FINAL REPORT

European Commission, DGIII

Study on the Effects on Suppliers in Developing Countries of a Ban on Azo Dyes and Products Treated by Azo Dyes

March 1998

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For and on behalf of
Environmental Resources Management

Approved by: T. DENNE

Signed:

Position: TECHNICAL DIRECTOR

Date: 9TH MARCH 1998

Executive Summary

This report presents the results of one of a set of three studies examining different aspects of restrictions on the use of certain azo dyes in the textile and leather sectors.

Azo dyes account for some 65% of all organic colourants in use, and there are some 3,200 azo dyestuffs. A very small set of azo dyestuffs are subject to use and trade restrictions in some Member States (Germany and the Netherlands) on the grounds that they can release one or more amines that are classified as carcinogenic. Restrictions mean that neither the dyes nor textiles and leather which have been treated with dyes that release the specified amines, nor goods made from these textiles or leather can be placed on the market.

Consideration is being given to introducing similar restrictions on a harmonised basis throughout the European Union. The purpose of this study is to assess the implications of so doing on developing countries.

Textiles, leather, clothing and footwear are internationally traded goods. A very large number of countries participate in this trade. Developing countries are important suppliers to the European Union. In 1994, China accounted for 13% of all imports of textile, clothing, footwear and leather into the EU (12), and India 7%. Textiles account for over 10% of merchandise exports from Pakistan, Egypt, India, Bangladesh, Turkey and Taiwan. The international trade regime for textiles is complex and highly politicised, with phase-out of restrictions under the old Multi Fibres Agreement that limited developing country exports to OECD markets involved in the Uruguay Round.

On the basis of desk research and interviews in India, Hong Kong and China, the study concludes that EU wide restrictions on carcinogenic azo dyes (i.e measures assumed to be similar to those already in place in Germany and the Netherlands) would affect some producers in all developing countries with a textile or leather industry because of the widespread use of the restricted dyes. However many of the larger dye and textiles or leather producers in developing countries have already started to adapt in order to comply with the restrictions in Germany, accepting the higher costs of substitutes.

The principal problems faced by producers in developing countries in adapting to a ban concern timing; information and testing. Uncertainty about the dates of phase-in of the German ban, about understanding which dyes are effectively restricted and which are not, lack of formal recognition of test results and laboratories in countries of origin and delayed development of approved test methods have caused real difficulties for developing country industries. If a European ban were introduced, it would be important to provide clear guidance on the dyestuffs affected and on the test methods to be used and have a system of testing and certification that could be administered in the country of origin and recognised by the EU.

The study also examined in outline the issue of WTO consistency because issues about possible protectionism in the textiles sector are beginning to be raised within the context of WTO discussions, for example on trade and environment. In outline, the study concludes that in order to be WTO-consistent, restrictions on some azo dyes should be justified by health risks to the consumer, should be the least trade restrictive measure that could deliver the required level of consumer protection and should not have the effect of discriminating between producers. The WTO analysis indicates the importance of the parallel study on risk assessment and suggests the importance of ensuring transparency in test requirements and of moving towards mutual recognition of test facilities.

CONTENTS

1 INTRODUCTION

1.1 THE STUDY

This is the Final Report in the DGIII project:

> *Study on the Effects on Suppliers in Developing Countries of a Ban on Azo Dyes and Products Treated by Azo Dyes*

Contract nº. ETD/96/500148.

The study has been carried out by ERM, in association with Dr Ian Holme of the Department of Textile Industries, University of Leeds, UK. ERM has drawn on consultants based in Germany, China, India and Hong Kong, as well as the UK based study team.

The work has been approached through a set of separate research tasks, as follows.

- Analysis of EU trade statistics to identify major developing country impacts.
- Analysis of trends in the use and regulation of azo dyes and business impacts of existing bans in selected developing countries - India, China and Hong Kong.
- Analysis of the technical and economic implications of a shift from azo dyes.
- Assessment of WTO issues associated with bans on imports of azo-dyes.
- Key issues for developing countries in responding to the German ban - identification of issues brought forward to the authorities in Germany.

The remainder of this report has the following structure:

- The remainder of *Section 1* sets the context for the study, highlighting a German ban on certain carcinogenic azo dyes, and identifying developing countries most likely to be affected by any EU-wide measures. It also explains the approach taken in the study.
- *Section 2* sets out the conclusions of the analysis. It takes the form of responses to five key questions representing issues likely to shape the extent of the impact of harmonised EU-wide measures on developing countries.

In this report, additional information is provided in a series of annexes, as follows:

- *Annex A* is the text of Dutch legislation restricting carcinogenic azo dyes.

- *Annex B* contains a selection of the currently available lists of azo dyestuffs that can split off the carcinogenic aromatic amines referred to in German legislation restricting import and use of certain azo dyes.

- *Annex C* contains the test methods for leather and textile products adopted in conjunction with the German legislation on carcinogenic azo dyes.

- *Annex D* is a summary table of interviews carried out in India and China as part of the study.

- *Annex E* is a print-out of Internet information about a Hong Kong Voluntary Registration Scheme for Harmless Dyestuffs.

- *Annex F* summarises General Agreement on Tariffs and Trade (GATT) and World Trade Organisation (WTO) disputes relevant to determining the compatibility of EU-wide restrictions on carcinogenic azo dyes with the rules of the Multilateral Trading System.

1.2 THE CONTEXT

1.2.1 *Azo Bans*

There are approximately 3,200 azo dyestuffs in use world wide, comprising some 65% of all organic colorants in use. A number of developed countries have implemented restrictions affecting use of and/or trade in some of these dyestuffs. EU countries that have implemented restrictions include Germany and the Netherlands, and restrictions are drafted in France. Outside the EU, we understand that countries including Canada and the US have also regulated use of carcinogenic azo dyes, with Canada recently developing draft regulations on benzidine. (1)

Of the total azo dyestuffs in use, only a limited number are affected by such restrictions: it is estimated, for example, that the German ban covers some 130-150 (depending on which published list of dyes is consulted). (2)

For the purposes of this study, the German restrictions have been taken as a starting point for case study analysis of responses in developing countries and the impact of such restrictions on developing country producers and exporters.

German legislation on product liability places an obligation on every company involved in the production chain of a consumer product to deliver products which do not pose health hazards to consumers. Additional regulations have been promulgated to ensure that German consumers do not buy products which are hazardous to health. These additional regulations include a 1994 modification to the *Verordnung zur Anderung der*

(1) Source: Perc, Trichloroethylene, Benzidine, Dichlorobenzidine to be regulated, International Environment Reporter, February 19 1997

(2) According to their Colour Index generic name: the number of trade names corresponding to these generic names is much higher

Bedarfsgegenstandeverordnung (the 'Legal Regulation for Articles of Daily Needs'), which prohibits the manufacture, import and sale of consumer goods containing certain, potentially carcinogenic, azo dyes.

Failure to comply with the legislation after its entry into force is a criminal offence. The legislation applies to all parties, (whether importers, producers, wholesalers and/or retailers), who import the affected products into the German market. In addition, it is an offence to produce or process clothing using prohibited azo dyes.

The structure of the German 'azo dyes ban' is complex. Although it is usual to refer to a `ban on azo dyes', the German ban is in fact placed on the use in consumer goods, including clothing, of a set of dyestuffs (*not named in the regulations*) that can release one or more of a (*specified*) list of amines which are classified as carcinogenic in the MAK list. The list of prohibited amines is reproduced in *Table 1.1* below. (We understand the same list is incorporated in draft French legislation.) The German legislation prohibits the manufacture and import of products capable of releasing the prohibited amines.

Table 1.1 *Banned Arylamines Under the German Regulation*

Amine	CAS Number (Chemical Abstracts Service Index Number: allocated by the American Chemical Society)
4-aminodiphenyl	92-67-1
benzidine	92-87-5
4-chloro-o-toluidine	95-69-2
2-naphthylamine	91-59-8
o-aminoazotoluene	97-56-3
2-amino-4-nitrotoluene	99-55-8
p-chloroaniline	106-47-8
3,3'-dichlorobenzidine	91-94-1
3,3'-dimethoxybenzidine	119-90-4
3,3'-dimethylbenzidine	119-93-7
p-cresidine	120-71-8
o-toluidine	95-53-4
2,4-toluylendiamine	95-80-7
2,4-diaminoanisol	615-05-4
4,4'-diaminodiphenylmethane	101-77-9
3,3'-dimethyl-4,4'-diaminodiphenylmethane	838-88-0
4,4'-methylene-bis-(2-chloroaniline)	101-14-4
4,4'-oxydianiline	101-80-4
4,4'-thiodianiline	139-65-1
2,4,5-trimethylaniline	137-17-7

An indication of the types of dyestuff (by Class) affected by the German ban is set out in *Table 1.2* below. Direct (79) and acid (17) dyes and azoic diazo components are the most affected by the ban. In contrast with the German legislation, legislation in the Netherlands includes an indicative list of affected dyes.

The Dutch legislation is set out in *Annex A*, and three separate lists of dyes implicated in the German legislation that are currently in circulation are reproduced in *Annex B*.

Table 1.2 *Azo Dyestuffs by Class Affected by the German ban*

Type of Dyestuff	Number
CI Acid Dyes	17
CI Azoic Diazo Components	5
CI Basic Dyes	2
Developer 14 = Oxidation Base 20	1
CI Direct Dyes	79
CI Disperse Dyes	3
CI Mordant Dyes	2
Total	109

Source: Bayer AG Technical Information

The German legislation has been amended on a number of occasions, and the dates for its entry into force changed. This is in part a result of discussions between the European Commission and the German authorities about the compatibility of the legislation with the free market provisions of the Treaty of Rome. When it was initially introduced (in 1992) the German ban applied to both dyes and pigments. Following complaints from industry, the legislation was amended. A general exemption for pigments was proposed, coupled with a testing requirement.

The development of test methods to accompany the legislation took some time. A fifth amendment to the legislation introduces a test method for textiles, and a separate DIN standard has been developed for leather testing. The test methods are reproduced in *Annex C*.

The complexities of the German ban have been a key factor causing difficulties for developing country exporters. The structure of the legislation places the onus of ensuring compliance upon the importers, producers, wholesalers and/or retailers affected. Knowing the supply chain is a key to compliance.

A range of mechanisms could be adopted by businesses in response to azo dyes legislation such as that in Germany. These include:

- the development of industry-wide certification schemes for particular dyes, or particular dyehouses, designed to provide a guarantee to purchasers that products along the supply chain comply with legislation on carcinogenic azo dyes.

- The use of contractual terms in supply contracts to require compliance with requirements on arylamines and carcinogenic azo dyes.

- The development of national testing centres to test on a case-by-case for the prohibited arylamines. Here, the reliability of the test centre is likely to be a key concern for its customers.

Without official recognition of such steps by authorities in importing countries maintaining controls on carcinogenic azo dyes, they remain 'self-help' responses: imported products will remain subject to testing for compliance with the legislation (rather than, e.g. compliance with recognised certification schemes) on or after import. Under 'strict liability' legislation like that in Germany, 'due diligence' steps taken by the importer are not relevant considerations when assessing whether the legislation has been complied with.

1.2.2 *Labelling*

Two additional amines classified as carcinogenic in animal experiments have been referred to in labelling schemes and requirements. These are:

- 4-minoazobenzene (or p-aminoazobenzene) and
- 2-amethoxyaniline (or o-anisidine).

These two additional amines were listed in the nineteenth amendment to EC Directive 67/548. Consequently, dyestuffs capable of splitting off these two additional amines are to be labelled with the skull and crossbones symbol and the warning sign 'may cause cancer'. The two additional amines have also been included in the scope of voluntary ecolabelling schemes.

The additional dyes that appear to be affected by the inclusion of these two additional amines are set out in *Table 1.3* below.

Table 1.3 *Azo Dyes Affected by Additional arylamines in labelling Schemes*

CI Generic Name	CI Number	Diazo Components
CI Acid Red 4	14710	o-An
CI Acid Red 5	14905	o-An
CI Acid Red 73	27290	p-Aab
CI Acid Red 116	26660	p-Aab
CI Acid Red 150	27190	p-Aab
CI Acid Red 264	18133	o-An
CI Acid Red 420	-	p-Aab
CI Acid Violet 12	18075	o-An
CI Acid Brown 415	-	o-An
CI Acid Black 131	-	o-An
CI Acid Black 132	-	o-An
CI Basic Yellow 82	-	p-Aab
CI Basic Yellow 103	-	o-An
CI Basic Red 76	-	o-An
CI Basic Red 111	-	p-Aab
CI Basic Red 114	-	o-An
CI Direct Red 24	29185	o-An
CI Direct Red 26	29190	o-An
CI Disperse Yellow 7	26090	p-Aab
CI Disperse Yellow 23	26070	p-Aab
CI Disperse Yellow 56	-	p-Aab
CI Disperse Orange 149	-	p-Aab
CI Disperse Red 151	26130	p-Aab

Where p-Aab is p-aminoazobenzene and o-An is o-anisidine

Source: Bayer AG, Technical Information

1.2.3 *Developing country Exporters of Textiles and Leather*

This section provides an overview of the countries most likely to be affected by the introduction of any EU-wide restrictions on products coloured with carcinogenic azo dyes. It is based on analysis of available statistics, coupled with results of telephone interviews with German authorities, with a view to identifying countries that had raised concerns or asked for clarification of the implications of the German ban.

Overall figures for imports of textiles, clothing, footwear and leather into the EU-12 in 1994 (the latest statistics available) were as follows:

- China: 13%
- EFTA: 5.7%
- Turkey: 7.5%
- Hong Kong: 5.5%
- India: 6.8%
- Others: 61.5%

The figures for textiles, clothing, footwear and leather respectively are set out in *Table 1.4* below.

The EU textile, clothing, footwear and leather industries overall have a trade deficit (more than ECU 14 billion in 1994). The deficit is expected to increase with increasing import penetration, in part through phase-out of bilateral restrictions on imports under GATT agreements. The EU trade deficit in textiles reached a maximum deficit in 1992 of an estimated ECU 3.8 billion, although this has improved steadily, reaching an estimated deficit of ECU 2.6 billion in 1995. In contrast, the EU leather tanning and finishing sector has a positive trade balance (ECU 746.3 million in finished leather according to *Panorama of European industry 97*). EU tanners are recognised by the industry to face serious competition from India, Pakistan, Argentina and Brazil, as well as Japan and the Eastern and Central European countries. This situation makes it particularly important that the health and safety motivations for the introduction of any harmonised restrictions should be clearly expressed: the potential for less developed countries to perceive EU restrictions as a form of protectionism clearly exists.

Overall trends in the leather tanning and finishing sector show a decline in imports from India and Pakistan, with a sharp increase in imports from Central and Eastern Europe. In relation to the footwear sector, the *1995/96 Panorama of European Industry* notes that even with the introduction of technological developments such as Computer Aided Design (CAD) and Computer Aided Manufacture (CAM), low-cost producers close to the European market in North Africa and Eastern Europe may become more important in the medium term.

Changes in the pattern of imports of clothing in 1994 compared with 1989 show a substantial increase in imports from China (15.8% from 8.6% in 1989), coupled with a decline in Hong Kong imports (down to 8.8% from 13.9% in 1989 - the result of a transfer of production away from Hong Kong to China and other countries in the region, in response to rising wage costs). In an EU

parallel, production is shifting to neighbouring countries, such as Tunisia, Poland and Morocco. (1)

Table 1.4 ***Principal Sources of EU-12 Imports of Textiles, Clothing, Leather and Footwear: 1994***

Textiles	Clothing	Footwear	Leather tanning and finishing
EFTA: 12.7%	China: 15.8%	China: 16.8%	India: 18%
China: 10.8%	Hong Kong: 8.8%	Indonesia: 11.3%	EFTA: 12.6%
Turkey: 10.2%	Turkey: 6.9%	Thailand: 7%	Pakistan: 9.8%
India: 6.8%	India: 6.8%	India: 6.1%	USA: 5.1%
USA: 4.5%	Tunisia: 6.5%	South Korea: 5.1%	Brazil: 4.1%
Rest of the world: 55.0%	Rest of the world: 55.2%	Rest of the world: 53.7%	Rest of the world: 50.4%

Source: Panorama of EU Industry 97

Statistics on the principal sources of EU imports cannot alone identify importing countries that are potentially the most affected by restrictions on carcinogenic azo dyes in the light of the significance of the textiles/leather industries to their economy overall. World Trade Organisation (WTO) statistics drawn from the WTO annual report 1996 provide additional indications as to the developing countries most likely to be affected by any restrictions on textile and clothing products coloured with carcinogenic azo dyes. *Table 1.5* and *Table 1.6* below provide indications for textiles and clothing respectively.

Table 1.5 ***Exports of textiles of Selected non-EU Economies: 1990, 1993, 1995***

Country	Value (million dollars)			Share in total merchandise exports (%)	
	1990	1993	1995	1990	1995
Pakistan	2663	3507	4256	47.6	53.3
Egypt	554	395	-	21.4	17.9
India	2180	2917	-	12.1	15.3
Bangladesh	305	309	-	18.3	13.6
Turkey	1440	1592	2527	11.1	11.7
Taiwan	6128	8177	11908	9.1	10.7
China	7219	8699	13918	11.6	9.4
Republic of Korea	6076	8954	12313	9.3	9.8
Macau	136	153	168	8	8.5
Hong Kong	8213	11212	13815	10	7.9
Domestic exports	2171	2092	1814	7.5	6.1
re-exports	6042	9121	12001	11.3	8.3
Iran	510	620	-	3	5.2

(1) Source: Panorama of EU Industry 97

Country	Value (million dollars)			Share in total merchandise exports (%)	
	1990	1993	1995	1990	1995
Czech Republic	-	625	814	-	4.8
Uruguay	85	79	90	5	4.3
Sri Lanka	25	103	-	1.3	4.1

Source: World Trade Organisation Annual Report 1996. Adapted from World Trade Organisation Statistics for a total of 52 countries. Non-EU countries for which textiles represent greater than 4% of 1995 exports are shown.

Table 1.6 *Exports of Clothing of Selected non-EU Economies: 1990, 1993, 1995*

Country	Value (million dollars)			Share in Total Merchandise Exports (%)	
	1990	1993	1995	1990	1995
Macau	1111	1090	1372	65.6	69.1
Mauritius	619	818	817	51.9	55.6
Bangladesh	585	1244	-	35	-
Sri Lanka	638	1343	-	32.2	-
Tunisia	1126	1504	2322	31.9	42.4
Turkey	3331	4339	6119	25.7	28.3
Pakistan	1014	1558	1611	18.1	20.2
China	9669	18441	24049	15.6	16.2
Romania	429	640	-	8.7	-
India	2530	2970	-	14.1	-
Croatia	-	644	673	-	14.5
Hong Kong	15406	20998	21297	18.7	12.2
Domestic exports	9266	9289	9580	31.9	31.9
Re-exports	6140	11709	11757	11.5	8.2
Poland	365	1577	-	2.5	-
Slovenia	-	643	659	-	8.0
Hungary	359	805	1035	3.6	7.9
Indonesia	1646	3502	3367	6.4	7.4
Egypt	144	181	-	5.6	-
Uruguay	153	138	132	9.0	6.2
Thailand	2817	4179	4620	12.2	6.2
Philippines	681	835	1065	8.4	6.1
Colombia	460	534	553	6.8	5.7

Source: World Trade Organisation Annual Report 1996. Adapted from World Trade Organisation Statistics for a total of 50 countries. Non-EU countries for which clothing represents greater than 5% of 1995 exports are shown.

There are no detailed statistics upon which to base an analysis of the proportion of the overall imports that would be affected by the introduction of trade-restrictive measures on products coloured with carcinogenic azo dyes. This is because of the difficulty of identifying the proportion of trade goods which have been processed using the restricted dyes. In any event, it is clear from interviews carried out in the course of this study that there are many external factors that could also impact on trade flows of affected products.

1.2.4 *Other Affected Developing Countries*

Developing countries identified in interviews with German authorities as having raised issues around the German ban were:

- China
- India
- Pakistan
- Korea
- Vietnam
- Turkey
- Indonesia
- Laos
- Bangladesh

Most of the enquiries received by the German authorities related to the testing and methods to be adopted in order to ensure compliance with the German legislation.

Other contacts revealed the example of a company instructing mills in one developing country to use only dyes produced by named (developed country) producers on the basis that they did not produce carcinogenic azo dyes and in order to avoid problems with exports to the EC.

The choice of countries for a series of workshops carried out by the Dutch Centre for the Promotion of Imports from Developing Countries (CBI) and a Dutch independent consultant, CREM, provides a further indication of countries affected by azo dyes legislation. The workshops were based partially on the results of a previous project: a questionnaire sent to trade promotion organisations (TPOs) which was used to gauge knowledge about and attitudes to azo dyes legislation. Workshops were targeted at small and medium sized enterprises (SMEs) involved in textile production in the following countries:

- Bangladesh
- Pakistan
- Sri Lanka
- Egypt
- Peru
- Colombia and
- The Philippines.

The workshops are considered further in Section 2.4.2below.

1.2.5 *Developing Country Case Studies*

Desk research and interviews with government and industry experts were carried out in India , Hong Kong and China. *Table 1.7* lists the interview contacts, and a summary of interviews carried out in China and India can be found in *Annex D*. These countries were selected for study as major exporters to the EU and because of the interest for the study in reporting the steps taken by industry, especially in Hong Kong, to adapt to the German ban. It should be noted that the statistics collected for this study highlight the growing importance of Eastern Europe and North Africa as sources of exports to the EU. The pattern of dye use in these countries has not been researched for this study, but no information has been received that suggests there is a radically different dye use pattern. Therefore we assume that the adaptation issues identified in the study will also apply to these suppliers.

Research in India and China focused on a review of affected industry (dye production, textiles and clothing) to the German restrictions on trade in products coloured with carcinogenic azo dyes. Research in Hong Kong focused on assessing the impact and effectiveness of a Voluntary Registration Scheme established there to facilitate compliance with the German ban. Hong Kong is a large re-exporter of textiles and clothing (particularly from mainland China). As it is not uncommon for one lot of garments to be exported to several countries, the German ban also has an impact on shipments to other countries.

The research team had a very effective response from contacts in India and in Hong Kong. Contacts in China, however, were less forthcoming. The short message from the interviews in China was that the textile and clothing industry has readily complied with the German ban because of a change in the products supplied by the dye products sector. The Chinese textile industry is reported to be 'very modern' compared to that of India. Concerns over testing and certification were not raised by contacts in China in contrast with the other countries covered by the study.

Table 1.7 *Interview Contacts*

Country	Organisation
India	Indo-German Export Promotion Project
	Council for Leather Exports
	University Department of Chemical Technology (Autonomous) University of Mumbai
	Farida Prime Tannery
	All India Skin and Hide Tanners and Merchants Association
	Presidency Kid Leather
	Central Leather Research Institute
	Apparels and Handlooms Exporters Association
	Handloom Export Promotion Council
	Handlooms Exports Syndicate
	Atul Products - Dyestuffs Division
	Weave India
	Ahmedabad Textile Industries Research Association
China	Guanghua Dyeing Industry Plant
	Leather Industry Association
	Ministry of Foreign Trade and Economy
	Textile Industry Ministry
	Chemical Industry Ministry
Hong Kong	Industry Department, Hong Kong Government
	Institute of Textiles and Clothing

1.2.6 *Technical and economic implications of a shift from azo dyes*

This task comprised three elements.

1. Understanding the structure of the `azo dyes ban' introduced in Germany. This is complex.

2. Assessing the extent to which substitution of restricted dyes is technically feasible.

3. Assessing the economic implications of substitution of restricted dyes.

1.2.7 *WTO issues associated with bans on azo dyes*

This task takes as a starting point the possibility of a harmonised ban on imports of products coloured with certain potentially carcinogenic azo dyes. It provides a legal analysis of the provisions of the multilateral trading system that apply to such a ban.

The task considers the implications of the basic legal framework set out in the GATT 1994; the relevance of the exceptions provided under Article XX to restrictions on azo dyes; the relevant requirements of the Technical Barriers to Trade Agreement (TBT) and work underway in the WTO Committee and Trade and Environment.

1.2.8 *Developing country responses to the German ban*

In order to get a wider picture of the potential impact in developing countries of a EU ban on azo dyes than provided by the detailed research in India, Hong Kong and China, some research was also carried out in Germany. This focused on identifying the developing countries that have raised concerns with the authorities, identifying the principal causes for concern.

Table 1.8 lists contacts made in Germany.

Table 1.8 Contacts Made In Germany

Organisation
Federal Ministry of Health
Federal Ministry of Economics
Federal Environment Agency
Federal Institute of Consumer Health
Middle and Large Commercial Entities Trade Body
Foreign Trade Association
Association of Finished Products Importers

This research indicated that many developing country exporters face similar difficulties in adapting to bans on azo dyes to the difficulties identified in

India and Hong Kong. In particular, developing country exporters face issues of information (which dyes are banned?) and testing and certification (demonstrating compliance).

2 CONCLUSIONS

2.1 KEY ISSUES

In its initial proposal, ERM put forward four key questions to address in the study, as follows.

If an EU wide restriction on azo dyes was introduced, and considering its impacts on developing countries:

1) What is the size of the potential problem?

2) Is the issue going to disappear in the light of developments already under way?

3) What are the options available to developing country producers?

4) Under what circumstance would an azo ban be consistent with WTO disciplines?

An additional question was subsequently added, based on initial work.

5) What steps might be undertaken by European Union institutions to ameliorate the effects of a ban on developing countries?

2.2 SIZE OF THE PROBLEM

2.2.1 *Perceptions of Azo Dyes Legislation*

A key issue determining whether developing countries raise objections to any EU-wide bans is whether or not any restrictions are perceived as a form of disguised protectionism. Here, the picture obtained from interviews in India was mixed: some interviewees mentioned the possibility that the German regulations constituted a protectionist trade barrier. We understand that participants at the CBI/CREM workshops in Colombia saw the azo bans as a deliberate block by the West to the import of Colombian textiles, instead of making efforts to respond positively to the legislation. However, in both India and China, interviewees also recognised the importance of protecting the health and safety of domestic consumers, viewing the German restrictions as an indication that there were health and safety issues at stake that needed to be taken seriously.

Internal market issues about the German ban have been raised and considered by the European Commission following numerous complaints about its trade impacts from industry interests both within and outside the EU.

We understand that bilateral discussions were held between the US and India in relation to US restrictions on dyestuffs considered allergenic or

carcinogenic. However, these discussions did not lead to the commencement of formal dispute settlement proceedings within the WTO.

There is currently considerable interest, both governmental and non-governmental, in the issues surrounding the relationship between trade liberalisation and environmental protection. The World Trade Organisation (WTO) Committees on Trade and Environment (CTE) and Technical Barriers to Trade (TBT) have provided fora in which concerns related to environmentally motivated restrictions on trade in textiles have been expressed by developing countries.

The TBT Committee is beginning a triannual review of the TBT Agreement. Depending upon resource availability, one of the case studies to be undertaken may relate to the textile industry and use of dyestuffs. It is understood from discussions with officials at the WTO Secretariat that India among other WTO Members has pushed for this subject to be included. In the CTE, textiles and clothing are among the sectors identified for further consideration under a work heading on the effect of environmental measures on market access. Concern about trade-restrictive environmental standards on textile products was a motivating factor behind the inclusion of this sector.

There are indications that concern about the German ban on azo dyes has heightened developing country awareness of the potential trade impacts: future restrictions may be more likely to be contested than in the past.

A number of disputes relating to the WTO's Agreement on Textiles and Clothing are currently in progress. The Textiles and Clothing Agreement sets out provisions to be applied by WTO Members during a transition period for the integration of the textiles and clothing sector into GATT 1994. None of the WTO disputes raise issues relating to carcinogenic dyes, but they do provide an indication of the current sensitivity of the textile sector to international trade concerns.

At a time of progressive liberalisation in the world textile industry overall, new restrictions taking the form of technical barriers to trade - even when justified on grounds of health and safety - may prove controversial.

2.2.2 *Use of Carcinogenic Azo Dyes*

Production and use of the banned azo dyes has been declining in Europe since the 1970's although there remains some use. For example, dye manufacturers in India note that they do have some exports of (restricted) azo dyes to Europe. In India there have been restrictions on benzidine based dyes since 1989 and the Indian government has taken steps to ban the manufacture and use of azo dyes derived from the 20 amines restricted under the German ban.

The azo dyes banned under the German regulations are understood to remain in use to some extent in most developing country textile industries. Tests carried out in Germany in 1994 indicated that approximately 25% of clothing

on the market then, and dyed outside Germany, was coloured with the azo dyes that are now restricted. (1)

Some developing countries also have dye exporting sectors, in particular India which has almost 2-3% of the world dyestuffs export market. India exports dyes to the European Union as well as to other industrialised and developing countries. However, it appears that it is dyes other than azo dyes (in particular reactive dyes) which dominate in exports from India, both by volume and by value.

Azo dyes are used in particular, but not exclusively, for cotton and leather. Although technological developments, health restrictions and export market restrictions have been limiting use of the particular azo dyes affected by concerns about carcinogenicity, it is probable that all developing countries exporting cotton or leather to the EU will have some manufacturers, at least, affected by a ban.

2.2.3 *Responses to Labelling Requirements*

Indications from interviews in India are that in general industry responses have not differentiated between amines referred to in legislation and the two additional arylamines in labelling schemes.

Many purchasers outside Germany have included requirements paralleling those of the German legislation in their contractual requirements, and the impact of the German legislation has been multiplied accordingly. Whilst the study has not considered the take-up of ecolabelling schemes relevant to the textile or leather industries, it seems likely that the same process may also have been taking place in relation to labelling schemes, independently of voluntary accreditation and certification under such schemes.

2.2.4 *Testing and Certification*

It appeared from interviews that the principal difficulties generated by the German ban related to testing and certification methods. These concerned the lack of an established test method and the costs of testing. For example, 1995 estimates of testing charges in Hong Kong were that charges ranged from HK$1,500 to HK$1,800 and that testing took between 5 and 10 days. (2) The costs escalate where a fabric contains more than one colour. It seems that many developing country exporters carry out their testing in the EC (e.g. Germany), or through multinational testing agencies. A detailed study on the differential impacts of environmental policies on small and large enterprises in India for UNCTAD suggests that this increases the cost of testing by about 20%, but can help to ensure reliability to importers. (3)

- There is also a shortage of testing and certification institutes and facilities in developing countries able to analyse and certify affected products or

(1) Textile Asia, June 1996, p 74
(2) An Initial Study of the New German Regulation Regarding Harmful Azocolours on the Textiles and Clothing Industries of Hong Kong, Hong Kong Productivity Council, February 1995
(3) Shipra Das, May 1996

dyes to the satisfaction of all in the supply chain and/or the German authorities. Two other issues are related to this:

- in Hong Kong, a report by the Hong Kong Productivity Council expresses concern over the ability of Chinese and other Asian suppliers to issue written declarations stating that the products delivered do not contain harmful azo colours.
- For some, particularly small-scale producers located in remote rural areas, there is an additional problem in accessing test/certification centres.

2.3 *INDUSTRY DEVELOPMENTS: IS THE PROBLEM GOING AWAY?*

It is clear that a number of factors in the textile and leather industries mean that there is a trend under way to reduced dependence on banned azo dyes.

- It is widely acknowledged that some azo dyes are proven animal carcinogens. As a result, much of the dye industry in the developed countries ceased manufacture of benzidene-based dyes in the early 1970's for occupational health protection reasons. Larger scale producers in developing countries are also aware of these concerns.

- It is also evident that many developing country exporters have had to take steps to conform to the German requirements and are phasing out the use of the restricted azo dyes, at least in products produced for export.

- The overall response from developing country producers suggests that for large scale producers of dyes, textiles, clothing and leather the fundamental issues about bans affecting carcinogenic azo dyes concern information, timing, testing and certification and that adjusting to the bans themselves is feasible.

Information on how small scale producers have responded to bans on azo dyes suggests that their adjustment problems are greater, and that restricted dyes remain in use. 1994-95 statistics for India show that small and medium sized enterprises make up the vast majority of leather and footwear, and ready made garments exports (90 and 95% respectively). (1) It is clear that the flow of information to and from the small scale production sector is more limited than for larger scale businesses. Other key issues arise out of difficulties in finding some substitutes domestically, tracing supply chains, negotiating favourable terms for small-scale orders of more expensive substitutes, and access to and affordability of testing.

2.4 *OPTIONS FOR DEVELOPING COUNTRIES*

2.4.1 *Substitution*

Technical Aspects of Substitution

There appear to be substitute dyes available for most of the banned dyes except for a few traditional `ethnic' colours. (The literature suggests that

technical substitution problems arise particularly in relation to C1 Azoic Diazo Components). Interviews in India indicate that in addition there may be difficulties attaining pure red and bright scarlet colours (based on benzidine based dyes) from the available substitutes.

In some cases, whilst alternatives are available, they may not be available domestically so that a shift to substitutes involves increasing imports of production inputs. For some less developed countries, this can raise foreign exchange and import duty issues which can make adaptation difficult. In India, the Council for Leather Exports has called for import duty on carcinogenic azo dye substitutes to be reduced to 20% from 65%, and for the government to reduce/abolish the central excise duty on locally made substitute dyestuffs.

Ideally the substitution process involves using acceptable substitutes within the same dye class. Where substitute dyes are from the same dye class, there should be no problems of dye equipment and application processes. Much of the industry, including in developing countries, now uses computer based colour matching which facilitates rapid identification of substitutes. This is more difficult for the smaller dye houses in developing countries which use visual matching. In these cases, there is a trial and error process to ensure that substitutes have the same performance e.g. in all lighting conditions.

A key issue for developing countries lies in identifying what are acceptable substitutes to banned dyes. Considerable confusion surrounded the German ban because of the structure of the legislation - identifying amines rather than dyes. In contrast, legislation in the Netherlands is accompanied by an indicative list of colours whose use is prohibited in textiles because they contain aromatic amines. The ease with which developing countries are able to adapt to a harmonised EU ban will depend, in part, on the extent to which an EU measure includes or is supported by, clear guidance on the dyes that are affected.

A detailed study in India suggests that substitution issues in the leather sector do not create a differential impact on small and medium sized enterprises to as great a degree as the textile sector. The leather sector has already had to adapt to strict environmental legislation in its export markets (e.g. in relation to Pentachlorophenols (PCPs)), whereas for the textile sector many of the issues related to adaptation are being faced for the first time (e.g. setting up testing facilities) - although a three-year phase-out of the use of benzidine-based dyes in textile fabrics began in 1990.

Interviews carried out in India also suggest that the existing network of trade contacts is an important factor in determining the speed of adaptation. Where the government, rather than market-place contacts are the first point of call for information, there may be substantial delays in obtaining information about new restrictions in export markets.

(1) Shipra Das, May 1996

Economic aspects of substitutions

There are cost implications of switching from the banned dyes. There are cost penalties of using substitute dyes, which are generally more expensive to produce and buy. There are also transition costs in effecting the substitution, for example, laboratory costs associated with re-matching, and possibly also a learning curve for the dyer to produce precise results from substitutes by modifying recipes and process formulations. In some cases, protecting newly developed substitute dyestuffs in response to restrictions could involve registering new dye patents. One Indian manufacturer of dyestuffs noted that this could cost in the order of $100,000 in US or EU markets.

Unless substitution involves a change in dye type (e.g. from direct dyes to reactive or vat dyestuffs), there should be no machinery changes required. In most cases, substitute dyestuffs will be selected from within the same class because dyers will wish to attain the same colour and colour fastness performance using the same dyeing machinery and familiar application methods.

Indications of cost impacts include the following.

- Dyestuff and chemical costs are estimated at 25% of total dyeing costs in Europe; and may be a higher proportion in developing countries where wages are lower. Increased dye costs therefore have a knock-on effect on the cost of final product prices: in some cases, it may not be possible to pass this on.

- Interviewees in India noted that dye costs can double for some medium shades e.g. Direct Black 178 and Direct Black 55 as substitutes for Direct Black 30. This may also be a function of improved dye quality in terms of colour fastness. Other sources suggest cost increases of 20-30% only; whilst for the leather sector (which uses different dyes to the textile sector) cost increases of 300% for substitute dyes have been reported. Where substitutes are imported, e.g. because they are not available domestically, this too may entail substantial cost increases (e.g. double the cost of the original, in the case of imported Acid Milling Violet BS).

A study for UNCTAD found that the overall cost of adjustment to eco-friendly dyes ranged between 15 and 20% for small and medium enterprise (SME) exporters of textiles and leather. In contrast, for larger firms, the cost of adjustment was 8 to 10 per cent. The difference seems to be explained by the ability of the larger exporters to negotiate more favourable prices for bulk orders from their suppliers. (1)

- Interviews in China suggested that although substitute dyes are more expensive, the overall impact on textile product prices is low. An exception is substitutes for No 23 yellow, which are particularly expensive.

(1) Shipra Das, May 1996

Estimated cost increases associated with the German regulation for the Hong Kong textile sector were developed by the Hong Kong Productivity Council in February 1995 and are reproduced below in *Table 2.1*.

Table 2.1 *Cost Increases for Hong Kong Textile Companies*

Estimated Cost Increase (%)	Greatest	Average
Dyestuff Cost Increase		
Whole industry (%)	60	3
Wool/silk dyeing (%)	60	12
Cotton/Other dyeing (%)	–	1.5
Testing Cost Increase (%)	20	3
Fabric/Accessories Cost Increase (%)	30	6
Garment Cost Increase (%)	30	6

Costs are also incurred by producers in testing products for the presence of banned amines, and in certification. Additional cost burdens have arisen because of uncertainties about test methods and laboratory standards, as discussed in *Section 2.2.4* above.

2.4.2 *Initiatives to help industry*

Introduction

A key factor in enabling producers in developing countries to adapt to restrictions is the availability of reliable, industry-oriented, information. A number of initiatives have been developed to this end.

- Several paper-based information systems identifying `acceptable' dyes have been developed in developing countries including India and China.

- The Ahmedabad Textile Industries Research Association (ATIRA) in India has set up a 'mini-encyclopaedia', dedicated to responding to restrictions on dyestuffs.

- The Institute of Textile and Clothing at the Hong Kong Polytechnic University has established a Voluntary Registration Scheme for Harmless Dyestuffs (VRS).

- The Dutch Centre for the Promotion of Imports from Developing Countries (CBI), together with a Dutch independent consultant, CREM, organised a series of workshops between October 1996 and January 1997 designed to help prevent Member State legislation relevant to azo dyes from becoming a trade barrier to developing country exporters.

- The Dutch Centre for the Promotion of Imports from Developing Countries (CBI) together with the Swedish International Co-operation Agency and in co-operation with the Far East Importers Association, have, since 1995, produced a series of 'Environmental Quick Scan' documents, to provide information about developments in the health and environmental field in the EU, Germany, the Netherlands and Sweden, that may affect the export activities of manufacturers in developing countries.

These initiatives are considered further below.

Lists of 'Safe dyes'

Over time a number of lists of dyes that are in practice restricted have been built up by the industry, and users have also received information from dyestuffs suppliers (with European exporters reasonably quick in identifying substitutes). However the trade literature stresses that users cannot safely rely on lists identifying the Colour Index generic names of banned dyes, and that to determine whether or not a particular dyestuff is affected it is essential to make contact with the manufacturer.

Other lists or sources of information on 'banned' and 'safe' dyes include:

- A 1995 text, *Banned Dyes and Their Substitutes*, written by Chinese dye experts from Shanghai, gives details of banned dyes and their substitutes, and a list of dyes that may be banned in future.

- The ATIRA initiative, considered below, which identifies 'safe' dyes.

- A 'Status Report on Azo Dyes' currently under preparation by the Central Leather Research Institute in India.

- The Apparels Export Promotion Council in India, which has produced a list of the banned dyestuffs.

A selection of lists of 'banned' or 'safe' dyes currently in circulation can be found in *Annex B*.

Ahmedabad Textile Industries Research Association

The Ahmedabad Textile Industry Research Association computerised mini-encyclopaedia gives the following information:

- synopsis of eco-standards and their specifications;
- list, classification and properties of banned amines;
- list of safe dyes with reference to other revealed chemical structure or manufacturer's declaration;
- list of dyes which are capable of releasing banned arylamines according to German regulation;
- list of dyes capable of releasing arylamines banned according to eco-label schemes;
- list of dyes which are declared toxic by ETAD and other organisations;
- the authentic CI (Colour Index) numbers and their current Colour Index status for all the listed dyes;
- eco-status of commercial dyes along with their fastness properties, their colour specification and relative dye strength;
- specifications for water to be used for processing;
- specifications for effluent discharge.

The mini-encyclopaedia is updated once every six months.

Interviews suggest that the 'mini-encyclopaedia' has not been used by the leather industry as the trade names of dyestuffs used by the leather and textile sectors differ.

ATIRA also provides other services capable of supporting adaptation to bans on carcinogenic azo dyes. These include:

- a consultancy service that provides advice to mills as to which dyes may be used or substituted - both in the light of the German ban and ecolabelling schemes
- a computer colour match prediction service for member mills
- a proposed database on safe alternatives to azo dyes so that quick Recipe Prediction Services can be offered to clients.

The Hong Kong Voluntary Registration Scheme

The Hong Kong Voluntary Registration Scheme was established as a result of a report commissioned by the Hong Kong Productivity Council. Under the scheme, dyes are registered as `harmless' against test results which are based on German methodology and carried out by a Hong Kong Laboratory Accreditation Scheme accredited laboratory.

All known manufacturers/suppliers of dyestuffs to Hong Kong dyeing factories have supplied, or pledged to supply, listings of dyes not affected by the German ban, together with a certificate that the dyestuffs conform with the German legislation. There is in fact nothing to prevent the scheme being used by buyers/suppliers/manufacturers from third countries.

Hong Kong has no indigenous dye-stuff manufacturing industry. Local suppliers are mainly dealers who purchase dye-stuffs from abroad and repackage them for local markets.

Listings includes details of the trade name, dye class, source and VRS registration number. Information on the registered dyes is available on the Internet, and the local industry association has requested members to use only registered dyes. There is no registration fee for dyestuff suppliers and manufacturers, and the service is free of charge to users. VRS information extracted from the Internet can be found in *Annex E*.

It has been forecast that the scheme will be required for a period of between three and five years, after which the acceptance level of harmless dyestuffs will render the service redundant.

A paper reviewing the scheme concludes that its benefit to small to medium sized enterprises is somewhat limited. It seems that the less established suppliers of dyestuffs are not yet represented in the VRS and generally have yet to develop the sophisticated information networks that would allow them to gain the benefits of Internet communication.

A number of issues remain to which the VRS itself cannot provide a response. These are the following:

- Difficulties faced by smaller manufacturers in verifying whether their products would pass the tests. Interviews carried out for this study suggest that small accessory dyeing factories tend to disregard the German ban due to lack of knowledge about dye-stuffs; lack of resources, and inflexibility.

- The scheme is not able to provide proof that imported dyed products are treated with registered dye-stuffs.

- The scheme does not provide proof that dyed products are using the same registered dye-stuff on different shipments of the same bill.

- The test results that provide a basis for registration may differ as between Hong Kong and German laboratories.

A number of other initiatives have been suggested that could support the benefits of the VRS:

- The development of a system of dyestuff certification - which is currently under consideration. This could lead to certification of dyeing factories certified as approved 'harmful azo colour free' suppliers. It is recognised that in order to maximise the value of such a scheme, certification should be recognised in importing countries.

- Model buying and control procedures. Model buying procedures would cover specimen terms for sales and purchase contracts. Model control procedures would cover areas such as the standard testing procedures and the recommended number of tests.

- The Industry Department has said that it will consider developing a laboratory accreditation scheme for testing.

In an initiative which parallels the VRS, the dyestuff association of India has submitted a list to the Textile Commissioner of dyes that are manufactured and which will not contain or release any of the twenty banned amines. Wherever a certificate is required by a textile processor, it can be called for from the manufacturer or supplier of the particular dyestuff. A number of interviewees in India considered that this had been very useful for the industry.

CBI/CREM Workshops

The Dutch Centre for the Promotion of Imports from Developing Countries (CBI), together with a Dutch independent consultant, CREM, organised a series of workshops between October 1996 and January 1997 designed to help prevent Member State legislation relevant to azo dyes from becoming a trade barrier to developing country exporters.

The workshops were targeted at small and medium sized enterprises (SMEs) involved in textiles production in seven developing countries:
Bangladesh
Pakistan

Sri Lanka
Egypt
Peru
Colombia
The Philippines

The workshops were led by specialists in textile exports and in environmental legislation and covered the following issues:

- current azo dyes legislation in European countries, and its effects on exports from developing countries
- detailed technical information on azo products (e.g. the difference between azo pigments and azo dyes and the restrictions on each of them within European legislation), and
- technical guidance on how to comply with azo and other environmental legislation (e.g. details on alternative products and processes).

According to CREM, the workshops were generally successful. However, there was a concern that representatives of large multinationals rather than SMEs were taking advantage of the workshops to increase their competitiveness.

There are plans for a second workshop in Pakistan. Two new countries, Jordan and Zimbabwe, have been targeted for future workshops.

Environmental Quick Scan

Information in the Environmental Quick Scan documents is compiled by a Dutch consultancy, CREM. The bulletins encourage exporters to adopt a pro-active attitude to developments in the health and environmental field in the EU, Germany, the Netherlands and Sweden. Bulletins are developed free of charge to developing country exporters. They have been produced for product categories including textiles and leather products. By way of example, the textiles bulletin covers the following topics:

- general environmental aspects of textile production;
- trade-related environmental policy (including process-oriented, product-oriented and waste management policies in the European Union and how they affect trade);
- product standards for textiles (including country-specific information on restrictions and standards in relation to particular substances including azo dyes)
- eco-labelling (including details of EU and national eco-labels for textiles)
- cleaner production (including advice on how to reduce environmental impacts at all stages of the life-cycle, for example, reduced pesticide use during cultivation) and
- working conditions and occupational health (including guidelines on improving labour conditions in the textile industry).

2.5 WTO CONSISTENCY

2.5.1 *Introduction*

Any EC-wide restrictions on carcinogenic azo dyes or on products coloured with carcinogenic azo dyes must meet the Community's obligations under the World Trade Organisation (WTO) rules (i.e. the rules of the multilateral trading system - MTS). Two components of the MTS are particularly relevant to EC-wide measures restricting imports of carcinogenic azo dyes and products coloured with them. They are:

- the General Agreement on Tariffs and Trade 1994 (GATT 1994);
- the Technical Barriers to Trade Agreement (TBT Agreement).

This Section considers the application of the rules of the MTS to Member State or Community measures restricting or banning imports of:

- carcinogenic azo dyes and/or
- products made with carcinogenic azo dyes.

Determining the MTS compatibility of a trade restrictive measure imposed for environmental health reasons is a complex task. Two principal reasons for this complexity are:

- The absence of clear interpretations of a number of the GATT and TBT Agreement terms that are of key importance in determining the compatibility of import restrictions with the MTS.
- The fact that (in common with other international legal systems) there is no formal system of precedent in the WTO or GATT dispute settlement systems.

As far as possible within these limitations, this Section sets out:

- explicit requirements that must be met by import restrictions on carcinogenic azo dyes and products coloured with them;
- points that should be addressed in framing a trade restrictive measure on import of azo dyes to the European Union.

It is intended that this Section should support policy development and decision making. The text of any legal instrument would require checking for WTO consistency.

2.5.2 *Dispute Settlement*

There is no requirement or mechanism under which the Community could seek authorisation or formal clearance of any harmonised measure related to azo dyes from the WTO, although there are requirements to notify proposed 'technical regulations' through the WTO Secretariat and to take written comments from other WTO Members into account.

Members of the WTO have the right to start dispute settlement proceedings in respect of measures that they consider breach the WTO rules. There are indications that the WTO's dispute settlement system is being used by WTO Members with increasing frequency, and a number of disputes that concern restrictions on trade in textiles (not concerning dyes) are currently being considered. There is no time limit for starting dispute settlement proceedings and WTO Members who have not contested individual Member State bans would remain free to contest an EU-wide ban.

Not all countries belong to the WTO, including some major EU trade partners such as China and Russia, although there are active negotiations about future membership by China in particular. Non-WTO Members are not able to make use of the dispute settlement system to complain about trade-restrictive measures planned or implemented by the EU, but normal diplomatic channels are of course open to them.

2.5.3 *Requirements that must be met by any EC-Wide Import Restriction*

Introduction

Both the GATT 1994 and the TBT Agreement contain requirements that could prove relevant to the compatibility of any EC-wide restrictions on imports of carcinogenic azo dyes or products coloured with them with the rules of the MTS:

- It appears that no measure that is incompatible with the GATT 1994 could be acceptable under the TBT Agreement;
- In the event of a conflict between the provisions of the GATT 1994 and the TBT Agreement (e.g. when a measure is permissible under Article XX, but not under the TBT Agreement) the TBT Agreement would prevail.

GATT 1994

The GATT 1994 contains a number of basic provisions and, in addition, a number of exceptions. The basic provisions include requirements that:

- WTO Members must not discriminate between other Members in relation to imports or exports ('most favoured nation treatment': Article I);
- WTO Members must not discriminate between 'like' imported and domestically produced goods under internal (national) regulations ('national treatment': Article III);
- prohibit most types of quantitative restrictions (Article XI).

A measure that conflicts with the basic provisions may be acceptable under one of the exceptions. The key relevant exception is in Article XX(b) of the GATT 1994, which includes an exception for measures that are:

- *'necessary to protect human, animal or plant life or health'*, and which are not
- *'applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade'* (the 'headnote' requirement).

A number of important issues and ambiguities about these requirements have been raised in dispute settlement proceedings considered by dispute settlement panels both before and after the creation of the WTO in 1995. Those reports that have not been 'adopted' cannot be considered legally authoritative however, although they do provide indications of possible interpretations in future, legally authoritative cases. There is in any event no formal system of precedent within the WTO. For the purposes of assessing the requirements to be met by any restrictions, the following points could prove to be of key importance.

- For the purposes of determining whether a measure is 'necessary' the focus in past cases has been on whether there were 'less inconsistent' measures 'reasonably available' or which could be 'reasonably expected to be employed'. The Commission should therefore consider the alternatives to outright bans in the light of its health objectives.
- The panel in one case concluded that measures that were taken so as to force other countries to change their policies and that were effective only if such changes occurred could not be considered 'necessary'. This reasoning does not appear applicable to a restriction on imports of products coloured with carcinogenic azo dyes: it should be clear that such a restriction would not be imposed in order to force other countries to change their policies, but to protect the health of EU consumers and/or workers.
- One dispute settlement panel before the creation of the WTO concluded that Article XX(b) did not allow the imposition of trade embargoes for the purposes of taking trade measures necessary to protect the health and life of plants, animals and persons. The scope of this conclusion is unclear, but it seems unlikely to apply to import restrictions addressing health issues in the territory of the Member imposing the measure.
- The scope of the 'headnote' requirement remains unclear and little tested in dispute settlement proceedings. It is possible that this would impose a 'proportionality' requirement on an EU-wide ban. This could in some circumstances mean weighing up a measure's health objectives against its trade effects.

Issues to arise out of key relevant dispute settlement panel reports under the MTS are summarised in table form in *Annex F*.

TBT Agreement Requirements

Even measures that meet all of these requirements would have to comply with the TBT Agreement. The key relevant requirements are considered in this Section.

Under the terms of the TBT Agreement, mandatory measures (called 'technical regulations under the TBT Agreement) restricting carcinogenic azo dyes 'prepared, adopted or applied' by the EU must not be '*more trade restrictive than necessary to fulfil a legitimate objective, taking into account of the risks of non-fulfilment*'. The reference to 'risks of non-fulfilment' here suggests that adequate risk assessment could prove to be of key importance to the compatibility of any EU-wide ban with the TBT Agreement. It is not clear however whether this requirement amounts to a 'proportionality' requirement, under which the objectives of measures could be weighed

against their trade effects (so that it might be deemed in some circumstances that high levels of protection of human health entail disproportionate trade restrictions).

Other requirements that must be met by a ban include national treatment and most favoured nation treatment requirements, i.e. that:

> *'in respect of technical regulations, products imported from the territory of any Member shall be accorded treatment no less favourable than that accorded to like products of national origin and to like products originating in any other country'.*

These requirements have the following consequences:

- An import ban should cover relevant imports from all WTO Members
- An import ban should be adopted in conjunction with bans on marketing and use of the relevant products within the EU.

Even if these conditions were met, a ban would involve drawing distinctions between textile, leather and other relevant products containing carcinogenic azo dyes and parallel products not containing carcinogenic azo dyes. Whether this could be treated as 'less favourable treatment' of 'like products' is not entirely clear, but the risks of challenge could be substantially reduced if the form of the ban showed clearly that it was directed at product-related risks to health and safety.

Under the TBT Agreement, EU-wide restrictions on relevant products must not be maintained if:

> *'the circumstances or objectives giving rise to their adoption no longer exist or if the changed circumstances or objectives can be addressed in a less trade-restrictive manner'.*

Maintaining awareness of changes in assessments of the risks associated with carcinogenic azo dyes will be an important step in meeting this obligation.

The TBT Agreement also contains detailed provisions on 'conformity assessment procedures', which are defined to include procedures for sampling, testing and inspection. In particular:

- Conformity assessment procedures must meet national treatment and most favoured nation treatment requirements.
- Conformity assessment procedures must not be 'adopted or applied with a view to or with the effect of creating unnecessary obstacles to international trade' and they must not 'be more strict or be applied more strictly than is necessary to give the importing Member adequate confidence that products conform with the relevant measures', 'taking account of the risks non-conformity would create'.
- WTO Members are to ensure that 'whenever possible' the results of conformity assessment procedures in other Members are to be accepted, so long as WTO Members are satisfied that they offer equivalent assurances of conformity.

There are a number of supplementary requirements to be met when implementing these two requirements. These include a requirement to site conformity assessment facilities so as not to cause unnecessary inconvenience.

Other relevant features of the provisions in the TBT Agreement are that:

- It contains a substantial emphasis on the use of international standards as a basis for regulations, including conformity assessment procedures, except where inappropriate for reasons including health and safety. This provision is particularly important when developing testing and/or certification requirements to accompany measures.

- On request by another WTO Member the Community may be required, through the Commission, to explain the justification for any measures in terms of certain of the requirements of the TBT Agreement. The relevant requirements are those relating to:
  - unnecessary obstacles to international trade and the 'not more trade-restrictive than necessary' requirement;
  - the use of international standards as a basis for technical regulations
  - not maintaining technical regulations in the event of changed circumstances or objectives.

- The TBT Agreement contains provisions on technical assistance including in relation to the establishment of bodies for conformity assessment and steps that could be taken by producers wishing to have access to conformity assessment systems in other Members. Steps to facilitate compliance that could help in meeting these provisions are set out in *Section 2.6* below.

2.5.4 ***Key Points to be addressed in framing a measure restricting imports of Carcinogenic Azo Dyes and Products Coloured with them***

Introduction

There are many uncertainties concerning the precise interpretation of key terms in GATT 1994 and the TBT Agreement in the context of a Europe-wide ban on carcinogenic azo dyes and products coloured with them. It is likely that to ensure WTO consistency a ban would have to be framed so as to take into account the considerations set out in this Section.

Discrimination

The potential for any measures to result in discriminatory effects should be taken into account and addressed so that any discrimination is removed. The test methods and conformity assessment procedures to be applied in conjunction with any ban will be of critical importance here. Any import ban should be accompanied by restrictions on marketing and use of the relevant products.

Addressing health and safety in the EU

It should be clear from the form and policy context for any measures (including, e.g. policy statements surrounding their development and

adoption) that it is intended to address product-related risks to health and safety in the EU, not non product-related risks such as health risks to non-EU workers. In particular:

- A measure that is based on a list of carcinogenic arylamines rather than a list of specific dyestuffs may be more readily justifiable on this basis, but this will depend on the overall context within which the measures are developed.
- A test method that tests for carcinogenic arylamines more clearly complements a measure based on carcinogenicity after import than test methods for specific dyestuffs.

Risk Assessment

The quality and findings of risk assessment carried out before adoption of any EU-wide measures restricting imports of relevant products may prove of critical importance to their compatibility with the MTS. In particular:

- Any measures should be based on as robust a risk assessment as possible so that they are not vulnerable under the GATT test of 'necessity' or the TBT Agreement test of 'no more trade restrictive than necessary to fulfil a legitimate objective taking account of the risks non-fulfilment would create'. The risks associated with failure to fulfil the human health objectives should be assessed. The health objectives of any measures should be framed as precisely as possible so as to reduce discretion in interpreting the relevant provisions of the TBT Agreement.

- The risk assessment should be based on an assessment of risks that relevant products present during use (or after import) rather than any risks associated with their production or processing outside the EU.

- It is advisable to consider and maintain clear records to show that the alternatives to an outright ban on import of the relevant products (e.g. labelling provisions or publicity campaigns) have been considered and, if there are reasons for rejecting them, that these reasons are clearly appreciated by those involved in the development of relevant measures.

Keeping Records

Keeping records to demonstrate consideration of all relevant issues would be a helpful step towards responding to requests for information or for justification of any measures in terms of the TBT Agreement provisions identified above.

Test methods and conformity assessment

In developing test methods and other conformity assessment procedures to accompany any measures, the Commission should give particular consideration to the role that could be played by existing or proposed international standards (e.g. on laboratory certification).

The Commission should give consideration to the circumstances under which recognition might be given to testing and conformity assessment procedures carried out in other Members.

Monitoring developments

The Commission should ensure that scientific and technical developments relevant to any measures are monitored and that they can subsequently be modified, if appropriate, so as to be less trade-restrictive.

Allowing Time to Adjust

The Commission should give consideration based on available information to the time necessary to allow time for producers in exporting countries to adapt their products (and, as appropriate methods of production) to the requirements of the importing Member. It is not possible to be precise about the optimum time-frame. The availability of access to clear, accessible information about any ban and time necessary to evaluate supply chains are likely to be of critical importance in determining the appropriate time-frame. Steps that could be taken to facilitate this are set out in the Section below.

2.6 STEPS TO FACILITATE COMPLIANCE

The results of our research suggest that the following steps would be important in minimising the impacts of a EU-wide ban on developing countries.

- Adequate transition time.
- Clear information:
  - on legal requirements including the products covered;
  - on test methods;
  - on certification and checking procedures;
  - including a `positive' and `negative' list of dyes;
  - restricted to dyes only, not including pigments.

In addition, there may be a role for EU technical assistance in facilitating adaptation to a ban. This might include:

- Information activities such as workshops etc. targeted at developing country trade associations and producers, particularly focused on craft/SME producers and extending to manufacturers of dyestuffs and dyehouses.
- Encouraging the development of stronger links between industry organisations in developed and developing countries.
- Support for the development of in-country test and certification facilities.

Annex A

Dutch Azo Dyes Legislation

/arenwetregeling AZO-kleurstoffen

WS

juli 1996 nr GZB/C&O/96224

Staatssecretaris van
ksgezondheid, Welzijn en Sport,
ndelende in overeenstemming met
Minister van Economische Zaken,
et op de artikelen 4 en 15, eerste
van de Warenwet;

luit

ikel 1
leze regeling wordt verstaan onder:
romatische aminen: de in bijlage I
deze regeling genoemde verbin-
gen,
AZO-kleurstof: kleurstof waarvan de
ictuur wordt gekenmerkt door de
wezigheid van een AZO-eenheid
N=N-..], dat wil zeggen twee stik-
fatomen met een tweevoudige
derlinge binding,
igment: een uit deeltjes bestaande
et toepassingsmedium praktisch
plosbare verbinding die als kleur-
wordt gebruikt.

kel 2
is verboden kleding, schoeisel en
degoed te verhandelen die niet
oen aan de eisen bij deze regeling
eld met betrekking tot hun samen-
ng of eigenschappen.

kel 3
eding, schoeisel en beddegoed
atten geen AZO-kleurstoffen waar-
romatische aminen gevormd kun-
worden.
et bepaalde in het eerste lid is niet
toepassing op kleding, schoeisel en
degoed waarin de in het eerste lid
elde AZO-kleurstoffen uitsluitend
vezig zijn als pigment.

el 4
methoden van onderzoek in bij-
II bij deze regeling zijn bij uitslui-
beslissend voor de vaststelling of
betrekking tot kleding, schoeisel
eddegoed al dan niet is voldaan
de bij deze regeling gestelde

afwijking van het bepaalde in het
te lid kunnen voor de vaststelling
et betrekking tot kleding, schoei-
n beddegoed al dan niet is vol-
aan de bij deze regeling gestelde
, ook andere methoden van
rzoek worden toegepast met
kking tot de zojuist genoemde
n indien deze waren, binnen een
re lidstaat van de Europese Unie
geproduceerd en aldaar rechtma-
de handel zijn gebracht en deze
oden resultaten opleveren die
lijkbaar zijn met die van de
oden van onderzoek genoemd in
ge II.

el 5
regeling treedt in werking met
g van 1 augustus 1996, met dien
nde dat:
ding, schoeisel en beddegoed
n de in artikel 3, eerste lid,
elde AZO-kleurstoffen aanwezig
n die voor de datum van inwer-
reding reeds in de handel zijn
icht, danwel ten aanzien waarvan
de verhandelaar aannemelijk kan
en gemaakt door middel van
telijke bewijsstukken dat zij vóór
atum zijn besteld, nog tot 1
mber 1997 mogen worden ver-
eld;
eedehands kleding, schoeisel en
egoed, alsmede kleding, schoeisel
ddegoed, tevens zijnde persoon-
beschermingsmiddelen als
eld in artikel 1, onder a, van het
nwetbesluit persoonlijke bescher
middelen, en kleding, schoeisel
degoed vervaardigd van terug-
nnen vezels waarin de in artikel
ste lid, bedoelde AZO-kleur-
n aanwezig zijn, nog tot 31
nber 1999 mogen worden verhan-

el 6
regeling wordt aangehaald als
nwetregeling AZO-kleurstoffen.

regeling zal met de toelichting in
atscourant worden geplaatst.

atssecretaris van
gezondheid, Welzijn en Sport
[illegible]ostra

nting

[illegible] aromatische aminen, waar
[illegible] behoren tot de
[illegible] danwel

ervan verdacht worden bij de mens kanker te veroorzaken.

Deze aminen kunnen onder andere worden gevormd door bepaalde kleurstoffen. Tot deze kleurstoffen behoren bepaalde zogenaamde AZO-kleurstoffen.

Uit onderzoek is bekend dat aromatische aminen via de huid in het lichaam kunnen worden opgenomen. Huidcontact met bedoelde AZO-kleurstoffen leidt derhalve tot een kankerrisico. Uit dien hoofde zijn vele van de hier bedoelde aromatische aminen en daaraan gerelateerde AZO-kleurstoffen al op Europees niveau verboden in stoffen en preparaten, zoals verf en inkt, bestemd voor gebruik door consumenten krachtens richtlijn nr 76/769/EEG van de Raad van de Europese Gemeenschappen.

Het gezondheidsbeschermingsbeleid is er op gericht elke onnodige blootstelling van de consument aan (verdacht) kankerverwekkende stoffen en preparaten te voorkomen, met name wanneer de consument zich niet bewust is van deze blootstelling. Onnodige blootstelling doet zich voor bij het voorhanden zijn van voldoende alternatieven voor de stoffen en preparaten in kwestie. Voor de hier bedoelde kleurstoffen is dat het geval. Uit een in 1995 gehouden verkennend onderzoek van de Inspectie voor de Gezondheidsbescherming van het Ministerie van Volksgezondheid, Welzijn en Sport, naar aanleiding van vragen uit de Tweede Kamer (Van Middelkoop, GPV), bleek dat in Nederland kledingtextiel wordt aangeboden welke AZO-kleurstoffen bevat die meergenoemde (verdacht) kankerverwekkende verbindingen kunnen vormen. Dergelijke kleurstoffen werden door de Stichting Natuur en Milieu in een in hetzelfde jaar gehouden onderzoek ook aangetroffen in schoenen. Naar aanleiding van deze bevindingen is het RIVM gevraagd onderzoek te doen naar de risico's voor de volksgezondheid verbonden aan de aanwezigheid van die kleurstoffen in kleding en aanverwante artikelen. Het RIVM concludeerde dat deze risico's niet verwaarloosbaar zijn, waarbij de internationaal aanvaarde norm van 1 op 1.000.000 bij levenslange blootstelling, als te verwaarlozen risico werd gehanteerd.

Voorliggende regeling, gebaseerd op artikel 15, eerste lid, van de Warenwet, strekt om bovenomschreven redenen van dringend volksgezondheidsbelang tot een handelsverbod van bepaalde waren die AZO-kleurstoffen bevatten welke (verdacht) kankerverwekkende aromatische aminen kunnen vormen.

In artikel 2 worden de produktgroepen genoemd waarop de regeling betrekking heeft. Het gaat hier om waren die in de regel langdurig in contact met het menselijk lichaam zijn maar niet per definitie rechtstreeks met de huid in aanraking komen. Deze keuze is gemaakt op basis van het gegeven dat blootstelling aan de bedoelde kleurstoffen zich ook kan voordoen bij het afwezig zijn van een dergelijk rechtstreeks huidcontact. Transpireren kan bijvoorbeeld uiteindelijk zorgdragen voor blootstelling van de huid aan bedoelde kleurstoffen, ook al is van een rechtstreeks contact van de huid met de waar in kwestie geen sprake. Derhalve dient bijvoorbeeld het begrip kleding ruim te worden geïnterpreteerd. Zo vallen niet slechts ondergoed, blouses, overhemden, t-shirts en broeken onder deze regeling, maar tevens truien, pullovers, (over)jassen en colberts, alsmede hoeden, petten, caps en shawls en handschoenen.

In artikel 2, juncto artikel 3, eerste lid, wordt de verhandeling van kleding, beddegoed en schoeisel die AZO-kleurstoffen bevatten waaruit kankerverwekkend aromatische aminen kunnen worden gevormd, verboden. De aromatische aminen in kwestie worden limitatief genoemd in de bij deze regeling behorende bijlage I.

De in de bijlage opgenomen verbindingen zijn alle door de Europese Commissie of door het Internationaal Agentschap voor Kankeronderzoek (IARC) van de Wereldgezondheidsorganisatie (WHO) als kankerverwekkend geclassificeerd omdat wetenschappelijk is vastgesteld dat ze bij mensen of proefdieren kanker kunnen veroorzaken.

In onderdeel c. van artikel 1 wordt een definitie van het begrip pigment gegeven. Kenmerken van een pigment zijn onder meer de onoplosbaarheid, de inertheid en de geringe neiging om onder niet-geforceerde conditie de bedoelde aromatische aminen af te splitsen. AZO-kleurstoffen kunnen in een bepaalde vorm, bijvoorbeeld als metaalzout, als pigment worden beschouwd. In verband met deze kenmerken zijn in artikel 3, tweede lid, kleding, schoeisel en beddegoed die AZO-kleurstoffen uitsluitend in de vorm van een pigment bevatten, uitgezonderd van het in de voorliggende regeling, bepaalde handelsverbod.

Artikel 4, eerste lid, verwijst, met uitsluiting van andere methoden van onderzoek, naar bijlage II van deze regeling voor de vastgestelde methoden van onderzoek ter bepaling van de vraag of de bedoelde waren voldoen aan de eisen van deze regeling. Ingevolge het beginsel van wederzijdse erkenning zoals dat voortvloeit uit de jurisprudentie van het Hof van Justitie van de Europese Gemeenschappen inzake het vrije verkeer van goederen, kunnen krachtens het tweede lid ook andere methoden worden toegepast voor kleding, schoeisel en beddegoed die binnen de Europese Unie zijn geproduceerd en rechtmatig in de handel gebracht. Het moet daarbij gaan om methoden van onderzoek die van een gelijkwaardig niveau zijn, dat wil zeggen dat zij resultaten opleveren die vergelijkbaar zijn met die van de in de bijlage II beschreven methoden.

Artikel 5 voorziet in een inwerkingtredingsdatum: te weten 1 augustus 1996. Waren die vóór de inwerkingstredingdatum reeds in de handel zijn gebracht, mogen na inwerkingtreding van de regeling nog tot 1 september 1997 worden afgeleverd aan de eindgebruiker. Voor twee categorieën kleding, schoeisel en beddegoed, te weten tweedehands waren en waren uit herwonnen (wol)vezels, is een beduidend langere uitverkooptermijn voorzien in verband met de sterk verminderde risico's verbonden aan deze categorieën. Een dergelijk lange overgangstermijn wordt in dit verband ook gegeven voor kleding, schoeisel en beddegoed die de bedoelde kleurstoffen bevatten en die tevens persoonlijke beschermingsmiddelen zijn in de zin van artikel 1, onderdeel a, van het Warenwetbesluit persoonlijke beschermingsmiddelen. De hier bedoelde waren mogen nog tot 1 januari 2000 aan de consument worden afgeleverd.

In de onderstaande tabel wordt tenslotte als hulpmiddel voor het betrokken bedrijfsleven een niet-limitatief overzicht gegeven van de AZO-kleurstoffen die de in de bijlage I behorende bij de regeling, genoemde aromatische amines kunnen vormen.

Indicatieve lijst van kleurstoffen waarvan het gebruik in textiel verboden is, omdat hieruit de in bijlage I behorende bij deze regeling genoemde, aromatische aminen gevormd kunnen worden

Colour index (c.i.) Generieke naam	Colour index (c.i.)nummer	Aromatisch amine¹)
Acid Black 29		B
Acid Black 94	30336	B
Acid Black 131		o-An
Acid Black 132		o-An
Acid Black 209		T
Acid Brown 415		o-An
Acid Orange 45	22195	B
Acid Red 4	14710	o-An
Acid Red 5	14905	o-An
Acid Red 24	16140	[illegible]
Acid Red 26	16150	[illegible]
Acid Red 73	27290	[illegible]
Acid Red 85	22245	B
Acid Red 115	27200	o-A
Acid Red 116	26660	p-Aab
Acid Red 128	24125	D
Acid Red 148	26665	o-A
Acid Red 150	27190	p-Aab
Acid Red 158	20530	o-T
Acid Red 167		T
Acid Red 264	18133	o-An
Acid Red 265	18129	o-T
Acid Red 420		p-Aab
Acid Violet 12	18075	o-An
Acid Violet 49	42640	-2)
Azoic Diazo Component 11	37085	C
Azoic Diazo Component 12	37105	2-A-4-N
Azoic Diazo Component 48	37235	D
Azoic Diazo Component 112 (= benzidine)	37225	-2)
Azoic Diazo Component 113	37230	T
Basic Brown 4	21010	2,4-T
Basic Red 42		o-An
Basic Red 111		p-Aab
Developer 14 (= Oxidation Base 20 = 2,4-T)	76035/6	-2)
Direct Black 4	30245	B
Direct Black 29	22580	B
Direct Black 38	30235	B
Direct Black 91	30400	D
Direct Black 154		T
Direct Blue 1	24410	D
Direct Blue 2	22590	B
Direct Blue 3	23705	T
Direct Blue 6	22610	B
Direct Blue 8	24140	D
Direct Blue 9	24155	D
Direct Blue 10	24340	D
Direct Blue 14	23850	T
Direct Blue 15	24400	D
Direct Blue 22	24280	D
Direct Blue 25	23790	T
Direct Blue 35	24145	D
Direct Blue 53	23860	T
Direct Blue 76	24411	OHB
Direct Blue 151	24175	D
Direct Blue 160		D
Direct Blue 173		D
Direct Blue 192		D
Direct Blue 201		D
Direct Blue 215	24415	D
Direct Brown 1	30045	B
Direct Brown 1:2	30110	B
Direct Brown 2	22311	B
Direct Brown 6	30140	B
Direct Brown 25	36030	B
Direct Brown 27	31725	B
Direct Brown 31	35660	B
Direct Brown 33	35520	B
Direct Brown 51	31710	B
Direct Brown 59	22345	B
Direct Brown 79	30056	B
Direct Brown 95	30145	B
Direct Brown 101	31740	B
Direct Brown 154	30120	B
Direct Brown 222	30368	T
Direct Green 1	30280	B
Direct Green 6	30295	B
Direct Green 8	30315	B
Direct Green 8:1		B
Direct Green 85	30387	T
Direct Orange 1	22370	B
Direct Orange 6	23375	T
Direct Orange 7	23380	T
Direct Orange 8	22130	B
Direct Orange 10	23370	T
Direct Orange 108	29173	o-T
Direct Red 1	22310	B
Direct Red 2	23500	T
Direct Red 7	24100	D
Direct Red 10	22145	B
Direct Red 13	22155	B
Direct Red 17	22150	B
Direct Red 21	23560	T
Direct Red 22	23565	T
Direct Red 24	29185	o-An
Direct Red 26	29190	o-An
Direct Red 28	22120	B
Direct Red 37	22240	B
Direct Red 39	23630	T
Direct Red 44	22500	B
Direct Red 46	23050	Dcb
Direct Red 62	29175	o-T
Direct Red 67	23505	T
Direct Red 72	29200	o-An
Direct Violet 1	22570	B
Direct Violet 12	22550	B
Direct Violet 21	23520	T
Direct Violet 22	22480	B
Direct Yellow 1	22250	B
Direct Yellow 24	22010	B
Direct Yellow 48	23660	T
Disperse Blue 1	64500	-2)
Disperse Orange 149		p-Aab
Disperse Red 151	[illegible]	p-Aab

[illegible]	Kleurindex [illegible]	Aromatisch amine
[illegible]	[illegible]	o-Aab
[illegible]		o-Aab

[illegible] afkortingen

Afkorting	Amine	CAS-nummer
o-A	o-aminoazotolueen	97-56-3
o-Aab	o-aminoazobenzeen	60-09-3
[illegible]	o-anisidine	90-04-0
2-A-4-N	2-amino-4-nitrotolueen	99-55-8
B	benzidine	92-87-5
C	4-chloor-o-toluidine	95-69-2
D	3,3'-dimethoxybenzidine	119-90-4
DCB	dichloorbenzidine	91-94-1
N	2-naftylamine	91-59-8
OHB	3,3'-dihydroxybenzidine	2373-98-0
o-T	o-toluidine	95-53-4
T	3,3'-dimethylbenzidine	119-93-7
2,4-T	2,4-tolueendiamine	95-80-7
m-X	m-xylidine	95-68-1

Bedrijfseffectentoets

Categorieën en aantallen bedrijven
Zowel industrie als handel in de door deze regeling bestreken produktgroepen kunnen worden geconfronteerd met bedrijfseffecten. Voor wat de industrie betreft, gaat het om de volgende categorieën bedrijven
- Producenten van textiel en textielprodukten voor zover het de vervaardiging van kleding en beddegoed betreft;
- Producenten van leer en lederwaren voor zover het de vervaardiging van schoeisel en kleding betreft.

Qua aantal ondernemingen is de genoemde textielsector veruit het grootst. Uitgaand van de ledenbestanden van de belangrijkste belangenorganisaties zoals de Fenecon (confectie-industrie) en de KRL (textielindustrie algemeen), is sprake van ongeveer 450 bedrijven met ongeveer 20.000 werknemers. In de genoemde leerindustriesector is sprake van een 70-tal fabrieken met in totaal 2500 werknemers.
De handel in bovengenoemde produktgroepen omvat importeurs, postorderbedrijven, groothandel, grootwinkelbedrijven en detailhandel. De laatstgenoemde twee categorieën leveren voor wat betreft de aantallen verkooppunten en werknemers het overgrote aandeel in deze handelssector. Daarbij wordt opgemerkt dat veel grootwinkelbedrijven zelf importeur zijn. Hetzelfde geldt voor de postorderbedrijven.
Ook hier is de textiel de belangrijkste produktgroep, kijkend naar aantallen ondernemingen en werknemers. Grootwinkelbedrijven en detailhandel tellen in totaal een 18.000 winkels, met ongeveer een 75.000 werknemers. (Bron: Mitex, Vereniging zelfstandige ondernemers modedetailhandel en VGTB Vereniging grootwinkelbedrijf textiel)
Ook binnen de produktgroep schoeisel wordt de kern van de activiteiten gevormd door de grootwinkelbedrijven en de (overige) detailhandel. Het totaal aantal verkooppunten bedraagt om en nabij de 3750, met een totaal van zo'n 16 000 werknemers. (Bron: Federatie Nederlandse schoenfabrikanten)
Er bestaat geen zekerheid over de vraag hoe groot het aandeel van de produkten dat de bedoelde kleurstoffen bevat precies is. Vermoedelijk gaat het hier slechts om een zeer gering percentage van het totale produktaanbod dat onder de regeling valt. Zo is uit het eerder genoemde representatieve landelijke onderzoek van de Inspectie Gezondheidsbescherming (IGB) in 1995 gebleken dat ongeveer 5% van de onderzochte monsters de hier bedoelde AZO-kleurstoffen bevat. Ook van de zijde van het bedrijfsleven kunnen geen concretere cijfers worden verschaft. Aangenomen wordt echter dat het om een gering aandeel binnen het totaal van het produktaanbod vallend onder deze regeling gaat.
Onduidelijk is tevens of het daarbij om produkten in het lage of hoge(re) prijssegment gaat.

[illegible]
[illegible] werd bekend dat de Duitse overheid aan wetgeving werkte welke qua inhoud nagenoeg [illegible] aan de voorliggende regeling. Deze Duitse wetgeving is inmiddels [illegible] van dit jaar van kracht [illegible] [illegible] de Nederlandse [illegible] de Duitse [illegible]

voorwaarden overeengekomen met leveranciers uit de ontwikkelingslanden, welke de leverancier ertoe verplichten slechts goederen te leveren welke vrij zijn van de in de Duitse wetgeving bedoelde AZO-kleurstoffen. Deze kleurstoffen zijn dezelfde als die welke verboden zijn ingevolge de voorliggende regeling. Waar nodig heeft dit geleid tot het zoeken en vinden van andere leveranciers en het laten uitvoeren van keuringen en monsternemingen om na te gaan of de leverancier zich wel aan de afspraken houdt.
Voor deze grote sector van het bedrijfsleven zal de regeling dan ook geen (verdere) meerkosten met zich meebrengen. Tot voor de consument merkbare prijsstijgingen hebben deze initiatieven niet of nauwelijks geleid. Zo blijkt de noodzaak tot het laten verrichten van monsternemingen en keuringen met het verloop van de tijd duidelijk te verminderen: afnemers en leveranciers zijn op een gegeven ogenblik gewend aan de nieuwe situatie.
Bovenaangegeven kosten zullen echter nieuw zijn voor importeurs die Duitsland niet tot hun afzetgebied rekenen en hun goederen voornamelijk betrekken van de kleine (en goedkope) industrieën uit ontwikkelingslanden. Dergelijke kleine industrieën betrekken hun verfstoffen en halffabrikaten her en der in vaak kleine hoeveelheden. Kwaliteit en samenstelling van deze produkten wisselen sterk en zijn vaak de toepassers niet eens bekend (Bron: Centrum tot bevordering van de import uit ontwikkelingslanden, CBI).
Van de zijde van de Vereniging Importeurs Verre Oosten, VIVO, wordt er op gewezen dat in een dergelijke situatie het laten verrichten van duur en frequent onderzoek van te leveren partijen absoluut nodig zal zijn om enige zekerheid te hebben over de samenstelling van de door deze industrieën geleverde produkten. Aangeven wordt dat dit zeker tot prijsstijgingen zal leiden. Ook hier is echter de verwachting legitiem dat de noodzaak tot het laten verrichten van onderzoeken na verloop van tijd zal verminderen. Daarbij kan worden gedacht aan een periode van ongeveer twee jaar. Alsdan zullen de leveranciers zich volledig hebben aangepast aan de nieuwe situatie. In feite dient in deze sector een inhaalslag te worden gepleegd. De aangegeven prijsstijgingen verschillen al naar gelang het produkt in kwestie en de handelswaarde daarvan en variëert van enkele dubbeltjes tot enkele guldens.
In Nederland en de overige EU-landen worden de [illegible] kleurstoffen als gevolg van Europese wetgeving al sinds geruime tijd niet [illegible] [illegible] produktgroepen.

Buitenland
In Duitsland is sinds 1 april van dit jaar wetgeving van kracht geworden met een gelijke strekking als de voorliggende regeling. Inmiddels bestaat ook in Frankrijk en Denemarken het voornemen om tot wetgeving inzake de hier bedoelde AZO-kleurstoffen te komen. Ook in dat verband zal het gaan om regelgeving welke voorschriften stelt aan de verhandeling van produkten die meergenoemde kleurstoffen bevatten. De Europese Commissie beraadt zich tevens over eventueel te treffen harmonisatiemaatregelen op dit terrein. Voor de volledigheid zij opgemerkt dat produkten van buitenlandse ondernemingen die naar de Nederlandse markt gaan, vanzelfsprekend tevens aan de eisen van de voorliggende regeling dienen te voldoen. Ingevolge het Warenwetbesluit uitvoer van waren, zullen de produkten in kwestie wel (weder)uitgevoerd mogen worden indien door de verhandelaar/exporteur aannemelijk kan worden gemaakt dat deze produkten op geen bezwaren stuiten bij de overheid van het ontvangende land en aldaar dus rechtmatig in het verkeer kunnen worden gebracht.

Marktwerking
Alle ondernemingen die produkten welke onder de reikwijdte van de regeling vallen op de Nederlandse markt willen brengen, zullen de produkteisen van de regeling in acht moeten nemen. Van ondernemerszijde is aangegeven dat ten gevolge van de eerdergenoemde Duitse wetgeving waartoe de initiatieven reeds in 1994 werden genomen, sinds geruime tijd reeds (contractuele) maatregelen worden getroffen om tot aanpassing van de produkten in kwestie te komen; het betreft hier met name die handelssectoren welke Duitsland mede als afzetgebied hebben.
Van de zijde van de importeurs gericht op de import uit ontwikkelingslanden is bekend dat een deel van deze importeurs uitsluitend de Nederlandse markt bedient. Dientengevolge zullen in deze sectoren naar verwachting de grootste inspanningen moeten worden geleverd om tot een tijdige aanpassing van het assortiment te kunnen komen. Daarbij speelt het vinden van leveranciers die consistent produkten kunnen aanleveren waarin uitsluitend alternatieve kleurstoffen worden toegepast, een belangrijke rol. Eerder is reeds gewezen op de eventueel hiermee gepaard gaande kosten van door deze importeurs door hen zelf uit te voeren preventieve (steekproefsgewijze) keuringen van partijen. Naar verwachting zal deze problematiek voornamelijk van tijdelijke aard zijn.
Verwacht wordt dat binnen twee jaar leveranciers zich zodanig op de nieuw leveringseisen hebben ingericht dat monsternemingen ten aanzien van de aanwezigheid van de hier bedoelde kleurstoffen slechts nog zeer sporadisch zullen plaats vinden.

Milieu
De toxicologische eigenschappen van de vervangende kleurstoffen zijn bekend. Naar de huidige kennis en stand van de wetenschap beoordeeld, hebben deze stoffen minder milieubelastende effecten dan de kleurstoffen die ingevolge deze regeling niet langer zijn toegestaan.

De Staatssecretaris van [illegible],
Erica Terpstra

Bijlage I behorende bij artikel 1, onderdeel a, van de Warenwetregeling AZO-kleurstoffen

Verbodslijst van aromatische aminen die vrij kunnen komen uit azokleurstoffen en die als kankerverwekkend geklassificeerd zijn of als zodanig beschouwd worden

Aromatisch amine	Afkorting	CAS nr.
o-amino-azotolueen	O-A	97-56-3
4-aminodifenyl		92-67-1
2-amino-4-nitrotolueen	2-A-4-N	99-55-8
benzidine	B	92-87-5
p-chlooraniline		106-47-8
4-chloor-o-toluidine	C	95-69-2
p-cresidine		120-71-8
2,4-diaminoanisol		615-05-4
4,4'-diaminodifenylmethaan		101-77-9
3,3'-dichloorbenzidine	DCB	91-94-1
3,3'-dimethoxybenzidine	D	119-90-4
3,3'-dimethylbenzidine	T	119-93-7
3,3'-dimethyl-4,4'-diaminodifenylmethaan		838-88-0
[illegible]		[illegible]
[illegible]		[illegible]
4,4'-oxydianiline		101-80-4
4,4'-thiodianiline		139-65-1
2,4-tolueendiamine	2,4-T	95-80-7
o-toluidine	o-T	95-53-4
2,4,5-trimethylaniline		137-17-7

Bijlage II, behorende bij artikel 4 van de Warenwetregeling AZO-kleurstoffen

1. Onderwerp, doelstelling en toepasbaarheid

Deze procedure beschrijft een chromatografische methode voor de identificatie van verboden Azo-kleurstoffen, zoals bedoeld in de Warenwetregeling Azo-kleurstoffen, in kleding, schoeisel en beddegoed. De methode is geschikt voor Azo-kleurstoffen, die toegepast zijn op cellulose- en eiwit (katoen, viscose, wol en zijde) vezels. Dea nalyse van verboden Azo-kleurstoffen op synthetische vezels (polyester, polyamide en polyacryl) vereist een afwijkende extractieprocedure (b.v. mierezuur, dimethylformamide).

Nr	Aromatische amine	CAS nr
1.	o-amino-azotolueen	97-56-3
2.	4-aminodifenyl	92-67-1
3.	2-amino-4-nitrotolueen	99-55-8
4.	benzidine	92-87-5
5.	p-chlooraniline	106-47-8
6.	4-chloor-o-toluidine	95-69-2
7.	p-cresidine	120-71-8
8.	2,4-diaminoanisol	615-05-4
9.	4,4'-diaminodifenylmethaan	101-77-9
10.	3,3'-dichloorbenzidine	91-94-1
11.	3,3'-dimethoxybenzidine	119-90-4
12.	3,3'-dimethylbenzidine	119-93-7
13.	3,3'-dimethyl-4,4'-diaminodifenylmethaan	838-88-0
14	4,4' methyleen-bis-(2-chlooraniline)	101-14-4
15.	2-naftylamine	91-59-8
16.	4,4'-oxydianiline	101-80-4
17.	4,4'-thiodianiline	139-65-1
18.	2,4-tolueendiamine	95-80-7
19.	o-toluidine	95-53-4
20.	2,4,5-trimethylaniline	137-17-7

2. Definitie

Verboden Azo-kleurstoffen: kleurstoffen, waarvan de structuur wordt gekenmerkt door de aanwezigheid van een Azo-eenheid (-N=N-), die na reductie, de hierna vernoemde aromatische aminen vormen.
Azo-kleurstoffen, die opgebouwd zijn uit de aromatische aminen, o-aminoazotolueen en 2-amino-4-nitrotolueen, worden in deze methode als o-toluidine en 2,4-tolueendiamine gedetecteerd.

3. Samenvatting

Het monster wordt geëxtraheerd gedurende 30 minuten met een citraat bufferoplossing (pH=6) bij 70°C. De oplossing wordt daarna gereduceerd m.b.v. natriumdithioniet. De vrijgekomen aromatische aminen worden m.b.v. vloeistof-vloeistof extractie overgebracht naar dichloormethaan. Voor screening van de monsters wordt het extract ingedampt. Het residu wordt heropgelost in de mobiele fase en geanalyseerd met vloeistofchromatografie en diode-array detectie (HPLC-DAD). Voor ondubbelzinnige identificatie van de aromatische aminen worden de aminen in het dichloormethaanextract gederivatiseerd met heptafluorboterzuuranhydride (HFBA). Het extract wordt uitgeschud met een fosfaat buffer (pH=7), om de overmaat HFBA te verwijderen. Na droging over watervrij natriumsulfaat wordt het extract ingedampt en het residu wordt heropgelost in iso-octaan/tolueen. De HFBA-derivaten van de aromatische aminen worden geanalyseerd m.b.v. gaschromatografie en massaselectieve detectie (GC-ITD).

4. Reagentia en hulpstoffen

Alle benodigde chemicaliën dienen analytisch zuiver te zijn
4.1 citraat bufferoplossing, 0,06M, pH=6 (b.v. Merck, Art. 1.09437 1000)
4.2 natriumdithioniet
4.3 natrium hydroxide, 1M
4.4 dichloormethaan
4.5 natriumsulfaat, watervrij
4.6 fosfaat bufferoplossing, pH=7 (b.v. Merck, Art. 1.09887.0001)
4.7 iso-octaan
4.8 tolueen
4.9 heptafluorboterzuuranhydride
4.10 aminen, de in de Warenwetregeling bedoelde aromatische aminen
4.11 moederoplossingen van de aminen (1,0 mg/ml):
Weeg van de zuivere standaard tussen 10-15 mg in (15 ml bruine glazen flesjes met teflon afsluitdop) en pipetteer een volume acetonitril, zodat de concentratie 1,0 mg/ml wordt. Bewaar deze oplossing in een koelkast bij ten hoogste 7°C. Houdbaarheid minimaal 6 maanden.
4.12 calibratieoplossingen van de aminen (0,10; 0,50; 1,0; 5,0; 10.0 ug/ml): Breng m.b.v. een gecalibreerde injectiespuit (100 µl) 10, 50, 100 µl of een steekpipet (1,0 ml) 0,5 ml en 1,0 ml van de moederoplossing van de aminen 4, 5, 6, 10, 11, 12, 15, 18 en 19 over in een maatkolf van 100 ml en vul aan met acetonitril-fosfaatbuffer, 40 60. Bewaar deze oplossingen in een koelkast bij ten hoogste 7°C. Houdbaarheid minimaal 1 week.

5. Apparatuur en hulpmiddelen

5.1 15 ml bruine glazen flesjes met teflon afsluitdop
5.2 100 ml rondbodemkolven met ingeslepen stop
5.3 25 ml reageerbuizen met ingeslepen stop
5.4 waterbad met thermostaat regeling
5.5 gecalibreerde injectiespuit van 100 µl
5.6 pH papier (pH 1-14)
5.7 Vortex mixer
5.8 vloeistofchromatograaf met diode-array detectie
5.9 gaschromatograaf met massa selectieve detectie

6. Werkwijze

6.1 Monstervoorbereiding
Knip een gedeelte van het te onderzoeken analysemonster, ca 10 gram, welke representatief is voor het gehele artikel, in kleine stukjes van 25 mm². Indien het analysemonster uit meerdere kleurschakeringen bestaat, worden de vezels afzonderlijk van elkaar opgewerkt. Weeg van het analysemonster, na menging, een representatief deel van 1 gram in een 100 ml rondbodemkolf.
[illegible]

Warenwetregeling AZO-kleurstoffen

Voortzetting van pagina 5

6 2 Extractie
Voeg aan de rondbodemkolf 100 ml citraat bufferoplossing toe en verwarm het geheel gedurende 30 minuten bij 70 C ± 5 C op een waterbad. Voeg 500 mg natriumdithioniet toe en verwarm nogmaals 30 minuten bij 70°C. Laat het extract afkoelen tot kamertemperatuur. Pipetteer 1 ml extract in een 25 ml reageerbuis. Breng m.b.v. 1 M NaOH, de pH van de oplossing tussen 9-10 (pH papier) en vul aan tot 10 ml met water. Extraheer de aminen met 2 x 10 ml dichloormethaan. Decanteer de bovenstaande waterfase en droog de dichloormethaanfase over natriumsulfaat.

6 3 Analyse m b v vloeistofchromatografie en diode-array detectie
Damp met behulp van een waterbad (50°C) het extract in tot bijna droog en laat het extract verder aan de lucht droogdampen. Los het residu op in 1 ml mobiele fase (acetonitril-fosfaatbuffer, 40:60). Injecteer 20 µl in de vloeistofchromatograaf.

6 4 Analyse m.b.v. gaschromatografie en massaselectieve detectie
Voeg m b v. een injectiespuit (100 µl) 50 µl heptafluorboterzuuranhydride aan de dichloormethaanfase (6 2) toe. Meng de oplossing m.b.v. een Vortex mixer en laat 5 minuten staan bij kamertemperatuur. Voeg aan de oplossing 5 ml fosfaat bufferoplossing toe en schud de oplossing gedurende 1 minuut. Decanteer de bovenstaande fosfaat bufferoplossing en droog de dichloormethaanfase over natriumsulfaat. Damp met behulp van een waterbad (50°C) het extract in tot bijna droog en laat het extract verder aan de lucht droogdampen. Los het residu op in 1 ml iso-octaan/tolueen, 9:1. Injecteer 1 µl in de gaschromatograaf.

7. Instrumentatie

7.1 vloeistofchromatografie

Apparaat	Model 305 pomp systeem met Model 231 autoinjector, Gilson
Stationaire fase	Superspher 60 RP-8 (4 µm); 250 x 4.0 mm i.d., Merck
Mobiele fase	acetonitril-fosfaat buffer pH=7, 40:60
Flow	1,0 ml/min
Kolomtemperatuur	25°C
Injectievolume	20 µl
Detector	Shimadzu SPD-M6A, wavelength range 190-300nm
Dataverwerking	Compaq Deskpro XE 466 met laserprinter

7 2 gaschromatografie

Apparaat	Saturn II (ion trap detector) met Model 8100 autosampler, Varian
Stationaire fase	fused silica capillair BPX5, SGE lengte 25 m, i.d. 0.25 mm, filmdikte 0.25 µm
Draaggas	helium, flow 1 ml/min, voordruk 30 psi
Injectievolume	1 µl
Oventemperatuur	80°C (1) → 25°C/min → 180°C → 5°C/min → 280°C (10)
Injector	Septum Programmable Injector, 90°C (1) → 180°C/min → 250°C
Interface	270°C
Manifold	230°C
Ionisatietechniek	Electron Impact (EI); 70 eV
Dataverwerking	Dicom 486 DX met laserprinter

8. Berekening

Voor de concentratieberekening worden de piekhoogten van de diode-array detector respons gebruikt, waarbij het aromatische amine een maximale respons vertoont (anilines 245 nm en benzidines 285 nm). De concentratie van het aromatische amine wordt uitgerekend met behulp van een calibratielijn, gebruikmakend van lineaire regressie. De calibratielijn wordt na elke injectie van de calibratieoplossingen opnieuw berekend. Voor berekening dienen de concentraties van de aromatische aminen binnen het lineaire gebied van de calibratielijn te vallen, teneinde de betrouwbaarheid van de metingen te waarborgen.
Berekening van de concentratie van het aromatische ami..e:

Camine = Ccalib x Vextract / Vpipet x Winweeg
Camine = concentratie van het aromatische amine, in µg/g
Ccalib = concentratie van het amine in de calibratieoplossing, in µg/ml
Vextract = volume van het extract (100 ml)
Vpipet = volume in behandeling genomen extract (1 ml)
Winweeg = ingewogen gewicht van het analysemonster (1 gram)

Vergelijking van de calibratielijn (concentratie versus detectorrespons):

y = Bx + A

B = hellingshoek van de calibratielijn
A = intercept met de Y-as

. Bevestiging

1 vloeistofchromatografie en diode-array detectie (HPLC-DAD)
e retentietijden van de pieken in het chromatogram van het analysemonster nogen niet meer dan 2% afwijken van de pieken in het chromatogram van de alibratieoplossing. Het spectrum (190-300 nm) van de verbindingen in het analysemonster worden vergeleken met het spectrum (190-300 nm) uit de bibliotheek van de diode-array detector, na achtergrond correctie. De overeenkomst ussen het spectrum van de verbinding in het analysemonster en het spectrum it de bibliotheek van de diode-array detector moet groter zijn 95%. Indien aan eze twee voorwaarden is voldaan, komt een analysemonster in aanmerking oor bevestiging met gaschromatografie en massaselectieve detectie

2 gaschromatografie en massaselectieve detectie (GC-ITD)
e selectieve ion-chromatogrammen (minimaal twee massa's, minimale signaal-uis verhouding 3.1) van de calibratieoplossing en monsteroplossing moeten vereenstemmen voor wat betreft retentietijd (<0,5%), piekvorm en intensiteitsverhouding (80-120%) tussen de specifieke ionen, na achtergrond correctie. iterferende ionen in een 'full-scan' spectrum (electron-impact) mogen niet aanwezig zijn in een intensiteit groter dan 25 % van de basis piekintensiteit, na chtergrond correctie

rivaat	Specifieke massa's (m/z)
[illegible]zidine HFBA	379, 576
[illegible]dine-HFBA	407, 604
[illegible]dianisidine-HFBA	452, 637
[illegible]amine HFBA	106, 134, 303
[illegible]sidine HFBA	135, 150, 319

10. Kwaliteitsborging

10 1 Controlemonster
Voor het waarborgen van de kwaliteit van de meetresultaten dient er bij elke meetserie een controlemonster te worden meegenomen. Dit controlemonster wordt op dezelfde manier geanalyseerd als een analysemonster. Dit controlemonster bestaat uit een katoenen doek aangeverfd met Direct Black 38 (benzidine). Van dit controlemonster worden de meetresultaten vastgelegd op een controlekaart en op juistheid getoetst aan de hand van de gestelde criteria, waarna een conclusie kan worden getrokken over de al dan niet juiste uitvoering van de analyse.

11 Validatie

11 1 Herhaalbaarheid
De herhaalbaarheid van de methode (extractie, reductie en analyse) is bepaald door een katoenen doek aangeverfd met Direct Black 38 (benzidine) in 5-voud te analyseren. De relatieve standaardafwijking van de methode bedraagt < 5%

11 2 Lineariteit
De diode-array detector vertoont een lineair verband tussen de detectorrespons en de concentratie van het aromatische amine in de calibratieoplossing van 10 µg/g tot 1000 µg/g. De correlatiecoefficient is voor alle vernoemde aromatische aminen in de calibratieoplossing groter dan 0 999

11 3 Detectiegrens
Op basis van de hier beschreven methode, dient een detectiegrens voor de vernoemde aminen gehanteerd te worden van 30 µg per gram waar voor vloeistofchromatografie en diode-array detectie en een detectiegrens voor de vernoemde aminen van 3 µg per gram waar voor gaschromatografie en massaselectieve detectie.

Wijziging Vreemdelingencirculaire 1994

JU

10 mei 1996/Nr 570151 96 IND
Immigratie- en Naturalisatiedienst
Stafafdeling Uitvoeringsbeleid en Documentatie

De Staatssecretaris van Justitie,
Gelet op art. 4, derde lid van de Vreemdelingenwet (Stb. 1965, 40) en de artikelen 19, eerste lid, en 23 van het Voorschrift Vreemdelingen (Stcrt. 1966, 188);

Besluit:

Artikel 1
De Vreemdelingencirculaire 1994, vastgesteld bij beschikking van de Staatssecretaris van Justitie van 23 december 1993, in werking getreden op 1 januari 1994, wordt gewijzigd overeenkomstig de in de bijlage bij deze beschikking aangegeven hoofdlijnen.

Artikel 2
Deze beschikking treedt in werking met ingang van de tweede dag na datum uitgifte van de Staatscourant waarin zij wordt geplaatst.

Artikel 3
De tekst van deze wijziging wordt algemeen verkrijgbaar gesteld door middel van aanvulling 15 op de uitgave 'Vreemdelingencirculaire 1994'.

's-Gravenhage, 10 mei 1996.
De Staatssecretaris van Justitie,
voor deze,
Het Hoofd van de Immigratie- en Naturalisatiedienst,
L. Elting.

Vreemdelingencirculaire 1994

Toelichting

Bij beschikking van de Staatssecretaris van Justitie is de 'Vreemdelingencirculaire 1994' gewijzigd. Deze wijziging (aanvulling 15) omvat hetgeen sedert de veertiende aanvulling (februari 1996) is veranderd als gevolg van internationale en nationale rechterlijke uitspraken, wijzigingen die het gevolg zijn van in internationaal verband gemaakt afspraken, wijzigingen in (nationale) wettelijke regelingen en organisatorische aanpassingen.
Deze wijzigingen zijn verwerkt in aanvulling 15 op de uitgave 'Vreemdelingencirculaire 1994'. Deze uitgave is tegen betaling verkrijgbaar bij de NV SDU.
Een – summier – overzicht van de belangrijkste wijzigingen volgt hieronder.

Deel A Algemeen deel

A4 Toelating

A4/2.2.2 De Benelux-regeling betreffende visumvrij verblijf in het Beneluxgebied voor onderdanen van Turkije die beschikken over een geldige verblijfstitel voor een van de Lidstaten van de Europese Unie is beëindigd. Vanaf 15 februari 1996 is voor onderdanen van Turkije visumvrije binnenkomst en visumvrij verblijf van ten hoogste drie maanden alleen mogelijk indien zij in het bezit zijn van een geldige verblijfstitel voor een van de Schengenstaten die de Uitvoeringsovereenkomst bij het Akkoord van Schengen momenteel praktisch toepassen. De visumvrije binnenkomst en (kort) verblijf gelden daarbij voor het grondgebied van alle betrokken Schengenstaten.
Naar de regeling (zoals vervat in TBV 1995/5) inzake de 'reizigerslijst' voor schoolreizen wordt thans in dit hoofdstuk verwezen.
De regeling zelf is in Deel C (C 37) opgenomen. Deze regeling ziet tevens op de wijze van bestellen. Het betreffende model is opgenomen in Deel D (D82).
TBV 1995/2 en 1995/5 komen hiermee te vervallen.

A4/3/9/4 De vrijstelling van kosten voor visumfaciliteiten voor onderdanen van Turkije is per 5 april 1996 komen te vervallen.
A4/6.3 en A4/6.7.2.1 Verwijzing naar de raadpleging van het (Nationaal) Schengen Informatie Systeem bij verblijfsaanvragen en verlenging van verblijfsvergunningen. De verdere procedure komt in hoofdstuk A5/7.2.5 aan de orde.

A4/7.6.1 Verwijzing naar de geactualiseerde tekst van B4/9.1 inzake de associatie EG-Turkije.

A5 Toezicht

A5/7.2 Geactualiseerde tekst van TBV 1995/6. Deze tekst behandelt de te volgen procedure indien een aanvraag om toelating dan wel de verlenging of het bezit van een verblijfsvergunning samenvalt met een geconstateerde signalering ter fine van weigering van toegang in het (Nationaal) Schengen Informatie Systeem. De bijbehorende modellen (D44-1 en D44-2) zijn opgenomen in Deel D.
TBV 1995/6 komt hiermee te vervallen.

A7 Vrijheidsontneming

A7/3.5.1 Toevoeging die betrekking heeft op de tenuitvoerlegging van vreemdelingenbewaring in een politiecel, naar aanleiding van recente jurisprudentie.

A7/3.5.2 Actualisering inzake de procedure voor aanmelding van een in bewaring gestelde vreemdeling bij het Rayonbureau Penitentiair Consulenten (voorheen onder de naam Penitentiair Selectie Centrum in de tekst van deze circulaire opgenomen), mede naar aanleiding van recente jurisprudentie.

A7/3.5.5 Toevoeging naar aanleiding van 'sober regime' bij inbewaringgestelden.

Deel B Bijzonder deel

B3 Buitenlandse pleegkinderen

B3/3 Uitbreiding van de medische verklaring met betrekking tot een buitenlands pleegkind.

B4 Europese gemeenschap, EER en Benelux

B4/9 Aanpassing van de tekst naar aanleiding van de uitspraak van het Europese Hof in de zaak Bozkurt met betrekking tot de interpretatie van art. 6 Besluit nr. 1/80.

B11 Buitenlandse werknemers

B11/5.2.2 Aanpassing van de tekst naar aanleiding van de uitspraak van het Europese Hof in de zaak Bozkurt met betrekking tot de interpretatie van art. 6 van het Associatiebesluit.

B17 Slachtoffers van vrouwenhandel

Verwerking van TBV 1996/3, d.d. 15 april 1996 in de tekst van B17. TBV 1996/3 komt hiermee te vervallen.

Deel C/D Bijlagen en modellen

C4 Geactualiseerde circulaire legalisatie en verificatie van buitenlandse bewijsstukken betreffende de staat van personen, inwerkingtreding 15 mei 1996.

C30 Geactualiseerde richtlijn van het Ministerie van Justitie, d.d. 1 juni 1995, voor de opsporing en vervolging van vrouwenhandel.

C37 Reizigerslijst voor schoolreizen.

D44-1 SIS-signalering; afhandeling conform artikel 25, eerste lid, van de Uitvoeringsovereenkomst bij het akkoord van Schengen.

D44-2 SIS-signalering; afhandeling conform artikel 25, tweede lid, van de Uitvoeringsovereenkomst bij het akkoord van Schengen.

D82 Reizigerslijst voor schoolreizen.

Annex B

Lists of Dyestuffs Affected by the German Ban

Table 20:

Azo dyestuffs that can split off carcinogenic aromatic amines in reductive conditions as listed in

- Sections III A1 and A2 of the MAK list (1994),
- German regulations on consumer goods (Bedarfsgegenständeverordnung, amended on July 15, 1994),
- German regulations on hazardous substances (Gefahrstoffverordnung- Nov. 10, 1993),
- Annex I of EC Directive 67/548 under cat. c2

and coupling components and developers containing such substances.

Research based on Colour Index, 3rd edition (4th revision) 1992 **(October 11, 1994)**

(We cannot accept any liability for the accuracy of this list.)

C.I. Generic Name	C.I. No.	Diazo component *)
Acid Orange 45	22195	B
Acid Red 4	14710	o-An
Acid Red 5	14905	o-An
Acid Red 24	16140	o-T
Acid Red 35	18065	o-T
Acid Red 73	27290	p-Aab
Acid Red 85	22245	B
Acid Red 104	26420	o-T
Acid Red 114	23635	T
Acid Red 115	27200	o-A
Acid Red 116	26660	p-Aab
Acid Red 119:1		p-C
Acid Red 128	24125	D
Acid Red 148	26665	o-A
Acid Red 150	27190	p-Aab
Acid Red 158	20530	o-T
Acid Red 167		T
Acid Red 264	18133	o-An
Acid Red 265	18129	o-T
Acid Red 420		p-Aab
Acid Violet 12	18075	o-An
Acid Brown 415		o-An
Acid Black 29		B
Acid Black 94	30336	B
Acid Black 131		o-An
Acid Black 132		o-An
Acid Black 209		T
Acid Black 232	30334	B
Azoic Diazo Component 11	37085	C
Azoic Diazo Component 12	37105	2-A-4-N
Azoic Diazo Component 48	37235	D
Azoic Diazo Component 112	37225	B
Azoic Diazo Component 113	37230	T
Basic Yellow 82		p-Aab
Basic Yellow 103		4,4'-D
Basic Red 42		o-An
Basic Red 76		o-An
Basic Red 111		p-Aab
Basic Red 114		o-An
Basic Brown 4	21010	2,4-T

C.I. Generic Name	C.I. No.	Diazo Component *)
Developer 14	76035	2,4-T
= Oxidation Base 20	22250	B
Direct Yellow 1	22010	B
Direct Yellow 24	23660	T
Direct Yellow 48	22370	B
Direct Orange 1	23375	T
Direct Orange 6	23380	T
Direct Orange 7	22130	B
Direct Orange 8	23370	T
Direct Orange 10	29173	o-T
Direct Orange 108	22310	B
Direct Red 1	23500	T
Direct Red 2	24100	D
Direct Red 7	22145	B
Direct Red 10	22155	B
Direct Red 13	22150	B
Direct Red 17	23560	T
Direct Red 21	23565	T
Direct Red 22	29185	o-An
Direct Red 24	29190	o-An
Direct Red 26	22120	B
Direct Red 28	22240	B
Direct Red 37	23630	T
Direct Red 39	22500	B
Direct Red 44	23050	Dcb
Direct Red 46	29175	o-T
Direct Red 62	23505	T
Direct Red 67	29200	o-T; o-An
Direct Red 72	22570	B
Direct Violet 1	22555	B
Direct Violet 4	22550	B
Direct Violet 12		D
Direct Violet 13	23520	T
Direct Violet 21	22480	B
Direct Violet 22	24410	D
Direct Blue 1	22590	B
Direct Blue 2	23705	T
Direct Blue 3	22610	B
Direct Blue 6	24140	D
Direct Blue 8	24155	D
Direct Blue 9	24340	D
Direct Blue 10	23850	T
Direct Blue 14	24400	D
Direct Blue 15	23710	T
Direct Blue 21	24280	D
Direct Blue 22	23790	T
Direct Blue 25	24145	D
Direct Blue 35	24175	D
Direct Blue 151		D
Direct Blue 160		D
Direct Blue 173		D
Direct Blue 192		D
Direct Blue 201		D
Direct Blue 215	24415	D
Direct Blue 295	23820	T
Direct Blue 306	24203	D
Direct Green 1	30280	B
Direct Green 6	30295	B
Direct Green 8	30315	B
Direct Green 8:1		B
Direct Green 85	30387	T
Direct Brown 1	30045	B

C.I. Generic Name	C.I. No.	Diazo component *)
Direct Brown 1:2	30110	B
Direct Brown 2	22311	B
Direct Brown 6	30140	B
Direct Brown 25	36030	B
Direct Brown 27	31725	B
Direct Brown 31	35660	B
Direct Brown 33	35520	B
Direct Brown 51	31710	B
Direct Brown 59	22345	B
Direct Brown 74		B
Direct Brown 79	30056	B
Direct Brown 95	30145	B
Direct Brown 101	31740	B
Direct Brown 154	30120	B
Direct Brown 222	30368	T
Direct Brown 223		T
Direct Black 4	30245	B
Direct Black 29	22580	B
Direct Black 38	30235	B
Direct Black 91	30400	D
Direct Black 154		T
Disperse Yellow 7	26090	p-Aab
Disperse Yellow 23	26070	p-Aab
Disperse Yellow 56		p-Aab
Disperse Yellow 218		p-C
Disperse Orange 60		Dcb
Disperse Orange 149		p-Aab
Disperse Red 151	26130	p-Aab
Disperse Red 221		p-C
Mordant Yellow 16		4,4'-T
Mordant Red 57	22310	B

*) Key to abbreviations of aromatic amines

2,4-T	2,4-toluylenediamine	(MAK III A2)
2-A-4-N	2-amino-4-nitrotoluene	(MAK III A2)
4,4'-D	4,4'-diaminodiphenylmethane	(MAK III A2)
4,4'-T	4,4'-thiodianiline	(MAK III A2)
B	benzidine	(MAK III A1)
C	4-chloro-o-toluidine	(MAK III A1)
D	3,3'-dimethoxybenzidine (o-dianisidine)	(MAK III A2)
Dcb	3,3'-dichlorobenzidine	(MAK III A2)
o-A	o-aminoazotoluene	(MAK III A2)
o-An	o-anisidine	(EC Directive 67/548 Cat. c2)
o-T	o-toluidine	(MAK III A2)
p-Aab	p-aminoazobenzene	(EC Directive 67/548 Cat. c2)
p-C	p-chloroaniline	(MAK III A2)
p-K	p-cresidine	(MAK III A2)
T	3,3'-dimethylbenzidine (o-tolidine)	(MAK III A2)

EDUCATIONAL INFORMATION

Eco-friendly Textiles – List of Prohibited Dyestuffs by Germany

It is wellknown that Germany has banned the use of Benzidine based Dyes (**Azo Dyes**). The ban was to come in effect from 1.1.1995. However due to requests from Indian garment and textile suppliers the enforcement of German legislation banning the use of specific azo dyestuffs which can release harmful amines from garments, textiles, leather goods etc. worn or used regularly close to the human body, has been deferred by six months. That means from **1st July 1995 onwards it will be prohibited to import into Germany products which have been dyed with the problematic dyestuffs and that from 1st January 1996 onwards it will be prohibited to sell such products in Germany.** Similar standards may get incorporated in European Union code also.

The Apparel Export Promotion Council (**AEPC**) and the Indo-German Export Promotion (**IGEP**) immediately upon receipt of a copy of new German Legislation thought to help the exporting community by compiling the information concerning this new legislation in the form of a ready reckoner.

AEPC and **IGEP** in collaboration with the **Technological Institute of Textile and Science, Bhiwani,** have compiled a list of affected dyestuffs available and used in India which should be avoided with immediate effect. The list is not exhaustive and is without any guarantee of completeness.

However, realising the importance of the eco-friendly textiles and export potentials of textile goods, we felt that the list should be published in **'Man-made Textiles in India'** to educate the students and the concerned users from our readership so that awareness about the banned dyestuffs could be created and the safe alternatives to the problematic dyes could be serarched and used. The list gives the dyestuffs which are known or suspected to release harmful amines or allergenic, carcinogenic or poisonous, matter falling in the categories of Acid, Direct, Basic, Disperse or Azoic dyes.

We hope this summary list from ready reckoner compiled by **AEPC** and **IGEP** would help the textile processors and exporters towards protecting the health of consumers and also to export eco-friendly textiles to European Union which is an attractive premium market segment.

- The Editor

List of Prohibited Dyestuffs:
(per September 1994) (without guarantee of completeness)

C.I. Generic Name	C.I. No.	Diazocomponents
Acid Orange45	22195	B
Acid Red 4	14710	o-An
Acid Red 5	14905	o-AN
Acid Red 24	16140	o-T
Acid Red 26	16150	
Acid Red 73	27290	p-Aab
Acid Red 85	22245	B
Acid Red 114	23635	T
Acid Red 115	27200	o-A
Acid Red 116	26660	p-Aab
Acid Red 148	26665	o-A
Acid Red 150	27190	p-aab
Acid Red 158	20530	o-T
Acid Red 167		T
Acid Red 264	18133	o-An
Acid Red 265	18129	o-T

.I. Gneric Name	C.I. No.	Diazocomponents
cid Red 420		p-Aab
cid Violet 12	18075	o-An
id Violet 49	62640	
id Brown 415		o-An
id Black 29		B
id Black 94	30336	B
d Black 131		o-An
d Black 132		o-An
d Black 209		T
ic Diazo nponent 11	37085	C
c Diazo nponent 12	37105	2A.4.N
c Diazo ponent 48	37235	D
Diazo ponent 112	37225	B
Diazo onent 113	37230	T
Red 111		p-Aab
Red 42		o-An
Brown 4	21010	2, 4-T
pper 14 = tion Base 20	76035	2, 4-T
Yellow 1	22250	B
Yellow 24	22010	B
Yellow 48	23660	T
Orange 1	22370	B
Orange 6	22375	T
Orange 7	20000	T
Orange 8	22130	B
Blue 295	23820	T
Green 1	30280	B
Green 6	30295	B
reen 8	30315	B
reen 8:1		B
reen 85	30387	T
own 1	30045	B
own 1:2	30110	B
own 2	22311	B
own 6	30140	B
own 25	36030	B
own 27	31725	B
own 31	35660	B
wn 33	35520	B
wn 51	31710	B
wn 59	22345	B

C.I. Gneric Name	C.I. No.	Diazocomponents
Direct Brown 79	30056	B
Direct Brown 95	30145	B
Direct Brown 101	31740	B
Direct Brown 154	30120	B
Direct Blue 222	30368	T
Direct Black 4	30245	B
Direct Black 29	22580	B
Direct Black 38	30235	B
Direct Black 91	30400	D
Direct Black 154		T
Disperse Yellow 7	26090	p-Aab
Disperse Yellow 23	26070	p-Aab
Disperse Yellow 56		p-Aab
Disperse Orange 149		p-Aab
Disperse Red 151	26130	p-Aab
Disperse Blue 1	64500	

Arylamines which can be released by the listed azo-dyestuffs:

o-A	:	o-Aminoazotoluene (III A2)
p-Aab	:	p-Aminoazobenzene (III A2)
o-An	:	2-Methoxyaniline (II A2)
2-A-4-N	:	2-Amino-4-nitrotoluene (III A2)
B	:	Benzidine (III A1)
C	:	4-Chlor-o-toluidine (III A1)
D	:	3,3-Dimethoxybenzidine (III A2)
DcB	:	Dichlorobenzidine (III A2)
N	:	2-Napthylamine (III A1)
o-T	:	o-Toluidine (III A2)
T	:	3,3-Dimethylbenzidine (III A2)
2.4-T	:	4-Methyl-1,3-phenylenediamine (III A-2)

Acid Dyes

There are a total of ca 880 Acid dyes of various brand names in use today. Some of the common brand names in India are given below.

Name of Company	Brand
Atul	Atul Acid
Bayer	Supramine, Acilan, Isolan
BASF	Lurazol, Acidol
Ciba-Geigy	Kiton, Benzyl, Erio
ICI	Coomassie, Solvay, Lissamine
Sandoz	Sandolan, Sandosilk, Nylosan

The C.I. names, commercial names and examples of common brand names are listed below:

C.I. Name	C.I. No.	Commercial Name	Examples
Amine Releasing			
Acid Black 29	-	Black B BS	Nylacid Fast Black B
Acid Black 94	30336	Black B BV	Chromeleather Fast Black BV Coriacid Black B
Acid Black 209	-	Black FC	
Acid Black 131	-	Black GBL/ BGL Grey BGL	Irgalan Black GBL Lanasyn Black BGL
Acid Black 132	-	Back BRL RBL	Irgalan Black RBL Lanasyn Black BRL
Acid Orange 45	22195	Orange R	Acid Orange R Milling Orange R Fast Orange R
Acid Red 4	14710	Eosine G GC Pink B, Scarlet B BL Red E	Anil Acid Fast Pink B Anil Acid Scarlet B Erio Scarlet B Atul Acid Pink B
Acid Red 5	14905	Rhodine GR Red R/RR	Erio Red R Azo Rhodine GR
Acid Red 73	27290	Croceine MOO/3B.3BA Scarlet MOO/3BC R Red GR	Atul Coreceine Scarlet MOO Acilan Croceine MOO Enosin Red GR
Acid Red 116	26660	Cloth Rec G2B	
Acid Red 150	27190	Cloth Rec 2R, No.6 Scarlet	
Acid Red 264	18133	Brill Red 3 BL	
Acid Red 420	-	Scarlet Y-LFW	
Acid Red 24	16140	Ponceau G/RT Ponceau Scarlet	
Acid Red 85	22245	Red G	Atul Acid Milling Red G
Acid Red 114	23635	Red 2R/RS BB	Coomassie Red 2R Nylomine Red C2R Sandolan Res RSI Sandolan Red F-RS Milling Red BB
Acid Red 115	27200	Red 2B	Eriosin Red 2B
Acid Red 128	24125	Red 3B Bordeaux R	Milling Bordeaux R Atul Acid Milling Red 3B
Acid 148	26665	Red BC	Emiacid cloth Red BC
Acid Red 158	20530	Red 3BL/ER	Supranol Red 3BL Telon Fast Red ER
Acid Red 167		Red B	Pollar Red B Milling Fast Red B
Acid Red 265	18129	Red BL	Sandolan Brilliant Red E-BL Milling Red BL
Acid Violet 12	18075	Red 2B/BB/ BBA/A2B Rhodine/ Carmine 4B	Acid Red A2B
Acid Brown 415		Brown S-GL	
POISONOUS			
Acid Orange 156	26501	Orange 3G Orange GL/ GNS	Sandolan Orange P-GL Nylosan Orange C-GNS
Acid Orange 165 Carcinogenic	28682	Orange 3 RE	Acidol Orange 3RE
Acid Dye	16155	Ponceau 3R/3RN	
Acid Red 26	16150	Ponceau 2R/ RR/RL/FR	Acid Ponceau 2RL
Acid Violet 49	42640	Violet 3B/ 4B/6B	Eriosine Violet 3B Acilan Violet SRBN Acid Violet 6B
Allergenic			
Acid Violet 17	4250	Violet 4B/4BS/R	Acid Brill Milling Violet 4BS Commassive Violet r Sandolan Brill violet E-4BNS

Azoid Dyes

There are about 40 to 50 diazotised bases and salts of various brand names in use today. Some of the brand names familiar in India are given below.

Name of the company	Brand Name
Amar Dyechem	Amarthol, Stabamine
Atul	Tulabse
Arlabs	Hindasol

The C.I. names and commercial names are listed below. No. specific examples of brand names are needed. All other bases like Yellow GC. Orange GC/GR, Scarlet GGS/RC/R, Red KB/RC/ GL/EGL/B/RL, Garnet GBC and Bordeaux GP etc. can be used safely. No blue is however available. Some shades can however be achieved by using Black K.

C.I. Name	C.I. No.	Commercial Name
	Amine Releasing	
Azoic Blue 037	–	
Azoic Diazo Component 11	37085	Fast Red TR Base Fast Red TR Salt
Azoic Diazo Component 12	37105	Fast Scarlet G Base Fast Scarlet G Salt
Azoic Diazo Component 29	37255	Fast Red GTR Base Fast Red GTR Salt
zoic Diazo omponent 48	37235	Fast Blue B Base Fast Blue B Salt
zoic Diazo omponent 112	37225	Fast Corinth B Base
zoic Diazo omponent 113	37230	Fast Dark Blue R Base
oic Diazo mponent 7	37270	Fast Orange R Base Fast Orange B Salt
	Poisonous	
oic Diazo mponent 20	37175	Fast Blue BB Base Fast Blue BB Salt
ic Diazo nponent 24	37155	Fast Blue RR Base Fast Blue RR Salt
ic Diazo nponent 41	37165	Fast Violet B Base Fast Violet B Salt

Disperse Dyes

ut 550 disperse dyes of various brand names are in use v. Some of the brand names familiar in India are given v.

e of the Company	Brand Name
	Amarlene
	Tulasteron
	Dispersol
	Resolin
	Palanil
	Terasil
equip	Chemilene
Chem	Resolin. Vernasol
t	Samaron
	Navilene
n	Terenix
	Rathilene
	Foron

names, commercial names, specific examples of brand names are listed below:

C.I. Name	C.I. No.	Commercial Name	Examples
		Carcinogenic	
Disperse Blue 1	64500	Blue 2GS Blue Extra	Cibacet Blue 2GS Palacet/ Navicet Blue Extra Chemilene Brill Blue Extra
		Allergenic	
Disperse Blue 1		as above	
Disperse Blue 3	61505	Blue/B/BN/RBL Blue 3B	Dispersol Blue B/BN Cibacet Blue BN Brilliant Blue RBL Terenix Blue F3BL
Disperse Blue 7	62500	Blue 7G Blue Green B Turquoise Blue g/AG	Dispersol Blue 7G Cibacet Blue Green B/CB/PB
Disperse Blue 26	63305	Navy B-G/ 2G/2GL	Dispersol Blue B-G Navilene Blue GL
Disperse Orange 1	11080	Orange 5R Scarlet 2G	Navilene Orange 5R Resolin/Palanil Fast Orange 5R Terasil Scarlet 2G Foron Scarlet E-2GFL
Disperse Orange 3	11005	Orange G/GR Orange 2R	Dispersol Orange A-G Tulasteron Fast Orange 2R Vemasol Bril Orange 2R
Disperse Red 1	11110	Scarlet B/2B/BG	Tulasteron Fast Scarlet B Cibacet Scarlet 2B Terenix Scarlet FBGL
Disperse Red 11	62015	Red 3B Pink 4B/5B Violet 6R	Dispersol Red B-3B Terasil Brill. Pink 4BN Navilene Violet 6R Terenix Violet F6RL
Disperse Red 15	60710	Red 2B/3B Pink B	Dispersol Red A-2B Navicet Pink BN
Disperse Red 17	11210	Red 2G/GG	Tulasteron Fast Red 2G Navilene Fast Red GG
Disperse Red 151	-	Red 4G	Terasil Brill Red 4G

Basic Dyes

There are about 250 basic dyes of various names in use today. Some of the brand names familiar in Indian industry are given below:

Name of Company	Brand Name
BASF	Basacryl
Sandoz	Sandocryl

The C.I. names, commercial names, and specific examples of Brand names are given below:

C.I. Name	C.I. No.	Commercial Name	Examples
Carcinogenic			
Basic Red 9	-	Fuchsine, Rosaniline Magenta N	
Basic Yellow 2	41000	Auramine O	
POISONOUS			
Basic Blue 3	51004	Blue BG/3G Blue Green 5G	Astrazon Blue BG Basacryl Blue Green X-5G Sandocryl Blue B-3G
Basic Blue 7	42595	Blue BO	Victoria Pure Blue BO Lake Blue BO
Basic Blue 81	42595	Blue FGA	Victoria Pure Blue FGA
Basic Red 12	48070	Phloxine G	Astra Phloxine G Extra Brilliant Pink AS/Red AG Pink AS
Basic Violet 16	48013	Violet 3R Red BG/6B	Astra Violet 3R Extra Basacryl Brill. Red BG, Sandocryl Red B-6B
Basic Yellow 21	48060	Yellow 6G/7G	Astrazon Yellow 7GLL Sandocryl Brill Yellow B-6GL
Amine Releasing			
Basic Brown 4 (solvent Brown 12)	21010	Bismarck Brown R Vesuvine B Brown AT	Atul Bismarck Brown R Astra Vesuvine B
Basic Red 42	-	Red BJ	
Basic Red 111	-	Red K-B/K-2BN	

Direct Dyes

Approximately 440 direct dyes of various brand names are presently in use. Some of the brand names used in Indian industry are given below:

Name of Company	Brand Name
Atul	Atul Direct
Arlabs	Texazol
Bayer	Sirius, Sirius Supra
Ciba	Chlorantine, Cupratine
Dinesh	Dinamine
Golden dyes	Goldamine Fast
ICI	Chlorazol, Durazol
Indokem	Incomine
Sandoz	Solar, Pyrazol
Texdyes	Texazol, Texirius

The C.I. names and commercial names are given below. No specific examples of brand names are given as all dyes are known by their commercial name.

C.I. Name	C.I. No.	Name
Amine Releasing		
Direct Black 29	22580	Black RO
Direct Black 38	30235	Black E/2E/EC/EG/ER/RT
Direct Black 4	30245	Black W/RW/R/RN/D
Direct Black 154	-	Deep Black XA/AXN
Direct Black 91	30400	Copper Black R/RL/RLW Black CRL/RL
Direct Blue 1	24410	Sky Blue FB/FF6B Blue 6B/FF
Direct Blue 10	24340	Blue G/GS/DG
Direct Blue 14	23850	Blue 3B/3BX/NB-2BG
Direct Blue 15	24400	Sky Blue/Pure Blue FB Sky Blue A/FF
Direct Blue 151	24175	Copper Blue B/BB/A
Direct Blue 160	-	Copper Navy Blue R/RL/RLL/RLW
Direct Blue 173	-	Copper Blue 3G
Direct Blue 192	-	Dialuminous Blue GF
Direct Blue 2	22590	Black BT/BH/ABC Navy Blue BH
Direct Blue 201	-	Blue BRL
Direct Blue 215	24115	Copper Blue GR
Direct Blue 22	24280	Blue RW/Blue 5G

Direct Blue 25	23790	Blue/Brill, Blue/ New Blue 5B
Direct Blue 295	23820	Blue 2B-NB
Direct Blue 3	23705	Azurine 3R Violet 2B
Direct Blue 35	24145	Brill. Blue 3B/3BN
Direct Blue 6	22610	Blue 2B/BB/2BX
Direct Blue 76	24411	Blue 2G/4G/6G
Direct Blue 8	24140	Azurine G Blue X, Blue G
Direct Blue 9	24155	Blue BW/BN
Direct Blue 53	23860	Pure Blue BF Evans Blue
Direct Brown 1	30045	Brown 3G/3GR/CG/GN Chrome Brown G
Direct Brown 1:2	30110	Brown CN/CGN/5C Brown 3G
Direct Brown 101	31740	Chrome Brown LG/GL
Direct Brown 154	30120	Brown 3G/3GC/3GN
Direct Brown 2	22311	Brown M/MR/MH/MY
Direct Brown 222	30368	Brown 3GA
Direct Brown 25	36030	Catechine G/GS/GR
Direct Brown 27	31725	Brown/Chrome Brown B/B3G
Direct Brown 31	35660	Brown B/BP/TB/BCW
Direct Brown 33	35520	Catechine B/3B/BN
Direct Brown 51	31710	Bronze SH/G
Direct Brown 59	22345	Brown B/CB/BN/DB/BM
Direct Brown 6	30140	Brown/Congo Brown G/GR
Direct Brown 79	30056	Brown/Orange 3G
Direct Brown 95	30145	Brown BR/BRL/BRLL
Direct Green 6	30295	Green B/BN
Direct Green 8	30315	Green G/GN/GC
Direct Green 8:1		Green G
Direct Green 85	30387	Dark Green BA
Direct Green 1	30280	Green/Dark Green/ Black Green B/BG Green P/PLS, Black FE
Direct Orange 1	22370	Orange G/2G/GL/GR/R/RL
Direct Orange 10	23370	Orange/Coupling Orange R/TR/PR
Direct Orange 108	29173	Viscose Orange A

Direct Orange 6	23375	Orange G/GG/GR
Direct Orange 7	23380	Orange G/TG
Direct Orange 8	22130	Orange R/RR/3R
Direct Red 1	22310	Red F/FC/FR/FN/FB
Direct Orange 10	22145	Garnet H/B/BY Bordeaux GL/CGN Direct Red BR/R
Direct Red 13	22155	Bordeaux B/BR/BN/BW
Direct Red 17	22150	Congo Rubine Rubine, Rubine A/R
Direct Red 2	23500	Red RB Purpurine/Benzopurpurine 4B/4BA
Direct Red 21	23560	Red B Benzopurpurine B
Direct Red 22	23565	Red 5B. Purpurine 5B Purple R
Direct Red 24	29185	Scarlet 4BA/4BAS/4BSL
Direct Red 26	29190	Scarlet 8B/8BS/8BA
Direct Red 28	22120	Congo Red Congo Red 4B/RS
Direct Red 37	22240	Red B. Scarlet B/BL
Direct Red 39	23630	Scarlet 3B
Direct Red 44	22500	Rubine B Bordeaux Extra
Direct Red 46	23050	Red 8B. Purpurine 8B
Direct Red 62	29175	Orange R/RS/F3R
Direct Red 67	23505	Purpuring 4B Cotton Red N
Direct Red 7	24100	Red 10B. Purpurine 10B Bordeaux BW
Direct Red 72	29200	Scarlet 4BN/4SW
Direct Violet 1	22570	Violet N/MN/NN/R/3R
Direct Violet 12	23550	Violet R/O/OC/ON
Direct Violet 21	23520	Corinth B
Direct Violet 22	22480	Violet LN
Direct Yellow 1	22250	Yellow G Chrysamine G
Direct Yellow 24	22010	Golden Yellow N Yellow CT
Direct Yellow 48	23660	Yellow TC
Others		
Developer 14 (Oxidation base 20)	76035	Developer B/H/MTD Metatoluylenediamine
Ingrain Blue 2/2	74160	Phthalogen Brill Blue 1F3G Brill. Blue 3G

DYEING & FINISHING

Ban on dyes & ecological approach

The German ban on a list of harmful dyes is forcing the industry to find out safe alternatives to the banned dyes. **H T Lokhande** and **Sandeep R Naik** provide information about all the 118 banned dyes, as well as status and position of remaining unbanned or so called "safe" dyes.

Red list and Green list for dyes and chemicals have been prepared in many of the European countries. Red listed items have either been banned or are being phased out. Nearly 8,000 dyes and chemicals, which are in use in textile world, have been identified, tested and classified into Red and Green lists. The German textile industry has taken the lead in insisting on or advocating for eco-labels for textiles imported from other countries. They have laid down eco-standards.

H T Lokhande and Sandeep R Naik: Division of Technology of Fibres And Textile Processing, Dept of Chemical Technology (UDCT), University of Bombay, Matunga, Mumbai 400 019.

The German Order (German Consumer Goods Ordinance) dated July 15, 1994, banning azo dyes that can form any of the 20 listed carcinogenic amines through cleavage of one or more azo groups, has created considerable disturbances in the minds of exporters of textile goods. The legislation which was to come into effect from July 1, 1995, was postponed by nine months and came into effect from April 1, 1996. This ban is likely to affect 41% of India's textile exports to the European Common Market. This has brought about a lot of environmental pressure on the textile processing industry.

Export performance

The Indian textile industry has

emerged as a major foreign exchange earner for the country during the last few years. The total exports by Indian textile industry amounts to approximately one-third of country's total export earning. The export of textile items in various sectors has shown good progress. Achievement in 1994-95 (up to February 1995) has been US $8,999 million as compared to US $7,974 million in 93-94. The target fixed for 1995-96 is US $10,500 million, which in all probabilities, will be achieved, if not surpassed[1].

The Table 1 shows the total textile exports and the exports by various sectors of the industry during last three years.

The European Countries (EC) and US are the two major markets for Indian textiles and clothings together accounting for over 70% of the total global imports in those countries. Exports of textiles to Germany alone account for 31% of the total exports of textile from India. The German exports are expected to be doubled in the next 2-3 years.

Table 1
Export earnings: Textile sector

Item	1992-93	1993-94	1994-95
Readymade Garments	3053	3714	3979
Cotton	1679	2009	2529
Handicrafts	830	1071	1229
Man-made textiles	496	588	682
Silk	254	252	271
Wool & Woollens	146	193	158
Jute & Coir	143	148	153

(In million US $

Factors affecting exports

A) Red, Blacm, Gray Lists

Today a major problem threatening the Indian textile industry is the environmental pollution arising out of the wet processing of the textiles due to poor awareness about eco-specifications prevailing in the western world. Use of some Red-listed chemicals is prohibited under various German regulations.

The European Community (EC) Directive 86/280 gave a so-called "Black List" of chemicals that have been prescribed, and a "Gray List" of chemicals that are subjected to further investigation. The Third North Sea Conference issued a directive in March 1990, demanding reduction in discharge to 50% of certain specific chemicals into river Rhine and hence in North Sea by 1995 (Red Chemicals). The Table 2 illustrates the specified pollutants.

When trying to define what is an eco-friendly garment or textile product, a very constructive approach is the concept of "Intelligent Products", which has been developed by the Homburg-based Environment Protection and Encouraging Agency (APEA) and which is increasingly being adopted by parts of the textile industry. It defines a product as "Intelligent", if it is at the same time profitable, does not cause damage to health and environment and made by good manufacturing practices[2].

Eco-labels for clean garments have been introduced by German textile industry which will constitute possible trade barriers. Different limits of tolerance are described for outer garments which are not in direct contact with the skin, eg, coats, skirts, trousers, sweaters, lining, etc and for inner garments coming into direct contact of the skin, eg, shirts, blouses, night wears, socks, stocking and baby wear/ children wear[3,4].

Table 3 gives the list of toxic chemicals with their maximum prescribed safe limits for various eco-labels.

B) Banned azo dyes

An order (September, 1994) from the Government of Federal Republic of Germany gives a list of 20 forbidden amines which contain benzidine and other 19 amines. The dyes/pigments based on amines contain the azo groups (-N=N-). Although benzidine and the benzidine-based compounds are known "carcinogens", of the other 19 amines some of them may not be carcinogens, but the same have been included in the list

of forbidden amines, perhaps due to their toxic nature to human life. It is believed that the azo group of the colourant under certain conditions break up to give the parent amine/amines.

Table 2
List of priority hazardous substances prepared at the third north sea conference

Substances	Substances	Substances	Substances
Mercury	HCH	Malathion	Hexachlorobutadiene
Cadmium	DDT	Parathion	Carbontetrachloride
Copper	Trifluralin	Dichlorovos	Parathion-methyl
Zinc	Endosulfan	Trichloroethane	Trichloroethylene
Lead	Simazine	Dioxins	Tetrachloroethylene
Arsenic	Atrazine	Chloroform	Trichlorobenzene
Chromium	Tributylin	Aziphos-methyl	1,2 Dichloroethane
Nickel	Fenitrothion	Pentachlorophenol	
Drins	Fenthion	Hexachlorobenzene	

Note: The list may not be considered as complete.

Ban on dyes & ecological approach

What is the German ban?

As per the German Legislation Consumer Goods Ordinance *" No articles of clothing or items which regularly come in contact with the human body may be put into circulation if they can release harmful amines due to the use of azo dyes, which are either known or suspected to be allergic, poisonous or carcinogenic. These dyes should not henceforth be used by any supplier of textiles or leather goods".*

The amines mentioned above have been classified as amines of the MAK Group III A1 and III A2.

Mak Group III A1 (Work place exposure) :

Carcinogenic amines : Benzidine, 4-chlorotoluidine 2- naphthylamine, and 4-amino di phenyl. These materials are said to be carcinogenic.

Mak Group III A2 o-Toluidine, o-dianisidine, p-chloroaniline, 3,3' dichlorobenzidine, o-aminoazo toluene, 2-amino - 4 - nitrotoluene and 2,4 - toluylene diamine: there is a justifiable suspicion that these are carcinogenic agents. These materials were tested only on animals and have proved to be clearly cancer-causing agents. This group also includes materials that might cause health risks.

The German ban on import of goods which were dyed with specific azo dyes based on 22 amines (forbidden amines), was to come into effect from January 1, 1995. But on the request of the Government of India, it was postponed initially by six months[7]. Thus, the ban was scheduled to come into force from July 1, 1995, on all imports into Germany. As regards retail sales in Germany the ban was expected to be effective from January 1, 1996. However, it was once again deferred by nine months and the proposed deferment means that the imports of textiles even containing azo dyes in Germany would now be permitted only up to March 31, 1996, and the sale of such goods within Germany only up to September 30, 1996.

The pigment dyed/printed fabrics have been excluded from the ban till March 31, 1998. Recycled products such as shoddy wool or articles made from shoddy wool have been exempted from this ban up to the end of 1999.

Garments, home textiles (especially bed clothes and towels), leather clothing, other clothings, upholstery fabrics, leather components for furniture, seat-covers, children's seats, shoes, belts, costume jewellery, other items like watch straps, frames for glasses, headphones, bandages, belly belts, hygiene articles, etc have been covered under the ban.

Table 3
Eco standards for textiles under different eco labels

	MST		Eco-Tex 100	Clean fashion		Steilmann
	percentage		ppm	percentage		ppm
Group I						
Formaldehyde :						
- free formaldehyde for outer garments	0.3		300	0.03		500
- Close to skin	0.0075		75	0.0075		300
- Baby clothing	0.002		20	0.002		50
Group II						
Pesticides :						
DDT	1.0	mg/kg	-	-		
HCH	0.5	mg/kg	-	-		
Lindan	1.0	mg/kg	-	-		
Aldrin	0.2	mg/kg	-	-		
Dieldrin	0.2	mg/kg	-	-		
2,4-D	0.1	mg/kg	-	-		
2,4,5 T	0.05	mg/kg	-	-		
Toxaphen	0.1	mg/kg	5	1.0	mg/kg	1
Group III						
Pentachlorophenol (PCP)	0.5	mg/kg	-	0.5	mg/kg	Banned
Group IV						
Heavy metals :						
As	0.01	mg/kg	-	-		-
Pb	0.04	mg/kg	-	-		-
Cd	0.005	mg/kg	-	-		-
Hg	0.001	mg/kg	0.01	0.01	mg/kg	-
Baby clothing	0.001	mg/kg	0.01	0.01	mg/kg	0.01 mg/kg
Ni	0.2	mg/kg	10	10	mg/kg	-
Baby clothing	0.2	mg/kg	10	10	mg/kg	-
Cu	3.0	mg/kg	100	50	mg/kg	-
Baby clothing	3.0	mg/kg	30	20	mg/kg	-
Group III	0.1	mg/kg	20	20	mg/kg	-
Baby clothing	0.1	mg/kg	1	1	mg/kg	-
Co	0.2	mg/kg	2	-		-
Baby clothing	0.2	mg/kg	1	-		-
Zn	5.0	mg/kg	-	-		-
Group V						
Azo dyes containing specified 20 aromatic amines	-		-		Banned	Banned
Group VI						
Halogenic carriers	-		-	-		Banned
Group VII						
Chlorine Bleaching	-		-		-	To be avoided

The dyes mentioned in Table 4 release the 22 (forbidden) carcinogenic amines on reductive cleavage of the azo group/s present in their

Table 4
List of banned dyes

Class of dyes	No. of banned dyes
Acid dyes	26
Azoic dyes	5
Basic dyes	3
Direct dyes	77
Disperse dyes	6
Oxidation base and developers	1
Total	118

molecules.

The amendment to the German regulation on the hazardous substances classified two further amines, viz, P-Amino Azobenzene and o-Anisidine as carcinogens (in animal experiments), which are found in a number of widely used dyestuffs.

The German regulation on hazardous substances (Nov 10, 1993) relating to the above two amines does not ban dyestuff that can split off these carcinogenic amines. They "simply" specify that such dyestuffs should be labeled with the "skull and crossbones symbol" with the warning sign "may cause cancer and must be handled like carcinogenic substances."

Punishment on violation of the German ban

Violation of the above regulation is liable for prosecution for criminal offense and those responsible for violations will be punished either by imprisonment up to three years or by imposing a fine, or both.

Pigments

About 38 pigments have been identified as possible forbidden pigments. The pigments have been kept out of the ban till March 31, 1998. The language of the German Ordinance speaks of azo dyestuffs. According to DIN standard the term 'dyestuff' is used as a general term for all substances classified as colouring agents. In a differentiation, the dyes are soluble in application medium (which is normally aqueous in nature) and pigments which consist of solid particles are practically insoluble in the application medium. According to the German Food Legislation, there is no difference between dyes and pigments. The German Consumer Goods Ordinance is a part of the German Food Legislation. However, the pigments are excluded from the ban till March 31, 1998. Nevertheless, 38 pigments that would eventually fall under the category of banned dyes have been identified and revealed in Table 7.

Safe dyestuffs

The banned (forbidden) dyes spread over six classes of dyes, viz, acid, azoics basic (cationic), direct, disperse, oxidation bases and developers. These six classes are termed as 'affected' classes of dyes. None of the dyes from the remaining classes of dyestuffs is banned, ie, dyes belonging to "reactives, vats, sulphur and of course natural dyes". These are termed as unaffected classes.

Table 5
List of forbidden amines

4	-	Amino biphenyl
		Benzidine
3,3'	-	Dichloro benzidine
3,3'	-	Dimethyl benzidine (o - Toluidine)
3,3'	-	Dimethoxy benzidine (o - Dianisidine)
4,4'	-	Diamino diphenyl methane
3,3'	-	Dimethyl - 4,4' - diamino diphenyl methane
4,4'	-	Methylene bis-(2-chloroaniline)
o	-	Chloroaniline
2	-	Amino - 4 - nitro toluene
4	-	Methoxy - m - phenylene diamine
2	-	Methoxy - 5 - methylaniline
4	- -	Methyl-1,3-phenylene diamine (2,4 - Toluylendiamine)
O	-	Toluidine (3,3' Dimethyl Benzidine)
2,4,5	-	Trimethyl aniline
4,4'	-	Oxydianiline
4,4'	-	Thiodianiline
O	-	Aminoazo toluene
4	-	Chloro - o-toluidine
2	-	Naphthylamine

(without any guarantee of completeness)

Experimental evidence of carcinogenicity

In 1895, Rehn reported a high incidence of hemorrhagic cystitis, recurrent papillomas and urinary bladder cancers in workers employed in the manufacture of dyes based on benzidine, ß-naphthylamines, etc, which proved them to be carcinogens. 4-Amino diphenyl, ß-naphthylamine, benzidine, 2,4- and 2,6-diamino toluene have been found to be human bladder carcinogens.

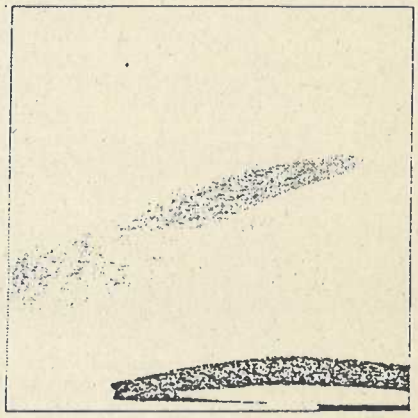


Table 8 gives the effects of the chronic administration of the primary amines on the blood, liver and bladder of dogs.

Table 9 gives the list of the diazo compounds which require careful control because of their proven carcinogenicity to humans or likelihood of proving carcinogenic hazards to man[9].

Mechanism of action and testing of these amines

Conditions that can cause reductive splitting of azo dyestuffs

* A reductive chemical medium (eg, reduction stripping of dyestuff).
* The human organism as a result of the action of intestinal bacteria or azo reductase in the liver on any azo dyestuffs in the body.
* These amines (obtained after reduction), if chemical carcinogens, exert their effect by causing DNA damage, which

Ban on dyes & ecological approach

Table 6
List of banned dyes[6]

CI Generic name		CI No.	Diazo component
Acid	Orange 45	22195	B
Acid	Red 4	14710	O - An
Acid	Red 5	14905	O - An
Acid	Red 24	16140	O - T
Acid	Red 26	16150	-
Acid	Red 73	27290	p - Aab
Acid	Red 85	22245	B
Acid	Red 114	23635	T
Acid	Red 115	27200	O - A
Acid	Red 116	26660	p - Aab
Acid	Red 128	24125	D
Acid	Red 148	26665	O - A
Acid	Red 150	27190	p - Aab
Acid	Red 158	20530	O - T
Acid	Red 167	-	T
Acid	Red 264	18133	O - An
Acid	Red 265	18129	O - T
Acid	Red 420	-	p - Aab
Acid	Violet 12	18075	O - An
Acid	Violet 49	42640	-
Acid	Brown 415	-	O - An
Acid	Black 29	-	B
Acid	Black 94	30336	B
Acid	Black 131	-	O - An
Acid	Black 132	-	O - An
Acid	Black 209	-	T
Azoic	Diazo Component 11	37085	C
Azoic	Diazo Component 12	37105	2-A-4-N
Azoic	Diazo Component 48	37235	D
Azoic	Diazo Component 112	37225	B
Azoic	Diazo Component 113	37230	T
Basic	Red 111	-	p - Aab
Basic	Red 42	-	O - An
Basic	Brown 4	21010	2,4 - T
Developer 14 = Diazotan			
Direct	Yellow 1	22250	B
Direct	Yellow 24	22010	B
Direct	Yellow 48	23660	T
Direct	Orange 1	22370	B
Direct	Orange 6	22375	T
Direct	Orange 7	20000	T
Direct	Orange 8	22130	B
Direct	Orange 10	23370	T
Direct	Orange 108	29173	T
Direct	Red 1	22310	B
Direct	Red 2	23500	T
Direct	Red 7	24100	D
Direct	Red 10	22145	B
Direct	Red 13	22155	B
Direct	Red 17	22150	B
Direct	Red 21	23560	T
Direct	Red 22	23565	T
Direct	Red 24	29185	O - A
Direct	Red 26	29190	O - An
Direct	Red 28	22120	B
Direct	Red 37	22240	B
Direct	Red 39	23630	T
Direct	Red 44	22500	B
Direct	Red 46	23050	DcB
Direct	Red 62	29175	O - T
Direct	Red 67	23505	T
Direct	Red 72	29200	O - AN
Direct	Violet 1	22550	B
Direct	Violet 12	22550	B
Direct	Violet 21	23520	T
Direct	Violet 22	22480	B
Direct	Blue 1	24410	D
Direct	Blue 2	22590	B

Table 6
List of banned dyes[6]

CI Generic name		CI No.	Diazo component
Direct	Blue 3	23705	T
Direct	Blue 6	22610	B
Direct	Blue 8	24140	D
Direct	Blue 9	24155	D
Direct	Blue 10	24340	D
Direct	Blue 14	23850	T
Direct	Blue 15	24400	D
Direct	Blue 22	24280	D
Direct	Blue 25	23790	T
Direct	Blue 35	24145	D
Direct	Blue 53	23860	-
Direct	Blue 76	24411	D
Direct	Blue 151	24175	D
Direct	Blue 160	-	D
Direct	Blue 173	-	D
Direct	Blue 192	-	D
Direct	Blue 201	-	D
Direct	Blue 215	24115	D
Direct	Blue 295	23820	T
Direct	Green 1	30280	B
Direct	Green 6	30295	B
Direct	Green 8	30315	B
Direct	Green 8	-	B
Direct	Green 85	30387	T
Direct	Brown 1	30045	B
Direct	Brown 1 2	30110	B
Direct	Brown 2	22311	B
Direct	Brown 6	30140	B
Direct	Brown 25	36030	B
Direct	Brown 27	31725	B
Direct	Brown 31	35660	B
Direct	Brown 33	35520	B
Direct	Brown 51	31710	B
Direct	Brown 59	22345	B
Direct	Brown 79	30056	B
Direct	Brown 95	30145	B
Direct	Brown 101	31740	B
Direct	Brown 222	30363	T
Direct	Brown 154	30120	B
Direct	Black 4	30245	B
Direct	Black 29	22580	B
Direct	Black 38	30235	B
Direct	Black 91	30400	D
Direct	Black 154	-	T
Disperse	Yellow 7	26090	p - Aab
Disperse	Yellow 23	26070	p - Aab
Disperse	Yellow 56	-	p - Aab
Disperse	Orange 149	-	p - Aab
Disperse	Red 151	26130	p - Aab
Disperse	Blue 1	64500	-

Abbreviations of the arylamines which can be released by the listed banned azo dyestuffs.[6]

O - A	:	o-Aminoazo toluene (III A2)
p - Aab	:	p - Amino azo benzene (III A2)
O - An	:	2 - Methoxyaniline (III A2)
2-A-4-N	:	2 - Amino - 4 - nitrotoluene (III A2)
B	:	Benzidine (III A 1)
C	:	4 - Chloro - o - toluidine (III A1)
D	:	3,3' - Dimethoxy benzidine (III A2)
DcB	:	Dichlorobenzidine (III A2)
N	:	2 - Naphthylamine (III A1)
O-T	:	o-Toluidine (III A2)
T	:	3,3'-Dimethyl benzidine (III A2)
2,4'-T	:	4-Methyl-1,3-phenylene diamine(III A2)

(Without guarantee of completeness).

leads to tumour formation. The reduction products are electrophilic and are covalently bonded to the nucleic acid of DNA resulting in DNA damage and hence inducing cancer.

* The entire mechanism of action may be represented as follows:

Schematic representation of the synthesis and reductive splitting, of azo dyestuffs

Reductive cleavage:

$$\underset{\text{Azo dyestuff}}{R - N = N - R'} \xrightarrow[\text{or enzymatic action (azo cleavage)}]{\text{reductive conditions}} \underset{\text{Aromatic amines}}{R\text{-}NH_2 + R'\text{-}NH_2}$$

Covalent bonding to the nucleic acid bases of DNA :

$$\underset{\text{Aromatic amine}}{R\text{-}NH_2} \xrightarrow{\text{Oxidation}} RNHOH \xrightarrow{pH < 7} RNOH_2 \longrightarrow \underset{\text{covalent bonding to nucleophilic sites on DNA}}{RNH^+}$$

Table 8
Effects of the chronic administration of the primary amines on the blood, liver and bladder of dogs

Aromatic amines	Metheno globin formation	Toxicity and / or carcino-genesis (Liver)	Bladder carcino-genesis
4-Amino biphenyl	+++	—	+++
2-Naphthylamine	+	—	++
1-Naphthylamine	—	—	—
Benzidine	—	—	+
Aniline	++	—	—
Dichlorobenzidine	—	+	++
Methylene dianiline	—	+++	+-b*
4,4'-Methylene bis-(2-Methyl aniline)	—	+	+
4-Amino-bipnenyl amine	—	++	+-b*
4,4'-Methylene bis-(2-chloroaniline)	—	-	+-

Abbreviations: b* : Short term exposure limit (15Min)
+ : Cancer caused

Table 7
[Contd. from 15th April, 1996]

CI Generic name			CI No.
Pigment	yellow	12	21090
Pigment	yellow	13	21100
Pigment	yellow	14	21095
Pigment	Yellow	15	21220
Pigment	yellow	16	20040
Pigment	yellow	17	21105
Pigment	yellow	55	21096
Pigment	yellow	63	21091
Pigment	yellow	77	20045
Pigment	yellow	87	21107.1
Pigment	yellow	114	21092
Pigment	yellow	124	21107
Pigment	yellow	126	21101
Pigment	yellow	127	21102
Pigment	yellow	152	21111
Pigment	yellow	170	21104
Pigment	yellow	171	21106
Pigment	yellow	174	21098
Pigment	yellow	176	21103
Pigment	yellow	186	21094
Pigment	Orange	13	21110
Pigment	Orange	14	21165
Pigment	Orange	15	21130
Pigment	Orange	15	21135
Pigment	Orange	16	21160
Pigment	Orange	31	20050
Pigment	Orange	34	21115
Pigment	Orange	44	21162
Pigment	Orange	50	21070
Pigment	Red	37	21205
Pigment	Red	38	21120
Pigment	Red	39	21080
Pigment	Red	41	21200
Pigment	Red	42	21210
Pigment	Red	62	23295
Pigment	Blue	25	21180
Pigment	Blue	26	21185
Pigment	Brown	22	10407

Eco-awareness and eco-standards

Eco-friendliness is very much essential in every industry and there is no escaping from it. The industries engaged in export, whether textiles, garments or chemicals have to quickly learn to reset their priorities[10].

Eco-standards regarding industrial production and processing are gaining ground as an instrument of environmental policy. It is of vital importance to the developing economics as the exports will need to conform to the prescribed eco-standards of the importing countries. Besides, the developing countries subscribing to the International Environmental Agreement must adopt new eco-standards for selected industries[5].

Availability of safe alternatives

About 80% of the banned dyes have safe alternatives and rest can be matched to the nearest shade with

Eco-standards regarding industrial production and processing are gaining ground as an instrument of environmental policy. It is of vital importance to the developing economics as the exports will need to conform to the prescribed eco-standards of the importing countries.

Ban on dyes & ecological approach

Table 9
List of the carcinogenic diazo compounds

Industrial chemical	IARC	ACGIH	DFG
4-Amino biphenyl	H	H	H
Benzidine	H	H	H
3,3' - Dichloro benzidine	S	S	S
3,3' - Dimethoxy benzidine	S	-	-
2-Naphthylamine	H	H	H
4,4' - Methylene dianiline	-	S	S
4,4' - Methylene bis-(2-Methyl aniline)	-	-	S
4,4' - Methylene bis-(2-Chloro aniline)	-	S	S
2-Amino azo toluene	-	-	S
N - Phenyl - 2 - naphthylamine	-	S	-
O - Toluidine	S	S	-
P - Toluidine	-	S	-

Abbreviations :

IARC International Agency for Research on cancer
ACGIH American conference of Governmental Industrial Hygienisss
DFG Deutsche for Schungs Gemainschaff
H Human carcinogen, based on epidemiological evidence
S Suspected human carcinogen, based on good animal evidence, plus available epidemiological evidence

(Without guarantee of completeness)

the other dyes. However, their cost may be usually higher[11]. The chemical constitution of the dyes/pigments and other information given in the Colour Index help in identifying a substitute/alternative for dyestuffs which may be required to be replaced or avoided. The alternatives could be from the same class of dyes, eg alternatives for an acid dye may from an acid dye itself. Inter-class alternatives are also possible, eg, an alternative for a direct dye may be from the reactive dye.

In printing, the latest trend shows a shift towards use of pigments. It is estimated that more than 70% will be the share of pigments from 1996 onwards. Amine-free intermediates for the manufacture of dyes and pigments will be given top priority. There is also a mad rush for the search of safe alternatives to the banned/toxic chemicals. Table 14 gives some of the suggested alternatives in the textile processing.

Table 10
Toxic compounds used in textile processing

Nature	Uses
Carbon tetrachloride	For cleaning textiles, solvent for fats, oils
Ethylene dichloride (Ozone depleting chemical)	solvent for fats, oils, rubber, cellulose acetate fumigant.
Hexachloro butadiene	Solvent for elastomers, wash liquor to remove > C_4 hydrocarbons
Pentachlorophenol (PCP)	Preservatives for starches, dextrines, glues, fungicides, cotton/rot proofing agent
Pentachlorobiphenyl (PCB)	Plasticiser, carriers, adhesives, fire retardant, pesticides extenders.

Table 11
Chemicals likely to be banned on textiles as ozone-depleting substances

Name	Structure	Uses
Trichloro ethane	1, 1, 1 Trichloroethane	Solvent Aerosol Propellant
Halon	Hexafluroethane	Aerosol Propellant Refrigerant
CFC	Chloro fluro compounds	Aerosols Refrigerant Scouring, Dispersing Emulsifying Agents

Testing of these amines[7]

There are many methods available for testing the aryl amines. They are:

1. Infra Red (IR) Spectroscopy.
2. Nuclear Magnetic Resonance (NMR) Spectroscopy.
3. Gas Chromatography(GLC or GSC) and/or Mass Spectroscopy.
4. Chromatography (TLC, HPTLC and/or HPLC).

1. Fourier Transform-Infrared Spectrophotometer

This instrument is effectively used for spectral analysis of various dyestuffs and dye intermediates both qualitatively and quantitatively. Arylamines, mainly 2-naphthylamine, benzidine, etc are found to be carcinogenic substances which can be estimated on their extraction from dyed substrates or waste water using the instrument.

2. Nuclear Magnetic Resonance Spectrophotometer

This is another important tool for spectral diagnosis of various chemicals and dyes. Complete spectral analysis is only possible when FT-IR data is related to the NMR spectral data.

3. Gas Chromatography

Internal Standard

The internal standard technique requires that all samples and standards be spiked with the fixed amount of a substance called internal standard. Chromatograms for each concentration level of the known standard are run with the peak areas for both the standard and internal standard. The ratio of peak area of each compound divided by the peak area for the internal standard is calculated. The ratio is plotted against the known concentrations of each compound.

External Standards: This method uses the area under different peaks.

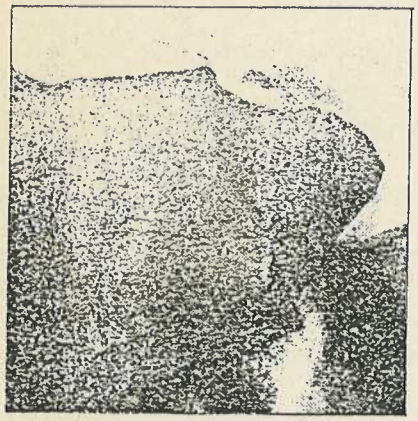
Gas Chromatography coupled with Mass Spectra (GC-MS)

Most of the arylamines can be easily determined quantitatively by using GC coupled with MS. Amines are usually reacted with acids or anhydrides to convert them into amides which are then analysed first by GC with an electron capture detector followed by their molecular weight determination by MS.

4. Chromatography

i) TLC Method

This method is rapid, simple and inexpensive. TLC is used for the identification of dyes and assessment of their purity. Although most separations have been carried out with



silica gel as an adsorbent, or stationary phase, cellulose powder and alumina have also been used. In the absence of water, the mechanism of separation is considered to be one of selective absorption of the components in the mixture, eg, solid-liquid chromatography. In the presence of water, especially for cellulose adsorbents, the mechanism is seen as a partition between the eluent and adsorbed water—a case of liquid-liquid chromatography. However, TLC does not give accurate results when the quantities of amines present are in ppm or ppb levels.

ii)High performance liquid chromatography (HPLC)

The simplest way to identify a component in a chromatogram is to compare its retention time with that of a standard substance under the same experimental conditions. Identical retention times are indicative of identical substances. To use this method one must be able to measure the retention time of the peak with the necessary degree of accuracy.

Table 12
Chemicals phased-out from textile processing[33]

Chemical	Use
*Benzidine	Dye intermediate
Benzopyrine	Dye intermediate
Hexachloropentadiene	Dye intermediate
Chloro Aniline	Dye intermediate
Dichloro Aniline	Dye intermediate
Thiram	Bacteriostatic/insecticide
Trichloro Phenoxy Acetic acid	Bacteriostatic/insecticide
Toxaphine (chlorinated camphene)	Bacteriostatic/insecticide
Dibutyl phthalate	Plasticizer
Tributyl phosphate	Plasticizer
Chlorinated Paraffins	Plasticizer flame retardant
Octachloro styrene	Plasticizer flame retardant
Polychlorinated Teronenyls	Plasticizer flame retardant
Tetrachloro Dibenzo-p-Dioxin	Plasticizer flame retardant
Nonyl phenol etnoxylates	Surfactant in processing
Arsenic compounds	Miscellaneous uses
Fluorides	Miscellaneous uses
Xanthanates	Miscellaneous uses
Decabromo diphenyl ether	Flame retardant
Dichloro toluene	Carrier
Trichloro benzene	Carrier

Initially, the samples of the Forbidden Amines (20 in all) should be procured and after dissolving in suitable solvents, they are analysed and their Rf values calculated. These Rf values may be kept as reference values. Using this information the

Table 13
Testing methods for toxproof label[33]

Parameter	Testing procedure
pH of aqueous extract	ISO 3071
Dye-stuffs that can release carcinogenic arylamines	Reduction DC OSA 2.516.217
Formaldenyde	Law-112/DNPH-method
Glyoxal	DNPH-method
Odour	DIN 10995
Chlorinated organic carriers, flame retardants and biocides	Extraction/GC
Heavy metals (soluble)	
Arsenic, lead, Antimony and cadmium	Extraction by use of artificial acid sweat Solution according to DIN 54020, determination by ICP-OES/AAS
Chromium VI	Cr (VI), DIN 38 405-D-24
Pesticides-	
Insecticides	Extraction
Herbicides	DIN 38407-F_1/HPLC
Chlorinated Phenols	
Pentachlorophenol	DFG, B_2, Biol. Mat.
Fastness	
Alkaline perspiration	DIN 54030
Acid perspiration	DIN 54020
Washing 40°C	DIN 54017
Rubbing, dry & wet	DIN 54021
Water	DIN 54006
Saliva and perspiration	DIN 53160

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Table 14
Some of the suggested alternatives in the textile processing

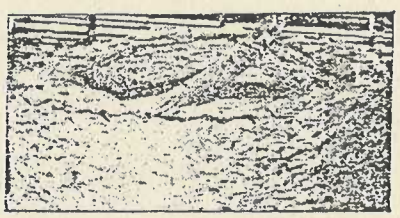
Chemical used at present	Suggested alternative
Banned azo dyes	Safe dyes, pigments
Chlorine bleaching	Peroxide bleaching
Acetic acid	Formic acid
Starch based warp sizes	Synthetic ones like PVA & acrylates
Kerosene in pigment printing	Synthetic thickeners based poly-carboxylic acids
PET/cotton two stage dyeing	Single class dyes like indigosols, pigments
Carding oils and antistatic lubricants	Non-ionic emulsifiers
Formaldehyde	Polycarboxylic acid
Pentachloro phenol(PCP)	Benzothiozol, Neem based products
Alkyl phenol ethoxylates	Fatty alcohol ethoxylates
Sodium sulfide	Glucose based reducing formulations
Metal complex dyes	Reactives, natural dyes & acid dyes

unknown amines can be identified.

The usual method of quantifying the chromatogram is by measuring the peak height or peak area. This assumes a proportionality between height or area in the chromatogram and concentration of the respective amine. This proportionality is determined by injecting known concentrations of the sample and measuring the peak or area. A calibration graph, ie, a plot of peak area (or height) vs concentration is then constructed from which the amount of amine present can be found out. These methods are fully automated by using integrated computerised facilities, and hence are more accurate and reliable.

5. UV-VIS Spectrophotometer

Amines can be detected and determined quantitatively after reacting them with certain colour forming reagents. Wavelength maxima and molar absorbance values need to be considered for this purpose. The equipment is useful in various



measuring modes. The data can be processed in a short time for a large number of samples even for very small sample sizes.

Conclusion

Alternatives for banned dyes have to be immediately found out. Some of the dyestuff manufacturers have already taken up this job, but in the absence of sufficient information, awareness about their use has not become widespread. Moreover, the prices of these new dyes may be higher than the respective banned dyes.

The Division of Technology of Fibres and Textile Processing, UDCT, Mumbai, has done exhaustive work in this direction. It has identified the list of pigment dyes that could be brought into the banned list in future. Safe alternatives of a large number of banned dyes have been identified and further work in this direction is on.

The exporters of textiles should take a serious note of the development and phase out the use of such dyes and chemicals in their textile products. No dye/chemical/auxiliary should be purchased unless it is supplied with the safety data sheet containing all the disclosures (including C I numbers for dyes) so that the prohibited dyes may be avoided. The manufacturers of dyes/chemicals/auxiliaries have a great responsibility. They should phase out the manufacture of prohibited products and substitute them with safer alternatives. The exporters/processors could also get their export consignments tested for presence/absence of banned dyes from reputed institutions to facilitate uninterrupted export obligations.

Table 15
Details of equipments required for the testing of eco-parameters[12]

Eco-parameter	Equipment required
Dyestuffs which release amines (carcinogenic)	IR, NMR, GC, GSC/GC-MS, TLC/HPTLC/HPLC
Fastness to perspiration	Perspirometer
Fastness to water	Laundrometer
Presence of heavy metals	Atomic absorption spectrophotometer
Free formaldehyde content	UV-Visible spectrophotometer
Presence of pesticides	Gas chromatography with mass spectrophotometer FTIR
Presence of pentachloro-phenol (PCP)	Gas chromatography with mass spectrophotometer High performance liquid chromatography
Biological oxygen demand Chemical oxygen demand	BOD and COD monitors

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Annex C

German Test Methods

Bundesinstitut für gesundheitlichen Verbraucherschutz und Veterinärmedizin

Preliminary Method for the Proof of the Use of Prohibited Azo Dyes on Coloured Textiles

This method has been developed according to § 35 LMBG by the working group "analysis of prohibited azo dyes" (chairperson Gabriele Schneider).

1. Purpose and Application

The method presented describes a method for the detection of the use of prohibited azo dyes in the means of the German regulations for consumer goods (Bedarfsgegenständeverordnung, BGVO) in the production and process of coloured textiles, especially those of cellulose and protein fibres (cotton, viscose, wool, silk). For the detection of prohibited azo dyes on synthetic fibres of polyester and polyacrylonitrile , additional steps (e.g. extraction of the sample with a suitable organic solvent) that are not described here, could be necessary.

2. Definition

The prohibited azo dyes are those, which can release the amines given in appendix 1 number 7 BGVO by splitting up their azo groups.
According to present scientific knowledge, the use of prohibited azo dyes in the production and treatment of textile objects is proofed if under the conditions of this method (cf. 6.2), the dyed textile object or part of it eliminates one of the following amines and if the concentration determined for a single amine exceeds 30 mg/kg.

1. 4-aminobiphenyl (CAS No: 92-67-1)
2. benzidine (CAS No: 92-87-5)
3. 4-chloro-o-toluidine (CAS No: 95-69-2)
4. 2-naphthylamine (CAS No: 91-59-8)
5. p-chloroaniline (CAS No: 106-47-8)
6. 2,4-diaminoanisole (CAS No: 615-05-4)
7. 4,4´-diaminobiphenyl methane (CAS No: 101-77-9)
8. 3,3´-dichlorobenzidine (CAS No: 91-94-1)
9. 3,3´-dimethoxybenzidine (CAS No: 119-90-4)
10. 3,3´-dimethylbenzidine (CAS No: 119-93-7)
11. 3,3´-dimethyl-4,4´-diaminobiphenylmethane (CAS No: 838-88-0)
12. p-cresidine (CAS No: 120-71-8)
13. 4,4´-methylene-bi-(2-chloroaniline) (CAS No:101-14-4)
14. 4,4´-oxydianiline (CAS No:101-80-4)

15. 4,4´-thiodianiline (CAS No: 139-65-1)
16. o-toluidine (CAS No: 95-53-4)
17. 2,4-toluylenediamine (CAS No: 95-80-7)
18. 2,4,5-trimethylaniline (CAS No: 137-17-7)

According to this method, prohibited azo dyes, which can form the amines given in the BGVO o-aminoazotoluene and 2-amino-4-nitrotoluene by splitting up their azo group, are determined by the amines o-toluidine or 2,4-toluylenediamine.

When after the reductive splitting according to 6.2. 2-naphthylamine occurs in a concentration of more than 30 mg/kg, it is not possible to proof the use of prohibited azo dyes securely without gathering further information, e.g. the chemical structure of the used dyes.

3. Short description of the method

In an aqueous citrate buffered solution (pH = 6), the textile sample is treated with sodium dithionite at 70 °C in a closed flask. The amines released by reductive splitting-up, are transmitted into a tert-butyl methyl ether phase by liquid-liquid extraction using Extrelut columns. The butyl methyl ether is evaporated in a rotary evaporator, and the residue is taken up in methanol or ethyl acetate, depending on the method of determination.

The amines are determined by high pressure liquid chromatography with a diode array detector (HPLC/DAD), thin layer chromatography (TLC,HPTLC) with densitometric quantification, capillary gas chromatography with flame ionization detector or a mass specific detector (GC/FID or MSD) or with capillary electrophoresis with diode array detector (CE/DAD).
It is necessary to identify the amines by at least two different methods of chromatographic separation in order to avoid possible mis-interpretation caused by interfering substances (e.g. position isomers of the amines that are to be identified) and thus false results.

Note concerning safety provisions:
The amines mentioned above are among the substances that are known to be or seen to be carcinogenic for men (see German regulations for occupational health: MAK-list III A1 and A 2). Therefore, special caution and measures for health care are necessary when working with these substances.

4. Chemicals

If not mentioned, reagent-grade chemicals are to be used:

4.1 methanol
4.2 ethyl acetate
4.3 tert-butyl methyl ether
4.4 citrate buffer solution, 0.06 M, pH 6 (e.g. Merck Art.-No. 1.09437.1000), warmed up to 70 °C
4.5 aqueous sodium dithionite solution c = 200 mg/ml, prepared freshly
4.6 Extrelut® 20 (Merck Art.-No. 11.738)
4.7 amines 1 to 18 according to No. 2 of this method (highest commercial quality)
4.8 calibrating solution K of the amines
4.8.1 for HPTLC/densitometry, K(D): (KD) 1, K(D) 3-K(D)18: c = 20 to 200 µg amine / ml ethyl acetate; K(D)2: c = 10 to 100 µg amine / ml ethyl acetate; prepared of the methanolic stock solution with contents of 1.0 mg amine / ml
4.8.2 for HPLC and GC, K(H/G): K(H/G) 1, K(H/G) 3, K(H/G)5 - K(H/G) 18: c = 15.0 µg amine / ml methanol; K(H)2 and K(H) 4: c = 7.5 µg amine / ml methanol; K(G) 2 and K(G) 4: c = 15.0 µg amine / ml methanol
4.8.3 for CE, K(E): K(E)1-K(E)18: c = 15.0 µg amine / ml methanol
4.8.4 for checking the method, K(V): methanolic solution of an amine mixture that contains the amines 2,5,7,8,9,10,16 and 17 in a concentration of c = 15.0 to 400 µg / ml each. The concentration depends on the amine and the way of determination.

Note: Methanolic amine solutions can be kept in amber glass bottles at refrigerator temperature for two weeks.

5. Special Equipment

5.1 30-ml-reaction vessel made of temperature-resistant glass with screw cap, height 10 cm, diameter 2.5 cm (e.g. Pyrex-Glas: order No. 61159 of QVF-Glastechnik GmbH, P.O.Box 1303, 65091 Wiesbaden)
5.2 water bath, drying oven or digestion block, all with thermostat
5.3 Extrelut® 20, prepared columns (Merck Art.-No. 11737)
5.4 vacuum rotary evaporator
5.5 pipettes: 20-ml-piston-type measuring pipette, 1-ml-Eppendorf pipette, 1-5-ml-Eppendorf pipette
5.6 100 ml round bottom flask with grinding NS 29/32
5.7 microliter pipettes
5.8 equipment for TLC or HPTLC, including ultraviolet box
5.9 instrumental equipment
5.9.1 HPLC with DAD or
5.9.2 GC with FID or MSD or

5.9.3 CE with DAD or
5.9.4 densitometer

6. Analytical Procedure

6.1 Preparation of the sample

Depending on the sample, ca. 10 g of the textile is cut down to pieces of about 25 sq. mm in an appropriate way and mixed. From this mixture, a representative sample of 1.0 g is weighed into the reaction vessel for the analysis. When taking a sample of coloured pieces and pieces made of different textile parts, these different parts (different colours and / or fibres) must be taken equally or separately.

6.2 Reductive splitting

The buffer (4.4) is warmed to 70 ± 2 °C and 17 ml of it is added to the sample. The reaction flask is closed and after short heavy shaking kept at 70 ± 2 °C in a drying oven or water bath for 30 min. All fibres should be covered with the solution.
Then the reaction flask is opened, 3.0 ml of the aqueous sodium dithionite solution (4.5) are added, the flask is sealed and shaken heavily. The flask is immediately kept at 70 ± 2 °C for additional 30 ± 2 min. Then it is cooled down to room temperature within 2 min.

6.3 Separation and Concentration of the Amines

Squeezing out the fibres with a glass rod, the solution is decanted on the Extrelute column. After 15 min it is eluated with 2 x 40 ml tert-butyl methyl ether. The eluate is collected in a 100 ml round bottom flask with grinding. The first 40 ml, split up into 2 x 10 and 1 x 20 ml portions, are used to wash the fibres before being poured on the column. 10 ml tert-butyl methyl ether are given onto the fibres immediately after decanting. The reaction flask is closed and shaken strongly. After the exposure time of the reaction solution on the Extrelute column, the tert-butyl methyl ether is decanted onto the column. This step is repeated with 10 and 20 ml tert-butyl methyl ether. Then 40 ml tert-butyl methyl ether are given directly onto the column. Usually, the eluate is clear and needs no further drying.
The tert-butyl methyl ether is boiled down to 1 ml (not to dryness) in a rotary evaporator with light vacuum at 50 °C maximum. It is then blown-off to dryness with a weak stream of inert gas.
The residue is immediately taken up with 2.0 ml methanol or with 2.0 ml ethyl acetate for TLC, HPTLC and without delay analyzed by TLC, HPTLC and / or instrumentally. In case of delay, the sample must be stored deep frozen.

7. Conditions for Thin Layer Chromatography (example)

chromatoplates (HPTLC): silica gel 60 F254 HPTLC, e.g. Merck Art.-No. 5548, 20 x 10

applied volume: 2.0 - 5.0 µl, dot-like
solvent 1: chloroform / acetic acid in the ratio of 90 + 10 parts by volume
chromatoplates (TLC): silica gel 60, e.g. Merck Art.-No. 5642, 20 x 10
applied volume: 10.0 µl, in a stroke, for the densitiometric evaluation with automatic applicator
solvent 2: chloroform / ethylacetate / acetic acid in the ratio of 60 + 30 + 10 parts by volume
solvent 3: chloroform / methanol in the ratio of 95 + 5 parts by volume
solvent 4: n-butyl acetate / toluene in the ratio of 30 + 70 parts by volume
development: saturated chamber

chromatoplates (TLC): silica gel 60, e.g. Merck Art.-No. 5175, 20 x 20
solvent 2: chloroform / ethylacetate / acetic acid in the ratio of 60 + 30 + 10 parts by volume
solvent 3: chloroform / methanol in the ratio of 95 + 5 parts by volume
(3 after 2 without drying the chromatoplates)
spray reagent 1: $NaNO_2$, 1% in 1 M HCl
spray reagent 2: 1-naphthol, 0.2 % in 1 M KOH
detection: 1. ultraviolet lamp
after spraying with spray reagent 1 and 2 in succession, reaction time 5 min
The considerably reliable identification is only possible if several systems of chromatographic separation are used; it might be necessary to use all systems.

8. Instrumental Conditions (examples)

8.1 HPLC

equipment: e.g. HP 100 (Hewlett Packard)
stationary phase: LiChrosorb 60 RP-select B® (5µm); 250 x 4.6 mm, e.g. M & W, Berlin Art.-No. 254671005
eluent 1: methanol
eluent 2: 0.575 g ammonium dihydrogenphosphate + 0.7 g disodium hydrogenphosphate in 1000 ml water, pH 6.9
gradient: start 15 % eluent 1, within 45 min linearly to 80 % eluent 1
flow: 0.8 - 1.0 ml /min
temperature of the column: 40 °C
volume injected: 10µl
detector: DAD with 240 nm, 280 nm and 305 nm
Results secured by comparison of spectra
(chromatogram of the amines mentioned in part 2, cf. fig. 2)

8.2 GC

equipment: e.g. HPGC 5890 with autosampler 7673 A
capillary column: PVMS / 54 (Perkin Elmer, PE-No. 698356), equivalent to SE 54 or DB 5, length 50 m, i.d.:0.32 mm; thickness of layer: 0.30 μm
injector system: splitless/split
temperature of injector: 250 °C
carrier gas: hydrogen
temperature program: 60 °C (1 min), 60 to 220 °C (8°C/min), 220 to 260 °C (2°C/min), 260 °C (5 min)
detector: FID or MSD
volume injected: 1μl, splitless 1 min.
(chromatogram of the amines mentioned in part 2 cf. fig.2)

8.3 Capillary Electrophoresis

equipment: e.g. HP 3DCE (Hewlett-Packard)
capillary 1: 56 cm, uncoated, 50μm i.d. with extended light path (HP)
capillary 2: 56 cm, coated with polyvinyl alcohol 50 μm i.d. with extended light path (HP)
voltage: 30 kV
buffer: phosphate buffer 50 mM, pH 2.5
solution for injection: 200 μl mixed with 100μl 0.01 M HCl and filtered by a membrane filter
time of injection: 4 sec
rinse: 5 sec
detector: DAD with 210 nm and 214 nm, results secured by comparison of spectra
(electropherogram of the amines mentioned in part 2 cf. fig. 3a [capillary 1] and 3b [capillary 2])

8.4 Densitometry

instrument: e.g. CD 60 (DESAGA)
modus: remission measurement
wavelength: 480 - 530 nm, depending on the amine analyzed.

9. Check of the Analytical System

In order to check the method, 1.0 ml of the calibration solution K(V) (4.8.4) is given into a reaction vessel (5.1), which contains 16 ml of the pre-warmed buffer (4.4). It is then

examined as described from chapter 6.2 onwards. The recovery of the amines should amount to at least 70 %.

10. Evaluation

10.1. Calculation

The amine content is calculated by the peak areas of the single amine components. The amine content is given as part by mass w in mg single component per kg product according to the following equation:

$$w(\text{amine component}) = (A(P) \times c(Kn) \times V) / (A(Kn) \times E)$$

A (P): peak area sample
A (Kn): peak area calibration solution of amines n =1 to 18
c: concentration [μg/ml]
V: volume [ml], to which the sample is made up according to 6.3 (final sample volume)
E: share of the weighed portion in the final sample volume [g]
w: part by mass

10.2 Reliability of the method

Reliability and comparability of the method are determined by a collaborative trial. The appraisal made in chapter 12 is used till the final determination of these parameters.

11. Report

The report has to include the following with reference to this method:

- name, origin and kind of the product examined, if necessary the examined part of the product
- variation of the method, especially additional steps
- description of the applied method of separation, detection and determination

With single amine contents $\leq$ 30 mg / kg :
"According to the extent of the examination, no azo dyes prohibited according to BGVO were detectable in the object presented"

With single amine contents > 30 mg / kg :
name of the amine component(s) > 30 mg / kg
"According to the analytical result it is proceeded that in the production or treatment of the object presented azo dyes that are banned according to BGVO have been used." In

case of 2-naphtylamine > 30 mg/kg cf. chapter 2, last sentence.

12 Further Details to the Validation of the Method

The method has been tested with four defined test tissues in a statistic pre-test with seven laboratories involved. Eight to nine single values per tissue were used for the statistic evaluation (tab. 1).
The recovery of the amines 2,5,7,8,9,10,16 and 17 in the calibration solutions has been tested by six laboratories (tab. 2).

Prüfung von Leder

Nachweis bestimmter Azofarbstoffe in Leder

DIN 53316

ICS 59.140.30

Deskriptoren: Prüfung, Leder, Azofarbstoff, Nachweis

Testing of leather — Determination of certain azocolourants in leather

Essais du cuir — Détermination de la teneur en colorants azoïques du cuir

Vorwort

Diese Norm wurde vom Arbeitsausschuß NMP 552 "Chemische Prüfverfahren von Leder" gemeinsam mit der Arbeitsgruppe Bedarfsgegenstände der Lebensmittelchemischen Gesellschaft, Fachgruppe der Gesellschaft Deutscher Chemiker (GDCh), ausgearbeitet und erprobt.

Das Verfahren ist weitgehend an das in der Amtlichen Sammlung von Untersuchungsverfahren nach § 35 LMBG für gefärbte textile Bedarfsgegenstände veröffentlichte Verfahren angelehnt, aber nicht vollständig damit identisch.

Die von der Arbeitsgruppe "Analytik verbotener Azofarbstoffe" der Kommission nach § 35 LMBG des Bundesinstituts für den gesundheitlichen Verbraucherschutz und Veterinärmedizin (BgVV) bei der Entwicklung für Textilien gemachten Erfahrungen wurden in dieser Norm berücksichtigt.

Aufgrund der Anforderungen aus der zweiten Verordnung zur Änderung der Bedarfsgegenständeverordnung (BGV), in der die Verwendung von Azofarbstoffen, die bestimmte aromatische Amine freisetzen können, verboten wurde, war die Entwicklung eines entsprechenden Nachweisverfahrens dringend erforderlich geworden.

1 Anwendungsbereich

Das in dieser Norm festgelegte Prüfverfahren dient zum Nachweis der Verwendung bestimmter Azofarbstoffe in Leder. Die Verwendung dieser Azofarbstoffe bei der Herstellung oder Behandlung von Bedarfsgegenständen ist durch die Bedarfsgegenständeverordnung verboten.

2 Normative Verweisungen

Diese Norm enthält durch datierte oder undatierte Verweisungen Festlegungen aus anderen Publikationen. Diese normativen Verweisungen sind an den jeweiligen Stellen im Text zitiert, und die Publikationen sind nachstehend aufgeführt. Bei datierten Verweisungen gehören spätere Änderungen oder Überarbeitungen dieser Publikationen nur zu dieser Norm, falls sie durch Änderung oder Überarbeitung eingearbeitet sind. Bei undatierten Verweisungen gilt die letzte Ausgabe der in Bezug genommenen Publikation.

DIN 53302-2
Prüfung von Leder — Probenahme für chemische Prüfungen

DIN 53303-2
Prüfung von Leder — Probenvorbereitung — Zerkleinern von Probestücken und Herstellen einer Durchschnittsprobe für chemische Analysen

Gesetz über den Verkehr mit Lebensmitteln, Tabakerzeugnissen, kosmetischen Mitteln und sonstigen Bedarfsgegenständen (Lebensmittel- und Bedarfsgegenständegesetz — LMBG)

Bedarfsgegenständeverordnung vom 10. April 1992, zuletzt geändert durch die 4. Verordnung zur Änderung der Bedarfsgegenständeverordnung vom 20. Juli 1995

Amtliche Sammlung von Untersuchungsverfahren nach § 35 LMBG, Band II/1, Verfahren B 82.02-2

3 Definitionen

Für die Anwendung dieser Norm gelten die folgenden Definitionen:

3.1 Bestimmte Azofarbstoffe: Azofarbstoffe, die durch Aufspaltung einer oder mehrerer Azogruppen eines der nachfolgenden Amine bilden können. Die Verwendung dieser Azofarbstoffe ist nach Bedarfsgegenständeverordnung verboten.

Fortsetzung Seite 2 bis 5

Normenausschuß Materialprüfung (NMP) im DIN Deutsches Institut für Normung e.V.

Ref. Nr. DIN 53316 : 1997-03
Preisgr. 06 Vertr.-Nr. 0005

Tabelle 1: Liste der Amine nach Bedarfsgegenständeverordnung

Nr	Chemische Bezeichnung	CAS Nr.
1	4-Aminodiphenyl	92-67-1
2	Benzidin	92-87-5
3	4-Chlor-o-toluidin	95-69-2
4	2-Naphthylamin	91-59-8
5	p-Chloranilin	106-47-8
6	2,4-Diaminoanisol	615-05-4
7	4,4'-Diaminodiphenylmethan	101-77-9
8	3,3'-Dichlorbenzidin	91-94-1
9	3,3'-Dimethoxybenzidin	119-90-4
10	3,3'-Dimethylbenzidin	119-93-7
11	3,3'-Dimethyl-4,4'-diaminodiphenylmethan	838-88-0
12	p-Kresidin	120-71-8
13	4,4'-Methylen-bis-(2-chloranilin)	101-14-4
14	4,4'-Oxydianilin	101-80-4
15	4,4'-Thiodianilin	139-65-1
16	o-Toluidin	95-53-4
17	2,4-Toluylendiamin	95-80-7
18	2,4,5-Trimethylanilin	137-17-7

Verbotene Azofarbstoffe, die durch Aufspaltung von Azogruppen die in der BGV genannten Amine
o-Aminoazotoluol (CAS-Nr. 97-56-3) oder 2-Amino-4-nitrotoluol (CAS-Nr. 99-55-8)
bilden können, werden nach diesem Verfahren über die Amine o-Toluidin bzw. 2,4-Toluylendiamin nachgewiesen.

Nach derzeitigem Kenntnisstand gilt die Verwendung verbotener Azofarbstoffe bei der Herstellung oder Behandlung von Ledern oder Gegenständen aus Leder als nachgewiesen, wenn unter den Bedingungen dieses Verfahrens mindestens eines der oben gelisteten Amine nachgewiesen wurde und der Anteil eines einzelnen Amins über dem Erkennungsschwellenwert von 30 mg/kg liegt. Dieser Wert bezieht sich auf homogenes Material einheitlicher Färbung.

3.2 Erkennungsschwellenwert

Gehalt der nach dem in dieser Norm beschriebenen Verfahren gebildeten Amine, oberhalb dessen aufgrund des analytischen Befundes davon ausgegangen werden muß, daß ein verbotener Azofarbstoff verwendet wurde.

Dieser Wert liegt bei diesem Verfahren bei 30 mg/kg Probe.

Der Erkennungsschwellenwert ist kein toxikologisch begründbarer Grenzwert.

4 Kurzbeschreibung des Verfahrens

Das zerkleinerte Leder wird nach "Entfettung" bei 70 °C in einem geschlossenen System mit Natriumdithionit in Pufferlösung bei pH = 6 behandelt. Die Reduktionslösung wird zusammen mit den Lederfasern einer Flüssig-Flüssig-Extraktion auf einer mit porösem Trägermaterial gefüllten Säule unterworfen und die erzeugten Amine in eine etherische Phase überführt.

Der Nachweis der Amine erfolgt durch Hochleistungsflüssigkeitssäulenchromatographie (HPLC) mit Diodenarray-Detektor (DAD), Kapillargaschromatographie (GC) vorzugsweise mit massenselektivem Detektor (MSD), Kapillarelektrophorese (HPCE) mit DAD und Dünnschichtchromatographie (TLC, HPTLC). Die Quantifizierung erfolgt ausschließlich mit HPLC-DAD.

Die Identifikation der Amine muß durch mindestens zwei verschiedene chromatographische Trennverfahren, z.B. HPLC und GC, erfolgen, um mögliche Fehlinterpretationen durch Störsubstanzen und somit Falschaussagen zu vermeiden.

5 Besondere Geräte und Hilfsmittel

5.1 Gefäße mit 30 ml bis 50 ml Inhalt aus temperaturbeständigem Glas mit dichtem Septumverschluß. Geeignet sind z.B. Schraubflaschen mit durchbohrtem Deckel und teflonbeschichtetem Septum oder Headspace-Probenflaschen mit Bördelkappen.

5.2 Trockenschrank mit Sandbad (zur besseren Wärmeübertragung ist sehr feiner Sand, z.B. Seesand 0,1mm bis 0,3 mm Korngröße, erforderlich) oder Wasserbad mit Thermostatisiermöglichkeit bei 70 °C auf ± 2 °C.

5.3 Thermometer mit einer Fehlergrenze von höchstens 0,1 °C bei 70 °C.

5.4 Säule aus Polypropylen oder Glas mit 25 mm bis 30 mm Innendurchmesser und 140 mm bis 150 mm Länge, Glasfaserfilter am Auslaß, gefüllt mit etwa 20 g porösem, körnigem Kieselgur[1]).

5.5 Medizinische Einmalspritzen mit Kanüle (Polyethylen, Polypropylen), 2 ml.

5.6 Vakuum-Rotationsverdampfer.

5.7 Ultraschallbad mit Heizmöglichkeit (alternativ Schütteltisch).

5.8 Instrumentelle Analytik:

- Automatischer Applikator für TLC und HPTLC;
- Densitometer für Remissionsmessungen für TLC- und HPTLC-Platten;
- Einrichtung zur Entwicklung von TLC- und HPTLC-Platten;
- Kapillarelektrophorese mit DAD;
- Kapillar-Gaschromatograph, Split/splitless-Injektor vorzugsweise mit MS/MSD;
- HPLC mit Gradientenelution mit DAD.

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[1]) Über Bezugsquelle gibt Auskunft: Normenausschuß Materialprüfung (NMP) im DIN Deutsches Institut für Normung e.V., Burggrafenstraße 6, 10787 Berlin, Postanschrift: 10772 Berlin

6 Chemikalien

Wenn nicht anderes angegeben, sind Chemikalien zur Rückstandsanalyse zu verwenden. (Chemikalien für die jeweiligen analytischen Nachweis- und Bestimmungsverfahren sind nicht enthalten.) Wasser muß entweder destilliert oder von entsprechender Reinheit sein.

6.1 Methanol.

6.2 tert-Butylmethylether.

6.3 Natriumdithionit, Reinheit mindestens 87 % nach jodometrischer Bestimmung.

6.4 Natriumdithionitlösung, 200 mg Natriumdithionit (siehe 6.3) /ml, täglich frisch in entlüftetem Wasser angesetzt.

6.5 n-Hexan.

6.6 Amine nach Abschnitt 4 (Referenzen): höchste erhältliche Reinheitsstufe.

6.7 Citrat-Natronlauge-Puffer, pH = 6, vorgewärmt auf (70 ± 5)°C (1000 ml Pufferlösung enthalten 12,526 g Citronensäure und 6,320 g Natriumhydroxid).

6.8 Standardlösung der Amine 1 bis 18 (siehe Tabelle 1) zur Kalibrierung: 15 µg Amin/ml Methanol.

6.9 Standardlösung der Amine 1 bis 18 (siehe Tabelle 1) zur Verfahrenskontrolle: 30 µg Amin/ml Methanol.

6.10 20 %ige methanolische NaOH, 20 g NaOH gelöst in 100 ml Methanol.

7 Probenahme und Probenvorbereitung

An unverarbeiteten Ledern erfolgt die Probenahme soweit möglich nach DIN 53302-2 und die Zerkleinerung der Probe nach DIN 53303-2. Soweit eine Probenahme nach DIN 53302-2 nicht möglich ist, sowie bei der Untersuchung von Ledern aus Fertigerzeugnissen, ist mindestens 1 g homogene Probe zu entnehmen und diese mit einem geeigneten Schneidmesser in Teilchen mit einer Kantenlänge von 3 mm ± 2 mm zu zerteilen und zu durchmischen.

Aus der zerkleinerten und durchmischten Probe werden 1,0 g für die Analyse verwendet. Bei der Entnahme der Analysenprobe von Fertigerzeugnissen ist etwa anhaftender Klebstoff sorgfältig mechanisch zu entfernen.

8 Durchführung

8.1 Entfettung

1,0 g zerkleinerte Lederprobe wird in einem geschlossenen Glasgefäß (siehe 5.1) mit 20 ml n-Hexan im Ultraschallbad bei 40 °C Anfangstemperatur 20 min behandelt. (Alternativ kann auf dem Schütteltisch 20 min mit 50 °C (Anfangstemperatur) warmem n-Hexan intensiv ausgeschüttelt werden.) Das n-Hexan wird vorsichtig unter Vermeidung von Verlusten an Lederprobe dekantiert. Unmittelbar danach wird die Probe nochmals mit 20 ml n-Hexan in gleicher Weise wie oben beschrieben behandelt, vorsichtig dekantiert und die entfettete Probe im offenen, liegenden Glasgefäß über Nacht im Abzug abgelüftet. Sofern die Lederfasern aufschwimmen und ein Dekantieren nicht möglich ist, muß zentrifugiert oder die n-Hexanphase mit einer Pipette oder Spritze abgezogen werden.

8.2 Reduktive Spaltung

Nach dem vollständigen Ablüften des n-Hexan wird 17,0 ml Citrat-Natronlauge-Puffer (siehe 6.7), der auf (70 ± 5)°C vorgewärmt wurde, zur abgelüfteten Probe gegeben.

Das n-Hexan muß vollständig abgelüftet sein, da andernfalls eine zu schlechte Benetzung der Probe mit der wäßrigen Reduktionslösung erfolgt. Gegebenenfalls ist restliches Hexan durch Erwärmen der Weithalsschraubflasche oder Einleitung eines Gasstroms in die Flasche zu entfernen.

Das Gefäß wird mit einem Septum versehen, durch leichtes Umschwenken die Lederprobe mit Pufferlösung benetzt und in einem vorgeheizten Sandbad im Trockenschrank oder in einem vorgeheizten Wasserbad auf (70 ± 2) °C erwärmt ((25 ± 5) min). Die Temperatur von 70°C muß im Reaktionsgefäß erreicht und gehalten werden. Die entsprechenden Geräteeinstellungen sind durch Messung der Temperatur im Reaktionsgefäß zu ermitteln und regelmäßig zu überprüfen.

Danach werden mit einer Einmalspritze (siehe 5.5) 1,5 ml Natriumdithionitlösung (siehe 6.4) durch das Septum zugegeben, durchmischt und (10 ± 1) min im Trockenschrank oder im Wasserbad erwärmt. Danach werden nochmals 1,5 ml Natriumdithionitlösung (siehe 6.3) zugegeben, durchmischt und weitere (10 ± 1) min erwärmt.

Das Reaktionsgefäß wird unter fließendem kaltem Wasser möglichst rasch auf Raumtemperatur abgekühlt.

Das Durchmischen muß so erfolgen, daß möglichst wenig Lederteilchen an der Gefäßwandung oder am Deckel haften und so der Reduktion entzogen sind.

8.3 Flüssig-Flüssig-Extraktion

Die gesamte Reduktionslösung aus 8.2 wird unter Rückhalten und Ausdrücken der Lederteilchen mit einem Glasstößel auf die Säule (siehe 5.4) dekantiert.

Man läßt 15 min einziehen. Zu der im Reduktionsgefäß verbliebenen Lederprobe werden 5 ml tert-Butylmethylether und 1 ml 20 %iger methanolischer NaOH (siehe 6.10) gegeben, die Flasche verschlossen, durchgeschüttelt und sofort auf die Säule (siehe 5.4) gegeben (sofern die Lederprobe stark zusammenklumpt, kann mit dem Glasstößel durchmischt werden). Nach dem Einziehen der Flüssigkeit in die Säule wird unter Ausspülen des Reaktionsgefäßes und vollständigem Überführen der Lederfasern auf die Säule mit einmal 15 ml und einmal 20 ml tert-Butylmethylether extrahiert, wobei die auf der Säulenfüllung liegenden Fasern mit dem Glasstößel aufgeschlämmt werden. Anschließend werden 40 ml direkt auf die Säule aufgegeben. Die Extrakte werden in einem 100-ml-Rundkolben mit Hülsenschliff aufgefangen.

Der Extrakt wird bei (50 ± 5) °C im Vakuum bei (500 ± 100) mbar am Rotationsverdampfer bis auf etwa 1 ml eingeengt. Danach wird im schwachen Stickstoffstrom der Ether vollständig bis zum Erreichen des Trockenrückstandes vertrieben.

Der Rückstand wird sofort in Methanol gelöst und mit Methanol auf ein Gesamtvolumen von 2 ml gebracht. Diese Lösung wird mit HPLC-DAD untersucht.

Zur Durchführung der qualitativen Bestimmung der Amine mit einem anderen Verfahren als der HPLC kann der aus einer zweiten Probe erhaltene Rückstand in einem für das chromatographische oder elektrophoretische Verfahren geeigneten Lösemittel aufgenommen werden, sofern Methanol weniger geeignet ist. Sofern tert-Butylmethylether als Lösemittel geeignet ist, kann auf ein Einengen bis zur Trockene verzichtet werden.

8.4 Verfahrenskontrolle

Parallel zu jeder Analyse bzw. Analysenserie werden 1,0 ml Standardlösung (siehe 6.9) in 16,0 ml Citrat-Natronlauge-Puffer (siehe 6.7) (ohne Probe) gegeben und in gleicher Weise wie die Proben behandelt und analysiert (ausgenommen Entfettung). Die jeweils erhaltenen Peakflächen werden zur Berechnung der Wiederfindung herangezogen.

Die Wiederfindungen müssen für die Amine 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18 mindestens 70 % betragen, für die Amine 16, 17 mindestens 50 % und für Amin 6 mindestens 20 %.

9 Kalibrierung

Die Standardlösung (siehe 6.8) mit 15,0 µg/ml Methanol wird zur Kalibrierung benutzt.

10 Chromatographische Untersuchung

Die nachstehend beschriebenen chromatographischen Bedingungen wurden in verschiedenen Laboratorien auf Anwendbarkeit überprüft und als geeignet für den Nachweis der aromatischen Amine nach Tabelle 1 befunden. Die angeführten chromatographischen Bedingungen sind als Beispiele zu verstehen.

10.1 Chromatographische Untersuchung zur Quantifizierung und Qualifizierung mit Hochleistungssäulenflüssigkeitschromatographie (HPLC)

Für die Quantifizierung ist ausschließlich HPLC mit DAD einzusetzen.

Eluent 1:	Methanol;
Eluent 2:	0,575 g Ammoniumhydrogenphosphat + 0,7 g Dinatriumhydrogenphosphat in 1000 ml Wasser, pH 6,9;
Stationäre Phase:	LiChrospher 60 RP-select B (5 µm) 250 × 4,6 mm;
Säulentemperatur:	40 °C
Fluß:	0,8 bis 1 ml/min;
Gradient:	Start 15 % Eluent 1 und 85 % Eluent 2, innerhalb 45 min linear auf 80 % Eluent 1 und 20 % Eluent 2;
Injektionsvolumen:	10 µl;
Detektion:	DAD bei 240 nm, 280 nm und 30 nm;
Zuordnung:	über Retentionszeiten und UV-Spektren.

10.2 Chromatographische Verfahren zur Qualifizierung

10.2.1 Kapillargaschromatographie (GC)

Probenvorbereitung:	Zur gaschromatographischen Untersuchung kann die methanolische Lösung aus 8.3 oder eine Lösung aus einem anderen geeigneten Lösemittel, z. B. tert-Butylmethylether, verwendet werden;
Trennsäule:	mittlere Polarität, z. B. SE 54 oder DB 5, Länge 50 m, I. D.: 0,32 mm;
Filmdicke:	0,5 µm;
Injektorsystem:	Splitless/Split;
Injektortemperatur:	250 °C;
Temperaturprogramm:	70 °C isotherm für 2 min, mit 10 °C/min auf 280 °C, isotherm für 5 min;
Detektor:	MSD, scan 45-300 amu;
Trägergas:	Helium;
Injektion:	1 µl, splitless 2 min;
Zuordnung:	über Retentionszeiten und Massenspektren.

10.2.2 Kapillarelektrophorese (HPCE)

Probenvorbereitung:	250 µl methanolische Probenlösung aus 8.3 werden mit 50 µl 0,01 M HCl vermischt und durch ein Membranfilter 0,2 µm filtriert. Diese Lösung wird kapillarzonenelektrophoretisch untersucht;
Kapillare 1:	56 cm unbelegt, 50 µm ID mit extended light path;
Kapillare 2:	56 cm Polyvinylalkohol-Belegung (PVA), 50µm ID mit extended light path;
Puffer:	Phosphat-Puffer 50 mmol, pH 2,5;
Säulentemperatur:	25 °C;
Spannung:	30 kV;
Injektionszeit:	4 s;
Einspülzeit:	5 s;
Detektion:	DAD 214 nm, 240 nm, 280 nm, 305 nm, Spektrenaufnahme;
Zuordnung:	über Migrationszeiten und UV-Spektren.

10.2.3 Dünnschichtchromatographie (TLC, HPTLC)

Probenvorbereitung:	Zur dünnschichtchromatographischen Untersuchung kann die methanolische Lösung aus 8.3 oder eine Lösung aus einem anderen geeigneten Lösemittel, z. B. Ethylacetat, verwendet werden.

10.2.3.1

Platten:	(HPTLC): Kieselgel 60 mit Fluoreszenzindikator F 254, 20 × 10 cm, Kammersättigung;
Auftragsmenge:	5 µl strichförmig mit automatischem Applikator;
Fließmittel 1:	Chloroform : Eisessig 90 : 10 Volumenanteile.

10.2.3.2

Platten (TLC):	Kieselgel 60, 20 × 10 cm, Kammersättigung;
Auftragsvolumen:	10,0 µl punktförmig mit automatischem Applikator;
Fließmittel 1:	Chloroform : Ethylacetat : Essigsäure, 60 : 30 : 10 Volumenanteile;
Fließmittel 2:	Chloroform : Methanol, 95 : 5 Volumenanteile, 1 und 2 nacheinander ohne Trocknen der Platten.

10.2.3.4 Diazotierungs- und Kupplungsverfahren

Die Platten werden aus der Kammer genommen und durch Stehen an der Luft oder in einem kalten Luftstrom (Abzug) vom Fließmittel befreit. Sie werden dann etwa 1 min in einer geeigneten Kammer starken nitrosen Gasen ausgesetzt, daß ihre Oberfläche gleichmäßig behandelt ist.

ANMERKUNG: Die Stickoxid-Dämpfe werden zweckmäßig durch Zugabe von festem Natriumnitrit zu verdünnter Salzsäure (1 : 1) hergestellt.

Die Platten werden anschließend etwa 2 min vorsichtig mit kalter Luft abgeblasen, um überschüssige Stickoxide zu entfernen. Danach werden sie gleichmäßig mit einer α-Naphtol-Lösung besprüht. (α-Naphtol-Lösung: 0,2 % α-Naphtol in 1 M KOH).

10.2.3.5 Zuordnung

Es werden die Rf-Werte bestimmt und mit den Referenzen verglichen. Das Aussehen der Flecke unter UV-Licht und die Anfärbung nach Diazotierung und Kupplung wird mit den Referenzen verglichen.

11 Auswertung

Die Berechnung der Amingehalte erfolgt über die Peakflächen der Amineinzelkomponenten in der Analysenlösung und die Peakflächen der Amineinzelkomponenten in der Kalibrierlösung (siehe 6.8). Der Gehalt an Amin wird als Massenanteil w in mg/kg Erzeugnis nach folgender Gleichung berechnet:

$$w_{\text{Arylamin}} = \frac{A_P \cdot \beta_K \cdot V}{A_K \cdot E} \qquad (1)$$

Dabei ist:

- w Massenanteil Arylamin in mg/kg;
- A Peakfläche in Flächeneinheiten;
- β Konzentration Arylamin in der Kalibrierlösung in µg/ml;
- V Volumen, auf das die Probe nach 8.3 aufgefüllt wurde, in ml;
- E Einwaage in g.

Indizes:

- P Probe;
- K Kalibrierlösung aus Abschnitt 9.

12 Prüfbericht

Im Prüfbericht sind unter Hinweis auf diese Norm folgende Informationen zu geben:

a) Bezeichnung der Probe;

b) Angewandte Trenn-, Detektions- und Bestimmungsverfahren (mindestens 2);

c) bei Fertigerzeugnissen: Teil des Fertigerzeugnisses, das untersucht wurde;

d) Art der Probenzerkleinerung;

e) Bei Gehalten (Massenanteil) je Aminkomponente ≤ 30 mg/kg:

"Nach dem Umfang der Untersuchungen wurden in dem vorgelegten Erzeugnis Azofarbstoffe, die nach der Bedarfsgegenständeverordnung verboten sind, nicht nachgewiesen."

Bei Gehalten (Massenanteil) je Aminkomponente > 30 mg/kg:

Angabe der Aminkomponente(n), deren Gehalt > 30 mg/kg beträgt.

Gemäß analytischem Befund wird davon ausgegangen, daß bei der Herstellung oder Behandlung des vorgelegten Erzeugnisses Azofarbstoffe verwendet wurden, die nach der Bedarfsgegenständeverordnung verboten sind.

f) Bei Gehalten (Massenanteil) an 4-Aminodiphenyl oder/und 2-Naphtylamin > 30 mg/kg:

"Bei Anwendung des Prüfverfahrens nach DIN 53316 wurde 4-Aminodiphenyl oder/und 2-Naphtylamin nachgewiesen. Nach dem derzeitigen wissenschaftlichen Kenntnisstand kann beim Auftreten dieser Amine ohne Einholung zusätzlicher Informationen nicht mit Sicherheit darauf geschlossen werden, daß verbotene Azofarbstoffe verwendet wurden."

g) Abweichungen von dieser Norm;

h) Prüfdatum.

13 Präzision des Verfahrens

Die nachstehenden Daten wurden durch Ringversuche an gefärbten Ledern unterschiedlicher Tier- und Gerbart ermittelt.

Die angegebenen Daten wurden bei Anwendung der HPLC mit DAD erzielt. Die im Ringversuch untersuchten Proben waren gemahlen. Für die Flüssig-flüssig-Extraktion nach 8.3 wurden MERCK Fertigsäulen EXTRELUT®20, Art. Nr. 11737, benutzt.

Tabelle 2: Zusammengefaßte Ergebnisse der Ringversuche

Lederprobe	Nachgewiesene Amine	Mittelwert $\bar{x}$ als Massenanteil mg/kg	Wiederholgrenze r mg/kg	Vergleichgrenze R mg/kg
A	Benzidin	13,5	5,4	8,4
	3,3'-Dimethoxybenzidin	15,4	4,4	6,4
	3,3'-Dimethylbenzidin	20,5	7,1	9,5
B	Benzidin	12,9	3,8	8,9
	o-Toluidin	37,5	15,4	38,5
C	3,3'-Dimethylbenzidin	25,6	8,0	17,0
	o-Toluidin	50,1	20,2	42,1
D	Benzidin	16,5	3,0	7,1

Annex D

Summary Table of Interviews in India and China

Summary Table of interviews in India (I) and China (C)

Impacts/Key Issues:	Dyestuffs	Leather	Textiles
Indo-German Export Promotion Project (I)	Some substitutes are costlier	Accreditation of labs is necessary Most businesses have successfully shifted	Accreditation of labs is necessary Most businesses have successfully shifted
Council for Leather Exports (I)		Process of substitution generally successful Costs(x3?) - the main issue Substitutes available locally (about 10% of alternatives imported - for specific shades/items) Need for testing to be standardised and centres accredited	
A tannery	More need for technical assistance here than to leather product manufacturers	Substitution generally complete (other than accidental use) Cost/performance disadvantages Cost (x2-3) - absorbed by producers Increased quantity of substitute dyestuffs required to get desired shade Lack of proper certification procedures - discrepancy in results; exporters take risk	

Impacts/Key Issues:	Dyestuffs	Leather	Textiles
Presidency Kid Leather		Substitution generally successful Cost (x2) Obtaining darker colours poses some problems but is feasible Risk to exporter - no certification of laboratories	
Central Leather Research Institute	Success of substitution due in part to tanners buying dyestuffs from standard sources Textile and leather dyes are different	Use of banned dyestuffs has been stopped - awareness generally high Cost of change to substitutes is high Increased quantity of dyestuffs has to be used No major issues relating to substitution of colours and shades Difficult to control manufacturers in the unorganised sector Delays due to lab analysis (although costs of analysis are not significant as a proportion of the total costs of the products) Lack of uniform accredited testing procedures	

Impacts/Key Issues:	Dyestuffs	Leather	Textiles
A dyestuff manufacturer	Dyestuffs capable of releasing the banned amines are being exported to non-EU Member States Move towards substitutes - manufacturers are upgrading facilities Substitutes cost increase to obtain the same colour (20-30%) More substitutes of Reactive affected dyes than Direct Substitutes less easy to apply, but better fastness Few problems in switching. Registration of dye patents in EU/US is expensive. Need for standard testing facilities/procedures 'Good laboratory practises certification' not available in India		

Impacts/Key Issues:	Dyestuffs	Leather	Textiles
Weave India (I)			In the handloom sector, there is no move towards substitutes Handloom textiles are manufactureed at village level Substitutes not available locally 'Exorbitant' costs of testing - especially a problem for textiles Long time involved in testing Labs inaccessible Cost escalation Cost of dye around 10% of the total cost of the product
Apparels and Handlooms Exporters Association	Substitutes are expensive		Use of banned azo dyes has nearly stopped Additional cost does no seem to have been insurmountable No major problems in obtaining the required colours or shades In contrast with the leather sector, there seems to be no problem with lack of accreditation. No complaints of non-acceptance of certification/no consignments rejected

Impacts/Key Issues:	Dyestuffs	Leather	Textiles
Handloom Exports Syndicate (I)	Alternatives brought in		Indian handloom industry has been unable to cope with German restrictions Cost of non-azo dyestuffs (x3/4) With azo dyes - 75% of yarn cost is for dyeing. Risen to 125% with non azo dyes Goods for domestic markets are still being dyed with the banned dyestuffs. Steps being taken to prevent use on products for export indigenously produced substitutes are available Problems remain - mostly for smaller units. Handloom industry different to others - served by small scale sector. Smaller units have to depend on dye houses for dyeing their requirements - often old Small producers not in a position to agree bulk orders, and under competition from powerloom sector No problems getting the right shades with the substitutes Need for approved labs Need for modern dye houses

Impacts/Key Issues:	Dyestuffs	Leather	Textiles
University Department of Chemical technology, Mumbai	Banned dyes constitute hardly 3.5% of total number manufactured in India		R&D work necessary to shade match safe alternatives - all shades can be produced
	Only some small scale units are manufacturing banned dyestuffs		Cost/performance of alternatives 'optimum'.
	Big units manufacturing safe alternatives		Almost all sectors now aware of the ban and have switched. With very few exceptions, banned dye items are not manufactured.
	In relation to the Indian legislation, the Dyestuff Manufacturers' Association of India has called for proper risk assessments in consultation with the industry		
Textiles Committee, Ministry of Textiles	With exception of banned benzidine based dyes, all others are used		Small-scale exporters are most seriously affected - cannot rely on small scale dye manufacturers
	Government of India draft notification - April 1996 - based on 118 dyes - including some that are carcinogenic but do not release the banned amines		Cost - x1.5 - 2.25
			Banned dyes easier to apply; cheaper; gave brilliant shades
	General trend - big dye manufacturers are switching to substitutes - small manufacturers (30 to 33% of total production) are giving export orders to big dye manufacturers (??)		Some further need for education - especially among small scale fabric manufacturers
			Need for standard testing/certification facilities
	Some dye houses not clear about banned dyes		Issues around fabric with more than one colour - testing costs

Impacts/Key Issues:	Dyestuffs	Leather	Textiles
National Institute of Fashion Technology, Ministry of Textiles			Garment exporters have started setting up larger garment units with consolidated production facilities Modern dyestuffs are available Cost sometimes 20-30% more Many garment exporters are already switching to substitutes/examining options of alternative vegetable dyes Testing expensive - should be subsidised
Ahmedabad Textile Industries Research Association (ATIRA)	Confusion created by fact that some manufacturers guarantee only 'pure dyes' and not the entire dye		Many substitutes available Pure red and scarlet colours (had been achieved by benzidine based dyes) not possible to achieve Cost - x2.25 at least for a medium shade Re: differences in shades for substitutes: Indian industry expects a wider colour margin rather than achieving the same colour Harmonisation of testing needed. Testing increases for fabrics containing more than one colour Need for a computer colour matching/prediction facility to be extended to all mills

Impacts/Key Issues:	Dyestuffs	Leather	Textiles
Chemical Ministry - Chemical Division of Department of Production (C)	60-70% of dyes exported by China are azo dyes No production of 118 dyes banned in Germany/ 'very few' produced in China. Few azo dye production facilities Dye facility profits not a concern Almost complete substitution Need for uniform monitoring techniques - government monitoring techniques not successful - enterprises unable/unwilling to pay fees		Cost - especially No.23 yellow (although dye takes up only 5% of cost of the complete textile product) Colours slightly different
Experts from Textile Engineering Society of China/ Dyeing Industry Professional Association (working on study for the Textile Ministry) (C)	77 dyes on German list are produced.		Cost differences not noted by Textile Association Substitutes are better quality than the azo dyes Colour differences very slight - not a major issue
Leather Industry Association (C)		Since the German ban, none of the 118 affected dyes have been used Almost complete substitution on account of client demands and state administered non-poison certificates Some issues with substitution of light colours	

Impacts/Key Issues:	Dyestuffs	Leather	Textiles
A dyestuff Manufacturer (C)	Fewer than 20 of the 118 dyes affected by the German ban used to be produced From Spring 1996 no relevant dyes have been used due to client requirements - i.e. complete substitution 77 Chinese dyes are included in the German ban list Substitutes are better quality than azo dyes and colour differences acceptable Substitutes are explained in a 1995 book written by Chinese dye experts		Cost differences not noted by the Textile Association

The following is a sample verification letter. You can request the letter free of charge.

Verification of Dyestuffs for

XYZ Garments Limited

at 1 Kwun Tong Road, Hong Kong

The sample (code: 1234) is claimed to be dyed by ABC Dyeing Factory only with the following dyestuffs:

1. Reactive Yellow

2. Reactive Red

3. Reactive Blue

These dyestuffs are included in the Voluntary Registration Scheme and are free of amines which have been banned for importation purposes in Germany.

Academic in Charge

Voluntary Registration Scheme

for Harmless Dyestuffs

Institute of Textiles & Clothing

Terms and Conditions of the Verification Letter

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Terms and Conditions of the Institute of Textiles & Clothing, The Hong Kong Polytechnic University

1. In providing this service, The Hong Kong Polytechnic University's Institute of Textiles & Clothing ("the Institute") aims, in accordance with its broad role as an educational institution, to promote stronger links between academics and the textile industry by providing a neutral and comprehensive selection of information for the textiles and clothing industry, especially persons engaged in wet processing, of dyestuffs which conform with the German Product Liability Act ("the Act").

2. Where a Letter of Verification is supplied by the Institute, its purposes are limited to:- (a) saving the time of recipients and end-users in obtaining the information needed; (b) providing reasonably comprehensive information on "wet processing" to assist recipients and end users in increasing their competitiveness; and (c) providing such information as has been made available to the Institute on dyestuffs which comply with the Act, which may otherwise be unavailable.

3. The Institute does not represent nor warrant any manner whatsoever that any dyestuffs are in fact harmless, safe or fit for any purpose whatsoever. The Institute relies solely upon, and provides only, information supplied to it by various industry sources. For clarification, the Institute does no more, when there is doubt as to the safety of dyestuffs provided by manufacturers or suppliers, than request that they submit test results of their analysis by reference to accredited testing houses. The Institute performs no independent testing or verification of dyestuffs nor any analysis of dyestuffs whatsoever.

4. The provision by the Institute of any information or any Letter of Verification is wholly gratuitous and without acceptance of any liability whatsoever. The Institute, in so doing, is not entering into any contractual or other relationship between it or the dyestuffs manufacturers/suppliers providing information to it, and any recipient or end- user of such information or Letter of Verification or any other person (all of such persons being herein referred to as "end-users").

5. The provision by the Institute of any information or Letter of Verification shall in all cases be subject to the end-users admitting and agreeing in every respect:- (a) to full knowledge, awareness and understanding of the facts set out in Clauses 1 to 4 above; (b) that neither the Institute, The Hong Kong Polytechnic University, nor any of their respective officers, employees or agents shall be liable in any way to the end- users for any property loss or damage or any financial or other loss whatsoever arising directly, indirectly or in any way out of any act or omission or any inaccuracy, insufficiency or any other defect or inadequacy whatsoever, in or associated with, the provision of any information or any Letter of Verification by the Institute; (c) that the Institute shall be in no way liable whatsoever to any end-users or any other persons in respect of any loss, damage or injury occasioned by reliance on any information in any way contained in, appended to, or referred to in any manufacturers or suppliers' letter of verification, any test or analysis documentation or any other information relied upon by the Institute or provided by the Institute to any end-user as part of the Institute's Letter of Verification; and (d) that the law of Hong Kong shall be the only law which governs the interpretation and effect of these clauses.

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Annex E

VRS Information from the Internet

FAQ about the German Regulation and the Voluntary Registration Scheme

1. Which azo dyes and pigments fall under the regulation?

Dyestuffs which can split into: benzidine, 4-chloro-2-methylaniline, 2-naphthylamine, biphenyl-4-amine, o-tolidine, o-dianisidine, 3,3'-dichlorobenzidine, 4-chloroaniline, o-toluidine, o-aminoazotoluene, 2-amino-4-nitrotoluene, 2,4-diaminotoluene, 2,4-diaminoanisole, 4,4'-diaminodiphenylmethane, 4,4'-diamino-3,3'-dimethyldiphenylmethane, 4,4'-diamino-3,3'-dichlorodiphenylmethane, 4,4'-bis-(dimethylamino)diphenylmethane, 4,4'-diaminodiphenylether, 4,4'-diaminodiphenylsulphide, 2,4,5-trimethylaniline, p-cresidine. Information for pigments is not available as yet.

2. Which consumer goods are affected?

Articles for clothing, bedclothes, and leather (e.g., wristwatch straps, shoes etc.).

3. When will the regulation be effective?

According to the 4th amendment of consumer goods regulations, from July 20th 1995 it is allowed to produce and import consumer goods until March 31st which do not pass the Azo Dyestuff Test, and it is allowed to sell them until September 30th 1996. Special clothes for professionals, e.g., soldiers, can be sold until December 31st, 1999. Azo Pigments will be covered by the regulation after September 30th, 1998.

4. What analytical method is prescribed by the regulation?

Four chromatographic methods, namely, thin layer chromatography (TLC), gas chromatography (GC), high performance liquid chromatography (HPLC) and capillary electrophoresis (CE), are acceptable for the analysis. At least two of these methods must be used for the identification of detected arylamines. The presence of any one of the banned amines in excess of 30 mg/kg is considered as positive indication of violating the German Regulation. Also noteworthy is that the reductive extraction of arylamines should be carried out in a slightly acidic medium of pH 6 instead of in a strong alkaline medium.

5. How can the detection of 'banned' azo dyes be carried out?

The analysis of amine in dyestuff generally involves several stages: sample preparation, extraction, reduction, isolation, detection and confirmation. Dyestuffs are firstly extracted from the fabric sample, and then chemically broken down into their corresponding amines with reducing agent. Since hazardous amines are the only components to be identified, an isolation of these degraded amines through a number of extraction processes is needed before the final chemical solution are sent for instrumental analysis.

6. What is the penalty for non-compliance?

Penalties for non-conformance with the German regulation will result in fines and prison sentences.

7. What is the Voluntary Registration Scheme?

The Voluntary Registration Scheme for Harmless Dyestuffs is essentially an information service to verify and organise data on behalf of Hong Kong manufacturers and other interested parties - of specific relevance to the dyeing and finishing industry. Suppliers of dyestuffs which will not, potentially break down into potentially carcinogenic amines and thereby present a hazard to consumers when in contact with the skin are listed in the Scheme.

8. Is the list of colorants in the Voluntary Registration Scheme comprehensive?

By virtue of the voluntary nature of the scheme there will inevitably be some omissions. It is the objective of those responsible for running the scheme to contact all existing and potential suppliers of

dyestuffs in order that they will choose whether or not to be represented - and this is an ongoing activity.

9. I am a dyer - how can I benefit from the Scheme?

If you are currently using dyestuffs which may be questionable for a variety of reasons you can check the listings and contact suppliers for quotations, in the event that substitution of products is an option. You may also wish to request your supplier(s) to register with the scheme in order that the 'safe' nature of the chemicals is clarified.

10. I am a manufacturer of woven/knitted goods - how can I benefit from the Scheme?

Ensure that the dyes used in your merchandise are registered with the Voluntary Registration Scheme and, if this is not the case, encourage suppliers to join the Scheme.

11. I am an exporter - how can I benefit from the Scheme?

The German regulation stipulates that you are responsible for the sequence of processes involved in making the goods which you export; if your products, and hence the chemicals used to colour your products, are to be acceptable it is likely that all suppliers in the process chain will be obligated to provide documentation to clarify the nature of the dyestuffs and other finishing agents. Preferably, there will be one supplier (of chemicals) per dye shade recipe used to dye your goods - and this may be checked through the scheme. If, on the other hand the documentation for your goods is incomplete you may wish to impress on your suppliers the fact that greater product and process control will be required when shipping to the German market in future.

12. What will I be charged for VRS registration/usage?

The service is free of charge for Hong Kong companies.

13. As a dyestuff supplier, how may I join the scheme?

Simply write to Dr YS Szeto at the Institute of Textiles & Clothing, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong - or call 852 27666446 - fax 852 27731432 - e-mail tcsetoys@polyu.edu.hk.

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Voluntary Registration Scheme (VRS)

The Voluntary Registration Scheme is for access to product and process information for the textile and clothing industry. It will be updated on a monthly basis. This information service contains dyestuffs which do not release the 20 banned amines (MAK III) under reductive conditions. The information has been provided, on a voluntary basis, by the dyestuff suppliers and manufacturers.

* If you would like to know more about this voluntary scheme ...

* If you would like to know which suppliers and manufacturers can provide the dyestuff ...

* A verification letter is provided upon request.

* Frequently asked questions

N.B.: This information service is in its introductory phase, and further items will be added to expand the scope of usage.

http://www.polyu.edu.hk:80/~itc/vrsintr.htm

Introduction

The German Government announced a new regulation (i.e. the 2nd Ordinance to amend the Consumer Goods Ordinance) on 15th July 1994 to prohibit the import of consumer goods containing colorants which could split into any of the twenty banned amines (MAK III, A1 and A2) under reducing conditions. The regulation has particular relevance for products of wool and silk; in addition, Germany is Hong Kong's second largest export market for garments, therefore the consequences for the textile and clothing industry are significant. In view of the urgency of the regulation, the Textile Council of Hong Kong invited the Hong Kong Productivity Council to conduct a study to gain a better understanding of this regulation, its impact and possible options available. The Hong Kong Productivity Council recommended the Voluntary Registration Scheme as one of the solutions. The Industry Department then invited the Institute of Textiles and Clothing, The Hong Kong Polytechnic University, to submit a proposal for the Scheme, and this was accepted. The Scheme commenced operation in October, 1995.

The Voluntary Registration Scheme contains a list of harmless dyestuffs which complies with the German Commission for Maximal Substance Concentration at Places of Work (MAK). This internet address therefore gives access to information on dyestuffs which - according to available test results - are recommended for conformance with the regulation adopted by the German Government on azo substances. A brief summary of the regulation is provided.

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The German Regulation

In essence, the regulation will result in the prohibition of imports of textile goods containing azocolours which, under reducing conditions, can split into one or more of the 20 specified carcinogenic or suspected carcinogenic amines. The amines are:

(1) 4-aminodiphenyl,

(2) benzidine,

(3) 2-amino-5-chlorotoluene,

(4) 2-aminonaphthalene,

(5) 2-aminoazotoluene,

(6) 2-amino-4-nitrotoluene,

(7) 4-chloroaniline,

(8) 2,4-diaminoanisole,

(9) 4,4'-diaminodiphenylmethane,

(10) 3,3'-dichlorobenzidine,

(11) 3,3'-dimethoxybenzidine,

(12) 3,3'-dimethylbenzidine,

(13) 2-methoxy-5-methylaniline,

(14) 3,3'-dimethyl-4,4'-diaminodiphenylmethane,

(15) 4,4'-methylene-bis(2-chloro-aniline),

(16) 4,4'-oxydianiline,

(17) 4,4'-thiodianiline,

(18) 2-aminotoluene,

(19) 2,4-diaminotoluene,

(20) 2,4,5-trimethylaniline.

Information from the German Federal Ministry of Health suggests that implementation of the prohibition on azocolours will be deferred - e.g., it is prohibited to produce and import consumer goods containing the banned amines from 1st April 1996, and it is prohibited to sell them from 1st October 1996. Special clothes for professionals, e.g., soldiers, can be sold until 31st December 1999. Azo pigments will be covered by the regulation after 30th September 1998. If through negligence or intent there is found to be nonconformance with the regulation, this may result in fines and prison sentences.

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http://www.polyu.edu.hk:80/~itc/rspilo

Initial Study on Azocolours

Having surveyed a cross-section of the local industry to determine both the impact, and possible future action for exporters of textile products to Germany, The Industry & Technology Development Council (ITDC) and Hong Kong Productivity Council (HKPC) summarised the situation vis a vis azocolours as follows.

On 15 July 1994, in addition to the "Product Liability Act" the German government promulgated a new regulation which, among other things, prohibits the manufacture, import or sale of textiles and clothing containing certain harmful azocolours. The original effective date of this regulation was 1 January 1995, but ther were no clear statements on the extent of its monitoring and enforcement. On 16 December 1994, the German Government promulgated an amendment to postpone the enforcement of the regulation by 6 months. In view of the urgency and uncertainty of the regulation, the Textile Council of Hong Kong (Textile Council) requested the Hong Kong Productivity Council (HKPC) to conduct a study to help the industry to understand this regulation, its impact and the possible options available.

Germany is Hong Kong's second largest export market for garment after USA. In 1993, the total exports of garment (including domestic exports and re-exports) from Hong Kong to Germany amounted to HK$19.7 billion, representing 12.3% of total exports of the product. It is not uncommon for one lot of garments to be sent to various countries. If Germany is one of the importing countries, then the whole lot would have to be produced in such a way as to comply with the German regulation. Hence, this new regulation not only affects the relevant goods exporting to Germany but also affects those goods exporting to other countries.

Harmful azocolours prohibited are those which under reducing conditions can split into one or more of the 20 specified carcinogenic amines.

Goods containing those prohibited azocolours can be identified in the laboratory. However, the new regulation does not specify any official test method and control limit.

To date, while the German government authorities have not promulgated the enforcement procedure for the new regulation, experts in industry, associations and ministries believe that government authorities will conduct regular spot checks on German retailers.

Experts see the risk of companies abroad being prosecuted for infringement of the new regulation to be of a lesser degree.

As the new regulation is related to the health and safety of the consumer it is viewed as a very sensitive issue by the German retailers, who run the risk of bankrupcy if the government authority discovers and announces health risks in their goods. It is expected that most German buying groups will react very sensitively and ask their suppliers to adhere to the very stringent requirements.

Textiles and clothing suppliers and exporters in Hong Kong are generally uncertain as to how they should comply with the requirements of this regulation, as most of them are not fully aware of the details of the regulation, its scope and implications, and their liability, especially when the dyeing process is carried out by a third party.

Hong Kong companies would inevitably have to spend more money and effort to control the use of those colours. They would need to consult independent testing laboratories as well as document internal control procedures in order to prove that all necessary precautionary measures have been taken to prevent the use of prohibited azocolours.

Only about 100 common azocolours out of 4,000 common textile colours might be banned. The German authorities consider the regulation covers all azocolours. However, the German Textile Association is still trying to convince the Ministry of Health that there is no need to include pigment colours in the ban because pigments are not bioavailable. Extensive investigations are aimed at developing a modified testing method to differentiate between dyestuff and pigment on textile fibre.

http://www.polyu.edu.hk:80/~itc/vrspilot.htm

The wool and silk dyeing factories will be affected most because they might be required to replace the prohibited acid and direct dyes with more expensive harmless dyes. Most of these prohibited azocolours have substitutes but at a higher cost. If harmful pigment azocolours are to be banned, it would have serious impact on pigment printing, since over 80% of textile prints in Hong Kong are pigment colours. Most dyeing factories in Hong Kong are very confused about the selection of harmless colours.

The industry should consider the viability of establishing a Voluntary Registration Scheme (VRS) for Harmless Dyestuff, a Dyehouse Certification Scheme (DCS) and the model procedures for buying and control to help itself to cope with this new German regulation.

Hong Kong government authorities should inform the industry in the future as and when the German government releases more specific information on the new regulation.

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Manufacturers/Suppliers

BASF

Bayer

Ciba-Geigy

Clariant

Crompton & Knowles

DyStar

Everlight Chemical Industrial Corporation

Heatime

Sumitomo Chemical Co., Ltd.

Yorkshire Chemical PLC

Zeneca

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BASF

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- Disperse Dyes
- Mix Dyes
- Pigment Dyes
- Reactive Dyes
- Vat Dyes
- Whole List of BASF Products

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BASF - Acid Dyes

Supplier	Trade Name	VRS Reg. No.
BASF	Acidol Black M-SGL	BFAC0001
BASF	Acidol Black M-SRL	BFAC0002
BASF	Acidol Black M-SRL	BFAC0003
BASF	Acidol Black M-SRL78	BFAC0004
BASF	Acidol Black M-SRLS	BFAC0005
BASF	Acidol Blue KM-R	BFAC0006
BASF	Acidol Blue KW-I	BFAC0007
BASF	Acidol Brilliant Blue 3RX-W	BFAC0008
BASF	Acidol Brilliant Blue M-5G	BFAC0009
BASF	Acidol Brilliant Red GLX-N	BFAC0010
BASF	Acidol Brilliant Yellow	BFAC0011
BASF	Acidol Brilliant Yellow	BFAC0012
BASF	Acidol Brilliant Yellow	BFAC0013
BASF	Acidol Brown KM-N	BFAC0014
BASF	Acidol Brown M-BL	BFAC0015
BASF	Acidol Bordeaux KM-B	BFAC0016
BASF	Acidol Bordeaux M-B	BFAC0017
BASF	Acidol Dark Blue M-TR	BFAC0018
BASF	Acidol Dark Blue M-TR	BFAC0019
BASF	Acidol Green M-FGL	BFAC0020
BASF	Acidol Grey M-BRL	BFAC0021
BASF	Acidol Grey M-G	BFAC0022
BASF	Acidol Olive KM-G	BFAC0023
BASF	Acidol Orange M-RL	BFAC0024
BASF	Acidol Red KM-S	BFAC0025
BASF	Acidol Red KW-E	BFAC0026
BASF	Acidol Red M-BR	BFAC0027
BASF	Acidol Scarlet M-L	BFAC0028
BASF	Acidol Scarlet M-L	BFAC0029
BASF	Acidol Yellow GNW	BFAC0030
BASF	Acidol Yellow KM-F	BFAC0031
BASF	Acidol Yellow KWA	BFAC0032
BASF	Acidol Yellow M-2GLN	BFAC0033
BASF	Acidol Yellow M-5RL	BFAC0034
BASF	Acidol Brown M-5RL	BFAC0035

--- End of List ---

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Annex F

Key GATT and WTO Dispute Settlement Reports

GATT and WTO Panel Reports

Name of Case and Date (and whether GATT or WTO case)	**Issue**	**Key Panel Conclusions**
GATT: Canadian Tuna, 1982 (adopted 1982)	US Ban on imports of Canadian Tuna and tuna products	The ban breached Article XI of the GATT. Under Article XX, the ban did not constitute a 'disguised restriction on international trade' because it had been publicly announced. However, it did not fall within the Article XX(g) exception because it was not 'primarily aimed at' conservation of ; the ban had been applied to all species of tuna, not just those in danger of depletion. Furthermore, no steps had been taken to restrict domestic tuna consumption in conjunction with the import restrictions.
GATT: US Chemicals Tax, (adopted June 1987)	US tax on certain imports produced with taxable chemicals and used to fund a government fund used to clean up hazardous waste sites	The tax was eligible for border tax adjustment. GATT border tax adjustment rules could be applied so as to enable contracting parties to follow the polluter pays principle, but did not oblige them to do so.
GATT: US Processed Herring, 1988 (adopted March 1988)	Canadian prohibition on exports of unprocessed herring and salmon	The export restrictions breached Article XI of the GATT. They could not be justified under Article XX(g) because they were not 'primarily aimed at' conservation. They could not be considered to be made effective 'in conjunction with' production restrictions because they were not 'primarily aimed at rendering effective' those restrictions.
GATT: Thai Cigarettes, 1990 (adopted, November 1990)	Thai restrictions on import of tobacco products	The trade restrictions breached Article XI of the GATT. They could not be justified as 'necessary' under Article XX(b) because *a contracting party cannot justify a measure inconsistent with other GATT provisions as 'necessary' in terms of Article XX(b) if an alternative measure which it could reasonably be expected to employ and which is not inconsistent with other GATT provisions is available to it.* The panel heard evidence from the World Health Organisation, and made suggestions on GATT-consistent alternatives that it considered to be reasonably available to Thailand.

Name of Case and Date (and whether GATT or WTO case)	Issue	Key Panel Conclusions
GATT: Yellowfin Tuna, 1991 (unadopted)	US ban on imports of yellowfin tuna and yellowfin tuna products from countries harvesting yellowfin tuna with *purse seine* nets in the Eastern Tropical Pacific Ocean	The import bans breached Article XI of the GATT. The national treatment principle in Article III requiring equal treatment of 'like products' *'calls for a comparison of the treatment of imported tuna as a product with that of domestic tuna as a product. Regulations governing the taking of dolphins incidental to the taking of tuna could not possibly affect tuna as a product'* The US measures could not be justified under Article XX(b) or XX(g). Articles XX(b) and (g) could only be successfully invoked in relation to life or health of humans animals or plants, or conservation of exhaustible natural resources, within the jurisdiction of the importing country. Furthermore, the US measures were not 'necessary' as required by Article XX(b) because the US had failed to show that it had exhausted all measures reasonably available to it to pursue it dolphin objectives through measures consistent with the General Agreement (in particular through the negotiation of international agreement).
GATT: Yellowfin Tuna, 1994 (unadopted)	US ban on imports of yellowfin tuna and its products from 'intermediary nations' - countries that had not themselves taken action to prohibit imports of yellowfin tuna considered in the first yellowfin tuna case	The intermediary nations embargos breached Article XI. In contrast with the 1991 yellowfin tuna report, the panel considered that Articles XX(b) and (g) could be applied to policies related to conservation of exhaustible natural resources or health and safety outside the territory of the party invoking the provision. However, measures *'taken so as to force other countries to change their policies, and that were effective only if such changes occurred'* could not be justified under Article XX(b) or (g). Therefore the intermediary nations embargoes did not fall within Article XX.
GATT: CAFE case, 1995 (unadopted)	US car taxes and requirements for average fuel consumption per fleet (CAFÉ)	The luxury tax and the gas guzzler tax were compatible with the GATT. The CAFE regulation was incompatible with Article III of the GATT since it discriminated between like products and could not be justified under Article XX(g). When determining the 'likeness' of products for the purposes of Articles III:2 and III:4, it is important to consider whether the *aim* or *effect* of the regulatory distinctions is to afford protection to domestic production. According to the panel, the purpose of Article III is not *'to*

Name of Case and Date (and whether GATT or WTO case)	Issue	Key Panel Conclusions
		prohibit fiscal and regulatory distinctions applied so as to achieve other policy goals'. The economic efficiency of a measure is not of itself a relevant consideration when applying Article III. It has been suggested by some commentators that the panel's interpretation of 'like products' may indicate a degree of flexibility in GATT treatment of environmental 'PPM-based' regulatory distinctions. In relation to the CAFE regulation, the panel considered that the less favourable treatment accorded to large imported cars was not primarily arimed at the consdervation of natural resources.
WTO: Reformulated Gasoline, 1995 (appealed, February 1996)	US gasoline quality standards	Aspects of the US gasoline standards were discriminatory because they subjected imported gasoline to more demanding quality requirements than gasoline of US origin, contrary to Article III of the GATT. A case-by-case approach should be taken to interpreting the term 'like products' in Article III, based on consideration of factors including similarities in the physical properties and end uses of various products. For the purposes of Article XX(g), clean air was an exhaustible natural resource. However, the US standards could not be justified under Article XX(g) because they were not primarily aimed at the conservation of natural resources. Neither could they be justified as 'necessary' within the meaning of Article XX(b).
WTO: Reformulated Gasoline, 1996 (Appellate Body report) (adopted 20th May 1996)	*Ditto*	The US measures under appeal did not comply with Article XX(g) (the only Article XX exception under consideration). Whilst they did fall within the scope of paragraph XX(g), they did not satisfy the requirements of the headnote to Article XX, the purpose of which was to ensure that abuse or illegitimate use of the Article XX was avoided.