

ECO-LABELLING FOR TEXTILES - THE BENEFITS AND OPPORTUNITIES

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SUMMARY

Consumers are becoming increasingly concerned with the adverse impacts of industrial pollution on the environment and their health. Mounting pressure on industry to adopt more “eco-friendly” manufacturing processes has led to an increased demand, particularly in the textile sector, for manufacturers to have an eco-label for their products. In addition to assisting the entry to new markets and maintaining existing ones, obtaining an eco-label can also generate financial savings through process optimisation and reduced consumption of raw materials, reduce processing time, improve environmental performance and improve working conditions. Obtaining an eco-label can also help obtain ISO 14000 and ISO 9000 accreditation.

Ecolabelling for textiles was implemented in two Egyptian textile factories as a part of the Support for Environmental Assessment and Management (SEAM) Programme.

1. THE EGYPTIAN TEXTILE SECTOR

The Egyptian textile industry is the fifth largest source of foreign earnings after oil, remittances, tourism and earnings from the Suez Canal. The total value of the sector in 1998 was LE8 billion, of which LE3 billion came from exports. Throughout the sector, cotton yarns presently account for the largest share of total exports, with over 60% going to Europe. This trend is expected to change though, with finished garments gaining an increasingly large share of the export market. It is anticipated that finished garments could represent up to 80% of total exports within the next few years.

The European export market is the main market driving the requirement for ecolabels. Given the importance of the European market to the Egyptian textile sector, then factories will need to respond to the challenges of ecolabelling in order to protect and expand their export markets.

2. THE NEED FOR AN ECO-LABEL

Consumers are becoming more concerned with the adverse impacts of industrial pollution on the environment and their health. Mounting pressure on industry to adopt more “eco-friendly” chemicals and manufacturing processes has led to an increased demand, particularly in the textile sector. Eco-labels that certify the “eco-friendliness” of the textile product are now increasingly demanded by consumers. While this will certify that their products do not contain chemicals that might be harmful to the consumer, the requirement for an eco-label is not uniform around the world. Currently, these are required mainly in Western Europe, with Germany being the most demanding. Other German and Nordic speaking countries follow closely behind.

With the removal of tariff barriers under the World Trade Organisation Agreement on Tariff and Trade in 2005, exporters may increasingly face more stringent environmental standards in the international marketplace. Manufacturers wishing to protect their existing markets and expand into new ones may well be required to obtain an eco-label that is acceptable to their client.

Experience in Egypt has shown that without an eco-label:

- some buyer preferences were being directed elsewhere;
- where this was not the case then the lack of an eco-label was used as leverage to negotiate prices down.

3. WHAT IS AN ECO-LABEL?

An eco-label provides brief information on environment related product qualities. It enables consumers to identify those products that are environmentally safe; that have been

manufactured using eco-friendly materials and do not contain chemicals that are harmful to the user. Since “eco-friendliness” is an additional product quality, it can be used for marketing and advertising purposes.

4. WHAT ARE THE BENEFITS OF ECO-LABELLING?

These can be briefly summarised as follows:

Enhanced export market opportunities - manufacturers and retailers of textile goods will probably come under increasing pressure to comply with the international eco-labels. Given the scenario of open worldwide competition beyond 2005, securing of an eco-label will greatly assist the manufacturers and retailers in enhancing the export market opportunities.

Improved product quality - through the removal of substances in the fabric that may be harmful to the customer.

Financial savings - through process optimisation and improvements that result in saving of water, chemicals and energy. Frequently, the processing time is reduced and the RFT (Right First Time) is improved. These benefits generally offset the incremental costs of using eco-friendly chemicals or of adopting a modified process.

Improved environmental performance - through phasing out of toxic and hazardous substances and conservation in water, energy and raw material usage. This leads to a reduction in the quantities and pollution potential of various emissions.

Step towards ISO 14000 and ISO 9000 - as quality control procedures are an integral part of product eco-labelling, it becomes easier to implement the ISO 14000 and ISO 9000 systems.

5. ECO-LABELLING SCHEMES

There is a wide range of eco-labelling schemes covering a variety of textile product groups. Each has developed criteria that vary in approach from full life cycle analysis to schemes that address only the quality of the final product. Types of organisations involved in eco-labelling schemes are shown in Table 1.

Table 1: Organisations involved in Ecolabelling Schemes

	Organisation	Eco-label Examples
Private	Non-Governmental Organisations (NGOs)	Good Environmental Choice (Sweden)
	Institution Related	Öko-Tex (EcoTex) 100 (Germany) Öko -Tex (EcoTex) 1000 (Germany) Öko -Tex (EcoTex) ® (Germany)
	Producer's association	AKN Trademark (Germany)
	Company related	Steilmann Otto Versand Hess Natur Green Cotton
Government	National	EKO-Seal (Holland) Environmental Choice (Canada) Eco-Mark (Japan) Green Mark (China-Taiwan) Eco-Mark (Korea), Environmental Labelling (China) Eco-Mark (India).
	Multinational	EU-label Nordic Eco-label

National eco-labels are generally established by the respective National Standards Organisation or Ministry of Environment. Multinational schemes are intended to facilitate trade within their common markets.

Private NGO and institution eco-labels set criteria that may be acceptable in a number of different countries. These tend not to be established in countries where a national eco-label already exists.

Within Egypt there are no national eco-labels for textiles nor are there any certifying bodies for internationally recognised eco-labels (as of August 2003). For the work undertaken by the SEAM Programme, the Öko-Tex (EcoTex) 100 eco-label was selected, as:

- it was well recognised in Germany, a key market for Egyptian products;
- it was widely accepted in other West European markets;
- it was relatively easy to implement for the main export product lines.

Certification was undertaken in Vienna, through the Institute of the International Association for Research and Testing in the Field of Textile Ecology.

6. HOW TO SELECT AN APPROPRIATE ECO-LABEL

When selecting an eco-label, Egyptian textile manufacturers should consider the following factors:

Buyer requirements - these will vary from country to country and be influenced by consumer preferences. Identify what eco-labels are preferred by the buyer and also those which may be acceptable in more than one of the manufacturer's export markets.

Major export products - eco-label certificates generally apply to single product lines only. In introducing eco-labelling, manufacturers may first wish to focus on their main export product as any loss in market share, as a result of not having an eco-label, may lead to adverse financial impacts.

Ease of implementation - select eco-labels where the criteria can be more readily achieved and sustained. Eco-labels based on final product quality may be easier to gain than those based on the full life cycle analysis, which takes into consideration raw material use, environmental impacts of every stage of the manufacturing process (including wastewater characteristics, air pollution and solid waste disposal), worker health, use of child labour, packaging, return of goods etc.

7. ECO-LABEL IMPLEMENTATION IN EGYPTIAN TEXTILE FACTORIES

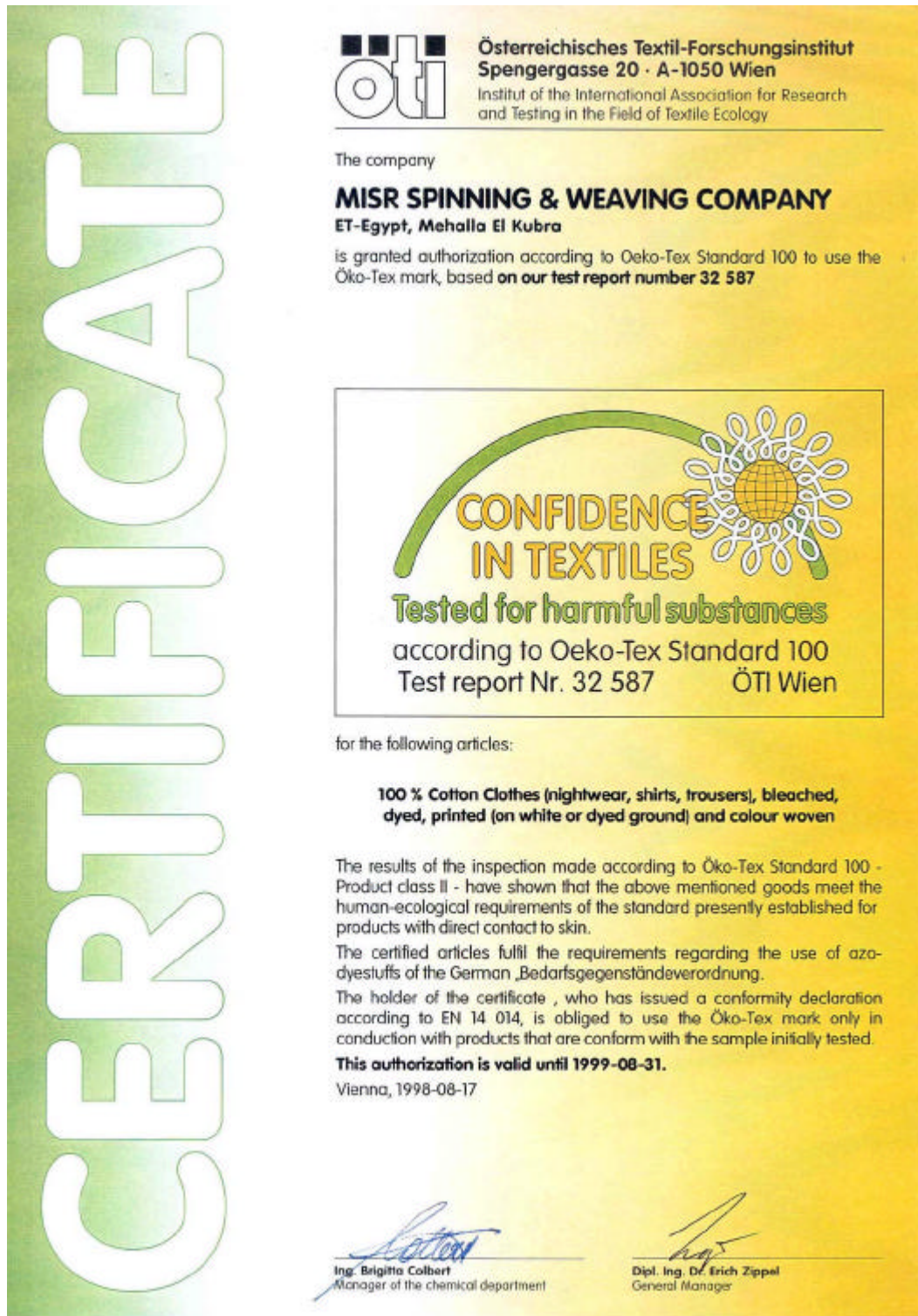
Under the SEAM Programme, an eco-label was achieved by two Egyptian textile factories, Misr for Spinning and Weaving Company, Mehalla El-Kobra and Giza for Spinning, Weaving, Dyeing and Garments Company, Kafr El-Hakeim, Giza.

Misr for Spinning and Weaving Co., Mehalla El-Kobra, is a public company, the largest in the Middle East. At the time of certification, it had an average annual production of 48,000 tons, of which approximately 50% was exported. The factory occupies an area of 600 acres (including residential area) and has a workforce of over 30,000. It processes cotton, wool, synthetics and blends to produce a wide range of products, including ready-made garments, yarns, finished fabrics, bandages and blankets.

Giza Spinning, Weaving, Dyeing and Garments Co. is privately owned, with an average annual production at the time of certification of 1,500 tons, approximately 95% of which is produced for export. The factory is on a 25 acre site and has a workforce of around 2,400. The main products are cotton, polyester ready-made garments, yarns and finished fabrics.

A copy of the certificate awarded to Misr Company is shown as Figure 1.

Figure 1: Certificate awarded to Misr Spinning & Weaving Co., Mehalla El Kobra



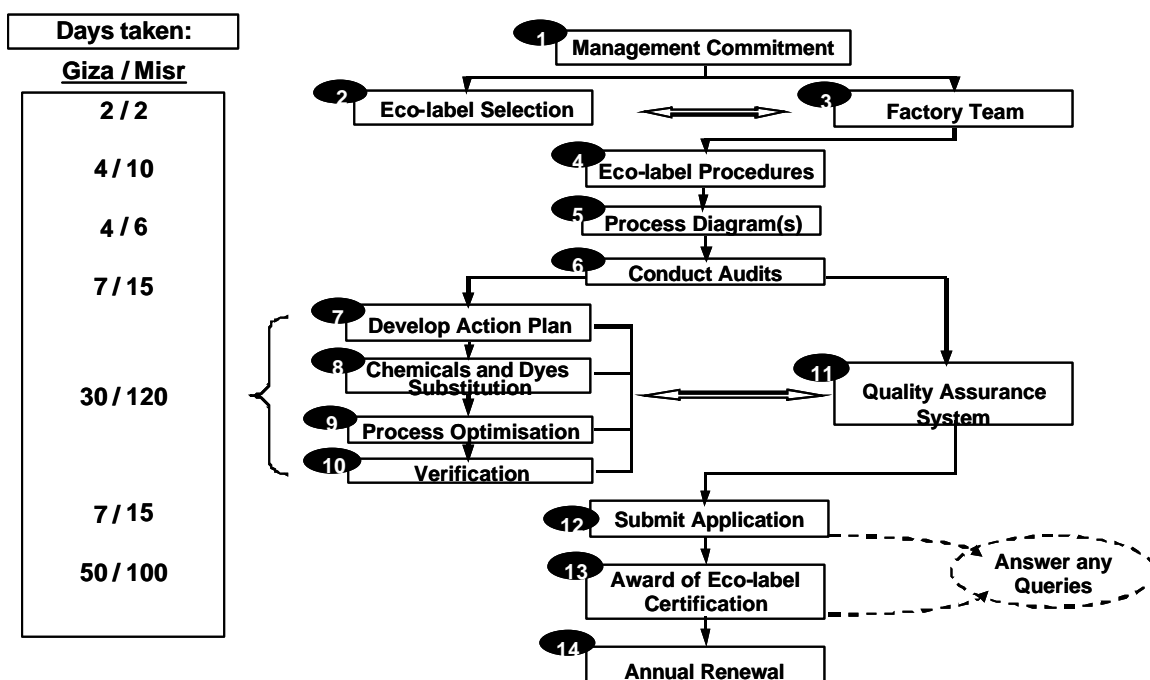
8. HOW TO OBTAIN AN ECO-LABEL

An assessment of the buyers and major export lines showed that an eco-label based on final product quality would be acceptable. Of these, the "ÖkoTex" eco-label was selected as it is widely accepted throughout Europe, including Germany, to which a large proportion of products are exported.

8.1 Key Steps

An eco-label can be achieved by following a set of 14 clearly defined steps, as illustrated in Figure 2. Of these, key steps include obtaining management commitment, carrying out a chemical audit, phasing out hazardous materials, process optimisation and establishing a quality assurance system.

Figure 2: Steps for achieving an Ecolabel



8.1.1 Management Commitment

From the outset, it is important that the senior factory management recognise the value of an eco-label and are committed to implementing the eco-labelling requirements. Understanding and commitment of top management is essential in:

- allocating appropriate human resources;
- encouraging the factory staff to implement the necessary changes in a timely fashion;
- providing the necessary financial resources for raw material substitution, testing and certification;
- seeking process optimisation changes that benefited the factory;
- developing the quality control culture that is an integral requirement of achieving and maintaining any eco-label.

8.1.2 Conducting a Chemical Audit

This step will identify all chemicals used in the process that are banned by the selected eco-labelling organisation. First of all, a detailed survey of the chemicals used in each production

stage must be carried out. The aim of this is to identify all chemicals used in the production of the fabric, from the processing of the raw fibres through the manufacturing process to the production of the finished article. These can then be compared with the list of banned substances provided by the eco-labelling institute to identify which ones need to be replaced. Wherever possible, material safety data sheets (MSDS) for each chemical should be obtained from the supplier - this will save time and money later.

8.1.3 Action Plan to Phase-out Objectionable Substances

An Action Plan should be developed to address the findings of the chemical audit. This is essential when there are a number of substances to be phased out and/or when there is a range of options for doing so. The Action Plan should clearly describe what substitutions are required and what needs to be done to achieve these. Some of the substitutions will be relatively straightforward (e.g. substitution of hazardous dyes with eco-friendly alternatives), whereas others may require a series of trials to be carried out.

If the substitution requires some trials to be carried out, the first step will be to carry out laboratory bench testing. Typically, this uses very small volumes of fabric, dyes and process chemicals. It is therefore a low-cost way of assessing a wide range of possible substitutes and/or process modifications. When this has been completed, the most promising options are assessed on a larger, pilot scale under production scale conditions. Finally, production scale trials are used to “fine tune” the most successful pilot scale trial, whilst maintaining optimum conditions.

8.1.4 Substitution of Hazardous Chemicals and Dyes

Once the Action Plan has been developed, objectionable chemicals can be phased out and acceptable substitutions made. Examples of hazardous chemicals and acceptable substitutes are shown in Table 2.

Table 2: Some Hazardous Chemicals and Acceptable Substitutes

Hazardous Chemical	Substitute
Sodium hypochlorite	Hydrogen peroxide
Pigments based on banned amines	Safe pigment colours
Kerosene	Synthetic thickener
High formaldehyde binders and resins	Low formaldehyde binders and resins
High formaldehyde	Low formaldehyde resin
Copper sulphate	polymeric agent

Fabric quality tests should then be carried out to confirm that the product meets eco-label requirements.

8.1.5 Process Optimisation

In some cases, the changes implemented may result in the use of higher-cost chemicals and dyes. However the overall cost may be reduced, as commonly, smaller amounts of better quality products are needed to maintain product quality.

It is also possible that costs may be reduced by optimising existing production techniques, both in the modified process and in downstream processes. Optimisation is achieved by inspecting all recipes and procedures and identifying where excess raw materials are being used and where process steps can be reduced.

8.1.6 Establish Quality Assurance System

Implementing a Quality Control System is an essential part of maintaining an eco-label. The aim of this is to prove to the certifying institute that all products manufactured have the same properties as any test sample sent to the institute. It is important that this is done properly as the institute can carry out tests to check this at any time. Persistent failure of these tests will result in cancellation of the eco-labelling certificate.

The Quality Control System is usually presented in the form of a “Quality Assurance Manual”, produced and maintained by the Quality Manager. This Manual should contain information on:

- Dyes and pigments in use along with their C.I. number
- Chemicals in use.
- Material Safety Data Sheet (MSDS) for all items.
- Processing sequence used and process control check points.
- Quality parameters of final product.
- Test methods for each of the items.
- Frequency at which each test needs to be conducted.
- Eco-Label requirements.
- Mode of verification, in case of correction, if any.

8.2 How Long will it take?

The length of time needed from start to finish will vary greatly, depending mainly on the complexity of the line selected and how much time can be dedicated by factory staff. Other factors include the number of chemicals that are used and how many of them are hazardous. Once hazardous chemicals have been identified, suitable alternatives will then need to be identified and obtained. Setting up an acceptable quality system also takes time - this will be a relatively easy task if a quality system is already in place.

In Misr Company and Giza Company, the activities that took the greatest amount of time to complete were the phasing out of objectionable substances and verifying the final results. However, the time required to achieve an eco-label for a product will decrease as staff become increasingly familiar with the actions that are required.

9. COST BENEFITS

It is often assumed that using eco-friendly dyes and chemicals rather than the traditionally used dyes and chemicals will significantly increase processing costs. This is not necessarily true. Table 3 shows that dyes, process and sizing chemicals account for only 5% of the total cost; even if the cost per kilogram of the eco-friendly dyes and chemical is higher, the effect on the overall cost is not highly significant.

Table 3: Typical Cost Structure of a Textile Manufacturer

Constituents	% Contribution to Total Cost
Raw material (mainly cotton)	50-55
Sizing chemicals	1
Dyes and process chemicals	4
Packaging	1
Salary and wages	17-18
Fuel oil, water and power	14-15
Stores and spares	5
Interest on depreciation	10

In addition, eco-friendly chemicals tend to be of higher quality and smaller amounts are needed to achieve the same, or sometimes better, results. This also tends to increase the percentage of Right First Time (RFT) production. Improved RFT means that less reprocessing has to be carried out, reducing the usage of chemicals, water and energy, as well as saving time previously lost in the correction of off-shade dyeing. Improvement in the RFT also helps to reduce the wastewater volume as well as the concentrations of the pollutants in the wastewater.

9.1 Effects of Chemicals and Dye Substitution

In Misr Company, chemical substitution and process modifications resulted in an improved process that generated annual savings of LE30,456. This value incorporates costs and savings from the purchase of dyes and chemicals, optimisation of water, steam and electricity consumption.

Similar gains were recorded for Giza Company. The majority of the savings came from improving the bleaching process, giving total annual savings of LE32,700. This offset the slight cost increase of dyes leading to overall savings of LE30,972. A more detailed breakdown of these costs is given in Table 4.

Table 4: Summary of Cost Changes for “Eco-friendly Substitution”

Process	Banned Substance	Eco-friendly Substitute	Cost Change (LE)	Annual Cost Savings (LE)
Half Bleaching	Sodium hypochlorite	Hydrogen peroxide	- 55.15 (decrease)	32,700 (decrease)
Direct Dyeing	Copper sulphate	Polymeric agent	+ 120 (increase)	1,728 (increase)
TOTAL (LE)				30,972

Note: Costs are based on the processing of 1 tonne of knitted fabric

Prior to attaining the certificate, some clients required that all consignments were tested to ensure that they conformed to the eco-labelling standards. At Misr factory for example, the total annual fabric testing costs were around LE20,000. With the award of the eco-label certificate, this testing is no longer required.

9.2 Potential Export Market Gains

Annual export value at the time of implementation at Misr Company was around LE383million. Of this, almost 15%, or LE57.5 million went to Germany, a country that is increasingly placing demands for eco-labelled products. While it was difficult to quantify the export benefits of the eco-label, a 5% increase, or conversely a 5% drop in the German market share, would have been equivalent to LE2.9 million per annum.

Annual export value at the time of implementation at Giza Company was approximately LE32.7million, of which about 20%, or LE6.5 million, went to Europe. While it was difficult to quantify the export benefits of the eco-label, a 5% increase or conversely a 5% drop in European market share, would have been equivalent to LE0.3 million per annum.

9.3 Improved Production Efficiency

In the process of achieving an eco-label, a number of modifications were made which improved production efficiency. In Giza Company for example, processing time was reduced by more than 47% in the half bleaching process and by 27% in the full bleaching process. This allowed the factory to process a 9 ton/day order for whites, compared to the earlier capacity of 4.5 ton/day. The modified method consumes 60% less water than the conventional method, with a corresponding reduction in wastewater volume. Steam consumption was reduced by 14%.

In Misr Company, a 5% improvement in “Right First Time” (RFT) in the dyeing process was achieved, in addition to a 20% reduction in processing time and a 14% reduction in steam consumption.

9.4 Improved Product Quality

Implementing an eco-label has resulted in an improvement in fabric quality and consistency. The most noticeable improvement resulted from the elimination of sodium hypochlorite in the bleaching process. As well as being banned by most eco-labels, the white colour produced by sodium hypochlorite is not permanent and the fabrics eventually turn yellow. In addition, use of this chemical sometimes weakens the fabric - in some cases, a 20% reduction in fabric strength was recorded. By eliminating this chemical, both of these problems were solved.

9.5 Environmental Improvements

Elimination of hazardous chemicals from the textile manufacturing process is also beneficial for the environment. In both factories, the complete phase-out of sodium hypochlorite and the anti-chlor agent sodium bisulphite resulted in the elimination of halogenated organic compounds (AOX) and a reduction of Total Dissolved Solids (TDS) in the effluent. The removal of this hazardous material has resulted in safer and better working conditions, as well as eliminating the odour of chlorine from the workplace.

In Misr Company, the use of kerosene in the printing process was minimised and a synthetic thickener used in its place. Kerosene is a flammable, hazardous material that is toxic to aquatic life, which also gives off strong, toxic fumes during use. It also leaves a strong, unpleasant odour on the finished product, which is not allowed by eco-labelling institutes. In Giza Company, removal of copper sulphate from the dyeing process reduced the toxicity of the final effluent.

Achieving an eco-label will also help improve the skills, confidence and motivation of employees.

9.6 Move towards achieving ISO14000

The implementation of quality control procedures is an integral part of product eco-labelling, which can be easily adapted to the ISO 14000 system. It is also a good starting point for achieving ISO 9000 certification.

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