

The automotive and textile industries are constantly changing and new information is constantly being produced. Keeping up to date is time consuming but need not be difficult providing research and development staff and others know where to look, which relevant journals to read and which conferences and exhibitions to attend. This section enumerates some sources of information likely to be of use to the automotive textile engineer. Attending conferences and exhibitions is an excellent way of keeping up to date and making personal contacts, but the more specialist ones may seem to be not well publicized to those not already involved in the industry.

Publications of the Textile Institute and World Textile Publications Ltd. are invaluable in keeping up to date in both academic and more industrial aspects. So far as wet processing is concerned the *Journal of The Society of Dyers and Colourists* and its annual *Review of Progress in Coloration* are excellent sources of information with extensive references. The monthly *International Dyer* features topical news and views and well-presented articles of a more practical nature. World Textile Publications also produce invaluable directories such as '*Index to Textile Auxiliaries*', and directories of UK textile agents and dyers and finishers in the UK and abroad.

Automotive textiles are closely linked to plastics, and journals of the plastics industry regularly feature news and information invaluable to the automotive textile technologist. Automotive textiles are used together with plastics in processes originally designed for plastics such as moulding and, indeed, polyester, nylon and polypropylene are used in the car in both plastic and fibre forms. *Plastics and Rubber Weekly* reports the latest news and developments in its area of interest and regularly features items and specialist articles in the automotive sector. *British Plastics and Rubber*, *European Plastics News* and the American publication *Modern Plastics International* all regularly feature news items and technical papers on the auto industry. The Institute of Materials, which now incorporates the Plastics and Rubber Institute, is a professional body, which keeps its

members informed of the latest developments through publications and conferences.

A growing number of journals specific to automotive interiors have appeared within the last 6 years or so and this underlines the growing importance of this part of the car. But it is important to be aware of the automotive industry as a whole, which is one of the most 'global' of industries in every aspect. This can be done by regularly studying some of the many automobile publications. In addition many national newspapers include motoring features, especially at weekends, which provide valuable consumer views and opinion on automotive products.

In addition to the conferences and symposia listed below, many additional ones are organized regularly by the Textile Institute, the Society of Dyers and Colourists and the Institute of Materials. Local and regional branches of these bodies meet regularly. Universities and research organizations such as the British Textile Technology Textile Group (BTTG) and RAPRA Technology also organize conferences and run short courses on various subjects. The Center for Professional Advancement regularly run courses on technical subjects including polymer compounding, plastics additives, coating processes both in the USA and in Europe. The Industrial Fabrics Association International (IFAI) whose activities are at present mainly in the USA, has a growing number of members in Europe and Japan and eventually regular meetings of branches in these areas will be held. The IFAI have specialist divisions, the relevant ones are, Marine Fabricators Association, Awning Division, Truck Cover and Tarpaulins Association and the Transportation Division. Composites Symposia are organized by universities and by various professional bodies including the Institution of Mechanical Engineers. Nottingham University has a 'Composites Club'. Technomic Publishing, the publishers of the Journal of Coated Fabrics, organize short courses and symposia on textile and polymer science subjects including an annual symposium on coated fabrics at various locations in Europe.

11.1 Conferences

11.1.1 General textiles

- 1 'International Man Made Fibres Congress', held annually at Dornbirn, Austria. In recent years automotive textiles have been featured every 2 years. Organized by Osterreichisches Chemiefaser-Institut Tagungsburo Dornbirn, Rathausplatz 1, A-6850 Dornbirn, or Kolingasse 1, A-1090 Vienna, Austria. The conference is sponsored and arranged in association with the CIRFS, Avenue E Van Nieuwenhuysse 4, B-1160 Brussels and the City of Dornbirn.

- 2 'Techtextil', held annually in Frankfurt, Germany where about a hundred papers on all aspects of technical textiles are presented. Organized by Messe Frankfurt GmbH, Postfach 15 02 10, D-60062, Frankfurt am Main, Germany.
- 3 'Textiles in Automobiles' (sometimes run in conjunction with the Plastics in Automobile Engineering Conference). Held on average every 2 to 3 years. Organized by Verein Deutscher Ingenieure (VDI), Graf-Recke-Strasse 84, D-40239 Dusseldorf, Germany.
- 4 'World Textile Congress', Huddersfield, England held annually featuring different aspects. Department of Textiles, University of Huddersfield, Queensgate, Huddersfield HD1 3DH, UK.
- 5 'Fibre to Finished Fabrics', organized annually by the Textile Institute usually in December in Manchester.

11.1.2 Automotive conferences

These regular conferences feature automotives and automotive interiors in general and are not specific to textiles. There are many others organized covering every aspect of technology and environmental issues. In the USA, the IFAI periodically organizes conferences on automotive interior trim and fabric.

- 1 Automotive and Transportation Interiors Expo, organized in the USA by the magazine of the same name.
2. Autoplas conferences on use of plastics in the automobile, (and also Recycling) organized by Schotland Business Research Inc., 16 Duncan Lane, Skillman, New Jersey 08558-2313, USA.
- 3 'Autotech Conference', held annually at the National Exhibition Centre, Birmingham organized by Centre Exhibitions jointly with the Institute of Mechanical Engineers, Automobile Division. NEC House, Birmingham B40 1NT, UK.
- 4 'Comfort in the Automotive Industry', organized approximately every 2 years by the Italian Associazione Technica Dell'Automobile (ATA) and Bologna University and held at Bologna. ATA, Strada Torino, 32/A, 10043 Orbassano (TO), Italy.
- 5 'Inter Auto' is organized by Inside Automotives International in conjunction with the Turret group. The last two events in Europe have been held at the RAI Centre, Amsterdam. Inside Automotives International, ANCAR Publications Inc., 21700 Northwestern Highway, Suite 565, Southfield, Michigan 48075 USA.
6. ISATA, (International Symposium on Automotive Technology and Automation) an annual event, organized by Dusseldorfer Messegesellschaft mbH-NOWEA, Postfach 101006, D40001, Dusseldorf, Germany.

11.1.3 Other relevant conferences

- 1 'Intabond', conference on hot-melt adhesive technology organized every 2 to 3 years by Dermil Research Ltd., 24 Buckingham Square, Wickford Business Park, Wickford, Essex SS11 8YQ, UK.
- 2 'Interplas' and 'Kunststoff' are international chemical exhibitions – organized every 2 to 3 years in Birmingham (NEC) and Dusseldorf. Dusseldorfer Messegesellschaft mbH-NOWEA, D-4000 Dusseldorf, Germany.
- 3 'Rubber Bonding' and other conferences are organized periodically by RAPRA Technology Ltd., in conjunction with partners such as *European Rubber Journal*.
- 4 Textile Coating and Lamination International Conferences organized annually by the *Journal of Coated Fabrics* – Technomic Publications Inc., 851 New Holland Avenue, Box 3535, Lancaster, PA 17604, USA.
- 5 'Urethanes Technology' organized by Crains Communications Ltd – both in Europe and Asia.

11.1.4 Machinery and materials

- 1 'Expofil'-European yarn Exhibition, held twice annually, Rue de Neuilly, BP 121, F92113 Clichy Cedex, Paris, France.
- 2 'Index' conference, (for non-woven fabrics), organized in Europe, usually in Geneva by EDANA-see above.
- 3 Conferences and exhibitions organized by the Messe Frankfurt, Messe Frankfurt GmbH, Postfach 15 02 10, D-60062 Frankfurt am Main, Germany, are held in Europe but recently additional events have been held in other parts of the world including Asia and South America. These include: (3.1) 'Interstoff'-yarns for fashion and performance, (Ludwig Erhard Anlage 1, 60327 Frankfurt-am-Main; (3.2) 'InterYarn'; and (3.3) 'Heimatex' (household and hospitality textiles).
- 4 'ITMA', the International Textile Machinery Exhibition is held usually every 3 years; the location rotates between Milan, Paris and Hanover. It is by far the largest exhibition of its type. Organized by the CEMATEX-Comité Européen des Constructeurs de Matériel Textile, General Secretary, Bredewater 20, Postbus 1 90, NL-2700 AD Zoetermeer, Netherlands.

11.2 Journals

Many of the journals publish an annual resource file, where to buy guide, year book or review of progress.

11.2.1 Textile journals

- 1 ATI, (*America's Textiles International*), Billian Publishing Inc., 2100 Powers Ferry Road, Atlanta, Georgia 30339 USA.
- 2 *International Fiber Journal* published six times a year by International Media Group Inc., 1515 Mockingbird Lane, Suite 210, Charlotte, North Carolina 28209 USA.
- 3 *International Textile Bulletin*, *Textile Leader* published four times a year by International Textile Services, Univer Hans, Kessler Strasse 9, CH-8952, Schlieren, Zurich, Switzerland.
- 4 *Japanese Textile News*, *Monthly*, (Japanese Textile News) Osaka Senken Ltd., 3-4-9, Bingomachi, Chuo-ku, Osaka 541-0051, Japan.
- 5 *Kettenwirk-Praxis* (German, with English translations) published four times a year by Karl Meyer Textilmaschinenfabrik GmbH, Postbox 1120, D-63166, Obertshausen, Germany.
- 6 *Knitting International* published by World Textile Publications – see Textiles Horizons, (9) below.
- 7 *Nonwovens Report International*, published by World Textile Publications Ltd., see Textile Horizons, (9) below.
- 8 *Textile Asia* published by Business Press Ltd, California Tower 11th Floor, 30–2 D'Aguilar Street, Hong Kong.
- 9 *Textile Horizons* published by The Textile Institute and World Textile Publications Ltd., Perkin House, 1 Longlands Street, Bradford, West Yorkshire BD1 2TP, UK.
- 10 *Textile Monthly* published by World Textile Publications – see Textile Horizons, (9) above.
- 11 *Textiles World* published by Maclean Hunter Publishing Co., 29N Wacker Drive, Chicago, Illinois 60606 USA.

11.2.2 Technical textiles

- 1 *Chemical Fibers International* issued six times a year with annual Year Book, IBP International Business Publishers GmbH, Mainzer Landstrasse 251, D-60326 Frankfurt am Main, Germany.
- 2 *High Performance Textiles*, monthly newsletter from International Newsletters – see Technical Textiles International, (7) below.
- 3 *Industrial Textiles* published by Impact! on behalf of the Made-up Textiles Association (MUTA), Media House, 55 Old Road, Leighton Buzzard, Bedfordshire LU7 7RB, UK.
- 4 *International Textile Bulletin*, *Yarn and Fabric Forming*, published four times a year by International Textile Service, see (3) in Section 11.2.1 above.

- 5 *Journal of Coated Fabrics*, Technomic Publishing Company Inc., 851 New Holland Avenue, Box 3535, Lancaster, Pennsylvania 17604 USA and in Europe Missionsstrasse 44, CH-4055 Basel, Switzerland.
- 6 *Melliand Textilberichte*, (also Melliand English), 60264, Frankfurt am Main, Germany.
- 7 *Technical Textiles International*, (with annual where to buy guide), International Newsletters, P O Box 133, Witney, Oxford OX8 6ZH, UK.
- 8 *Technische Textilien*, (German with English Translations), PO Box 10 0606, D-6000 Frankfurt am Main, Germany.
- 9 *Textiles Usage Textiles* (TUT), (French with English summaries) published by Euredia SA-editorial collaboration with the French Textile Institute, 16 Rue Ballu F-75311, Paris cedex 09, France.

11.2.3 Dyeing and finishing

- 1 *American Dyestuff Reporter*. Promenade A, Suite 2, Harmon Cove Towers, Secaucus, NJ 07094, USA.
- 2 *International Dyer* published by World Textile Publications Ltd., see *Textile Horizons*, (9) in Section 11.2.1.
- 3 *International Textile Bulletin, Dyeing, Finishing, Printing*, published four times a year by International Textile Service, see (3) in Section 11.2.1.
- 4 *Journal of the Society of Dyers and Colourists*, (with annual Review of Progress in Colouration and annual Resource File), published ten times a year by the Society of Dyers and Colourists.
- 5 *Textile Chemist and Colorist* published by the American Association of Textile Chemists and Colorists, PO Box 12215, Research Triangle Park, North Carolina 27709, USA.

11.2.4 Plastics and chemicals

- 1 *British Plastics and Rubber*, MCM Publishing Ltd., 37 Nelson Road, Caterham, Surrey, CR3 5PP, UK.
- 2 *European Plastics News*, EMAP Maclaren, Maclaren House, 19 Scarbrook Road, Croydon, Surrey CR9 1QH, UK.
- 3 *European Adhesives and Sealants* (with annual Year Book), FMJ International Publications, Queensway House, 2 Queensway, Redhill, Surrey RH1 1QS, UK.
- 4 *Modern Plastics International* (with annual buyers guide), McGraw Hill, Modern Plastics International, P O Box 605, Hightstown NJ 08520 USA.
- 5 *Plastics and Rubber Weekly*, EMAP Business Communications, Ruislip, Middlesex HA4 9LT, UK.

- 6 *Urethanes Technology*, Crain Communications Ltd., New Garden House, 78 Hatton Garden, London EC1N 8JQ, UK.

11.2.5 Composites

- 1 *Advanced Composites Bulletin*, monthly from International Newsletters – see Technical Textiles International, (7) in Section 11.2.2.
- 2 *Composite Science and Technology*, published 16 times a year by Elsevier Science Ltd., The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, UK.
- 3 *Material Science* published by the Institute of Materials, 1 Carlton House Terrace, London SW1Y 5 DB, UK.

11.2.6 The environment

- 1 *Environment Business Magazine*, (annual Directory) Information for Industry Ltd., 4 Valentine Place, London SE1 8YX, UK.
- 2 *Environment Times* (quarterly), Beckhouse Media, 22 Warwick Street, Adlington, Lancashire PR7 4JQ, UK.
- 3 *The ENDS Report*, Environmental Data Services Ltd., Finsbury Business Centre, 40 Bowling Green Lane, London EC1R 0NE, UK.
- 4 *European Environment* published six times a year by John Wiley and Sons, Baffins Lane, Chichester, West Sussex, PO19 1UD, UK.
- 5 *EUWID Recycling and Waste Management*, PO Box 1332, D-76586 Gernsbach, Germany.
- 6 *Material Recycling Weekly*, EMAP Maclaren Ltd., 19 Scarbrook Road, Croydon CR9 1QH, UK.

The Environment Agency, Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS32 4UD. The Department of the Environment publish a large amount of free literature on environmental matters, energy conservation and other issues. Free advice is offered as well as information on technical matters, environmental legislation, conferences and seminars. They have a telephone helpline 0800 585794 (in the UK) and have a web site <http://www.etsu.com/etbpp/>

The European Union also produce information on the environment – the general contact is Office for official publications of the European Communities, L-2985 Luxembourg.

The National Society for Clean Air and Environment Protection (NSCA), 136 North Street, Brighton BN1 1RG. NSCA issue their Pollution Handbook every 2 or 3 years and also publish a series of well-written and well-presented information leaflets for the general public.

11.2.7 Automotive interiors

- 1 *Automotives Interiors International*, Turret-RAI plc., Armstrong House, 38 Market Square, Uxbridge, Middlesex, UB8 1TG, UK.
- 2 *Automotive & Transportation Interiors*, (with annual where to buy guide), 6255 Barfield Road, Suite 200, Atlanta, Georgia 30328-4300 USA.
- 3 *Inside Automotives International*, (with annual where to buy guide), ANCAR Publications Inc., 21700 Northwestern Highway, Suite 565, Southfield, Michigan 48075 USA.

11.2.8 Automotives – general

- 1 *Automotive Engineering* (a publication associated with SAE of the USA), PO Box 5004, Pittsfield MA 01203-9990, USA.
- 2 *Automotive News Europe*, Crain Communications Intl., New Garden House, 78 Hatton Garden, London EC1N 8LD, UK.
- 3 *Automotive Industries AI*, 201 King of Prussia Road, Radnor, PA., or 3011 W. Grand Boulevard, Ste. 2600 Detroit, MI 48202, USA.
- 4 *Automotive News International* (as Automotive News Europe above).
- 5 *Automotive Sourcing*, bimonthly, 6 Heathgate Place, 75–87 Agincourt Road, London NW3 2NT, UK.
- 6 *Automotive World Publications*, (Financial Times), Maple House, 149 Tottenham Court Road, London W1P 9LL, UK.
- 7 *Car* published by EMAP National Publications Ltd, Angel House, 338–46 Goswell Road, London EC1V 7QP, UK.
- 8 *Vehicle News*, (L'information du vehicule), published by Interpress, 36 Rue Ballu F-75009 Paris, France.

11.3 Technical and professional organizations and institutions

11.3.1 Textile

- 1 American Association of Textile Chemists and Colorists, P O Box 12215, Research Triangle Park, North Carolina 27709-2215 USA.
- 2 American Flock Association c/o NTA Bolgen, 230 Congress Street, Boston MA 02110 USA.
- 3 American Textile Manufacturers Institute, 1130 Connecticut Avenue, NW-Suite 1200, Washington DC 20036-3954, USA.
- 4 Association of Nonwovens Fabric Industry, PO Box 1288 Cary, North Carolina 27512, USA.
- 5 BTTG, (British Textile Technology Group), Shirley House, Wilmslow Road, Didsbury, Manchester M20 2RB, UK.

- 6 CIRFS (Comité International de la Rayon et des Fibres Synthétiques), Avenue E Van Nieuwenhuyse 4, B-1160 Brussels, Belgium.
- 7 Deutsches Wollforschungsinstitut (DWI), Veltmanplatz 8, D-52062 Aachen, Germany. (German Wool Institute – Organizers of the annual Aachen Textile Conference.)
- 8 EDANA, (The European Disposables and Nonwoven Association), 157 Avenue Eugene Plasky, Bte 4-1030 Brussels, Belgium.
- 9 Ghent University, Dept of Textiles, Technologiepark 9, 9052 Gent Zwijnaarde, Belgium.
- 10 Hohenstein Institutes, Schloss Hohenstein, D-74357 Boennigheim, Germany.
- 11 Industrial Nonwovens and Disposable Association, 1700 Broadway 25th Floor, New York, NY 10019 USA.
- 12 Institut Textile de France, Avenue Guy de Collongue-B.P. 60-69123 Ecully Cedex, France.
- 13 International Industrial Fabrics Association (IFAI), Several divisions including a Transportation Division and European and Japanese Branches. IFAI USA, 1801 County Road B W, Roseville, MN 55113-4061 USA. European Office; IFAI Europe, Marcel Thiry laan 204, B-1200 Brussels, Belgium. Japanese Office, IFAI Japan, 3-8-9 Nishidai, Itami, Hyogo 664, Japan.
- 14 Made-Up-Textiles Association Ltd. (MUTA), 42 Heath St. Tamworth, Staffordshire, B79 7J, UK.
- 15 North Carolina State University, Dept of Textiles, Box 8301, Raleigh, North Carolina 27695-8301, USA.
- 16 Osterreichisches Chemiefaser, Kolingasse 1, A-1090 Vienna, Austria.
- 17 Society of Dyers and Colourists, (publishes monthly Journal and annual resource file), P O Box 244, Perkin House, 82 Grattan Road, Bradford, West Yorkshire BD1 2JB, UK.
- 18 Sächsisches Textil Forschungs Institut, Annaberger Strasse 240, D-09125, Chemnitz, Germany.
- 19 Swedish Institute for Fibre & Polymer Research (IFP), Box 104, SE-431 22 Molndal, Sweden.
- 20 The Textile Institute, St James's Buildings, Fourth Floor, Oxford Street, Manchester M1 6EJ, UK.
- 21 The Textile Technical Institute (AKZO Nobel), Kasinostrasse 19–21, D-42103 Wuppertal, Germany.
- 22 The Nonwovens Network, BTTG WIRA House, West Park Ring Road, Leeds LS16 6QL, UK.
- 23 Verband de Flockindustrie eV, (Association of the Flock Industry), Tannenberger Strasse 66/62 D-72760 Reutlingen, Germany.
- 24 WIRA Technology (BTTG), West Park Ring Road, Leeds LS16 6QL, UK.

- 25 Woolmark Company, Valley Drive, Ilkley, West Yorkshire LS29 8PB, UK.
- 26 Wools of New Zealand, Design and Development, Little Lane, Ilkley, West Yorkshire, LS29 8UG, UK.

11.3.2 Some UK universities/institutions with textile departments

- 1 Bolton Institute, Deane Road, Bolton BL3 5AB, UK.
- 2 Huddersfield University, Queensgate, Huddersfield HD1 3DH, UK.
- 3 Leeds University, Leeds LS2 9JT, UK.
- 4 Manchester Metropolitan University, Cavendish Building, Manchester M1 5GD, UK.
- 5 Nottingham Trent University, Burton Street, Nottingham NG1 4BU, UK.
- 6 Royal College of Art (Postgraduate Art & Design – Textile Design), Kensington Gore, London SW7 2EU, UK.
- 7 Heriot-Watt University, Scottish Borders Campus (formerly Scottish College of Textiles), Netherdale, Galashiels, Selkirkshire TD1 3HF, UK.
- 8 UMIST, PO Box 88, Manchester M60 1QD, UK.

11.3.3 Plastics, rubber and composites

- 1 Association of Plastics Manufacturers in Europe (APME), Avenue E. Van Nieuwenhuysse 4, Box 3, B-1160 Brussels, Belgium.
- 2 British Rubber Manufacturers' Association Ltd., 90 Tottenham Court Road, London W1P 0BR, UK.
- 3 The Society of Advanced Materials and Process Engineers (SAMPE), International Business Office, 1161 Parkview Drive, Covina, California 91724-3748 USA.
- 4 The British Plastics Federation, 6 Bath Place, Rivington Street London EC2A 3JE, UK.
- 5 The Center for Professional Advancement, Box 1052, 144 Tices Lane, East Brunswick, NJ, USA 08816-1052.
- 6 Institute of Materials, 1 Carlton House Terrace, London SW1Y 5DB, UK.
- 7 Nottingham University Composites Club, School of Mechanical Materials, Manufacturing Engineering and Management, University of Nottingham, University Park, Nottingham NG7 2RD, UK.
- 8 RAPRA Technology Ltd., (Rubber Industries Research Association), Shawbury, Shrewsbury, Shropshire, SY4 4NR, UK.
- 9 The Society of Plastics Engineers, 14 Fairfield Drive, PO Box 403, Brookfield, CT 06804-0403 USA.

- 10 The Malaysian Rubber Producers' Research Association, Tun Abdul Razak Laboratory, Brickendonbury, Hertford SG13 8NL, UK.
- 11 VDI-Gesellschaft Kunststofftechnik (VDI-K), Graf-Recke-Strass 84, 40239 Dusseldorf, Germany. (Institute of German Engineers – Technical Plastics).

11.3.4 General engineering/joining technology

- 1 Alliance of Automobile Manufacturers (AAM) 1401 H Street NW-Suite 900, Washington DC 20005-2110, USA.
- 2 Japanese Automobile Manufacturers Association (JAMA), Otemachi Bldg., 6-1, Otemachi 1-Chome, Chiyoda-ku, Tokyo 100-0004, Japan. European address; 327 Avenue Louise, B 1050 Brussels, Belgium.
- 3 Loughborough University, Institute of Surface Science and Technology, Ashby Road, Loughborough, Leics LE11 3TU, UK.
- 4 Oxford Brookes University, Joining Technology Research Centre, Oxford OX3 0BP, UK.
- 5 Society of Automobile Engineers (SAE), 400 Commonwealth Drive, Warrendale PA 15096-001 USA.
- 6 Society of Motor Manufacturers and Traders (SMMT), Forbes House, Halkin Street, London SW1X 7DS, UK.
- 7 Organisation Internationale des Constructeurs d'Automobiles (OICA-International Organisation of Motor Vehicle Manufacturers), 4 Rue de Berri F-75008 Paris, France.
- 8 The Institute of Mechanical Engineers – Automobile Division (IMEchE), 1 Birdcage Walk, London SW1H 9JJ, UK.
- 9 The International Federation of Automotive Engineering Societies (FISITA), 1 Birdcage Walk, London SW1H 9JJ, UK.
- 10 Verband Der Automobilindustrie eV (VDA), Westendstrasse 61, Postfach 17 05 63, D-60325 Frankfurt am Main 17, Germany.
- 11 The Welding Institute (TWI), Abington Hall, Abington, Cambridge CB1 6AL, UK. N.B. 'Welding' encompasses all joining techniques – including adhesives.

11.3.5 Testing and standards

- 1 American Association of Textile Chemists and Colorists, PO Box 12215, Research Triangle Park, North Carolina 27709-2215, USA.
- 2 American Standards Institute (ANSI), 11 West 42nd Street, 13 Floor, New York, NY 10036-8002, USA.
- 3 Association Française de Normalisation, F-92049 Paris, La Defense Cedex, France.

- 4 ASTM (American Society for Testing and Materials), 1916 Race Street, Philadelphia PA 19103-1187, USA.
- 5 British Standards Institution, 389 Chiswick High Road, London W4 4AL, UK.
- 6 CEN (The European Committee For Standardization), Central Secretariat; Rue de Stassart 36, B-1050 Brussels.
- 7 Detroit Testing Laboratory Inc., 7111 E Eleven Mile, Warren MI 48092, USA.
- 8 DIN Deutsches Institut für Normung, Burggrafenstrasse 6, D-10787 Berlin, Germany.
- 9 Ente Nazionale Italiano di Unificazione, Via Battistotti Sassi 11/b 1-20133 Milano, Italy.
- 10 International Organization for Standardization, Central Secretariat, 1 Rue de la Varenbe Caisse Postale 56, CH-1211, Geneva 20, Switzerland.
- 11 Korean National Institute of Technology and Quality, 1599 Kwanyang-dong, Dongan-ku, Anyang City Kyonggi-Do 430-060, Republic of Korea.
- 12 Japanese Industrial Standards Committee, Department of Standards, Industrial Science and Technology Agency, Ministry of International Trade and Industry, 1-3-1, Kasumigaseki, Chiyoda-ku Tokyo 100.
- 13 United States Testing Inc., 1415 Park Ave., Hoboken NJ 07030, USA.

11.4 Market information on automotive industry

- 1 Inside Brief, Turret RAI PLC, Armstrong House, 38 Market Square, Uxbridge, Middlesex UB8 1TG, UK.
- 2 IFAI, 1801 County Road, BW Roseville MN 55113-4061, USA. (Members)
- 3 Intercontuft (International Consultants), 3080 Tervuren, Moorelboslaan 15, Belgium.
- 4 Financial Times Automotive, Maple House, 149 Tottenham Court Road, London W1P 9LL, UK.
- 5 LMC Automotive Services, 14–16 George Street, Oxford OX1 2RF and in the USA; LMC Automotive Services. 1841 Broadway, Suite 611, New York, NY 10023, USA.
- 6 Marvel, 11 Place du General Leclerc, F-92300 Levallois-Perret, France.
- 7 Motor Industry Research Association, (MIRA), Watling Street, Nuneaton, Warwickshire CV10 0TU, UK.
- 8 Ward's Automotive International, published twice monthly, Ward's Communications, 3000 Town Center, Suite 2750, Southfield, Michigan 48075 USA.

11.5 General textile reference

- 1 *'European Index of Yarns and Fibres'*, 3rd edn, Bradford, World Textile Publications 1999.
- 2 *'Index to Textile Auxiliaries'*, 17th edn, Bradford, World Textile Publications 2000.
- 3 McIntyre JE & Daniels PN (eds), *'Textile Terms & Definitions'*, 10th edn, Manchester, The Textile Institute, 1995.

11.6 Glossary of terms and abbreviations

These are for information only by the reader in the context of textiles in transportation; they should not be considered as official definitions. There is a growing number of abbreviations being used in the automotive industry to describe processes, materials, and even type of vehicle. These are in addition to the chemical, engineering, and information technology terms. Many of these abbreviations are presented in the list here, which is by no means intended to be exhaustive. The automobile textile engineer will come across all these in the course of his or her duties. There is a 'Textile Terms and Definitions' publication available from the Textile Institute.

AAMA	American Automobile Manufacturers Association.
AATCC	Association of American Textile Chemists and Colourists.
ABC pillars	structures which support the roof in a car. A at the front holding the windscreen, B at the centre and C at the rear.
ABS	acrylonitrile-butadiene-styrene plastic. Not to be confused with automatic braking system.
ACEA	European Automobile Manufacturers Association.
ACORD	Automotive Consortium on Recycling and Disposal.
AIAG	Automotive Industry Action Group (USA).
ALREM	Association of Load Restraint Equipment Manufacturers.
APME	Association of Plastics Manufacturers in Europe.
ASTM	American Society for Testing and Materials.
ATA	Associazione Tecnica dell'Automobile (Italy).
ATH	aluminium trihydrate (flame retardant agent).
BATNEEC	best available techniques not entailing excessive cost (for prevention of release of harmful substances to the environment).
BCF	bulked continuous filament.

Benchmarking	a procedure which compares competitive products to one's own and then seeks to establish the 'best practice'.
BOD	biological oxygen demand.
BPF	British Plastics Federation.
BRITE EURAM	Basic Research for Industrial Technologies in Europe, European Research in Advanced materials (EU sponsored research).
BSI	British Standards Institution, hence BS = British Standard.
BS AU	British Standard Automobile Series.
BTTG	British Textile Technology Group.
CAD	computer assisted design.
CAM	computer assisted manufacturing.
CARE	Consortium for Automotive Recycling.
CEFIC	European Chemical Industry Council (Federation).
CEN	Comite European de Normalisation.
CFC	chlorofluorocarbons, chemicals once used in refrigeration, foam making etc. Identified as damaging to the environment and now being phased out world-wide.
CHIP	chemical hazard information & packaging regulations.
CIELAB	Commission International du Eclairage (LAB refers to colour differences calculated).
CIRFS	Comité International de la Rayonne et des Fibres Synthetiques (Brussels).
COD	chemical oxygen demand, the amount of oxygen needed to purify effluent.
COSHH	Control of Substances Hazardous to Health.
CRAG	Composite Research Advisory Group, (UK Ministry of Defence).
CRE	constant rate of extension.
CRL	constant rate of load.
CTR	constant rate of traverse.
DBDO	decabromo diphenyl oxide (flame retardant agent).
DETR	Department of the Environment, Transport and the Regions. (UK).
DFD	design for disassembly.
DFM	design for manufacture.
DIN	Deutsches Institut für Normung (German Standards Institute).
Dioxins	a generic term applied to groups of chemicals including polychlorinated dibenzo- <i>p</i> -dioxins (PCDDs) and chlorinated dibenzo-furans. They are sometimes pro-

	duced as by-products in certain combustion processes and some are extremely toxic.
DOE	Department of the Environment.
DTCA	Defence Clothing and Textile Agency (UK).
ECE	European Colourfastness Establishment.
EDANA	European Disposables and Nonwovens Association.
ELV	end-of-life vehicle. Vehicle that has come to the end of its useful life – sometimes referred to as EOL – end-of-life vehicle.
EMAS	European Eco-Management and Audit Scheme.
EMS	Environmental Management System.
Energy recovery	the useful energy produced by using waste material as fuel.
EOL	end-of-life vehicle.
EPM	ethylene propylene monomer rubber.
EPDM	ethylene propylene diene monomer rubber.
EV	electric vehicle.
EVA(c)	ethylene vinyl acetate.
FAAS	flame atomic absorption spectroscopy.
FAKRA	Fachnormenausschuss Krafflahzeuge – German body for automotive standards – probably best known in textiles' industry for accelerated light stability test, DIN 75202.
FDY	fully drawn yarn.
FES	flame emission spectrophotometry.
FISITA	International Federation of Automotive Engineering Societies.
FMEA	Failure Mode and Effects Analysis – a systematic procedure to assess the potential failure of a component or process and its effects and to establish ways to prevent re-occurrence.
FR	flame-retardant properties.
FRP	fibre-reinforced plastic.
FTIR	Fourier transform infra red (analysis).
GC	gas chromatography, an analytical method.
GLC	gas liquid chromatography, an analytical method.
GRP	glass-reinforced plastic.
GRU	glass-reinforced urethane.
GRV	gross vehicle weight.
HDPE	high density polyethylene.
HMPE	high modulus polyethylene.
HOY	high-orientated yarn.
HT	high tenacity – a term applied to yarns of above

	average tensile strength, i.e. generally in excess of 7 g/dtex.
IFAI	Industrial Fabrics Association International.
IMMFC	International Man-Made Fibres Congress (Dornbirn, Austria).
IMO	International Maritime Association.
IMR	in mould reaction.
INDA	Industrial Nonwoven and Disposables Association, (USA).
IP	instrument panel.
IPC	integrated pollution control.
IPPC	integrated pollution prevention and control.
IR	infra red.
ISO	International Standards Organisation.
ISOPA	European Isocyanate Producers' Association (Polyurethane Industry) – an organisation within the European Chemical Industry Federation (CEFIC).
ITMA	International Textile Machinery Association (Exhibition every four years in Europe).
IWS	International Wool Secretariat.
JAR	Joint Aviation Regulations.
JASO	Japanese Automobile Standards Organization.
JIS	Japanese International Standard.
LCA	life cycle analysis – a method of assessing a product or process for impact on the environment which takes into consideration every factor, from the raw materials, production, distribution, use and disposal. Also referred to as 'cradle to grave' analysis.
LCP	liquid crystal polymer – used in instrument panel displays.
LDPE	low density polyethylene.
LEV	low emissions vehicle.
LOD	limiting oxygen index, FR test used mainly by researchers.
MF	melamine formaldehyde.
MFI	melt flow index-viscosity measurement for molten polymers and adhesives.
MIRA	Motor Industries Research Association (UK).
MPV	multi-purpose vehicle.
MPW	mixed plastics waste.
MS	mass spectrometry, an analytical technique.
MUTA	Made up Textiles Association.
NAMAS	National Measurement Accreditation Service – by the NPL (UK).

NBR	acrylonitrile butadiene rubber.
NBS	National Bureau of Standards (US).
NFPA	National Fire Protection Agency (USA).
NMR	nuclear magnetic resonance, an analytical technique.
NPL	National Physics Laboratory, (UK).
NR	natural rubber.
NSCA	National Society for Clean Air and Environmental Protection, (UK).
NVH	noise, vibration and harshness.
OEL	occupational exposure limit (of chemicals).
OEM	original equipment manufacturer, i.e. Ford, BMW etc.
OICA	International organization of motor vehicle manufacturers.
PA	polyamide, known also as nylon – designated with numbers which relate to the starting materials from which they are made, e.g. nylon 6, nylon 66, nylon 46 etc.
PAN	polyacrylonitrile, usually refers to acrylic fibre, e.g. Courtelle.
PBDE	polybrominated diphenyl ethers.
PBI	polybenzimidazole, a material with very high FR properties.
PBTP	polybutylene terephthalate, a polymer related to PET, with more stretch in yarn form and a lower melting point.
PCDD	see dioxins.
PE	polyethylene.
PET	polyethylene terephthalate, known commonly as polyester.
PO	polyolefin, a general chemical term used to describe plastics made from polyethylenes and polypropylenes.
POY	partially orientated yarns.
POY	pre-orientated yarn.
PP	polypropylene.
PRAVDA	Project Altfahrzeugverwertung Deutscher Automobilhersteller, (German automobile manufacturers used vehicle recycling project).
PSAB	pressure-sensitive adhesive-backed.
PSB	polystyrene-butadiene rubber.
PSV	public service vehicle.
PU	polyurethane, interior trim can be made from polyurethane polyester foam or from polyurethane polyether foam. In the trade they are referred to as

	‘polyester foam’ or ‘polyether foam’ and even as simply, ‘ether’ and ‘ester’. Not to be confused with polyester.
PUR, (PU)	polyurethane.
PURRC	Polyurethane Recycle and Recovery Council (of the Society of the Plastics Industry – USA).
PVA(c)	polyvinyl acetate.
PVA(l)	polyvinyl alcohol.
PVC	polyvinylchloride.
PVDC	polyvinylidene chloride.
PVDF	polyvinylidene fluoride.
QS 9000	Quality system based on ISO 9000 specially designed for the auto industry.
Rad XL PP	radiation crosslinked polypropylene (foam).
RAPRA	Rubber and Plastics Industry Research Association (UK).
RIM	reaction injection moulding.
RV	recreational vehicle.
SAE	Society of Automotive Engineers, (USA).
SAMPE	Society of Advanced Materials and Process Engineers, (Composites).
SBR	styrene butadiene rubber.
SDC	Society of Dyers and Colourists (UK).
SEM	scanning electron microscopy.
SEPA	Scottish Environmental Protection Agency.
SERA	Socialist Environmental and Resources Association.
SME	small medium enterprise.
SMMT	Society of Motor Traders and Manufacturers.
SPC	Statistical Process Control.
S-RIM	structural reaction injection moulding.
SUV	sports utility vehicle.
Tack	the property of an adhesive to form a measurable bond, immediately it is brought into contact with a surface under low pressure. Sometimes referred to as ‘grab’ or ‘green tack’.
Taguchi Methods	Statistical techniques for prototyping and optimizing product and process design.
TDI	toluene di-isocyanate.
TI	Textile Institute.
TLV	threshold limit value.
TPE	thermoplastic elastomer.
TPO	thermoplastic polyolefin.
TPU	thermoplastic polyurethane.

TQM	Total Quality Management.
TSS	total suspended solids (in effluent).
UF	urea-formaldehyde.
UL	Underwriter's Laboratory (e.g. for FR testing).
UV	ultra violet.
VDI	Verein Deutscher Ingenieure – Association of German Engineers.
VOC	volatile organic compound.
UNCED	United Nations Conference on the Environment.
WIRA	Wool Industries Research Association.
ZEV	zero emissions vehicle.

11.7 Abbreviations used in references at end of chapters

ATI	America's Textiles International.
BPR	British Plastic and Rubber.
EPN	European Plastic News.
IMMFC	International Man-Made Fibres Congress.
JSDC	Journal of the Society of Dyers and Colourists.
JTN	Japanese Textile News, Monthly.
MPI	Modern Plastics International.
PRW	Plastics and Rubber Weekly.
TTi	Technical Textiles International.
TuT	Technical usage Textiles (France).