

What is the minimum weight of a safe subcompact car? Wie leicht kann ein sicherer Kleinwagen sein?

Wallentowitz-H

Comprehensive vehicle safety requires a high level of both driving and crash safety. When it comes to subcompact cars fundamental difficulties have to be overcome regarding occupant protection in particular. Apart from high pressure on costs, it is the short deformation zones and the high loading of the lighter car in vehicle-vehicle collisions, which turn out to be critical. Not only the safety requirements, but also economical considerations set limits to the efforts towards lightweight design in this market sector. Moreover, customer expectations regarding comfort, styling, quality appearance, spaciousness and variability of the passenger compartment conflict with the aim of effective lightweight design. The empty weights of subcompact cars have actually been rising substantially with every model renewal for years. Constructional measures for turning back this trend should include the fundamental optimization of vehicle concepts, for example concerning the position of the engine-transmission unit. In particular, such measures should be designed to improve the compatibility in vehicle-vehicle collisions. When it comes to the application of lightweight materials, it is especially high performance fibre-reinforced plastics, which facilitate weight reduction, if the corresponding structures are designed appropriate to the material involved. Considering also the application of new driver assistance systems for the prevention of accidents, a safe, two-seated subcompact car with an empty weight of less than 500 kg seems technically feasible in the near future. The feasibility in series production, however, depends on conditions like the fuel price and the compatibility of heavier vehicles.

Investment and globalisation in the automotive textile yarn market|Investment und Globalisierung im textilen Autogarnmarkt

Ullman-A-J

The year 2002 marked another advance in global car production, recording an increase of 3.8 % over 2001. The total output was recorded at a little over 41 million passenger vehicles. China leads the advance with a production increase of about one million vehicles in 2002. In Europe the car production declined by 2 %. The European market of 14.39 million private automobiles fell by 3 % compared to 2001. Europe exported 2.6 million vehicles last year, an increase of 11 % and imported 2.2 million, a rise of 1 %. Japan is increasingly dependent on its overseas manufacturing plants but local production recovered in 2002. The USA saw some 12.3 million vehicles roll-off the production lines and imported 3.3 million vehicles. Canada and Mexico manufactured 4.4 million vehicles in 2002, the same number as for 2001. A new car today contains over 11 kg of textiles. In 2002, some 259000 tonnes of textiles with a value of USD 1.06 billion were used in European vehicle manufacture. By the year 2008, it is forecasted that 302400 tonnes of textiles with a revenue value of USD 1.18 billion will be used in European vehicle manufacture. The industry is forcing down prices at the same time as it is demanding continuing innovation, technical development and ever-quicker response times. Over the last five years the dominance of velour fabric for automotive interiors has declined to be replaced by greater demand for flat woven fabrics. In Europe today there is increasing fabric choice to differentiate models within a range. This can mean the choice of flat woven or knitted fabric and wide colour options. The automotive market in China is booming. Passenger car sales rose 82 % in the past six months. Carmakers are also making large profits with many vehicles selling at twice the price they command in the U.S. the amount of fibre consumed per car is increasing and fibre manufacturers invest considerable sums in the research and development of new type of fibres. The European manufacturing operations will concentrate on the specialised higher-end products.

Oeko-tex standard for the car interior|ÖKO-Tex Standard für Autoinnenausstattung

Zippel-E

Öko-Tex is widely used within the textile chain for cost efficient verification and declaration of ecology of use properties. It is based on a System that hands along the relevant information from the fibre producer onwards and thus, often is established as shopping requirements. The requirements currently in use for delivering to the automotive industry, on the one hand differ and on the other can not be based on the information handed up along the chain. Therefore it might be a good idea to close the connection by establishing requirements adequate for the use in automotive interiors. The ÖTI institute, deeply involved in the testing of floor-coverings and founding member of the Oeko-Tex-Association, for a long time deals with textile health issues and especially the problems of emission and VOCs. Though basic useable methodology seems identical to the problems of emissions from floor-coverings and mattresses, the conditions of use are significantly different. This should be included into the modelling process for measurements parameters and limiting values. The textile chain needs and uses a system for simple verification of main harmful substances in textiles. The current Öko-Tex emission model used for carpets and mattresses is explained.

Textile applications in the automotive industry|Textile Anwendungen in der Automobilindustrie

Malvicino-C|Marzorati-D

The cabin and the interiors are becoming even more important representing a significant competition issue and an innovation domain. The textiles presently used in the automotive field are mainly intended as a covering material with only an aesthetic function. On the one hand the textile and fabric domain is offering a wide choice of new materials that very often are multi-functional: temperature

dependent air permeability, anti-bacterial, reflective, illuminated, membrane coupled, etc. On the other hand there is the need to transform the car cabin in a 'living room' where the comfort and well-being are the main issues and the increase of electronic contents makes allowable the possibility to manage it with active components (ventilated panel or seats, diffused illumination, integrated and diffused sensor or actuators, etc.). To achieve these goals the innovative textiles could play a key-role, the main constraint is represented by the typical requirements of the automotive field: reliability, durability and cost. Some innovative applications of textile materials in the framework of passenger car evolution and related assessing methods are described: interior surfaces are made breathable with a special fabric cover to realize a revolutionary air conditioning system, sweating thermal modulus to assess the comfort properties of standard and innovative seats, mathematical model of the thermoregulatory system to estimate the effect an thermal comfort of clothing and environmental conditions. The textile materials represent a good opportunity to innovate the automotive interiors.

Steigende Temperaturanforderungen an Fasern und Textilien in Automobilbauteilen|More stringent temperature requirements regarding fibres and textiles in automotive components

Rink-G

Es werden die unterschiedlichen technischen Anwendungen von Textilfasern in Automobilen aufgezeigt und in einer kurzen Übersicht beschrieben. Textilfasern werden in Bauteilen vornehmlich zur Verstärkung eingesetzt. Dies sind Bauteilgruppen wie Reifen, Riemen und Schläuche. Sie müssen aber auch den Anforderungen genügen, die an die Bauteile gestellt werden. Dann werden die verschiedenen textilverstärkten Bauteile nach ihren Verwendungen und nach ihren Einsatzorten beschrieben. Es werden die Anforderungen an die Bauteile skizziert und die daraus resultierenden Anforderungen an die textilen Werkstoffe abgeleitet. Neben den mechanischen Beanspruchungen, für die Verstärkungen benötigt werden, wird besonders auf die Temperaturbeanspruchung eingegangen. Die Temperaturbelastung wird bestimmt durch die Funktion des Bauteils und von der Einbausituation. Zu berücksichtigen sind außerdem chemische Belastungen und Angriffe, die auf das Bauteil und damit unter Umständen auf das Textil einwirken. Zu den Bauteilen werden die zurzeit in der Automobilindustrie benutzten Materialien besprochen. Zugleich werden Entwicklungstrends aufgezeigt und werden Prognosen für zukünftige Lösungen gegeben.

3-D automotive textiles - a comparative evaluation|3D-Textilien im Auto - eine vergleichende Bewertung

Fuchs-H

Three-dimensional textiles provide a perfect structure for car interiors. They completely fulfil important characteristics in use such as softness, breathability, upholstery properties and aesthetic functions. But also aspects of recycling can be better taken into consideration if pure textile composite structures are used. Nowadays, the application of spacer knits and spacer fabrics is state-of-the-art. The product group of three-dimensional nonwovens or spacer nonwovens such as Kunit, Multiknit, Struto und Napco is an the advance not least because of economic reasons. The trend for car interiors is characterized by increased requirements to softness and comfort, which is realized by the so-called soft touch. Processing methods such as back spraying, back lining and laminating play an important role. The application of three-dimensional nonwovens for car seats is partly realized, but further research and development is necessary for headliners, door trims and column covers. A comparative assessment of different applicable textile structures is shown especially related to quality aspects. Warp-knitted spacer fabrics are double-layer, warp-knitted constructions in which the two sides of the textiles are joined together. Spacer fabrics with more than 20 mm thickness are under development. Multiknit nonwovens are produced from 100 % carded fibres by the stitch-bonding process. The lengthwise oriented card web is first bonded on the Kunit stitch-bonding machine. In a second stage the Kunit nonwoven is bonded on the Multiknit stitch-bonding machine. Thermally treated Multiknit nonwovens are known under the trade name Caliweb. Spacer fabrics can also be produced on flat weft knitting machines equipped with two needle beds. More recent development work has concentrated on producing spacer fabrics on circular weft knitting machines. In general spacer fabrics are characterised by high productivity during the manufacturing process. 3D textiles will have an intensified use as textile components for fibre-reinforced plastics as lightweight building units in carrying parts, whereby nonwovens can only be used in a limited way.

Einsatzpotenziale textiler Fertigungsverfahren im Automobilbau|Potentials of textile manufacturing methods for automotive applications

Laourine-E|Kolkmann-A|Gries-T

Textilien finden bereits in weiten Bereichen im Automobilbau Verwendung. Um das Potenzial textiler Anwendungen und deren Einsatzmöglichkeiten im Automobilbau weiter auszubauen, sind die textilen Fertigungsverfahren zu verbessern und neue Kombinationsmöglichkeiten zu schaffen. Es werden textile Fertigungsverfahren, die zur Herstellung von Verstärkungs- und Verbundstrukturen eingesetzt werden, erläutert. Dabei werden neben zweidimensionalen Textilien auch dreidimensionale Textilien beschrieben. Der 3D-Rundflechtprozess ist eine automatisierte Produktionsmethode, mit der dreidimensionale Teile produziert werden können. Beispiel geflochtener Teile wie T-Profile und geflochtene Verbindungselemente aus Carbon werden vorgestellt. Ein weiterer Schwerpunkt ist das Fügen der Textilien, bei dem aus zweidimensionalen Strukturen durch Formen und Verbinden eine dreidimensionale Struktur entsteht, ein so genannter trockener Preform. Eine wichtige Fügetechnologie stellt das Nähen dar. Es wird eine Nähmaschine vorgestellt, mit der technische Textilien von einer Seite her zusammengefügt werden können. Die Funktionsweise wird anhand eines KFZ-Unterbodens erläutert. An 2 Beispielen wird das Potenzial der textilen Fertigungsverfahren aufgezeigt. Das erste Beispiel 'ein Dachhimmel' stammt aus dem Interieurbereich eines Pkw. Der Dachhimmel ist eine Kombination einer Verstärkungsstruktur mit einem Vlies und ist selbsttragend. Das zweite Beispiel ist ein Demonstratorbauteil aus dem Karosseriebereich, das aus Multiaxialgelegestrukturen hergestellt wurde. Dabei kamen einseitige Nähtechniken zum Einsatz.

Spun-dyed polyester yarns to be used as pile in automotive textiles|Spinngefärbte Polyestergarne für den kritischen Poleinsatz im Automobil

Jorgensen-P-E|Hüsing-E

Overhead presentation. Approximately 17 million cars are produced in Europe yearly. Fabrics for seats, doors and headliners, which mainly consist of textured and dyed polyester yarns, are all forming parts of these cars. Each year ca. 50000 t textured polyester yarns are used in automotive textiles in Europe. Almost the entire quantity is dyed - piece-dyed, yarn-dyed and spun-dyed. For the time being the spun-dyed part increases and is expected to reach around 15000 t in 2005. The general trend within textured automotive textiles has in recent years moved towards a larger part of flat constructions, mainly as woven fabrics, but also as flat knitwear. However, in the cars produced in Europe velour is also used - especially the French and the Japanese producers follow this trend. The requirements to automotive textiles increase all the time - this applies not least to velour fabrics. Yarn-dyed yarns have for many years been used for velour; however, today it is also possible to use spun-dyed yarns in critical velour constructions. Spun-dyed textured PET yarns give a number of advantages compared with similar yarn-dyed products - for instance in terms of light fastness, dye consistency and lot size. A disadvantage is, nevertheless, the limited selection of dyestuffs, which makes it difficult and some times even impossible to solve the problems with metamerism compared with yarn-dyed alternatives. When you deliver spun-dyed yarns for critical use a number of significant properties has to be observed, and at the same time a stringent process control is necessary. The considerations to be made and the measures to be taken relate to the choice of dyestuff, the spinning for texturing and the finishing of the textured yarn. Just like in the earlier processes there are a number of considerations and measures relating to the production of fabric. The considerations should be made in close cooperation with the yarn producers to get the optimal result.

The universal application of polyester fibres for acoustically effective components in the car interior|Die universelle Anwendung von Polyester-Fasern für akustisch wirksame Bauteile im Fahrzeuginnenraum

Becker-U|Nick-A

The use of acoustic performing materials in the automotive industry is essential for improving comfort, safety and sound design. Innovative applications based on polyester fibres to fulfil customer's wishes are described. Emphasis is put on materials with excellent acoustic properties and they are compared with one another. Polyester fibres can be used for acoustic absorbers without any mechanical stiffness as well as for parts with high mechanical stiffness. The air sound absorption of porous material can be measured with the impedance tube and with a reverberation test room. For the tests the Cabin Alpha has been used, which is a reverberating room with reduced dimensions. Apart from absorption properties of materials the insulation in combination with heavy layer is of interest. Laboratory acoustic systems for investigating the insulation properties are the Apamat and Petite Cabine. The difference between them is the excitation. The absorption of porous materials is essentially dependant on the airflow resistivity and the material thickness. Melt-blown-fibre felts, PES-felts and mixtures of cotton with polyester fibres are used as absorbers. Melt-blown-felts show the best values. In addition to acoustical requirements also mechanical demands must be fulfilled. But also flammability, odour, formaldehyde and fogging emissions are very important for interior parts. In most cases it is no problem for PES based products to fulfil these demands. From the recycling point of view PES solutions are excellent because material recycling can be realised and this is in line with the 'end of Live Vehicles' (ELV) directive.

Einsatz von beflockten Textilien im Automobil|Use of rooked textiles in the car interior

Hoffmann-G|Offermann-P|Freudenberg-C|Mrozik-B

Textilien erfüllen im Auto sehr vielfältige Funktionen. Neben rein technischen Aufgaben geben textile Werkstoffe den Oberflächen einen textilen Charakter. Beflockte Textilien zeichnen sich durch eine besondere Optik und Haptik aus. Durch die von der Oberfläche senkrecht abstehenden Fasern und die sehr großen Faseroberflächen sind die beflockten Flächen auch für funktionale Aufgaben geeignet. Der Einsatz von Flockfasern in der Automobilindustrie zeigt keine einheitlichen Trends. Während im Bezugstoffbereich der Einsatz von Flock eher rückläufig ist, werden die Flockfasern zunehmend für die Beflockung von harten Oberflächen und für technische Aufgaben genutzt. Die hohen Qualitätsanforderungen der Autoindustrie verlangen von Flockherstellung bis zur Reinigung der beflockten Flächen eine fehlerfreie Prozesskette. Mit neuen Lösungen und technologischen Entwicklungen versucht die Flockindustrie bei moderaten Fertigungskosten qualitativ hochwertige Flockprodukte zu liefern. Das Eigenschaftsprofil der Flockfasern kann durch die Kombination mit anderen Werkstoffen für weitere Einsatzbereiche effizient genutzt werden. Die TU Dresden untersucht in mehreren Forschungsprojekten die thermischen, akustischen und druckelastischen Eigenschaften von Flockfasern. Durch die schichtweise Anordnung von Membranen mit Abstandshaltern aus Flockfasern kann bei sehr geringer Dichte eine sehr gute Wärmeisolation erzielt werden. Mit ähnlichen Schichtaufbauten mit porösen Membranen, beflockten Flächen und Vliesstoffen in Kombination werden sehr gute akustische Eigenschaften erzielt. Die Anordnung von Flockfasern zwischen zwei textilen oder einer harten und einer textilen Fläche bringt sehr gute druckelastische Eigenschaften. Die Qualität und Funktionalität der beflockten Flächen hängt wesentlich von der Materialauswahl und der Durchführung der elektrostatischen Beflockung ab. Durch die gezielte Nutzung der Flockeigenschaften wie Schallabsorption, Druckstabilität und große Faseroberflächen kann der Einsatzbereich des Flocks im Automobil erweitert werden.

New technologies for optimizing color development processes in the automotive industry|Neue Technologien für die Optimierung von Farbentwicklungsprozessen für die Automobilindustrie

Franz-W|Picht-S

In today's competitive environment, more and more demands are being made on the colour design for the interior of private automobiles. At the same time, more than ever before, there is a need to accelerate the development process from the product concept through to the market launch, and to reduce development costs. Traditional colour development procedures are extremely time-consuming and expensive. Digital sampling on the other hand allows the specification of reproducible digital colour values, which can be exchanged quickly and easily via e-mail with any office, which has compatible equipment, and displayed accurately on any Computer screen. Particularly important with regard to matching the colours of different surfaces within the vehicle interior is the opportunity to digitally combine colours with textures and surfaces for a realistic simulation on the screen of the appearance of the finished product. One major advantage of digital sampling is the fact that the amount of time and money spent on preparing samples is reduced considerably. Well-researched decisions in the colour development process can be made weeks earlier than in the past, without the need for physical samples. Quality is also improved: the time pressure which builds up in the traditional colour development process often forces those responsible to compromise. In contrast, quick and flexible communication between manufacturers and suppliers, based on digital sampling, means that the best can be achieved in less time and at lower cost.

Design of recyclable textile structures (nonwovens) for the automotive industry|Die Entwicklung von recycelbaren Textilstrukturen (Vliesstoffen) für die Automobilindustrie

Normand-X|Dreux-F|Peron-B

Nowadays, the environmental requirements are more and more important in all industrial fields and notably in the automotive sector. That requires to work the most to develop new products, which are 100 % recyclable. Today, the automotive products comprise several raw materials which are difficult to separate, and partially recyclable. An analysis of 204 synthetic filter medium types on the market was carried out. The principal objective of the studies presented in developing textile structures (nonwovens) composed of thermoplastic (recycled or not) mono material having the same characteristics (acoustic, comfort, mechanical behaviour, filtration efficiency, dust holding capacity, pressure drop, etc.), even better than existing products of the automotive market. This new concept will allow to reduce the production of last wastes in the automotive sector and even to define a new method of valorization in closed circuit of an automotive product. The aims of those studies are to replace classical engine air filter and classical acoustic insulation products manufactured in several raw materials, which are difficult to separate, and partially recyclable by filter or textiles structures (nonwovens) composed of a thermoplastic (recyclable or not) mono material. The recycling of this mono material was studied for automotive applications or for other fields. The key advantages which manufacturers grant unquestionably to the synthetic media are increased capacity and their recyclability. However, they will also be studying the new requirements such as fire behaviour, resistance to humidity, behaviour with soot types etc. As for recycling, the major advantage of those synthetic media and acoustic structures, the crushing and shredding tests carried out on industrial units allow us to conclude that they are industrial recyclable with such technologies.

Process and product optimization of viscose tire yarn by laser-assisted bobbin control|Prozess- und Produktoptimierung von Viskosereifenkord mit laserunterstützter Spulenkontrolle

König-R|Baumgartinger-J

In order to meet the rising customer requirements in the automotive supply industry, Glanzstoff decided to introduce a fully automatic bobbin inspection system. The bobbins are scanned by optoelectronic means applying laser technology and high resolution cameras. The measured results are evaluated by means of image processing using high-end PCs. The bobbins are classified according to specified classification criteria. The results consist of the classification symbol for the bobbin itself and a detailed description of all inspected classification parameters. The bobbins arrive by conveyor belt and are presented to the measuring station by a robot. In the measuring station the bobbin is turned by the robot. While the bobbin is being turned through 360 degrees, the sensors scan its surface. Special image analysis software ensures reproducible, precise evaluation of the quality parameters. The results determined are transferred to a data concentrator, passed on in compressed form to the processing computer and stored in an SQL database. Given the systematic structure of the data record per bobbin it is possible to obtain qualitative conclusions through to the individual spinning position. This data now provides the basis for further process improvement and optimization at Glanzstoff. At the same time it is ensured that the customer can only receive 100 %-tested goods. The benefits for the customer are reliability, reproducibility, no touching of bobbins, integration in logistics by full or partly automation, reduction of labour costs etc.

Dolan fibres for convertible cartops|Dolan-Fasern für Cabriovertoppe

Meinert-J

One of the most demanding application for pigment dyed acrylic fibres is the end use fabrics for textile convertible car-tops. Due to the excellent properties in the end product the polyacrylic fibre Dolan has established its position for this end use. The leadership in quality could be improved continuously. An overview is given of the requirements, which are essential for the convertible, and shows the special properties the fibre has to offer. Extraordinary development work is necessary to improve service and product quality to the car top manufacturing chain. One of the ingredients to form a long-term supplier for this critical technical textile is a close and trusting co-operation. A permanent dialogue with all parties involved in the production of convertible car tops from Dolan fibre is essential. A 3-layer car-top fabric consists of a top fabric, a lower fabric and an intermediate waterproof layer. Textile car-tops have to meet various demands such as abrasion resistance, light- and weather fastness, dimension stability and elasticity, resistance to certain chemicals, waterproofness etc. The different test methods are summarised in table form. The central role of the top layer is to provide resistance to UV-light, wind and weather conditions. Therefore the use of extremely light- and weather fast pigments is essential. Next to the colour fastness, the likeliness of the fibre for yellowing is important.

Yellowing can be simulated with test method AATCC 169. The Atlas MTS company offers outdoor weathering tests in Florida, Arizona or the French Med. Through ongoing development Dolan 25 was optimised for the end use car-top fabric. At the same time all further processing steps were optimised for this product, this includes the spinning of the yarn, the weaving and the finishing as well as the rubber-coating and vulcanisation. Dolan 25 has established its position as fibre for convertibles.

Latex-free car carpets|Latexfreie Autoteppiche

Hammerschmidt-J|Linsbauer-H

In the past, the automotive industry aimed to cover the entire area in the passenger and trunk compartments with fabrics. As the introduction of the EEC end-of-life-vehicles directive 2000/53/EC, requests a rate of 80 % for re-use and recycling in used cars from 2006 onwards we face an increased demand for solutions for this problem. The preferred method in all these developments is a single raw material solution. At this moment in the car boot the main type of carpets is a needle felt in various constructions. As it is moulded in all the cases there is a latex binder involved. In those cases where people used a high percentage of polypropylene in the floor, there has been some problems which had not been solved yet. On the one hand the high degree of moulding was a serious problem. On the other hand it was difficult to get the necessary dimensional stability in the heat aging test. These points became in fact more important since the moulding sometimes got to an extreme degree in the car boot. By means of a modified production technology and the use of special binder Fibre systems - based on polyolefines - a technical solution was found for this in the form of a Dilour-double layer-construction. The key was the replacement of the latex by the PO binder fibres, taking into consideration all the technical requests such as thermal - and dimensional stability of the final product (car interior). Based on the development work in the needle felt (Dilour- Double Layer Construction) sector the same work was done for the tufted carpets. A tufted carpet made of 100 % polyolefin fibres was developed. Both the primary and the secondary-backing had to be made of a combination of regular and binder fibres. The pile material is a spun yarn, made of 100 % polypropylene fibres (Asota M30). The layer which is mainly responsible for the dimensional - and thermal stability has been taken from the needle felt project. The connection of the tufted carpet with the 'carrier layer' is made - contrary to needle felts - with an extruded film of hotmelt polyolefines. With the help of this modified production technology and the targeted use of PO binder fibres, a technical solution was found in the shape of a 2-layer Dilour/Random velour. The solution meets the future demands of the European automotive industry with regard to recycling.

Improvement of nonwoven primary backing performance for tufted automotive carpets by moulding simulations|Optimierung von Tuffträgern für Autoteppiche durch Umformsimulation

Berkhoff-M-R|Maltha-A|Schurian-A

The automotive industry continuously increases the demands on moulded car carpets. In general, moulding of tufted automotive carpets becomes more and more extreme. Sometimes this can lead to tearing or pile drifting of the moulded carpet. To improve the mouldability of the carpet the decisive properties have to be determined. It turns out that the properties of the nonwoven primary backing can play a significant role during moulding of tufted car carpets. The correlation between nonwoven product properties and mouldability is investigated by performing moulding simulations using 3D-simulation software based on a finite element method (FEM). Up till now simulation software has been used to optimize the tools in the moulding process - like punch, die and blank-holder - with fixed carpet material properties. Presently, it is used to gain more insight in the optimal product properties of one of the most important components of the carpet, i.e. the nonwoven primary backing. With the knowledge thus acquired, new types of nonwoven primary backings can be engineered to fulfil the ever increasing demands on car carpets. It has been shown, both with simulations and actual moulding, that newly developed types of nonwoven primary backings exhibit improved mouldability.

Textiles 4 Motion - Prüfverfahren für Polsterstoffe|Textiles 4 Motion - Test methods for textile upholstery materials

Daniel-A|Silveira-M

Folienpräsentation. Die Entscheidung zum Kauf eines bestimmten Fahrzeugs wird von einer Vielzahl von Faktoren beeinflusst. Die optische Qualität des Interieur-Materials spielt hierbei eine mitentscheidende Rolle. Insbesondere die Charakteristik des Sitzes widerspiegelt den ersten 'persönlichen Kontakt' des Kunden mit dem Interieur des Fahrzeugs. Die Designabteilungen setzen ihre Bemühungen in die Kreation von Textilien, die den Kunden verzaubern, ihm Komfort vermitteln, neue Trends setzen und technisch zuverlässig hinsichtlich ihrer Gebrauchseigenschaften sind. Wie werden die technischen Anforderungen nun durch diese Entwicklungen, durch das sich stetig wandelnde Gebrauchsverhalten des Kunden und seinen Erwartungen beeinflusst? Es werden einige Prüfverfahren von Polsterstoffen im Automobilbau diskutiert, die sich aus den neuen Trends in Technik und Design entwickelt haben. Berichtet wird zu Themen, wie Linting, Nahtschiebewiderstand, Anschmutz- und Reinigungsverhalten sowie zum Klettband-Test. Trends bei Autositzbezügen gehen in Richtung helle Farben, Hoch-Tief-Effekte, Effektgarne, feine Garne, veloursartige Stoffe, konturenreiche Sitze etc. Unter Linting wird das Verhaken von Fremdfasern im Sitzbezug verstanden. Bei der Prüfung des Lintings werden das Anfusselverhalten und das Reinigungsverhalten getestet. Der Nahtschiebewiderstand ist eine Gewebeeigenschaft. Die Prüfung erfolgt auf einer Zugprüfmaschine. Der Klebbandtest wird zur Prüfung gegenüber Klettverschlüssen eingesetzt. Weiterhin besteht die Möglichkeit einer kombinierten Prüfung mit Beanspruchung durch Klettband und Fremdpillingtest.

Automotive seat heating technology changes|Automobil-Sitzheizungstechnologie im Wandel

Ulbrich-T

Overhead presentation. W.E.T. Automotive Systems produces seat climate, seat heating and cable systems as well as heating elements for industry and steering wheel heaters. Meeting the requirement that 'a seat heating system should warm the seat, but should otherwise not be noticed' constitutes quite a challenge. The materials used for seat heating systems have to meet a wide variety of requirements in terms of touch, design, safety and comfort. Therefore different technologies have to be used which employ heating cables, carbon, metal yarns or conductive synthetics as a heating medium. The carrier material for seat heating systems can be technical fleece, knitted fabrics, foams, upholstery waddings or three-dimensional knits. As regards temperature control, comfort tends to be maximized by electronic control systems. In addition to the classical function of simply providing the right temperature, seat heating systems nowadays have to offer multi- functionality in the fields of touch and design, active and passive seat climate control as well as passenger detection. Originally, the peel & stick method was used and the seat heating System was integrated as an individual component in the course of seat assembly. More recent methods rely on stitching the heating system into the seat cover or introducing the heating system into the seat by way of foaming. In recent years, seat heating systems have had to meet more and more sophisticated requirements in terms of heat-up and heat control, simulation of environmental conditions and component tests as well as mechanical strength, flammability and protection against improper use. The continuous enlargement of functionality in car seats will consequently lead to an extended role of the seat heater as a functional medium. Even small cars and medium-category vehicle segments will be more and more equipped with seat heaters.

CAD-application in the construction of car seats and manufacturing of prototypes|CAD-Anwendung in der Sitzkonstruktion und Prototypenfertigung

Krzywinski-S

Automobile manufacturers and their suppliers are kept busy nowadays by the growing number of car types, the development cycles which become ever shorter. A continuous process consisting of three-dimensional modelling, design, production and quality control has become general practice in the development of new components both in general mechanical engineering and the automobile industry. Currently, product development of textile components (such as covers of car seats) follows the traditional method. This means that there is no data link between design and two-dimensional pattern generation, which consequently implies long development times and high cost. A high degree of manual skill is still applied in pattern development. Moreover, the effect of different materials and their varying behaviour is only intuitively considered during laminating or alternative coating. Each time the foam structure is changed, the comfort properties are checked. This requires to develop a complete seat cover and to make a model. Therefore, this project aims to reduce the currently significant commitment of time and money during pattern generation for the prototype development and the material variations and changes of the material structure in order to shorten development times. The project aim is the development of a continuous process of a more efficient pattern generation by using three-dimensional data (car seats) which can be imported from the automobile industry (foam, metal structures) or obtained by measurement (three-dimensional scanning). Thus the designer can work on the three-dimensional model. For pattern development it is necessary that the components metal, foam and complete seat are simplified and adjusted. Special attention is paid to the various ways of fastening the textile seat covers to the seat upholstery. Numerous methods of visualization make it possible - at this early stage of development - to check the effect of disintegrating the pattern parts by varying trim seams, patterns and colours. Necessary changes can be made at once. The two-dimensional patterns are calculated on the basis of the complete design.

Proper cleaning of car seats and interior panelling - Possibilities and limits|Sachgerechte Reinigung von Autositzen und Innenverkleidungen

Swerev-M|Bockelmann-E|Tagge-J

Overhead presentation. In Germany there are 44657303 cars, 85880 buses, and 2619267 trucks. Stains are soiling, which are being applied to the textile material through use and environmental effects more or less locally limited. Correspondingly, there is a great variety in type and composition of stains. Most strikingly, stains and dirt can be described as 'matter out of place'. Only very few of the occurring stains consist of one homogenous substance. For the most part, the stains are a mixture of different components, which must be removed by means of appropriate spotting agents. According to their main component the variety of stains can be assigned to a few stain groups or stain types. The six most common and important types of stains are: tanniferous, proteinaceous, sacchariferous, starchy, fatty and dye- containing stains. In contrast to the stain removal (spotting) in textile dry-cleaning, the stain removal from textiles in the interior of vehicles is considerably more difficult, as the used textiles are normally applied in a combination with completely different materials. For example, laminated textiles, back-foamed textiles, surfaces with braiding work or natural fibre composites are being used. For this reason, classic stain removal methods as used in the textile dry-cleaning can only be applied to some extent in vehicle interiors. The existing possibilities are discussed, including spraying extraction with appropriate appliances, shampooing in combination with spraying extraction, and spotting in combination with spraying extraction. With cold spray, e.g. chewing gum can be removed residue-free, as well as chocolate can be brushed-out and sucked-off easily. Rubber gloves can be used to remove animal hairs efficiently

Functional coatings via nanotechnology - Recent trends|Funktionelle Beschichtungen mit Hilfe von Nanotechnologie - Aktuelle Trends

Amberg-Schwab-S

Fibres may be equipped with additional material properties by chemical functionalization of their surfaces. In combination with the characteristics of the well-known bulk polymers additional property profiles for different fields of application may be envisaged. Inorganic-organic hybrid polymers (ORMOCERs) are well-suited for the specific functionalization of different polymer surfaces. With hybrid materials, inorganic structures of glassy or ceramic nature are cross-linked with organic polymeric units on a molecular level. Such nanocomposites can be prepared by wet chemical processing via the sol-gel-process. The synthesized coating materials are water-based or they contain nontoxic solvents. The curing is carried out thermally at relatively low temperatures or by the energy-saving UV-

technology. Besides their fundamental properties such as transparency, chemical stability and hardness, these molecular composite layers can be equipped with additional functionality by the use of organo-substituted precursor molecules (silanes), which are chemically bonded to the hybrid matrix. With this method it is also possible to influence the surface polarity of Fibres. Dirt repellent or antistatic layers are feasible. Furthermore, it is possible to achieve barrier layers against gases, vapours and migrating monomers as well as coatings with UV-protection or antimicrobial functions, respectively. Consequently, a convenient environmentally friendly technique is available for Fibres: novel versatile combinations of permanent properties are achievable in one step.

Aramid short fibers as reinforcement for transmission belt compounds|Verstärkung der Transmissionsriemen durch Aramidkurzfasern

Peters-M-W-M-G

For many years short fibres have been used to reinforce all sorts of rubbers and thermoplastic elastomer products. With its portfolio of aramid Fibres, p-aramid (Twaron and Technora) and m-aramid (Teijinconex) Teijin Twaron provides the rubber compounder and component manufacturer with a potent ingredient to expand the performance of the rubber products beyond their current horizons. Short fibres can be used in all types of rubbers irrespective of cure system from the commodity rubbers, e.g. natural rubber, EPDM and chloroprene to the more exotic rubbers as silicon and fluoro-silicones. The short fibres are made compatible with all types of rubber manufacturing equipment. As a result, these short fibres have found application amongst others in transmission belts. When added to the rubber belt compounds the short fibre improves the whole range of properties simultaneously. For the tests CF, Technora DCF, TeijinConex CF, TeijinConex DCF, Twaron CF, Twaron DCF, Rhenogran P-91 and Twaron pulp 1091 have been used. Twaron pulp is produced out of continuous filament yarns by cutting and milling. The pulp particles have a 1 - 2 mm average fibre length and a high specific surface area. The high surface area ensures an excellent mechanical anchorage of the pulp particles in a rubber matrix. On the other hand the high surface area gives a thorough entanglement of the particles which hinders a homogeneous compound dispersion. The Twaron pulp is said to have potential as reinforcing material for several elastomeric materials. The Masterbatch fibre premix is developed for the ease of mixing. The non-fibrillated aramid short cut fibres, offered as greige short cut (CF) or dipped short cut (DCF), lack the dispersion difficulty, although the dosing of short cut fibres is eased by the dip on the dipped chopped fibres. Aramid chopped fibre reinforced compounds show a high on-end abrasion. The Technora chopped fibre reinforced compounds give the highest modulus, yield, abrasion and tear strength. The energy loss of p-aramid chopped fibre loaded compounds is 30 - 60 % lower. The Technora is the superior product in all aspects, while Teijinconex and Twaron give very similar effects.

Actual status of the airbag development in Europe|Aktueller Status der Airbagentwicklung in Europa

Köhnen-R

Overhead presentation. In connection with the continuous growing number of restraint systems in vehicles during the last years new questions referring to the used polymer material for restraint cushions have been issued. The airbag applications in car are explained, including passenger airbag, driver airbag, thorax airbag and curtain airbag. Between 1986 and April 2001 6377 cases have been investigated in which airbag systems had saved the life of front passengers. Apart from the principal requirements to the cushion from each individual kind of system legislation have caused design changes in the area of the utilized gas generators. New dual stage inflators are necessary to make the 'low risk development' possible, such as pyro and hybrid technology. The changed position of the module requires modified bag designs in terms of geometry. Smaller compartments are requiring smaller modules in their total size. Based on the changed constellation material properties have been analyzed under various aspects. The content of the speech tries to reflect the changes which have been introduced during the recent years, displays the changes in terms of requirements and illustrates the achieved results from the tests performed based on the adjusted requirements. Based on the recent changes cushion materials are moving to: (i) silicone coated nylon fabrics with thin coating layers to avoid particles melting through the fabric, (ii) sewing threads are made of Stanylenta nylon 4.6 with improved heat capacity and (iii) lower denier nylon fabrics with high tenacities are used to reduce the package volume and to maintain strength of the fabric.

EMV Textilien - Textile Lösungen zur Abschirmung von Elektrosmog im Autoinnenraum|EMV textiles - Solutions for screening electrosmog in the car interior

Mellmer-M

Overhead presentation. Modern life would be inconceivable without electrical appliances at home and in the work environment. High-frequency transmitters, such as mobile phones, have become part of our everyday life. Electro smog is used to describe electromagnetic fields that have a negative impact on humans, the environment and technology. 90 % of future innovations in the automotive interior will be based on electronics. This creates the conditions necessary for an error-free functioning of electronic systems. What advantages do textiles have against foils, metal casings in reducing electromagnetic interference? Given the flexibility in terms of structural design, the textile can, for instance, be employed to shield off building components and subassemblies, it can be used as insert to cover casings, for lamination, back injection and impression for in-mould lamination, but also for the jacketing of cable harnesses as made-to-measure part. Shielding in general includes shielding of human beings, shielding of components, shielding of buildings as well as military shielding. For shielding electrical conductive yarns are necessary. In the fabric the fabric construction, the yarn itself and the finishing method have influences on the shielding capacity. As conductive materials steel fibres, carbon, copper, silver etc. are used. The shielding effect provided in relation to the structural design of the textile is illustrated. Different shielding fabrics are presented, including single jersey circular knitted fabrics, woven fabrics in plain weave, and a coated fabric. In the measured frequency range of 0 Hz to 1 GHz, the efficiency of the developed textiles exhibits a consistent reduction and very slight dependency on the polarizing direction. Depending on the structural design of the textile, the field strength is reduced by up to 99 %.

Online quality control of Airbag yarn production - impact on quality and costs|On-line Qualitätsüberwachung der Airbaggarnproduktion - Einfluß auf Qualität und Kosten

Mielke-M

Overhead presentation. The determination of quality-related data in the production of yarns for the automotive industry and other safety-relevant applications has become state of the art. In this way, we cannot only reduce risks but at the same time save considerable costs by reacting more rapidly to any quality problems that may occur. The quality level achieved in this way is an indispensable link in the just-in-time delivery chain. Sensor manufacturers face the problem of having to provide customers with cost-effective, highly reliable and functional products. In so doing they have to strike a balance between what is technologically feasible and the practical requirements. An overview of time-tested sensor technology, various aspects of development work and a preview of innovations to be presented at ITMA will be given. In filament yarns filament breaks, fluctuations in yarn count, irregular yarn entanglement, fluctuations in spin finishing coating and fluctuation in yarn tensile strength may occur. A yarn defect e.g. broken filament leads to standstills in the subsequent processes. The most serious problem is that this kind of defect is only detectable on the yarn bobbin in rare cases. The resulting costs are shown on the example of an airbag yarn production with a spinning speed of 4000 m/min and a yarn count of 440 dtex. Using an online monitoring system will result in savings of EURO 103000 at 32 spinning positions. The Tangletec sensor can detect tangleknots and is based on an optical principle. The light ray of a LED that is attached to the bottom of the glass plate is pointed at a certain angle from below at the yarn running above. Depending on whether a compact or an open part of the yarn is passing over the reflection window, more or less light is reflected to the receiver. The sensor can monitor yarn from 76 to 6000 dtex up to a speed of 6000 m/min. Fraycam II is a Fraytec sensor for the detection of filament breaks at high speeds. The Fraytec sensor may trigger a camera. The 'photographs' are stored directly on the hard disc of a connected industrial computer. A new Fraytec sensor will be launched on the market this autumn.

Development of crash-related structural components made of fibre-reinforced plastics for the motor vehicle industry|Entwicklung crashrelevanter Strukturbauteile aus Faserverbundwerkstoffen für die Automobilindustrie

Urban-P|Franzen-M

An effective means of reducing the energy demand of motor vehicles is lightweight design, since all components of the overall road resistance except for the aerodynamic resistance are approximately proportional to the vehicle weight. Because of the excellent specific stiffness and strength of high performance fibre reinforced plastics and the necessity of saving the available crude-oil resources, these materials are expected to gain more and more importance in the motor-vehicle industry. In the scope of both a collaborative research centre and industrial projects, prototypes of various vehicle components made of fibre reinforced plastics have already been developed at the Institut für Kraftfahrwesen Aachen. The objective of a current research project is the realization of bumper beam with textile reinforcement for a passenger-car body. The development of the bumper beam is accompanied by an extensive program of material tests. The test results form the basis of the material selection on the one hand and the validation of simulation models on the other hand. Apart from standardized tensile and compressive tests, that program also comprises tear-out tests on boreholes in the laminates as well as dynamic three-point bending tests on profiled samples. The bumper structure is designed, so that it fits into the space which is available in a reference car. The design is then optimized using numerical algorithms based on the finite element method. After the manufacturing of prototypes, the results of mechanical tests will make it possible to assess the performance of the combination of material and component design.

New polyester yarns for improved performance in automotive applications|Neue Polyestergerne für verbessertes Verhalten in automobilen Anwendungen

Rovira-F

Polyester filament yarns are the major fibre products used in automotive upholstery fabrics meeting the industry stringent quality and performance requirements. Automotive industry styling trends and performance specifications provide an opportunity for products with improved properties. The new Multi-channel filament yarns from DuPont SA result in fabrics that are softer, have superior crush resistance, higher cover, good lint resistance and excellent aesthetics. Dacron Multi-channel yarns are designed with a unique technology, which enables the creation of fabrics with beautiful aesthetics combined with outstanding performance. The bending modulus of Dacron Multi-channel yarns is three times less than that of round cross-section yarns of the same dtex per filament. Although the Multi-channel filaments can be net easily across the flat ribbon side, they could be very stiff across its narrow thickness. Due to the random disposition of the filaments in the yarn bundle and in the fabric pile, they can move around in concert and can rapidly flex and recover. Because of the improved cover, fabrics can be designed with less yarn for the same result as with round cross-section and therefore obtain superior yield. The ribbon like cross-section with its extra surface area and cover provides deeper dyeing of the fabrics achieving fuller colours. Like the tetra-channel fibres, the new six-channel yarn provides the same level of moisture transport. The only yarn produced and available so far is 78 dtex f47 semi-dull warp drawn multi-channel. The yarn is warp drawn from POY 133 dtex f47 Type R3102. The range of false twist textured products includes 78 dtex f47, 110 dtex f47, 167 dtex f47 and 167 f94.

Trends in harmonising flammability standards for home textiles|Tendenzen in der Vereinheitlichung der Brennbarkeitsstandards für Heimtextilien

Uhl-K

The harmonization of technical standards in connection with the idea of a common European market was formulated as early as 1968. It was in this year that all duties on the movement of goods between the member states were removed. In the process, however, it soon became clear that differing national standards and regulations, the so-called 'non-tariff barriers to trade', were hindering the free movement of goods. In order to realize the idea of a common market, it was necessary to have common rules, i.e. uniform technical regulations and uniform requirements in terms of products and services. In the so-called 'new concept of harmonization', which came on the scene in the middle of the 80s, the EU went on to produce definitions in terms of European statutory regulations: these, however, constituted merely the fundamental requirements in terms of safety and protection of health. Another factor in all is that products that meet minimum requirements, as laid down by mutual accord, may be sold in the EU. These minimum requirements are guaranteed by uniform European standards. In the home textile sector there have been many activities concerned with the development of European harmonized standards. The main points in developments in home textiles, in respect of drapes, curtains, upholstery fabrics and bedding materials are considered. The advantages and problems, together with the attempts at finding solutions, which are involved with harmonization are high-lighted. The most relevant standards for furniture upholstery sector in Europe are BS 5852 and the European harmonised standard EN 1021, part 1. Since 1994 a harmonised unified standard has been in place for small fire sources, which England has agreed to and which are in place as BS EN 1021. The General product Safety directive published in the Official Journal of the EC prescribes minimum safety standards for all products manufactured and sold within the EEC area.

Polyamide fibres acting in bio control|Bioaktive Fasern

Rochat-S

Overhead presentation. Rhodia research and development had a R&D budget of EURO 227 million in 2002, or 3.3 % of sales, and employs more than 1500 researchers worldwide. Meryl Skinlife is a new mineral bacteriostatic yarn that limits unpleasant body odours by controlling the spread of bacteria. An exclusive additive is introduced to the heart of the fibre, which subsequently diffuse an active product on the surface of the fabric. The textile fabric is resistant to frequent washing cycles. Today, there is a booming demand of the consumers for bioactive functions, such as anti- dustmite, anti-microbial and anti-fungal functions. There are two possibilities for this kind of treatment. In the classical solution the agent is applied by a post-treatment. Drawbacks are possible migration towards the skin (allergy) and loss of the activity with washing. The second possibility is to bring the active substances into the polyamide fibre. Advantages are long lasting effect and control of the level of bioactivity. Dustmites in the bedroom can be found in curtains, in stuffed seats, in carpets, in upholstery, in pillows as well as in mattress, bed base, blankets and sheets. In France for example 30 % of the consumers want healthy carpets and 30% want easy care carpets. An anti dustmite-test is explained. The control of dustmite population is possible with Rhodia's new technology. The additive is introduced in PA66 during spinning. Therefore, the anti-dustmite activity is resistant to washing with detergent. The influence of the new agent on gram positive bacteria such as *S. aureus* and gram negative bacteria such as *K. pneumoniae* has been tested. The bacteriostatic effect resist to 30 washing cycles at 40 degrees C. The advantages of the treatment are no investment in special equipment, yarn can be processed using standard processes and no degradation of other performances of the yarn.

Polyester fibres with added functionalities for curtains and upholstery|Polyesterfasern mit Zusatzfunktionen für Vorhang- und Polsterstoffe

Lamberts-Steffes-E

The textile industry in Europe is pushed more and more to produce niche products as a result of cost pressure from countries in the Far East. Upholstery and drapery fabrics are classic applications for polyester fibres. This raw material leads to unbeatable care properties. More and more added functions like flame retardancy, soil repellency, colour fastness to light or abrasion resistance get more importance, which are often required in various combinations. These needs have to be fulfilled with modern polyester fibres. Securelle of DuPont is a certified flame-retardant polyester fabric that fulfils the common European flammability standards for upholstery and drapery fabrics. On the example of the flame retardant fibres of DuPont SA the possibilities of added value along the textile value chain from fibre to certified fabric will be discussed. The flame retardancy characteristics of Securelle are permanent because they are in-built in the fibre itself. There is no possibility that they can be washed out. The Dacron polyester fibres used to produce Securelle fabrics offers spinners, fabric manufacturers, designers, architects, contractors and end consumers an important and versatile new fabric option for all fabric types including drapes, curtains, upholstery, bedding and soft furnishings. The fibre is available as staple fibre or filament. As staple fibre there is 1.5 dtex with 38 mm cut length or 3.3 dtex with 60 mm cut length. Flat and false twist textured filament yarns exists in 78 dtex f34 in greige. Furthermore, filament of 167 dtex f68 is available as false twist textured or air-jet textured yarn in greige, packaged dyed or dope dyed in black. Securelle fabrics offer excellent use behaviour including colour fastness to light and washings, shorter and low temperature laundering, recyclability and non-toxicity. Fabrics are particularly easy to care. As Securelle fabrics are determined to be used for residential homes next to public buildings, the requirements are different in comparison to contract fabrics. These fabrics have to please the end consumer and satisfy his needs for comfort and aesthetics. Next to retardancy Securelle fabrics therefore offer more natural appearance and touch, improved resistance to pilling, and protection against dirt and soiling.

Eco-friendly polyester products|Umweltfreundliche Polyester-Produkte

Yamada-J

Overhead presentation. Teijin Fibres Ltd. has so far developed and is developing a variety of eco-friendly products based on its new perceptive policy aimed at 'earth-conscious polyester fibre products'. Giving attention in particular to the excellent recycling efficiency of polyester, Teijin Fibres Ltd. has developed the recycling technology for high-purity reclaimed polyester and has established a recycling network of used fibre products, aiming to create a recycling-based society. The environment-friendly polyester products will be introduced from the viewpoints of resource conservation, energy saving

and easy recycling, which are closely linked to our efforts for development of Fibre products to minimize their environmental burdens in the course of production, application and disposal. Morphotex is a group of materials with low environmental impact. It has a structural colour by light interference and no dyeing process is needed. The interference theory of thin layers is discussed. Field of applications are car seats, lady's garments, sportswear, Kimono dresses as well as cosmetics, body painting etc.

A new PET filament with fractal structure|Ein neues Polyesterfilament mit Fraktal-Struktur

Guo-Xushan|Tong-Yan

The original PET fibre is no toxic and innocuous for biological material, which is the material for artificial vessel and artificial organs. At present, the structures of synthetic fibre are stiff and uniform. They have no fractal structure as turning structure from core to sheath of natural fibres. They can be described by Archimedes' geometry only. As a result, though the synthetic fibre such as PET fibre has fine strength, crease- resistance and corrosion stability, it still has shortcomings that are polar light, bad comfortability and dyeability etc. Through research on silk and natural fibres by fractal theory, it was discovered that the formation mechanism and structure of silk and spider silk at normal temperature and pressure are all related to fractal theory. In this development, except for the stress orientation crystallization in the formation of PET filament, the Avrami thermo-crystallization was introduced, too. Controlling the formed condition of PET filament in the necking position, the domain crystallite is formed in the size of 7x21 nm. This is the 'form gene' which can produce a turning round effect. This 'form gene' self-similarity magnified 104 times according to fractal theory, the fractal PET filament have the structure of turning structure with fractional dimension from core to sheath. Ibis turning round structure of the PET filament is similar as that of natural fibre. The fabric made by fractal fibre have the properties of crease- resistance, wash and wear, fine conductivity of moisture, good elasticity, no polar lights, and can be dyed under normal pressure, etc.

The effects of colours|Die Wirkung von Farben

Feldi-G

Overhead presentation. Sinterama produces polyester yarns, flat, twisted and textured, false-twist or air-taslanized, in raw white, package dyed and dope dyed. Since the yarns are used all over the world in various applications from furnishing fabrics to automotive interiors to clothing, the yarns have to satisfy certain minimal requirements regarding tenacity, elongation, pilling, light fastness etc. Sinterama has carried out a study to evaluate the difference in light fastness levels according to the norm ISO 105-B02 between a package dyed yarn and a dope dyed yarn depending on the variation of certain parameters, such as the ratio between yarn count and number of filaments or dpf (denier per filament), but also the lustre of the yarn depending on the amount of titanium dioxide contained in the base polymer. For testing the colourfastness the xenon arc fading lamp test has been carried out. In package dyed yarn as the intensity of colour increases there is a tendency for the light fastness to improve. Dope dyed yarns do not have this variability and maintain more than adequate results even with lighter shades. As the level of titanium dioxide increases in the yarn, there is a deterioration of the colour fastness mostly visible in package dyed, whereas dope dyed in some cases maintain acceptable levels. Decreasing the dpf there is also a deterioration in the fastness levels, which is more noticeable in package dyed yarns. The results achieved do indicate an advantage for the dope dyed yarns against their package dyed counterparts in maintaining good light fastness levels.

Lenzing viskose rainbow - An innovation for the dyehouse|Lenzing Viskose Rainbow - eine Innovation für die Färberei

Crnoja-Cosic-M

Lenzing Viskose Rainbow is a new cationically modified viscose fibre, which is mainly used in blends with polyester and cellulosic fibres. In the blend with polyester, Lenzing Viskose Rainbow allows a drastic reduction in dyeing time. A one-step, single-bath process is used with an overall process length of approx. 4-5 hours with clear savings in terms of energy, water and process chemicals. This process can also be used to dye deep shades with good 60 degrees C washfastness values. Bicolour effects can be realized with Lenzing Viskose Rainbow in blends with conventional cellulose Fibres (Viscose, Lyocell, Modal, cotton, etc.) using an exhaust dyeing process. Under specific process conditions Lenzing Viskose Rainbow can be dyed with direct or reactive dyestuffs tone-in-tone with the conventional cellulose Fibres. In the same process and in the same conditions metal complex dyestuffs are then used which only dye Lenzing Viskose Rainbow selectively so that there is a mixture of the metal complex and the direct or reactive dyestuff on the fibre. The conventional cellulose fibre will be dyed with the direct or reactive dyestuffs exclusively. Thus all combinations with white (Rainbow: colour as preferred, conventional cellulose: colourless) and with black (Rainbow: black, conventional cellulose: colour as preferred) and numerous other colour combinations are possible. Polyester/Viskose-Rainbow- Belnds can be dyed within 3 to 4 hours with the exhaust dyeing process with good waschfastnesses.

Evolon - Functional textiles for the home|Evolon - Funktionelle Textilien für das Heim

Groten-R

Overhead presentation. Evolon fabrics are made of continuous bi-component filaments laid down on a layer belt, splitted into micro-filaments and entangled by high-pressure hydro-jets. Specific properties of Evolon fabrics are mechanical resistance, drapeability, soft hand, durability, high opacity etc. Particularly properties for home textiles, with concrete applications and investigation results, are discussed. The field of applications covers decorative comfortable bed linen, anti-allergic bedding, incontinence covers, rental service fabrics, upholstery covers and venetian blinds. Evolon fabrics meet the requirements of particle protection without membrane lamination because of very small pores. Evolon fabrics meet the requirements of even the highest filtration barrier quality levels for anti-allergen

fabrics. Evolon fabrics take up around 400 % water relative to its own weight. Because of the fine porosity and the puncture resistance light weight Evolon fabrics are used for quilt covers. Evolon fabrics can be treated mechanically and chemically by standard textile finishing. In contrast to a woven fabric, where warp and weft filaments build interstices, an Evolon fabric is a multi-layer product which is quite dense to light. Evolon can also improve the seat climate of a car seat significantly.

The complete bed solution|Die komplette Lösung für das Bett

Tighe-E

Cargill Dow LLC's revolutionary Ingeo fibres are not only setting the standard for the future of fabrics; they are also reducing our impact on the environment. Cargill Dow is the first company to produce a family of melt processable performance fibres, which can be made entirely from annually renewable resources, such as corn, wheat, etc. PLA fibres are now a completely new generic fibre. The process to create Ingeo fibres allows the company to 'harvest' the carbon that plants remove from the air during photosynthesis. Carbon is stored in plant starches, which can be broken down into natural plant sugars. The carbon and other elements in these natural sugars are then used to make a series of polymers, called polylactide (PLA). Cargill Dow is following the path towards a more sustainable society and is working to make their process even better. The vision of Ingeo fibres is more than just a performance product, it encompasses the additional goal of reduced environmental impact. Today in the US and here in Europe Ingeo fibres are being used in the Nonwovens and Fillings business areas. The fibres available today include a range of both dry and siliconized solid and hollow versions in broad range of dtex from 1.4 to 17. Fibre balls are also available through Molina and conjugated spiral fibre will soon be available from our partner Far Eastern Textiles (FET). The fibre products being supplied have been fully tested to ensure outstanding performance when compared with the incumbent products in the market. Specifically, we can refer to load/loft testing where pillow produced with Ingeo fibres have been subjected to 30000 compression cycles to simulate 3 years usage. Wash testing had also been carried out on pillows and duvets at 40 and 60 degrees C and demonstrates that Ingeo performs excellently when compared to incumbent products on the market. Today Ingeo fibre is being increasingly used in bedding, pillows, duvets, mattress tops and mattresses to provide the complete bedding solution.

Silvertex - die neue Generation einer textilen multifunktionalen high-tech Fläche|Silvertex - the new generation of textile multi-functional high-tech fabrics

Militz-D|Winkler-E

Intelligente Textilien verändern derzeit den Textil- und Bekleidungsmarkt. Ziel der Entwicklung war eine textile Fläche, die eine effektive Abschirmung gegen elektromagnetische Felder gewährleistet, um auf dieser Grundlage eine Bekleidung für Träger von Herzschrittmachern zu fertigen. Dazu sollte mit einem silberhaltigen Polyamidgarn ein textiler Faradayscher Käfig entwickelt werden. Die Entwicklung als Maschenware zu realisieren ging von der Analyse vorhandener textiler Flächen und den Anforderungen an ein Kleidungsstück aus. Flächen aus gewebten Materialien hatten Abschirmwirkungen im Frequenzbereich von 600 MHz bis 6 GHz von bis zu 90 %. Ein leitfähiges plattiertes Material als Maschenware zeigt Abschirmwirkungen von über 99 % bis in einen Frequenzbereich von über 18 GHz (Radarbereich). Silvertex ist eine Flächeninnovation aus einem oder mehreren Fadensystemen, die in verschiedenen Modifikationen verstrickt, gewirkt oder verwebt werden kann. Darüber hinaus wurden weitere Produkte entwickelt, bei denen die Abschirmung gegen elektromagnetische Felder sinnvolle funktionale Anforderung war, z.B. im Bereich der Bettwaren wurde dies mit der Billerbeck GmbH, Wien, realisiert. Anwendungstests verschiedener Prototypen zeigten noch eine Reihe weiterer Effekte, die aus der Verarbeitung von Silber resultierten, wie: (1) der oligodynamische Effekt mit bakterizider und fungizider Wirkung, (2) der katalytische Effekt, mit beschleunigtem Abbau von Geruchsstoffen und (3) der antistatische Effekt. Die dargestellten 'Primärfunktionen' von silvertex können noch im Sinne eines Bausteins mit anderen funktionalen Komponenten kombiniert werden.

Comparative microclimatic research of bedding components|Vergleichende mikroklimatische Untersuchungen an Bettwaren

Helbig-K

Technical examination of textile materials focuses on a comparison of their characteristics, e.g. in checking their thermal insulation and humidity transport, while microclimatic testing of products with subjects attempts to assess the significance of these characteristics for the climate close to the body of the users. Test methods are described (measurement of temperature and humidity close to the body, in the cavity between sleeper and bed components, inside the blanket and on the pillow) which serve to describe the influence of the material of the used bed components on the general climatic situation. This situation is evaluated under the aspects of comfort and suitability. In this respect, product evaluation by physiological anthropologists is always founded upon the knowledge on the variability of subjective preferences, of physiological factors and of the respective environmental conditions. The test methods are exemplified with a recent test of bedding components made from different fibre materials. In testing microclimate with test subjects, there are two major differences compared to technical testing: (i) the direct effects of the material on human beings is assessed through measurements of temperature and relative humidity in the sleeping cavity, and (ii) the variability of physiological features can be taken into account in working with test subjects. The most telling differences resulted in the comparison of the sleeping cavity, the contact area and the blankets. It was found that polyester has the lowest insulation properties, while Lyocell has a clearly higher value. In the relative humidity of the sleeping cavity, the best result was reached by the Lyocell bed (43.5 % rH). The relative humidity in the contact area between the prostrate test subject and the support system shows similar clear differentiation between standard bed, PES bed and Lyocell bed, the latter reaching values under 40 % rH.

Liegekomfort von modernen Matratzensystemen|Lying comfort of modern mattress systems

Trappl-P

Rund ein Drittel unseres Lebens verbringen wir liegend in Betten. Um keine Schäden zu erleiden und ein angenehmes Schlafklima zu gewährleisten, müssen die Matratzen einerseits den menschlichen Körper optimal unterstützen ohne Druckstellen hervorzurufen und andererseits ein Mikroklima schaffen, das eine dem Schläfer angepasste Wärme- und Feuchteabgabe ermöglicht. Berichtet wird über Studien mittels Computertomographie (CT), die im Wiener Allgemeinen Krankenhaus durchgeführt wurden, bei denen die Grenzlinien zwischen Schläfer und Matratzensystem untersucht und daraus die Druckverteilung abgeleitet wurde. Ein Modell zur Optimierung der Druckverteilung von Matratzen wird vorgestellt. Die männliche Testperson wog 73 kg. 7 % entfallen auf den Kopf, 60 % auf den Rumpf, 19 % auf die Oberschenkel und 14 % auf Unterschenkel und Füße. Für die CT-Messungen wurden dem Rumpf 1900 qcm, den Oberschenkeln 750 qcm und den Unterschenkeln 700 qcm zugeordnet. Es wurden Auflagedrücke von 14 bis 23 cN/qcm erreicht. Die Druck- und Stauchhärte der Matratzen wurden mit einer Druckprüfmaschine getestet. Bereits bei einem Eindruck von wenigen mm entstehen Drücke bis 20 cN/qcm. Eine gleichmäßige Druckverteilung kann mit einer PU-Schaummatratze erreicht werden. Hinsichtlich Mikroklima wird über instationäre Wärmeableitungsmessungen sowie über Wasserdampfdiffusion von Schaumstoffmatratzen und Federkernmodellen berichtet. Der Wärmefluss zwischen Schläfer und Matratze wurde gemessen. Federkernmatratzen lassen einen sehr hohen Wärmestrom zu, während die PU-Schaummatratze nur einen geringen Wärmestrom zeigte. Weiterhin wurde die Schweißableitung mit dem Hautmodell gemessen. Federkernmatratzen haben den geringsten Wasserdampfableitwiderstand. Kompakte Matratzen, wie Latex-Matratzen, zeigen deutlich höhere Wasserdampfableitwiderstände.

Allergiker-Matratzenbezüge - Entscheidungskriterien aus Verbrauchersicht|Mattress encasings for allergics - Purchasing criteria from the consumer's point of view

Rimpp-W

Während Mitte der 90er Jahre davon ausgegangen wurde, dass 20 % der deutschen Bevölkerung unter Allergien leiden, geht der Deutsche Allergie- und Asthmabund heute davon aus, dass inzwischen ein Drittel der Bevölkerung betroffen ist. 90 % der Allergenfracht in einem Haus oder einer Wohnung gehen dabei vom Bett aus. Gerade im Bett und vornehmlich in der Matratze findet die Hausstaubmilbe ideale Lebensbedingungen vor. Aufgrund der idealen Lebensbedingungen siedeln sich 6 bis 9 Monate nach erstmaliger Benutzung einer reinen Matratze Hausstaubmilben an. Deshalb werden die Matratze, das Oberbett und das Kopfkissen mit Bettzwischenbezügen eingehüllt, die das Einnistern der Hausstaubmilben verhindern. Doch nur die vollständige Einhüllung (Encasing) der Matratze bringt wirklichen Schutz. Gute Allergikerbezüge (Atopie-Bezüge) müssen Schutz, Komfort und Dauerhaftigkeit bieten. Sie müssen so dicht sein, dass auch die Exkremente der Hausstaubmilbe nicht durchdringen können. Atopie-Bezüge müssen Feuchte und Wasserdampf aufnehmen können. Die Schutzfunktion darf auch nach längerem Gebrauch und mehrmaligem Waschen nicht abnehmen. Die Entwicklung von Allergikerbezügen zeigt zunächst Vliesstoffe, dann dichte Gewebe, danach beschichtete Textilien und heute werden Membran-Lamine für diese Zwecke eingesetzt. Dureta-Allergiker-Bezüge sind die einzigen dieser Art auf dem Markt. Sie basieren auf einer Sympatex-Membran und wiegen für die gesamte Matratze nur 60 g. Für die Bezüge wird eine Schutzwirkung von 98 % zertifiziert. Die Aufnahmekapazität beträgt 2 kg Wasserdampf in 8 Stunden. Dieser Wasserdampf kann tagsüber wieder abgegeben werden. Bettklimatische Untersuchungen haben ergeben, dass diese Bezüge zu einem guten Schlafklima führen. Das Partikelrückhaltevermögen ist bis 0,5 Mikrometer gesichert.

Welcome to Uniplex. A new spun yarn technology for man made fibres by DuPont and SSM|Uniplex (TM) Spinntechnologie von DuPont und SSM

Corcoran-W-R|Thery-D

Overhead presentation. Developed by DuPont, Uniplex is a process to convert filament yarns into spun yarns in one single step. Based on a unique stretch

The importance of the nonwovens market from the point of view of a viscose fibre producer|Die Bedeutung des Nonwovens-Marktes aus Sicht eines Viskosefaserproduzenten

Jakob-H

Products based on nonwovens are showing continuous growth. Production possibilities are characterized by a wide variety and the technology thus allows a great range of products ranging from technical applications to products in daily use. The most used fibres in nonwovens are polypropylene, polyester and viscose. Due to its absorbent properties for many fields of application viscose is a necessary raw material and fulfils all requirements of processing on modern high capacity nonwoven lines. New technologies, products and markets have contributed to a continuous growth of the consumption of viscose in nonwovens. The forecast for the future is again a continuous growth of nonwovens and viscose will further on be the leading absorbent fibre. In Western Europe nonwovens have been growing continuously over the last years. The driving technologies within nonwovens are spunlaid and drylaid, which account for more than 80 % of nonwovens produced in Western Europe. Within drylaid nonwovens, which are the main application field for viscose staple fibres, the spunlace (hydroentanglement) technology has led to a continuous growth over the last years. The spunlace technology is the ideal technology to produce absorbent nonwovens and viscose is the ideal and only absorbent fibre for this. The major applications for viscose fibres are in the hygiene and medical area. Looking at future development of viscose and cellulosic fibre in nonwovens the prospects are promising. Within all regions of the world growth is foreseen and it is expected that the total consumption of viscose on a worldwide basis will reach 300000 tons by 2005.

Fibre innovation by AQUAFIL|Faserinnovation von AQUAFIL

Bertamini-L

Overhead presentation. Innovation is the main key to support the textile floor-covering market. To improve appearance retention for carpets exposed to light and heat, Aquafil developed a new version of Alto yarn called Alto- DeLuxe, based on a BASF Lumaxx PA 6 polymer. Carpet appearance retention of Saxony and shag carpets, can be enhanced through the introduction of welding points inside the yarn. Limitation of bacterial growth is possible with self

EUROPEYARN - Strategies, targets and new developments in staple fibre yarns|EUROPEYARN - Strategien, Ziele und neue Entwicklungen bei Stapelfasergarnen

Wolter-O

New developments of Europeyarn are staple Fibre yarns/linen threads/heat-set yarns. They produce solution dyed yarns for automotive and other application fields as well as PA/PET blends with heat-set/combed yarns. The fusion between Fibrilia with 56 % and TWD with 44 % took place in 2003. The head office of Europeyarn is Berkamen (D). In July 2003 Europeyarn was taken over to 100 % by the Austrian company Neudagarn. The company produces classical and twisted yarn in raw white and half combed yarns. The production capacity of the whole group is 21000 tons per year with a turnover of EURO 70 million. The company also wants to grow outside Europe. The company would like to improve the service and application technology first of all for all customers. Main aims are the development of fine yarn counts as single yarns and new qualities in the range of twisted and heat-set yarns.

New developments Pa 66 and Pa 6 in BCF and staple for the carpets|Neue Entwicklungen bei PA-Stapelfasern und BCF-Garnen für die Teppichindustrie

Uden-J-van

Overhead presentation. Rhodia Technical Fibres' development policy comes up to the company strategy of excellence (being the best in class for the customers), innovation (exploiting all Rhodia's R & D resources in polymers and chemistry), unique (production methods and products in BCF, fully integrated carpet staple technology) and development centre close to all European customers. This all has resulted in a complete product with innovative products and product properties. For the medium and high-end residential market, the heavy duty contract market, the hospitality market, automotive market, markets for special applications, both in PA 66 and 6 BCF and staple. Rhodia has an R&D budget of EURO 227 million, or 3.3 % of sales. Meryl Skinlife is a new bacteriostatic yarn that limits unpleasant odours by controlling the spread of bacteria. PA-66 Sylkharesse is produced in a 2-step BCF process, the crimp is steam set. PA-66 BCF Flocon is made using a unique water cooling system. Three types are available, such as Hexa Flocon 1750 dtex f94, 1280 dtex f47 and 875 dtex f47. PA-66 BCF Air Cooled 11 dpf is available in 110 dtex f100 semi bright and semi dull, 8,5 dpf 850 dtex f100 semi dull and 5,5 dpf 1080 dtex f180 semi bright. The PA-66 staple fibre program includes fibres in the count range from 3.9 dtex to 23 dtex. For the contract business Noval Contract (PA-66), Noval Contract Colors (PA-6), Massive Opal (PA-66), Massive Staple (PA-66) and Massive Colors (PA-66) are available. Noval Contract special is available with 40, 80 and 420 dpf. BCF for flat carpets include a new 3200 dtex f40 yarn with a flat cross section.

Corterra polymer - the commercialisation of a new fiber for the carpet industry|Corterra-Kunststoffe - Die Markteinführung eines neuen Faserrohstoffes für die Teppichindustrie

Schnitzeler-F

Overhead presentation. Shell Chemicals has recently commercialized Corterra PTT polymers, a thermoplastic material that can be spun into carpet fibres and yarns combining durability with inherent stain resistance and low electrostatic charge generation. PTT has a unique 3 dimensional heliocoidal structure resulting from 1,3-propanediol (PDO). PTT is characterised by a low melting point and a low glass transition temperature. Most stains, including mustard, iodine and hot coffee, can be removed with hot water and are dry within a few hours. Moreover, Corterra fibres stain resistance offers an ease of maintenance and reduced need for replacement. The world's largest manufacturer of tufted broadloom carpets Shaw Industries, Inc., a subsidiary of Berkshire Hathaway, Inc, had launched Corterra carpets. The market response obtained confirms the breakthrough in the combination of nylon-like wear performance without the need for chemical stain treatments and complicated cleaning procedures. Corterra carpets answer market needs by combining durability and stain resistance with luxurious feel, very good performance, anti-static properties, and most importantly, easy care. Shell Chemicals signed a contract with SGF Chimie to found a 50/50 limited partnership to build and operate the first world-scale plant for the production of Corterra polymers, with an annual production capacity of 95000 tons near Montreal, Quebec/Canada. PTT product chain is advantaged versus nylon in reducing greenhouse gas emissions and by-product salts. No additives required for stain resistance. Further information are given under www.corterra.com.

Fehrer's "Carpet Star" - a new process for the production of structured nonwovens|Fehrer's 'Carpet Star' - ein neues Verfahren zur Herstellung strukturierter Nonwovens

Pum-H

Overhead presentation. The NL 11/TWIN-SE 'Carpet Star' is a structuring needle punching machine for the production of high quality rib and velours products and in particular, structured fabrics with a surround on borders on all sides. The production speed is 1500 rpm. This double board machine is characterized by a precision drive system, which facilitates high production speeds even with short repeats. A quick advance system transports the felt during the intervals between penetrations. The two needle zones are adjusted to one another electronically in accordance with the prescribed recipe. As a result, maximum pattern design flexibility is guaranteed. Advantages are: very large repeats at previously unattained speeds, patterned carpets with a surround on borders on all sides, possibilities to not only create differing patterns in the body of the carpet, but also with surround border, ability to provide completely new patterns as well as simulated oriental carpet, tremendous speed increase for patterns that can be produced on single board structuring machines.

Hochleistungs-Faserverbundwerkstoffe in der Tuftingproduktion|High performance composites in the production of tuftings

Hanuschik-D

Im Rahmen eines Forschungsprojekts wurden am TFI die grundsätzlichen Voraussetzungen für den Einsatz von Faserverbundwerkstoffen (FVW) an einer Tuftingmaschine untersucht. Tuftingmaschinen sind für die Teppichbodenherstellung Massenproduktionsmittel. Hochleistungsmaschinen der jüngsten Generation sind in der Lage, mit Einstichfrequenzen (Maschinendrehzahlen) von bis zu 1800 Stichen/min zu produzieren. Entgegen den Herstellerangaben werden in der Praxis die meisten Maschinen mit einer deutlich geringeren Maschinendrehzahl gefahren. Die Gründe hierfür sind vielschichtig. Ein wesentlicher Aspekt ist die Tatsache, dass je nach Warenqualität ab einer bestimmten Drehzahl die Polgarnaufnahme unsauber wird, was zu einem fehlerhaften Warenausfall führt und die Qualität mindert. Als eine wesentliche Ursache für diese Fehler kommen Stabilitätsprobleme an dynamisch stark belasteten Maschinenelementen, wie Nadel-, Greiferbarre, Wellen, Stöbel etc. in Frage. Diese Probleme treten erst bei hohen Drehzahlen infolge von Massenträgheitskräften auf. Eine Reduzierung der bewegten Massen bzw. eine Steigerung der Festigkeit dieser Bauteile könnte zu einem wesentlichen Vorteil bei der Produktion führen. Hier eröffnet sich das Feld für den Einsatz von Hochleistungs-Faserverbundwerkstoffen (FVW). Mit ihren charakteristischen Kennwerten, wie geringes Gewicht bei gleichzeitig hoher Steifigkeit und erhöhten Dämpfungseigenschaften gegenüber den Stahlwerkstoffen, eignen sich FVW besonders für den Einsatz an Bauteilen oder Bauteilgruppen, die hohen zyklischen Belastungen ausgesetzt sind. An der Nadelbarre der Tuftingmaschine konnte eine Massenreduzierung von 68 % erreicht werden. Daraus resultiert eine Verringerung der Belastung der Versatzeinrichtung und des Antriebsstrangs. Weiterhin konnten die thermische Längenänderung um den Faktor 10 reduziert und die Geräuschentwicklung minimiert werden.

Stain and soil protection for carpets (Fleck- und Schmutzschutzausrüstungen für Teppiche)

Baumann-M

Ab 2004 übernimmt DuPont Textiles & Interior neben der bekannten Markenfaser Antron zusätzlich den Vertrieb der DuPont-Chemikalien für den Teppichbodenbereich (Zonyl Fluorcarbon und Zelan Stainblocker). Bei der industriellen Herstellung von Teppichen werden Fleck- und Schmutzschutz-Chemikalien als 'ABS Feature' appliziert. Die Applikation erfolgt üblicherweise in zwei Stufen und besteht aus einer Stainblocker-Ausrüstung sowie einer nachfolgenden Behandlung mit Fluorcarbon. Vorgestellt wird die umfangreiche Produktpalette der DuPont-Fluorcarbon- und -Stainblocker sowie die kürzlich entwickelte Zelan Hot Shock Methode. Vorteile der neuen Hot Shock-Applikationsmethode für Stainblocker sind die benötigten geringen Produkteinsatzmengen, hohe Beständigkeiten gegenüber alkalischen Reinigungen und gegenüber starken Begehungen, geringste mögliche Neigung der ausgerüsteten Ware zur Vergilbung, bei einer Applikation auf Differential Dyeing Nylon-Teppiche kein Ausbluten der basischen Farbstoffe während der Ausrüstung sowie keine Farbtonveränderung bei sauer anfärbbaren Garnen. Praxistests zeigen, dass sich die Reinigungsintervalle bei einer mit Zonyl ausgerüsteten Ware deutlich verlängern lassen. Beim Hot Shock-Verfahren durchläuft die Ware einen beheizten Trog mit einer 80 - 85 Grad C erhitzten Zelan 8236 Flotte, wobei die Tauchzeit etwa 5 bis 10 Sekunden beträgt. Im Gegensatz zu anderen Applikationsmethoden ist das Hot Shock-Verfahren auch für Differential Dyeing-Teppiche geeignet, da die kurze Tauchzeit nicht zu einem Ausbluten der basischen Farbstoffe führen kann. In einer Umfrage wurde festgestellt, dass eine Ausrüstung von Teppichen mit Teflon Carpet Protector als wünschenswert angesehen wird. Die Wirkung dieser Substanz beruht auf der Herabsetzung der Oberflächenspannung der damit ausgerüsteten Fasern im Teppichboden. Einen optimalen Fleck- und Schmutzschutz bietet das aus Fluorcarbon und zusätzlich mit einem Stainblocker bestehende System Teflon SP.

Anforderungen an das Emissionsverhalten von Kfz-Innenraumbauteilen|Demands on emissions in the car interior

Schwarzer-P

Folienpräsentation. Durch die gestiegene Mobilität der Bevölkerung hat sich die Aufenthaltszeit von Personen im Auto erhöht. Gleichzeitig ist das Bewusstsein der Verbraucher hinsichtlich der Emissionsbelastungen in Innenräumen gestiegen. Daher gehört die Überprüfung, Reduktion und Vermeidung von Emissionsbelastungen im Innenraum von Kraftfahrzeugen des VW-Konzerns seit Jahren zum Entwicklungs- und Qualitätsmanagementprozess. Es werden die Prüfverfahren zur Werkstoff-, Bauteil- und Gesamtfahrzeuguntersuchung vorgestellt, die Grenzwerte erläutert, das Emissionsverhalten der großflächigen Textilbauteile dargestellt, die Problematik von Verbundsystemen am Beispiel der Säulenverkleidung erörtert, der Einfluss der Bauteilemissionen auf die Gesamtfahrzeugemissionen am Beispiel der Polsterstoffe dargestellt sowie ein Vergleich zwischen den großflächigen Textilbauteilen und anderen Bauteilen in Bezug auf das Emissionsverhalten im Fahrzeuginnenraum vorgestellt. Zu den verwendeten Werkprüfvorschriften gehören die PV 3015 für Foggingprüfung, die PV 3341 für die Prüfung des Gesamtkohlenstoffes, die PV 3925 für die Formaldehydprüfung sowie die PV 3900 für die Geruchsprüfung. Die Prüfabläufe werden beschrieben. Entwicklungsbeispiele werden anhand von Bodenteppichen, textilen Dämpfungssystemen usw.

vorgestellt.

Environmental aspects of carpet production and use of an MS-based electronic nose|Umweltaspekte der Teppichproduktion und Einsatz einer auf MS basierenden elektronischen Nase

Simoens-D|Jambers-W

Overhead presentation. During the last decade Centexbel, the Belgian research and testing institute for textiles, has performed carpet related research on a number of themes where the reduction of emissions was an important criterion. Last year Centexbel has invested in a small-scale semi- industrial coating line that allows testing new coatings on substrates of 50 cm width. This line combines a number of different application techniques and different curing and lamination units. Centexbel reported already on research to reduce zinc in foam backings of carpets. This reduction of zinc can be 75 % (for AAG and some NSF-gel foams) to 90 % (non-gel foam and the majority of the NSF formulations). Today, tuft locking is being realized mainly with carboxylated styrene-butadiene (XSBR) latex applied with a traditional coating technique. Recent research at Centexbel has shown that similar tuft locking can be obtained using unfilled latex compounds with traditional coating technique or using other polymers with powder scattering technique and this at a competitive cost. In all these research topics it was necessary to have a quick evaluation technique for emissions of VOCs. As the current odour analysis of carpets uses an odour panel, which, in less controlled conditions, may be subjective, the use of electronic noses was evaluated as a fast, reproducible and objective test method. Centexbel developed a model to predict odour evaluation and has gathered experience to quickly indicate the presence of a set of suspicious components in the emissions of carpets, making use of a so-called electronic nose, the HP 4440 Chemical Sensor with a mass spectrometer detector.

Indoor sensorial testing and assessment of odours|Sensorische Prüfung und Beurteilung von Gerüchen im Innenraum

Saleschak-G|Bauer-H-P

Overhead presentation. Through the last years the number of impairments caused by indoor air pollutants is increasing. The main reasons for the impairments are overheated rooms, the change in the chemistry of the building products, the decreasing of air change rates caused by better sealing of rooms and the upcoming of new emission sources (e.g. ozone built up by electronic apparatus). More often beside the indoor air concentration of volatile organic compounds, impairments caused by odours also have to be judged. In practice the objective judgment of sensory perception causes big problems because the different proceedings of experts could lead to different opinions that are connected with a legal insecurity. A short summary of the basics of sensory perception of odours by humans and an overview about the problems of subjective perception is given. Influence factors on smelling include physical factors, emotional factors, environmental conditions, kind of smelling, concentration of the smelling etc. Best smell ability is at the age between 30 and 40. Women have better smell ability than men. Smokers smell a little worse. An effect of smell attractions over a longer time period causes adoption. By breathing in short jerkily considerably more air reaches the Regio Olfactoria. The smell impression of substances depends on the concentration in the breathing air. To determine smell analytical sensors are necessary. People who are testing smells have been carefully selected and trained. A check list before and during the smell test is discussed. The smell assessment is divided into intensity and acceptance values reaching from odourless to very strong odour and pleasant to disturbing respectively.

Inhalation toxicity of nylon respirable fibre particulates (RFP's) in rats|Sensorische Prüfung und Beurteilung von Gerüchen im Innenraum

Kennedy-G-L|Warheit-D-B

Nylon RFPs (respirable-sized, fibre-shaped particulates) were prepared using flock rotary cutters followed by vigorous opening procedures. Groups of male rats were exposed nose-only, 6 hours/day, 5 days/week and 4 weeks to either 0 (control), 4, 15, or 57 f/cm³ (ratio RFPs: particulates = 1:10-20). The lung and toxicological response to Nylon RFPs was analyzed using lavage fluid, cell proliferation response, histopathologic, and fibre clearance/retention. Rats were evaluated the day after the 20th exposure, at 1 week, and at 1, 3, 6, and 12 months after exposure. No adverse response was seen in either the lungs (inflammation) or the intact animal (lung histopathology) following inhalation of Nylon RFPs. More than 90 % of the alveolar macrophages recovered from lavage fluid from high dose rats contained either nylon RFP or particulates in the cytoplasm indicating exposure and deposition occurred. Returned lung burdens went from a high approximately 10(Exp7) RFP which decreased rapidly to 10(EXP4) following exposure. The number of fibres retained in the lung was essentially background proportional to the amount inhaled. No evidence of lung specific toxicity was seen in rats inhaling Nylon RFPs.

Forschung und Entwicklung für den europäischen Teppichbodenmarkt|R & D for the European carpet market

Schröder-E

Seit nunmehr 40 Jahren begleitet das Teppichforschungs-Institut (TFI) als Dienstleister den Teppichsektor. Es wird ein Überblick gegeben über die Forschung im Bereich textile Bodenbeläge in den zurückliegenden Jahren. Dabei wird der Bogen gespannt von der Optimierung der Vorprodukte über Prozessoptimierung bis hin zu den Veränderungen der Produkte. Die Forschung muss vom Einsatz der Rohstoffe über die Herstellungsprozesse, die Installation, die Nutzung bis hin zur Entsorgung alle Phasen des Produktzyklus eines Teppichbodens beleuchten. Dabei hat sich die Forschung permanent mit den Erfordernissen des Markts verändert oder auch neue Möglichkeiten generiert. Beispielhaft wird angeführt, wie Forschung einerseits Markttrends erzeugt hat und andererseits

gesellschaftliche Anforderungen auslöste. Wenn in der Vergangenheit ein wesentlicher Schwerpunkt der Forschung darauf lag, Prozesse und damit Produkte kostengünstig zu gestalten, was zu einem hohen Automatisierungsgrad und immer schneller werdenden Maschinen führte, wird sich die Forschung in Zukunft noch komplexeren Themenstellungen widmen, wobei das Systemdenken und die Befriedigung individueller Kundenwünsche im Vordergrund stehen werden. Die Forschung wird sich dabei im Spannungsfeld von Qualität, Ökologie und Ökonomie bewegen. Ein Trend geht hin zu immer kürzeren Auftragslängen und folglich schnelleren Partiewechseln. Mit dem Motion Controller können Garn- und Trägerspannungen an der Tuftingmaschine kontrolliert und geregelt werden. Eine Nadelbarre aus Verbundwerkstoffen bringt eine Massenreduzierung um 68 %. Mit dem RECAM-Projekt wurden Wege für das Recycling textiler Bodenbeläge und deren ökologische und ökonomische Sinnhaftigkeit aufgezeigt. Textile Bodenbeläge müssen nicht deponiert werden. Sie können als Energielieferant der thermischen Verwertung zugeführt werden. Eine stoffliche Verwertung ist zwar denkbar, aber derzeit noch unwirtschaftlich. Das Projekt ProDaMaTex bietet eine Möglichkeit zur Kommunikation zwischen Vorlieferant und Verarbeiter.

USA carpet market: Recent developments|Neueste Entwicklungen im Bereich textiler Teppichböden in den USA

Braun-W

Overhead presentation. The Carpet and Rug Institute (CRI), the national trade association for the US carpet industry, has evolved into a new organization. CRI has developed an aggressive marketing plan to reach the critical audience and has done national surveys to make sure we are selling 'our' market the 'light' product. In 2001 the total shipment of carpets amounted to 1.9 billion sqm, 53 % of which has been delivered in the residential area and 47 % in the commercial area. The commercial segment includes corporate (30 %), retail (18 %), education (15 %), health care (15 %), hospitality (13 %) and government (9 %). The message of the new business model is 'carpet for a better environment'. The means carpet for healthier air, carpet sounds better and carpet feels better. Carpet reduces instances of slip and fall and severity of fall injuries. CRI provides a 'Green Label Program' for the certification of cushions, carpets and adhesives. A co-operative study with Hamilton Health Care confirms that carpets can be sanitised. To prove the suitability of carpets for better indoor environment a new seal of approval program, a new cleaning chemical testing program and a new extraction cleaner testing program have been launched. Goals are identification of common issues facing the industry, development of global strategies, sharing of costs on research etc. for more information see www.wcrc-net.org.

Phoenix rising from the ashes|Ein Phoenix aus der Asche - europäische Bauproduktrichtlinie als Grundlage für den Durch(Neu)-Start textiler Bodenbeläge

Bauer-H

The European Building Code regulates the general requirements of building products by defining their basic properties. Since floor coverings firmly connected with the substrate are considered to be building products they are subject to the definitions of the Building Code. The recently published EN 14

Antron.Innovate. Inspiration for textile floorcoverings and a perfect business opportunity|Antron.Innovate. Inspiration für textile Bodenbeläge

Blank-U

Overhead presentation. The European market for textile floor-coverings has been receding for nearly a decade. The total market volume in Europe in 2003 will be 1.9 billion sqm, in Germany 430 million sqm. This has had many reasons including substitution of soft by hard flooring. Several important opinion leaders perceived hard floor as being more fashionable and offering greater design flexibility than carpets and began specifying it more frequently. Few innovations and an overall quality and price erosion made the carpet industry and its ingredient suppliers suffer from this declining market. DuPont Textiles & Interiors (DTI), as the largest manufacturer of nylon 66 fibre globally, wanted to help arrest this decline and started an integrated development and marketing program to reinvigorate the textile floor-coverings market in Europe. This initiative is called Antron.Innovate. Antron.Innovate encourages new thinking and new creativity at all levels of the value chain. Six diverse but associated interiors materials were reflected in new carpet styles developed in DTI's own development centre. These were presented to carpet mills, trade, A&D, and at fairs and exhibitions to the public. A trilingual ad and public relations campaign based on misconceptions about carpet accompanies the Antron.Innovate push, as new styles from manufacturing partners are launched. Some carpet styles stimulated by these Antron.Innovate ideas are already commercially available.

BCF texturing - the key to success|BCF-Texturierung - der Schlüssel zum Erfolg

Bauer-J

Overhead presentation. The classical market for BCF yarns - the carpet industry - is, in light of the current economic situation, under considerable pressure. Carpets have become a commodity and face increasing competition from alternative floor coverings like wood or tiles. Traditionally strong BCF producing countries suffer from relatively high manufacturing costs and loose importance due to an increasing investment activity in developmental and so-called low cost countries. High raw material (resin) prices do traditionally leave small margins for yarn producers. All this results in an especially high price pressure on BCF yarns, forcing the producers to either reduce manufacturing costs significantly or produce innovations to distinguish themselves in specific market niches. Typical subjects for differentiation are high quality, low cost and predominately new applications. This moves the traditional critical performance measures such as high speed, high efficiency and low downtimes in the focus of BCF yarn production. Additionally, new process requirements like extended production capabilities (for higher and for lower deniers of yarns and filaments) and the flexibility to choose between

innovation and economics according to the current market requirement come into play. Especially the texturing equipment determines process speed as well as product quality and reproducibility and therefore limits the market access of BCF yarns today. Rieter has honoured this fact by the development of an improved friction free texturing system that is the consequent reaction to the tendencies of the market and answers the new demands in a unique way. In this process, friction is eliminated as a relevant process factor. A precisely controlled plug formation is possible by the combination of texturing jet and cooling drum settings. The result is a better crimp level and a better coverage in the carpet. For PA the texturing speed can reach 4000 m/min and for PP 3600 m/min. A high process stability can be achieved due to simplicity and robustness of the components. Since the new texturing jet has extended its speed range significantly, all other major process steps have to fulfil the new requirements regarding speed/throughput, filament quality and filament uniformity.

Latest developments in BCF-technology|Neueste Entwicklungen in der BCF-Technologie

Schemken-M

Saurer Group and Neumag have ceased to be mere suppliers of machinery and components and have for many years been closely cooperating with their customers by offering them complete solutions in the field of BCF yarn technology, an approach that has brought about interesting results. In cooperation with the customers studies covering the entire production chain of BCF yarns were and still are carried out worldwide. At the same time improvements have been made in machine design which now allows throughputs of up to 50 kg/h/spinnerette package for Monocolor BCF lines, which has become possible as a result of some equipment and process improvements, for instance in the dye metering system, the spinning system, the cooling of threads and in the core element of the BCF process - texturing. In recent years these elements have been continuously adapted and improved to allow this increase in performance and quality. Major attention is put to the ergonomic design of the production line. Neumag has developed a new concept that allows easier operation. In addition to ergonomic aspects, modern process control technology and software support play an important role in the BCF process. Neumag has developed a completely new system, which actively supports the operator of a BCF yarn line. With the S5 Neumag is bringing a new texturing machine generation onto the market. 5000 m/min is the maximum speed of this machine. A wide range of BCF yarn qualities can be produced on the S5. The quality of the texturised yarn is considerably influenced by the cooling of the yarn. The yarn which leaves the cooling drum has temperatures well above 40 degrees C and this reduces the crimp. Through a larger cooling drum and a different depositing system, a retention time which is 6 times as high is possible. Different software modules have been developed which support customer with the operation of the plant. The maintenance tool, for example, supports the operator with the planning and execution of his regular maintenance work on BCF machine.

Advances in fibre finish technology for nylon BCF carpet yarns|Fortschritte in der Faserfinish-Technologie für BCF-Teppichgarne

Kutsenko-M

Overhead presentation. A contemporary approach is discussed to the development of high speed BCF finishes, based on sophisticated laboratory testing capabilities. Techniques of characterizing the wetting behaviour of neat oil and aqueous finishes for short contact duration in the finish application as well as the effect of viscosity are discussed. The measurement of dynamic surface tension at different rates has been carried out by the Krüss BP-2 bubble pressure tensiometer. Advanced Finish Nozzle (AFN) is an alternative to traditional ceramic applicator, designed to improve finish application. AFN is a combination of applicator guide and finish migration nozzle. Finish application from emulsion is an alternative option, although it presents some shortcomings associated with the presence of large amount of water. A high tension friction test is proposed to differentiate finishes for their sturdiness in high speed processes. This test simulates the boundary lubrication conditions. Thermal stability of the finishes is thoroughly characterized by a smoke point apparatus and pressure DSC techniques to insure finish resilience to elevated temperatures. All these test methods allow to design finishes to address specific performance requirements. Finish development times can be shortened by pre-screening and reducing the number of finish candidates.

Biologically degradable spun-bonded nonwovens for technical applications|Biologisch abbaubare Spinnvliesstoffe für technische Anwendungen

Bleichschmidt-D|Fuchs-H|Geus-H-G|Kunze-B

Spunbonded nonwovens are preferably made of polypropylene or polyester, due to high effectiveness of the manufacturing process, the good quality level of products and particularly low raw material prices. Still, they cause substantial ecological problems because of their non-degradability with the disposal. One solution is the production of biologically degradable spunbonded nonwovens, which are not yet produced particularly for technical applications. Saxon Textile Research Institute made fundamental investigations to determine process engineering parameters for the spinning process, for web formation, thermal and hydrodynamic web solidification and product properties of bonded nonwovens on laboratory plants. Polymers, such as polyamide and an aliphatic-aromatic copolyester, were used in the trials. The weight per unit area of the spun bonded nonwoven ranged between 30-200 g/sqm and showed high softness and good elasticity. Digging trials proved that the spun bonded nonwoven was biologically diminished after 28 days. Trials on laboratory plants of the Reifenhäuser Maschinenfabrik Troisdorf showed the lab test results to a large extent transferable to industrial standards, with consideration of still necessary optimizations. The spun bonding equipment technology has to be adjusted to the characteristics of biopolymers, while process parameters must be substantially modified towards polypropylene and polyester.

Spunbonded nonwovens by nanoval processes|Der Nanoval-Prozess für Spinnvliese

Gerking-L

Splitting of molten polymer filaments into a multitude of finer filaments is attained with this process if a laminar gas, normally air flow in a Laval nozzle underneath the spinneret hole draws the melt filament until its inner pressure, steadily increasing due to surface tension, surmounts the pressure in the surrounding steadily accelerated gas flow and it bursts open. Continuous filaments of 2-6 microns, 0.03-0.3 dtex respectively, are formed. These 'spider fine' filaments can be deposited as a nonwoven web or wound up as a yarn. They reach staple-fibre tenacity. Design of the spinning equipment is simple as there are no narrow slits beside the spinning holes. Compared with standard melt-blown systems energy consumption is much smaller because only cold air of a few 100 mbar is used, and throughput of a spinneret row is much larger at 2-10 g/min per spinning hole. It is also possible to make unsplit continuous filaments, especially Lyocell. In this case the filaments, after being deposited on a perforated belt, are conveyed together with it through a water bath for coagulation and bonded together autogenously. Filament breaks do not happen due to the accompanying airflow and their tendency to fibrillation is substantially reduced.

Thermoplastic polyurethane elastomeric spunbond fabric "ESPANSIONE"|Thermoplastisches PU-Elastomer-Spinnvlies 'ESPANSIONE'

Shimizu-H

In recent years, various nonwoven fabrics manufacturing by various raw materials and manufacturing process have wide variety of end-uses according to their characteristics. The technology of nonwoven has been improved significantly. Espansione is a meltblown nonwoven fabric composed of thermoplastic polyurethane elastomer, which has been developed using original melt-spinning technology. Espansione is constituted of 100 % polyurethane elastomer continuous fine filaments. On account of the structure, Espansione has a number of physical properties such as high stretchability, elasticity, air permeability, moisture permeability and easy handling of welding and cutting process. A new adhesive polyurethane nonwoven fabric, Espansione FF, which is composed of special thermoplastic polyurethane for hot-melt adhesive applications, has been developed by further improving the production technology of Espansione. No solvent is used, making it environment-friendly and human-friendly. Because Espansione FF uses hot-melt adhesive technology, it is very good concerning work efficiency and offers various features such as long-lasting stretchability and air permeability after adhesion and has a wide variety of end-uses. Espansione FF can easily adhered with an iron or a heat presser at a temperature of between 100 and 180 degrees C, depending on the fabrics to be adhered. The material can be used to attach knitted fabrics which have superior flexibility such as two-way tricot fabrics and cotton circular knitted fabrics. Compared with other hot-melt adhesives, Espansione FF retains the suppleness after bonding. Espansione FF has additional properties such as light-fastness, good washing-fastness and good dry- cleaning properties.

Stretch-nonwovens|Stretch-Vliesstoffe

Hietpas-G-D

Overhead presentation. The field of nonwovens has always been driven by a unique combination of high productivity and low labour needs together with specifically engineered fibres and advanced fabric construction technology. However, several large markets remain closed to nonwoven fabrics, one example is the immense ready-to-wear apparel market. The poor suitability of nonwovens in this market has been thoroughly studied, and the most commonly cited reason for this centres on the inability of most nonwovens to acceptably recover from out-of-plane deformation and linear extension. A second issue concerns the 2-dimensional nature of many nonwovens in that they often tack drape and a supple aesthetic. For these reasons most nonwoven based garments are single-use and highly functional in nature, surgical cloths being the most common example. The concept of stretch nonwovens is discussed. In the first case, it will be pointed out that stretch nonwovens do exist in the commercial marketplace. In most cases these are highly engineered textile products for specific end-uses. A specific example is the use of Lycra elastanes in the diaper industry. For this purpose Lycra XA has been developed. This product is an elegant combination of traditional rigid nonwoven materials with elastomeric materials. An overview of the recent proprietary developments of DuPont, which are outgrowths of this technology, will be given. Second, other new and promising proprietary technology with the potential for broader market application based on stretch staple Fibres will be presented.

Tencel - a versatile high performance fibre for nonwovens|Tencel - eine vielseitige und hervorragende Faser für Vliesstoffe

Wilkes-A

In the early 1990's a new cellulosic fibre was launched commercially under the brand name of Tencel. Tencel is a high performance, solvent spun, 100 % cellulosic fibre, which is ideal for many nonwoven applications because of its high strength, absorbency, purity and biodegradability. Over the last 2- 3 years Tencel has developed from a product selected for niche industrial applications to a fibre of choice for many major nonwovens producers worldwide. During this period an extensive research program has culminated in the introduction of a family of new Tencel grades enhancing attributes ranging from fibre processing performance to final fabric properties. The current product family comprises grades optimized for most nonwovens manufacturing processes, including spunlacing, needle-punching, wet-laying and air-laying. The recent development and use of Tencel in nonwovens applications are shown, discussing aspects such as the fibre enhancements used to maximize high speed carding performance, the characteristics of the fibre in the spunlacing, wet-laying and air-lay processes, focussing on entanglement and bonding, and the key relationships between basic fibre properties and fabric aesthetics. The case for specifying Tencel fibre in nonwoven products is compelling. Priced cost effectively, with unique attributes and excellent environmental credentials, its future in absorbent nonwoven products is assured.

Iontex - Special fibres for filtration and water purification|Iontex - Spezialfasern für Filtration und Wasseraufbereitung

Schobesberger-H

The selective removal of toxic ionic species from diluted waste streams requires highly effective filtration systems. The development of new filtration systems based on cellulosic textile materials with ion exchange capacities is the objective of the EU-funded research project Iontex. In cooperation with other European partners Lenzing and IFTH are developing cellulosic fibres respectively nonwovens with ion exchange properties. The advantages of such Iontex textile filter materials compared to traditional technologies are a much bigger surface available for ion exchange reactions, which at the same time means a faster reaction kinetics, and a lower pressure drop at higher flow rates. That makes Iontex filter particularly suitable for purification of liquids with low amounts of harmful substances and high flow rates as given in the plating and nuclear industry and for drinking water purification. In order to introduce ion exchange groups into cellulosic textile materials, two different approaches have been investigated: a reactive surface treatment of the cellulosic textile or nonwoven on the one hand and the introduction of homogeneously distributed functional groups into the cellulosic fibre on the other. In a process developed and patented by IFTH functional monomers are grafted onto the surface of the textile material after activation by electron beam treatment. For the functionalization of cellulosic Fibres Lenzing's well established incorporation technology is used by preparing micro-dispersions of ion exchange substances and introduction into the viscose spinning dope. This technology allows the immobilization of ion exchange groups in viscose or modal fibres. Investigations by electron microscopy confirmed that even functional groups inside the fibre are accessible for ion exchange reactions. The ion exchange capacity of the fibre is determined by the amount of the incorporated resin. The fibres can be processed into nonwoven filter materials by needle-punch or hydroentanglement. Iontex filters are characterized by high efficiency and selectivity, they can be easily regenerated and provide sufficient mechanical and chemical stability in the respective media.

PA-monofilaments and staple fibres for long life paper felts|PA-Monofile und Stapelfasern für langlebige Papierfilze

Bouquereel-F

Overhead presentation. The R&D budget of Rhodia is EURO 227, or 3.3 % of sales. The company employs 1500 researchers worldwide. In the continuous papermaking process, an aqueous pulp solution is progressively transformed into a fine sheet of paper through some complex steps called 'forming', 'pressing' and 'drying'. In each of these steps, the felts, directly in contact with the paper are the key pieces. They determine the productivity and the quality. Among these different felts, the press felt is probably one of the most important. Today, 100 % of the press felts are made with polyamide (mostly 6 or 66). Since the 80s, the felt producers have developed optimized constructions offering higher de-waterability and better compaction resistance. During the same period, the producers of polyamide monofilaments and staple fibres continuously improved their products. For example, the abrasion time to break of a single staple fibre in a lab-scale test was doubled between first generation of PA and the last generation of PA. Such improvement of PA staple fibre or monofilament was mostly obtained through an increase of the molecular weight. Unfortunately, such route of continuous increase of PA molecular weight cannot be followed anymore because of several process problems: (i) at the level of the Fibre production, melt viscosity is so high that polymer becomes un-processable, and (ii) at the level of the felt production, the Fibre becomes too stiff. Before getting ultra-high RV relative viscosity, innovative solutions must be found in order to manage these two major 'disadvantages'. Today, Rhodia is offering to the market a new generation of PA products offering again an increase of RV (and consequently an increase of compaction and abrasion resistance) but with required melt fluidity and fibre softness.

A new generation of engineered polyester fibres for nonwovens|Eine neue Generation von maßgeschneiderten Polyesterfasern für den Einsatz in Vliesstoffen

Witschas-M

Overhead presentation. The properties of polyester for nonwovens are discussed such as high modulus and strength, good mechanical stability, bulkiness, high value in use etc. DuPontSA has recently developed the Hydrofix product family with durable hydrophilic properties, which remain hydrophilic even after hydroentanglement. Hydrofix fibres with a count of 1.6 dtex and a cutting length of 38 mm have been processed on a Fleissner Aquajet line to form fabrics with 30 to 70 g/sqm. The absorbency has been tested using the EDANA recommended test method 10-4-02. Hydrofix provides the typical, mechanical bulk properties of PES since the basic polymer is unchanged, whereas the surface is modified throughout the fibre manufacturing process. The surface modification technique can be combined with different fibre characteristics (fineness, X-section etc.). Hydrofix is positioned to support e.g. wipes, offering strength, softness and good absorption properties; it is ideal for pulp blends as a cost-attractive alternative to viscose based wipes.

TREVIRA bicomponentfibres for nonwovens|TREVIRA Bikomponentenfasern für Vliesstoffe

Thönnessen-F|Dahringer-J

Within the traditional West European textile industry, only the nonwoven sector continues to show growth. Current consumption in Western Europe is more than 50000 t per year, while the European production is now running at a level of less than 10000 t per year. Originally used in upholstery and mattress filling, nonwovens now find application wherever problems can be solved with intelligent products. They are now used in every aspect of our daily existence. From hygiene products to automobiles and filtration, it would be hard to imagine life without nonwovens. In addition to mechanical and chemical bonding, thermal bonding with bicomponent fibres is being increasingly used. The quality of the nonwovens produced by this method is significantly influenced by fibre fineness, polymer composition, the geometric arrangement of the polymers, textile technological properties and the percentage content of the bicomponent fibres used. Besides the traditional carding types, Trevira

supplies bicomponent fibres specially developed for the airlaid sector. These fibres are developed partly in collaboration with the customers. Bicomponent fibres consists of two different polymers. The best known and most commonly used bicomponent fibres have a sheath/core or side by side structure. These fibres are very suitable for nonwoven hygienic products, are clean, ecofriendly and reduce cleaning work to a minimum. Nonwovens with a high shrinkage can be produced. Trevira 254 has a melting point of 254 degrees C and the melting point of the copolyester sheath is about 110 degrees C. the bicomponent fibre Trevira 254 is generally used in blends in a ratio of 10-50 %, depending on the application. Trevira 254 is supplied in 1.3, 2.2, 3.0 and 4.4 dtex. In Trevira 264 the melting point of the sheath is increased to 190 degrees C. Trevira 255 is used for thermal bonding of airlaid products. Trevira 256 is processed in the conventional way, using carding technology. To meet requirements for higher-melting bicomponent fibres, a fibre with a melting point of 220 degrees C is available. PBT is used as the sheath polymer. Furthermore, side-by-side eccentric bicomponent fibres and flame-retardant bicomponent fibres are presented.

Developments in polyester staple fibres for spunlace|Entwicklungen bei Polyesterfasern für die Wasserstrahlverfestigung

Salvio-G

With about one quarter of the total production of nonwovens from man-made fibres, cellulosic materials included, polyester, after polypropylene, is the second major fibre used for nonwoven textiles. Since its first appearance, thirty years ago and especially in the past ten years, the spunlace technology has been experiencing a growing wide application among the un-spun end uses and in particular for hygienic, biomedical and medical nonwovens. The machine constructors have introduced new and more efficient water jet entanglement manufacturing lines and the fibre producer has had to optimize the characteristics of its products for operative conditions at higher water pressure and faster carding speeds. Spunlace production lines are running today with up to 250 m/min with cards and up to 400 m/min with spunbond heads. Hydroentanglement is considered to be a highly versatile process because it can be used to produce nonwovens with a broad range of end-use properties. Montefibre is a leading European producer of hydrophilic polyester staple fibre for the process of hydroentanglement of carded webs in pure and in blend with cellulosic fibres. A large number of certified nonwovens for medical and surgical products, for hygienic disposables and for technical end-uses has been designed and obtained in different weights using the hydrophilic and low-foaming Terital polyester fibre by the major European spunlace manufacturers. Montefibre research activity, starting from the well consolidated product in 1.7 dtex, has been exploring a finer denier that gives improved mechanical characteristics, enhanced hand and higher covering surface to the final nonwoven product. A reduction of nonwoven end weight and consequently a lower production cost can also be realised keeping unvaried the final specific surface and the good mechanical properties of the standard products obtained with 1.7 dtex by using a minor amount of 1.3 dtex instead of 1.7 dtex.

Solutions in the context of the end of life vehicles (ELV) directive|Lösungen im Interesse der Altautoverwertung

Gleeson-F

Traditional methods used for the disposal of automotive products will see significant change in the next couple of years. In conjunction with other environmental protection regulations the European Commission has given direct address to the management of End of Life Vehicles (ELV) with the introduction of the Directive 2000/53/EC. The directive requires member states to attain the following targets. By January 1, 2006 the re-use and recovery shall be increased to 85 % with re-use and recycling increased to a minimum of 80 %. By the January 1, 2015 the re-use and recovery shall be increased to 95 % with re-use and recycling increased to a minimum of 85 %. Encompassed in the directive is the EU philosophy that future constructions should be designed and manufactured for efficient dismantling, re-use and recycling. Also addressed is the requirement for 'continuous improvement' in the handling and recycling of plastic materials. In this regard polymers present their own unique challenges with composite constructions adding to the complexity and difficulty with regard to meeting the clear objectives of the directive. It is desirable that a single polymer is selected with a range of potential properties to fulfil the performance demands of the automotive industry in areas such as acoustics, stiffness, resilience, comfort and durability. Polyester is such a polymer, with a broad capability for structure modifications that enhance performance while maintaining basic properties that allow successful recycling and re-use. As a world leader in polyester recycling and polyester provider, Wellman International Ltd. has the capability and technical expertise to offer solutions in the context of the End of Life directive.

PP special fibres for technical nonwovens|PP-Spezialfasern für technische Vliesstoffe

Schobesberger-C

Overhead presentation. The market size for polyolefin fibres for nonwovens is about 4000 tons per year. New developments strictly following specific applications lead to asota FR, a permanent flame retardant polyolefin (PO) fibre, to be used especially for wash- and re-useable as well as recycle- and disposable airline passenger blankets. The results of flammability tests (vertical), smoke emission and toxic gas emission tests are shown in table form. Another development is just launched for use in higher temperature filtration: thermal and oxidation resistant PO fibre for liquid as well as gas filtration. One discussion point will be the cost effective construction for anti-bacterial and/or anti-dustmite mattress layer. This is known as asota Actigard finishing. And, an actual problem in southern European countries will be fought against: legionellas in air-conditioning systems. This shall show the ability to create tailor-made fibres in a competitive way to fit the need of specific applications in various end-uses.

Fluor polymer fibres meet nonwovens technology|Fluoropolymerfasern in Vliesstoffen

Wimmer-A

Overhead presentation. Fluorocarbon fibres have a heat resistance up to 260 degrees C, a good chemical resistance, an LOI of 100 %, good filtration efficiency, good cake release, low friction, good water repellency etc. The targets of this investigation were to treat a conventionally manufactured needlefelt made of 100 % Lenzing Profilen by a hydrodynamic after-treatment also called spunlacing. Furthermore filtration tests were to be conducted for the treated filter media and to be compared with two conventional needlefelts, one of these with a special surface coating. Main focus of these tests have been the filtration efficiencies (dust concentration of the clean gas) and the determination of the particle size of the emitted dust. The results show a significant improvement of the filtration efficiency. The unconditioned, spunlaced Lenzing Profilen felt already provides good filtration efficiency for particles below 2 micron in size. Additionally, some more filtration related differences in-between the conventional filter media and the spunlaced media will be displayed. Due to the improved filtration efficiency the spunlaced felt achieves, even as unconditioned filter media, much improved dust concentrations at the clean gas side. The dust emissions came down from around 4 mg/cubic meters with the basic needlefelt to below 0.5 mg/cubic meters for the spunlaced felt. With this spunlace after-treatment of a conventional felt we are getting a step closer to absolute surface filtration with all its advantages of no blinding tendency and improved differential pressure behaviour. Furthermore, a wet-laid-fleece made from Lenzing Profilen fibres will be introduced and the properties of the web will be displayed.

New fibre production line for nonwovens with special quality standards|Neue Fasern für Nonwovens mit speziellen Qualitätsstandards

Leitner-A

Overhead presentation. Lenzing has been expanding its nonwoven Fibre business in the 1990s to follow the expansion of the spunlace segment. To improve the fibre quality and to boost the Fibre production capacity in 2001 a new fibre production line was installed. The total investment was approx. 20 Mill. Euro. The nominal capacity is 100 tons/day. All production steps are performed under standard conditions an standard machinery, modified in the number (spinnerets) or size (after-treatment, dryer). Therefore the technological risks were very low. All known weak elements were fought by measures e.g. spinning machine, after-treatment, wet opener and dryer are made of stainless steel. The after-treatment comprises 2 conveyors with a width of 4000 mm, 14 washing fields and a gas recovery with CS2 condensation. In the dryer the fresh air and the circulation air is filtered and there is a metal detection system between dry opener and baling press. The dryer is a Lenzing drum dryer with 20 drums including 2 conditioner. For all process liquids new circulations were installed, these are run totally separated from the textile fibre lines to prevent cross contaminations. Today the new line runs well at a capacity of 120 tons/day and a project is run to further increase the capacity to 140 tons/day or expressed as a yearly capacity to 50000 tons/year.

Engineering polymers for nonwoven applications|Technische Kunststoffe für Vliesstoffanwendungen

Brück-M|Bernstein-R|Haas-B

Overhead presentation. The benefits and business opportunities engineering polymers can offer for the nonwovens markets will be presented. Ticona, a global supplier of engineering thermoplastics and a business of Celanese AG, has developed special polymer grades suited for textiles and technical fabrics. These grades meet the continuously increasing material requirements needed by the technical textile markets such as high temperature and chemical resistance, good elasticity combined with strength, conformity to the approvals for medical applications and food contact. Due to a wide range of melt viscosities these high quality polymers can be spun by various common technologies to manufacture monofilaments, multifilaments, staple fibres and nonwovens. The specific properties and the potential applications of the following Fibre-spinning polymers are discussed: Fortron polyphenylene sulfide (PPS), Celanex thermoplastic polyester (PBT), Riteflex thermoplastic polyester elastomer (TPE-E), Hostaform polyoxymethylene copolymer (POM), Topas cyclic olefin copolymer (COC). Successful meltblown and spunbond applications in markets such as automotive, industrial, medical and construction, with a focus on filtration, are highlighted. Fortron has a good chemical resistance and a high temperature resistance. PPS is available as monofilament, staple fibres or nonwovens. Celanex has a low and consistent melt viscosity and a very good chemical resistance. It is used for example as binder for PET layers. Topas is used for products which are in contact with food. Riteflex is an elastic polymer with hard and soft segments. It has excellent elastic and resilience properties. Hostaform has an outstanding elastic recovery and a linear stress-strain behaviour.

Customer benefits from the newest spin finishes for nonwovens|Kundennutzen der neuesten Spin Finishes für Vliesstoffe

Kaltenecker-O

Overhead presentation. Some of the most important parts of hygienic products e.g. baby diapers are nonwovens which are preferably manufactured with polypropylene. Whereas for the production of carded nonwovens spin finishes are needed to process the staple fibres it is not necessary to apply spin finishes in manufacturing of hydrophobic spunbonded nonwovens. But in modern hygienic products the different parts have to provide special functionalities, which can be achieved by tailor made multi-component spin finishes. Therefore, besides the task of ensuring the processability of fibres, spin finishes for the use in hygienic nonwovens made of staple fibres as well as of spunbonds additionally have to provide certain characteristics for the end user. One of the most important tasks is to change the hydrophobic properties of polypropylene into hydrophilic. In the present generation of hygienic articles mainly standard hydrophilic spin finishes are used which can easily be washed off by contact of body fluids or other water based liquids. For new innovations in this field there is a demand of permanent hydrophilic spin finishes. Boehme developed a new generation of permanent hydrophilic spin finishes, which combine excellent hydrophilicity with high permanency and easy handling. Synthesin allows easy wetting, fast liquid transport, optimal guidance for liquid, fast dissolving kinetics and retarded break through. Synthesin spin finish perfects kinetics and distributions. Boehme Synthesin are perfectly adapted to fibre polymers. This can be proved by contact angle measurements.

Ausrüstung für hochsaugfähige Vliesstoffe|Finish for high absorption nonwovens

Hengstberger-M-K

Mehr als die Hälfte der weltweit hergestellten Vliesstoffe werden im Hygiene

The design and capabilities of Neumag's ason spunbond technology|Das Design und Leistungsvermögen moderner Neumag Spinnvliesanlagen

Rave-H

In order to gain a short return an investment the spunbond producer needs a line designed for the flexibility to react to different market conditions. This flexibility is needed in terms of fabric basis weight range, fibre diameter and also polymer raw material. However, as important as flexibility is the reliability of the process and machinery to produce these products in a constant quality. If profitable, a production line must be capable of manufacturing a product over years with constant quality. A Neumag spunbond line Ason features a flexible process for the production of spunbond fabric of 0.5-6 dpf and larger and 10-150 g/qm (for thermobonding) and larger using all melt-spinnable polymers. The change from running a PP product with 15 g/qm and 1 dpf to a PET product with 80 g/sqm and 2 dpf can be done within a few hours. On the other hand all equipment is laid out to produce the same product with constant quality over long periods if necessary. Each component of the process requires special design work to support the Ason spunbond technology the spin beam used in a production line needs to cover a wide temperature range from 220 degrees C to 330 degrees C. In a 5 m wide spunbond production line a very even polymer melt distribution over the entire width is crucial. Thus, each polymer inlet in the spin pack feeds a section of approximately 150 mm. Besides the spin beam the most important part of a spunbond line is the drawing means. The Ason spunbond technology uses an overpressure draw slot. The key parameter for this slot are a high draw force at low air pressures as well as an even draw force distribution in cross direction. A wide range of products can be manufactured on a single line without equipment modification. All components in the spunbond lines have been designed to fully utilise the flexibility of the process while giving the reliability needed in a production plant.

Ricem FL and FL/S - Homopolymer acrylic fibres for high performance nonwoven applications|Ricem FL und FL/S - Homopolymer Acrylfasern für hochwertige Vliesstoffanwendungen

Goes-W-van-der|Tedesco-R

Overhead presentation. Ricem FL is the only acrylic textile fibre for nonwovens based on a 100 % homopolymer polyacrylonitrile. Ricem FL type was developed to exploit the need for a hydrolysis resistant filtration fibre alternative to PES. Due to its chemical composition, and a very compact structure, Ricem FL fibre has an outstanding resistance to long term exposure in very aggressive environments both acid as alkaline at high temperatures. In addition, the strong mechanical properties and the easy textile processing of Ricem FL Fibres makes it an ideal material for filtration felts in dust collecting equipment in exhaust gas-cleaning of power plants, waste incinerators and cement dryers. In long-term duty, it has been proven that Ricem FL exhibits excellent mechanical and dimensional stability and the filtration performance of the nonwovens does not alter significantly for years. Emission levels, progressively reduced by environmental agencies since the 1980s and Ricem FL's relevance in overall cost maintenance, makes it a key element in a sustainable energy policy as pursued by leading power providers.

Mobility, automotive technology and environment protection - a contradiction in terms? Mobilität, Automobiltechnik und Umweltschutz - ein Widerspruch?

Hell-W

Overhead presentation. Mobility, especially automotive state of the art mobility, does not contradict environmental protection. The article shows that the alleged contradiction is being resolved in reality through the incorporation of intelligent technology. In fact, since a long time BMW Group not only deals with the design, the manufacturing and marketing of modern and high class automobiles, but with their usage and the emerging implications for society. The emissions of limited gases are decreasing, urban traffic noise levels, potentially disturbing citizens today are dominated by the noise caused by the rolling tires. The emission of carbon dioxide can be divided into 39 % from power stations and district heating, 20 % from households and small consumers, 19 % from industry, 12.5 % from cars and motorcycles, 7.5 % from commercial vehicles and buses and 2 % from other transport systems. There is a VDA agreement to reduce overall fleet consumption by 25 % in Germany between 1990 and 2005. Integrated solutions incorporating as well road surface design are therefore necessary. The same holds for traffic in dense agglomerations. Where automotive mobility becomes more difficult due to dense traffic and limited space, industry places its hopes in intelligent traffic management systems to optimize traffic flow. The main aims in car development are reduction of emissions, reduction of consumption, increase of car dynamics, increase of safety as well as increase of convenience. The use of hydrogen and related technologies is under investigation. The generation of hydrogen is possible from unlimited and renewable sources. Short- and mid-term target is the reduction of fuel consumption. Long-term target is the development of competitive and sustainable products such as hydrogen vehicles. The possible 100 % traffic flow of two intersecting roads is reduced to about 45 % by equally prioritized traffic lights. Bridging avoids time losses by traffic separation. The new developments include car navigation systems. These systems can be used to avoid bottlenecks in traffic. The can be done by traffic flow depending traffic lights and area traffic management on motorways.

Material ConneXion: Where mind meets matter | Material ConneXion: Wo Ideen auf Lösungen treffen

Schiano-A

Overhead presentation. Founded by George M. Beylerian in 1997, Material ConneXion is the world's most extensive membership-based resource for new, innovative materials and processes. Based in New York and Milan, Material ConneXion provides architects, engineers, industrial and interior designers access to the latest and most exciting materials available worldwide that is often overlooked or inaccessible to specifics. Its physical library houses over 3000 material samples in eight categories: ceramics, glass, metals, polymers, carbon-based materials, cement-based materials, natural materials and natural-based derivatives. With an on-site membership, members have the opportunity to work with Senior Material specialists or peruse the stacks for project solutions and inspiration. The Web Membership allows access for one year. Material ConneXion Milano, in operation since July 2002, offers a range of membership options. Each virtual and onsite membership provides information and services to create firms as well as corporate, cultural and consumer-based business that seek new materials for their projects and products. Every month, the library is enriched with new materials selected by an interdisciplinary jury of experts from among hundreds sent continually by manufacturers or discovered by specialised technicians. Each material and its unique properties are presented to the jury who then evaluate it according to its innovative contribution to industry, environment or science. The digital database allows for user-determined research of materials based on keyword searches. The physical library is made up of Material Tabula panels. Each panel presents a sample of the material for physical inspection, a graphic representation of the material's categorisation within the library, and a description of its properties. In addition to the Library Material ConneXion offers marketing and consulting services on all aspects related to materials. Material ConneXion offers the opportunity to promote the products of a producer through totem panels and show cases that show the materials and all the technical and commercial information related to the products and the company. Furthermore, seminars and workshops are organised. Complete access to the virtual library is available via the Material ConneXion database at www.materialconnexion.com.