sent to a fine opening process. This process further loosens the fibres, where the entangled fibres are separated using spikes located in the core of the machine.

Once the fine opening process is completed, the fibres will be sent to the hopper. This is also the feeding system, which controls the accuracy of the flow of fibres into the carding machine. Parameters are set based on product specifications.

The carding process is to comb and control the alignment of the fibres, so as to produce quality fibres web. The web is transported to the cross layer process at a pre-adjusted width of the product by a lay-down process to maintain the web.

In the next stage of the process, the web goes through a three (3)-section needle-punching machine to mechanically bond the fibres to form the non-woven geotextiles.

Then, the textiles are conveyed through to a winder machine, where the speed and width are based on specifications and requirement. This is where the webs are further compressed.

In some cases, the textiles are further processed through either tentering or calendering.

The tentering process involves a heat bonding process. The needle-punched fabric will go through an oven. The inlet of the oven is set according to the width of the needle-punched fabric.

The fabric is gripped along the sides by an endless pin chains for transportation into the oven. The tenter extension is also adjusted and weights are placed to position the fabric onto the chain.

After coming out of the oven, the two (2) sides of the fabric are tightened and pulled by the winder. The fabric is pulled through the press roller and passed through a cooling stage. Once the fabric is cooled, it goes through the feed station and onto the winder.

As for the calendering process, the needle-punched fabric will go through three (3) heated rollers. This heating process will stabilise the fabric structure.

Prior to the calendering process, the gap of the roller will be adjusted according to the thickness of the fabric specified by customers.

Alternatively, the fabrics may also go through the singeing process whereby the surface of the needle-punched fabric is singed to create a smooth finish.

The finished products will then be wound, packed and labelled for warehousing and despatched.

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5. INFORMATION ON THE EKIB GROUP *(cont'd)*

5.4.4.3 Production Facilities, Capacity and Utilisation

The production, capacity and utilisation of facilities by the EKIB Group are as follows:

Types of Products	Annual Capacity	Production for the ten (10)-month financial period ended 31 October 2003	Percentage Utilisation
Geotextiles			
- Woven	2,000 tonnes	999 tonnes	50%
- Non-Woven	3,500 tonnes	2,207 tonnes	63%
- Knitted	1,000,000 m ²	673,190 m ²	67%
Geocomposites			
- Vertical Geodrains	14,400,000 m	9,228,179 m	66%
- Geomattress	720,000 m ²	511,645 m ²	71%
Geogrids	1,000,000 m ²	463,492 m ²	46%
Polypropylene fibres	2,400 tonnes	1,673 tonnes	68%

m² = metre square

Based on three (3) eight (8)-hour shifts per day. The factory runs 24 hours per day

As at 31 October 2003, the EKIB Group has invested approximately RM34.3 million in machinery and equipment for its operations. These include the following:

Production Facilities	Number of Units
Braiding and winder machine	5
Air compressor	1
Sewing machine	10
Knotting machine	1
Twisting machine	2
Assembly machine	1
Weaving machine	4
Web projectile machine	1
Geogrid oven	1
Knitting machine	2
Carding machine	2

5. INFORMATION ON THE EKIB GROUP (cont'd)

Production Facilities	Number of Units
Opening machine	1
Drier	3
Non-woven machine	2
Singeing machine	2
Web drafter	1
Needle punch machine	1
Extruder	4
Chillers	1
Punching	2
Gluing machine	4
Coiling machine	4
Crusher	1
Vertical Geodrains roller mould	2
Vertical Geodrains mould	1
Yarn spreader	1
Calendering machine	1
Screw compressor	1
Catch releaser machine	1
Chip mixer and dryer machine	2
Cooling machine	2
Catch machine	2
Releaser machine	1
Crimper machine	1
Cutter machine	1
Resin recycle machine	1

5.4.5 Estimated Market Coverage

In 2002, the market size for geosynthetic products in Malaysia was estimated at RM400 million.

In 2002, EKIB Group's market share of geosynthetic products in Malaysia is estimated at 13%.

(Source: Independent Assessment of the Geosynthetics Industry prepared by Vital Factor).

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

5.4.6 Principal Markets for Products

The principal markets of the EKIB Group comprise both local and export markets. The local market contributed approximately 94.2% of the EKIB Group's total revenue for the ten (10)-month financial period ended 31 October 2003 and the remaining 5.8% were direct exports. Local sales amounted to RM58.3 million, while direct exports amounted to RM3.6 million for the ten (10)-month financial period ended 31 October 2003. The EKIB Group primarily exports geotextiles (includes woven, non-woven and knitted) and geocomposites (includes vertical drain) to overseas countries.

The EKIB Group's revenue contributions by principal markets for the ten (10)-month financial period ended 31 October 2003 are as follows:

By countries	Proportion of the EKIB Group's Revenue (%)
Malaysia	94.2
Vietnam	2.6
Thailand	1.3
Bangladesh	0.8
Egypt	0.6
Singapore	0.3
India	0.1
Italy	0.1
TOTAL	100.0

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5. INFORMATION ON THE EKIB GROUP (cont'd)

5.4.7 Types, Sources and Availability of Raw Materials

Following are the major types of raw materials, finished products, and sources of supply for the operation of the EKIB Group for the ten (10)-month financial period ended 31 October 2003:

	Value of Purchases RM	Proportion %	Sources of Supply	
			Local %	Import %
Manufacturing Raw Material				
Industrial Yarn				
- Polyester yarn	9,812,618	37.2%	0.5%	99.5%
- Polypropylene yarn	877,530	3.3%	100.0%	0%
	<u>10,690,148</u>	<u>40.5%</u>	<u>8.6%</u>	<u>91.4%</u>
Fibres				
- PP staple fibres @	3,039,865	11.5%	2.7%	97.3%
- PET staple fibres	88,007	0.3%	0.0%	100.0%
- PET green fibres	308,364	1.2%	0.0%	100.0%
	<u>3,436,236</u>	<u>13.0%</u>	<u>2.4%</u>	<u>97.6%</u>
Plastic resins				
- PP resin	7,279,324	27.6%	36.2%	63.8%
- PET resin	287,492	1.1%	100.0%	0%
- High density polyethylene resin	1,272,846	4.8%	100.0%	0%
	<u>8,839,662</u>	<u>33.5%</u>	<u>47.5%</u>	<u>52.5%</u>
Diluent for PVC Coating	1,066,324	4.0%	100.0%	0%
Masterbatch	240,441	0.9%	100.0%	0%
Anti static agent	110,638	0.4%	0.0%	100.0%
Kraft paper	107,918	0.4%	0.0%	100.0%
Others ^	310,720	1.2%	100.0%	0.0%
Finished Products for trading				
Geocells	1,546,982	5.9%	100.0%	0%
Others	41,062	0.2%	100.0%	0%
	<u>1,588,044</u>	<u>6.1%</u>	<u>100.0%</u>	<u>0%</u>
	<u>26,390,131 #</u>	<u>100.0%</u>	<u>31.8%</u>	<u>68.2%</u>

Notes:

^ Others include ultraviolet additives and LPG Gas

The total purchases of raw material of the EKIB Group for the ten (10)-month financial period ended 31 October 2003 amounted to RM26.4 million excluding fuel oil, electricity, wages and other consumables

@ Not inclusive of PP staple fibres manufactured by FIT and purchased by EKSB

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

As the EKIB Group is mainly involved in the manufacturing of geosynthetic products and materials, the usage of yarn and fibres constitute the largest form of raw material used in its manufacturing operations.

For the ten (10)-month financial period ended 31 October 2003, imports of raw materials accounted for 68.2% of the total purchases of the EKIB Group. Raw materials for its manufacturing operation represent 94.0% of total purchases of the EKIB Group, while the remaining 6.0% was purchases for its trading operation.

5.4.7.1 Industrial Yarn

For the ten (10)-month financial period ended 31 October 2003, industrial yarn accounted for 40.5% of total purchases of the EKIB Group. The EKIB Group mainly uses polyester and polypropylene yarns. Of these, polyester yarn represented the most significant raw material, accounting for 37.2% of total purchases of EKIB Group for the ten (10)-month financial period ended 31 October 2003. Currently, the EKIB Group purchases approximately 91.4% of its industrial yarn from overseas manufacturers whilst the remaining 8.6% were sourced locally.

Import value of synthetic filament yarn, other than sewing thread of high tenacity of polyesters (not put up for retail sales) including synthetic monofilament of less than 67 decitex (including polyester yarn) increased at an average annual rate of 32.5% between 1999 and 2003. In 2003, the import value increased to RM31.9 million (*Source: Independent Assessment of the Geosynthetics Industry prepared by Vital Factor*).

In 2003, Malaysia's major sources of the imports of synthetic filament yarn, other than sewing thread of high tenacity of polyesters (not put up for retail sales) including synthetic monofilament of less than 67 decitex (including polyester yarn) are Korea, Taiwan, Taiwan, Japan, Indonesia, Thailand and China (*Note: Full year 2003 figures are preliminary only*) (*Source: Independent Assessment of the Geosynthetics Industry prepared by Vital Factor*).

Thus far, management has not experienced any shortage in the supply of industrial yarn, as this type of material is available from a number of overseas countries.

5.4.7.2 Fibres

Fibres constitute the next largest raw material purchased, accounting for 13.0% of the EKIB Group's total purchases amounting to RM3.4 million for the ten (10)-month financial period ended 31 October 2003. The EKIB Group mainly uses polypropylene staple fibres, polyester staple fibres and polyester green fibres. The EKIB Group sourced all its fibres directly from overseas manufacturers and suppliers. Polypropylene staple fibres form the largest proportion of fibres used, representing 11.5% of the EKIB Group's total purchases for the ten (10)-month financial period ended 31 October 2003.

In 2003, the import value of synthetic staple fibres of polypropylene, not carded, combed or otherwise processed for spinning (including PP staple fibres) decreased by 22.7% amounting to RM20.6 million. The import value grew at an average annual rate of 5.3% between 1999 and 2003 (*Note: Full year 2003 figures are preliminary only*) (*Source: Independent Assessment of the Geosynthetics Industry prepared by Vital Factor*).

In 2003, some of the major countries of import into Malaysia of synthetic staple fibres of polypropylene, not carded, combed or otherwise processed for spinning (including PP staple fibres) includes Taiwan, Japan, Korea, Indonesia, Thailand and China (*Note: Full year 2003 figures are preliminary only*) (*Source: Independent Assessment of the Geosynthetics Industry prepared by Vital Factor*).

In 2003, the import value of synthetic staple fibres of polyesters, not carded, combed or otherwise processed for spinning (including polyester staple fibres) decreased by 21.7% amounting to RM41.1 million. (*Note: Full year 2003 figures are preliminary only*).

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

Some of the major countries of import into Malaysia of synthetic staple fibres of polyesters, not carded, combed or otherwise processed for spinning (including polyester staple fibres) includes Taiwan, Indonesia, Thailand, Korea, Japan and India *(Note: Full year 2003 figures are preliminary only)* *(Source: Independent Assessment of the Geosynthetics Industry prepared by Vital Factor)*.

Thus far, management has not experienced any shortage in supply of these fibres, as they are easily available from a number of overseas countries.

5.4.7.3 Plastic Resin

The EKIB Group also uses polypropylene and high density polyethylene plastic resins for its manufacturing operations. Of these, polypropylene resin form the largest proportion used by the EKIB Group, representing 27.6% of total purchases for the ten (10)-month financial period ended 31 October 2003. Polypropylene resin is mainly used for the manufacture of fibres, which is undertaken by FIT, a subsidiary company of EKIB. High density polyethylene resin is the raw material used for the manufacturing of the polymer core for its vertical geodrains. Generally, the EKIB Group purchases approximately 47.5% of its plastic resin from local sources, while the remaining 52.5% was imported. The imported resin incorporates ultra violet (UV) additives.

In 2002, locally produced resin exceeded 2 million tonnes

(Source: Independent Assessment of the Geosynthetics Industry prepared by Vital Factor).

In 2002, production capacity for some of the plastic resin was as follows:

Plastic Resins	Capacity
Polypropylene	410,000 tonnes
Polyethylene*	1,000,000 tonnes

Note:

* Polyethylene including high density polyethylene and low density polyethylene plastic resin.

(Source: Independent Assessment of the Geosynthetics Industry prepared by Vital Factor).

The two (2) main local producers of polyethylene resin in Malaysia are Titan Polyethylene Sdn Bhd and Polyethylene Malaysia Sdn Bhd. Local producers are able to satisfy most of the local requirements, however there is still a need to source some of the polyethylene resin from overseas countries, particularly for grades of polyethylene resin that are not available locally.

For 2002, the production quantity of polyethylene resin grew by 17.3% over the previous year, amounting to 993,569 tonnes *(Source: Independent Assessment of the Geosynthetics Industry prepared by Vital Factor)*.

In 2002, the import value of high density polyethylene plastic resin increased by 6.5%, amounting to RM318.5 million. Some of the major import countries include Singapore, Kuwait, Korea, Saudi Arabia, Japan and Thailand *(Source: Independent Assessment of the Geosynthetics Industry prepared by Vital Factor)*.

Between January and June 2003, the import value of high density polyethylene plastic resin increased by 18.4% to RM179.0 million compared with the corresponding period in 2002 *(Source: Independent Assessment of the Geosynthetics Industry prepared by Vital Factor)*.

Thus far, management has not experienced any shortage in the supply of plastic resins, as there are readily available locally and from a number of overseas countries.

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

5.4.8 Product Quality

As part of the EKIB Group's emphasis on product quality, the following approaches have been adopted to ensure that certain quality standards are maintained:

- Testing of samples is done prior to mass production. This is to ensure that the products meet the required properties and specifications.
- Each level of the manufacturing process including weaving, warping, needle punching and calendaring has to go through a checking process for quality assurance.
- Quality checks in the form of inspections are carried out with a sample of the final product before despatching to the customer.

The EKIB Group also has stringent quality control programmes in accordance with the International Standard Organisation (ISO) and American Society for Testing and Materials (ASTM) standards by testing samples of its products as follows:

Survivability

- mass per unit per area, often referred to as weight;
- thickness, the dimension perpendicular to the fabric under a specific pressure;
- grab tensile strength, the breaking strength of fibres in a specific width together with the additional strength contributed by adjacent fibres;
- elongation, a comparison between the initial and final specimen length at the breaking load;
- puncture strength, measures the resistance of geosynthetic products to penetration by a blunt object; and
- trapezoidal tearing strength, the force required to continue a tear in a geotextiles once initiated.

Performance Tests

- wide width tensile strength, the breaking strength of a wide specimen and provides more accurate unidirectional design tensile strength values. Stress-strain results can be utilised to determine geotextiles modulus;
- seam strength, the strength of sewn geotextiles using a relatively wide sample. These values are compared to the base material's wide width strength;
- apparent opening size, the number or opening size, of the US standard sieve of having openings closest in size to the largest opening in a filter geotextiles; and
- permittivity, measures the flow in the normal direction through a geotextiles. It can be expressed either as vertical water flow (litres/metre square/second), or permittivity (second⁻¹ defined as per second), or coefficient of permeability (centimetre/second).

Durability Test

- ultra violet (UV) stability, the ability to retain strength upon exposure to UV light;
- chemical resistance, the ability to resist deterioration on exposure to chemical solution;
- clogging resistance, the ability of a soil/geosynthetic system to maintain acceptable long term flow through the system without excessive flow reduction;
- bio-clogging resistance, the ability of a soil/geosynthetic system to maintain acceptable long term flow through the system without excessive flow reduction as a result of biological growth;
- creep, the time dependent deformation of a geotextile under constant load; and
- abrasion resistance, the ability of a surface to resist wear by friction.

The Group has 8 people in the Quality Assurance team that are focused on ensuring that the standard of product quality consistently meets the specifications and expectations of customers.

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

As part of the EKIB Group's emphasis on quality, EKIB Group has obtained the following accreditations in Quality Management System from Bureau Veritas Quality International. This provides customers with the assurance of quality of its products.

Company	Accreditations	Expiry Date
EKSB	ISO 9001:2000	4 July 2004
KESB	ISO 9001:2000	26 March 2006

5.4.9 Research and Development

Research and development ("R&D") plays an important role for the EKIB Group, particularly to create and sustain competitive advantages through the following:

- continuous improvement in product quality to ensure customer satisfaction;
- increase production effectiveness, efficiency and productivity to minimise costs;
- continuously enhancing existing products and services to better meet the needs of customers; and
- create new products and services to address areas of growth and opportunities.

The constant creation and enhancement of competitive advantages are critical in a competitive market place to sustain the EKIB Group's business growth and success in the long term.

Pertinent areas of R&D are as follows:

- development of new products;
- customisation of geosynthetic products; and
- improving manufacturing processes.

EKIB has in-house R&D facility that allows them to undertake R&D, develop prototypes and test products. Some of the testing undertaken includes survivability, performance test and durability test. The EKIB Group has 8 technical personnel and quality assurance personnel who are involved in R&D activities. The estimated amount spent on R&D for the last three (3) financial years and the ten (10)-month financial period ended 31 October 2003 were as follows:

	Financial year ended 31 December			Ten (10)- month financial period ended
	2000	2001	2002	31 October 2003
R&D capital expenses (RM)	7,000	13,700	116,604	6,098
R&D operating expenses (RM)	301,695	334,615	489,389	426,939
Total R&D expenses (RM)	308,695	348,315	605,993	433,037
Proportion of Group's Revenue (%)	0.7	0.9	1.1	0.7

Note:

The R&D expenditure for the financial year ended 31 December 2000 to 2002 have been utilised in the computation of taxation for the respective financial years.

5.4.9.1 Achievements in R&D

As part of the EKIB Group's intention to stay ahead of its competitors, it has to continuously develop new products. Some of the products that have successfully undergone R&D and are currently in full production include geotextiles, geogrids and geocomposites (including geomattresses).

5. INFORMATION ON THE EKIB GROUP *(cont'd)*

Geotextiles

In 2000, the EKIB Group was involved in the design, manufacture, supply and installation of woven geotextiles with tensile strength of 400kN/50kN and non-woven geotextiles with mass per unit area of 300gm/m² on the seabed of about five (5) metres deep for the formation of two (2) artificial islands located off Pantai Kok in Pulau Langkawi.

Woven geotextiles that have been developed in-house and are currently in production have the following properties:

- bi-directional strength and stiffness;
- lightweight to provide ease of installation; and
- high resistance level to environmental degradation.

Non-woven geotextiles that have been developed in-house and currently in production include the following:

- a uniform web with a random structure produced by bonding, interlocking fibres or both;
- three (3) dimensional pore structure for more soil-like performance;
- multidirectional strength;
- conformability to resist installation damage and ensure intimate soil contact;
- high strength to weight ratio; and
- resistance to environmental degradation and creep to facilitate extended design life.

Geogrids

The EKIB Group has been able to manufacture geogrids with tensile strength of 400 kN in warp direction and 200 kN in weft direction.

Geocomposites

Geocomposites in the form of geomattresses has been successfully developed by EKIB Group and is currently in full production.

5.4.9.2 On-Going R&D

Customisation of Geosynthetic Products

To meet the varying needs of customers, each of the applications may require the use of different polymer materials and additives to achieve different properties and characteristics. Some of these customised geosynthetic products can be in the form of woven geotextiles, non-woven geotextiles or a combination of both, called geocomposites. In addition, geocomposites consist of any combination of geotextiles, geogrids, geomembranes and other materials including poly sheets and pipes. The EKIB Group usually test out different methodologies and materials with a same sample run before a full production run takes place.

Improving Manufacturing Processes

The EKIB Group continuously focuses on process improvement, particularly in enhancing its manufacturing processes. This is critical as it has a direct impact on manufacturing efficiency, effectiveness, productivity and product quality. As such, the EKIB Group undertakes R&D through:

- selection of process flow best practices;
- research in new technologies and machinery in improving the effectiveness, efficiencies, productivity and quality in the manufacturing processes;

5. INFORMATION ON THE EKIB GROUP (cont'd)

- continuous evaluation and improvement of existing processes and procedures to optimise work flow;
- modification on existing machinery and equipment to increase efficiencies in the production process;
- use of statistical control for feedback and monitoring; and
- incorporation of quality control processes.

New Products Development

The EKIB Group is currently undertaking R&D in the following new products:

- Geotubes;
- Corrugated profile vertical geodrains; and
- Shade cloth.

Geotubes

Geotubes are made of polypropylene woven geotextiles. The geotubes are approximately 100 metres long with a diameter of 3.25 metres long, and are filled with sand. Generally, geotubes are placed parallel to the shoreline with the intent of creating protection against storm surges and erosion. Geotubes are used as a replacement for sand dunes. In addition, it can be used for containment and dewatering of industrial waste, municipal sludge and marine sediments.

Areas of R&D involves meeting product specifications and properties including:

- warp and weft tensile strength;
- seam strength;
- apparent opening size; and
- level of permittivity.

One of the key characteristics is for the resultant geotubes to be submerged and stay submerged and stationary against strong underwater currents.

Corrugated Profile Vertical Geodrains

Currently, the EKIB Group manufactures vertical geodrains where its polymer core is profiled with regularly spaced studs wrapped around with non-woven geotextile. The EKIB Group intends to extend its product range for vertical geodrains where its polymer core has a corrugated profile. Additionally, the EKIB Group will also use a heat-bonding process instead of the traditional method of using glue to seal the non-woven geotextiles to encapsulate the polymer core. The main advantage of the corrugated profile vertical geodrains is cost savings in the following areas:

- The corrugated profile provides additional strengths to the polymer core thereby enabling less use of raw materials by approximately 35% compared to stud profiled vertical geodrains.
- Heat bonding of the non-woven geotextiles eliminates the need for glue, providing cost savings.

Areas of R&D include the following:

- Optimum thickness of the polymer core to provide sufficient strength and at the same time minimising the use of raw materials;
- Design and positioning of the corrugation to provide additional strength and at the same time maximise capillary action for water discharge;