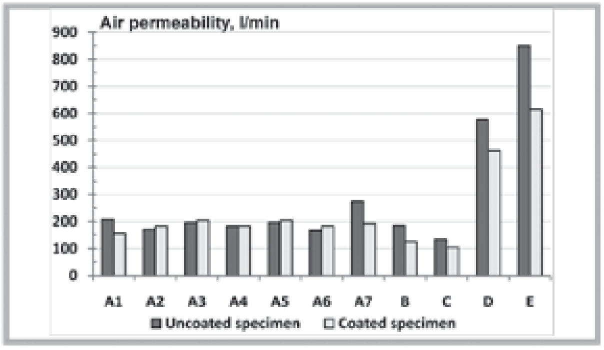

Figure 6. Air permeability of the specimens before ■ and after □ the electrospinning process.

voltage of 30 kV gives the best results for press felt performance with respect to surface smoothness and pore size. To define an optimal nanofiber web for certain felt designs requires its own specific test.

Further research propositions

Before the commercial utilisation of electrospinning with press felts, some key problems concerning adhesion, durability and manufacturing need to be overcome.

There are several possibilities for increasing the adhesion between the coating and the substrate, such as plasma and corona treatments, and the grafting of the polymer. The mechanical durability of the nanofibre web can be enhanced by the following methods: one solution is to locate the nanofibre web between batt layers on the paper side, in which a very thin batt layer is placed on top of the nanofibre web to protect it from mechanical forces and stresses. The disadvantage of this is that the nanofibre web does not improve the smoothness of the paper; however, the retention and sheet dewatering might be improved. Moreover, the preparation method - needle-punching may not be a suitable way to connect the batt and nanofibre layers due to the tearing of needles during the felt making. Another solution is to use elastic polymers in the solution, since the nanofibre layer is usually damaged when substrate fibres move relative to one another. If the nanofibre layer is elastic, it can tolerate larger movement of substrate fibres without exceeding its strain limits. In such cases, the impact of these polymers on the properties of nanofibres, on the electrospinnability of the solution and on the electrospinning process itself requires extra attention.

In summary, present felt manufacturing technology requires innovative ideas and progressive modifications in order to integrate the electrospinning process into PMC production with high-performance specifications.

Conclusions

We combined the electrospinning technique with press felt structures to achieve enhanced properties for technical textiles. We observed that the nanofibre web improves the surface smoothness of press felts, at the same time reducing the air permeability. A coating of 1 g/m^2 of nanofibres decreased the air permeability and improved the homogeneity of the nanofibre web. The latter parameter indicates better sheet dewatering. Moreover, the needling pattern was eliminated on the paper side, resulting in a lower risk of marking and paper fibre penetration. The surface pore size and its distribution were clearly smaller with coated specimens than with uncoated ones. Thus our assumption concerning better retention and paper fibre support is justified, but it requires further testing. Our assumption that the attachment of a nanofibre web to a press felt surface would be too loose despite heat treatment (ironing), proved to be true. One reason for this was that the nanofibres were only laid down horizontally with no vertical nanofibres to connect the nanofibre web to the lower staple fibres of the specimens.

Though further research is required, our study showed that a nanofibre coating has the potential to improve press felt performance.

Acknowledgment

The authors wish to thank Mr Kari Niemi from VTT (Finland) and Mr Kim Törnqvist from Cheos Inc. (Finland) for their assistance with topographical measurements.

References

1. Herbert H. (ed.), Handbook of Paper and Board, Wiley-VCH Verlag, Weinheim, 2006, 505 p.
2. KnowPap 10.0 - Learning Enviroment, Prowledge Oy, 2009, http://www.knowpap.com/english/knowpap.htm.
3. Hatch K. L., Textile Science, West Publishing Company, Minneapolis/Saint Paul, 1993, 472 p.
4. Hakala, T., Wilenius, T., Harlin, A.; Laboratory ageing Test Device for Press-Felt Clothes of Paper Machine, Autex Research Journal, Vol. 7(1), 2007, pp. 71-79.
5. A simulator improves press felt cleaning, Innofabrics, (2), 2003, p. 9.
6. Meadows D. G., Edwards J. C.; Johnson Filaments-making monofilaments for machine clothing, Tappi Journal, Vol. 77(6), 1994, pp. 47-49.
7. Bouquerel F., 42nd International Man-Made Fibres Congress 2003, Dornbirn, Austria, 2003, Polyamide Monofils & Staple Fibers for High Performance Paper Felts.
8. Slater P.; Clothing and energy connection, Tissue World, October/November, 2006.
9. Elkins, P. R., Machine Clothing; How Can It Get Better? Pulp & Paper Canada, Vol. 104(9), 2003, pp. 11-20.
10. l'Anson, S.; Identification of periodic marks in paper and board by image analysis using two-dimensional fast Fourier transforms, Tappi Journal, Vol. 78(7), 1995, pp. 97-106.
11. Nelvig A., Engström J., Hagström B., Walkenström P.; Nanofibers in technical textiles, The Nordic Textile Journal, 2007, pp. 90-99.
12. Engström J., Thorvaldsson A., Hagström B., Walkenström P.; Nanofibers - small fibers with big potential, The Nordic Textile Journal, 2009, pp. 46-53.
13. Rupertseder W., Ertl T.; Innovative filter media by means of integrated nanofibers, IREMA-FILTER GmbH, pp. 1-4.
14. Heikkilä P.; Nanostructured fibre composites and materials for air filtration. Publication 749. Doctoral dissertation, Tampere University of Technology, Tampere, 2008.
15. Mantovani E., Zappelli P.; Observatory-Nano, Report on Textiles No. 1. 7th framework programme, ObservatoryNano, May 41, 2009, p. 41.
16. Walkenström P., Thorvaldsson A.; Electrospinning of nanofibers for biomedical applications, The Nordic Textile Journal, 2008, pp. 22-29.
17. Qin X., Xin D.; Air content of PAN nanofiber nonwovens by different electrospinning processes, Chemical Fibers International, Vol. 59(2), 2009, pp. 115-117.
18. Heikkilä P., Harlin A.; Parameter study of electrospinning of polyamide-6, European Polymer Journal, Vol. 44(10), 2008, pp. 3067-3079.

Received 11.01.2010 Reviewed 16.06.2010

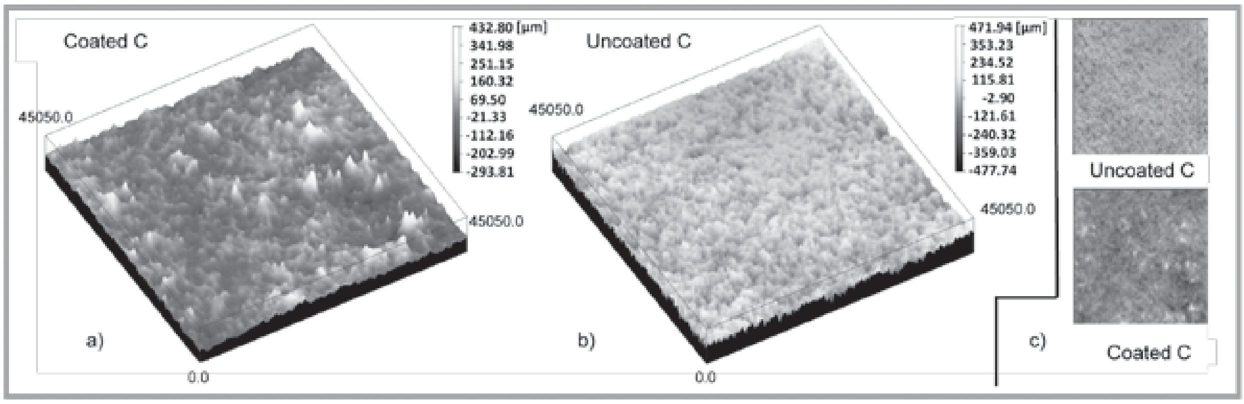

***Figure 5.** Surface topography of the C specimens with (a) and without (b) an electrospun nanofibre web, and photographs of both specimens (c) from their paper side.*

dicated that the electrospinning process was not operating perfectly.

Surface topography measurements were conducted on specimens B and C with and without an electrospun fibre coating. The specimens were visually checked to ensure they were undamaged and were scanned on their paper side by a laser profilometer. In ***Figure 5***, the 3-D measuring plots of the C specimens are shown, in which light (maximum) and dark (minimum) colours indicate the variation in topography: -294 - 433 µm and -478 - 472 µm for C specimen with and without a nanofibre coating, respectively. The better surface smoothness of coated C specimen is obvious.

Figure 5.c shows photographs of both specimens from the paper side; the appearance of the coated C specimen has less contrast, indicating a smoother surface due to the nanofibre web. The needling tracks are more obvious in the photograph of the C specimen without nanofibres; the tracks run diagonally from upper left to lower right. Needling tracks were also observed in the B specimen without nanofibres (not shown here).

The roughness values of the B and C specimens with and without electrospinning are presented in ***Tables 2*** and ***3***. The minimum and maximum values of the topography with their difference (range) and standard deviation (RMS-value) are shown in ***Table 2***. ***Table 3*** presents RMS-roughness values in certain wavelength bands (2 - 4,096 µm), the smaller values indicating smoother surfaces. Electrospinning clearly improves the surface smoothness of these press felts.

***Table 2.** Minimum and maximum roughness values, range values and standard deviation values of specimens B and C with and without an electrospun nanofibre web.*

Roughness, µm	Uncoated B	Coated B	Uncoated C	Coated C
Minimal value	-392.93	-235.75	-477.74	-239.81
Maximal value	611.34	430.64	471.94	432.79
Range	1004.27	666.39	949.68	672.61
Standard deviation	69.97	49.50	69.73	50.85

***Table 3.** Roughness values of specimens B and C at different wavelength bands with and without an electrospun nanofibre web.*

Band, µm	RMS-roughness in µm at different wavelength bands, µm			
	Uncoated B	Coated B	Uncoated C	Coated C
2 - 4	4.04	1.35	4.64	1.88
4 - 8	5.47	1.72	6.20	2.38
8 - 16	7.14	2.09	7.84	2.85
16 - 32	8.70	2.45	9.53	3.41
32 - 64	10.97	2.64	12.21	3.68
64 - 128	13.77	2.56	15.92	3.52
128 - 256	15.22	2.20	17.59	2.97
256 - 512	14.94	2.31	17.00	2.81
512 - 1024	13.78	3.29	16.07	3.50
1024 - 2048	13.23	5.67	15.33	5.48
2048 - 4096	13.52	9.20	16.02	8.90

Based on area measurements from the SEM figures and calculations from the ImageTool program, the diameter of the nanofibres was determined as about 147 ± 35 nm. The surface pore size distribution was mainly in the range 0.1 - 1 $µm^2$ for the coated B and 0.1 - 1.5 $µm^2$ for the coated C specimen. The average surface pore size was about 6,700 $µm^2$ for the uncoated B and C specimens. The values of the surface pore size varied widely from under 1,000 $µm^2$ to over 15,000 $µm^2$. The level of the surface pore size between the coated and uncoated specimens was thus very different.

The thickness, weight per unit area and air permeability of the press felt specimens were measured before and after electrospinning. Based on the measurements, the changes in thickness and weight per unit area were found to be insignificant; the coating either increased these values not at all or only by a few percentage at most. The air permeability decreased slightly after electrospinning (***Figure 6***); the decrease was significant when the quantity of nanofibre was 1 g/m^2.

The spinning distance varied with specimens A5 - A7. However, it seemed that the spinning distance did not have a significant effect on air permeability, whose variation was dependent on the quality of the press felt.

After the tests, we concluded that 1 g/m^2 of nanofibre at a distance of 150 mm and ning cycle was 0.125 g/m² or 0.250 g/m², and the total amount was achieved by repeated cycles. After the electrospinning process, the specimens were heat-treated by ironing to improve the adhesion of the nanofibre coating. The temperature was about 100 °C, and the ironing time was 2 minutes. All the experiments were performed at room temperature.

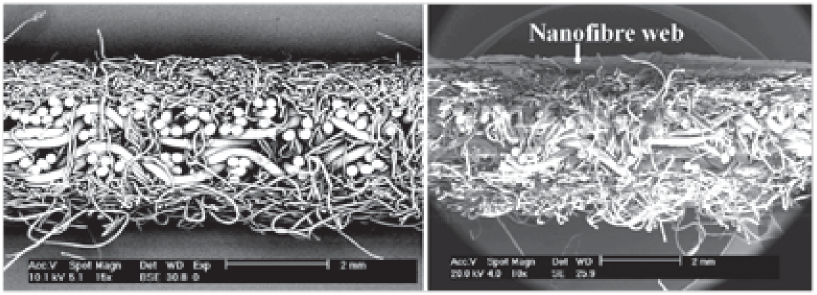

Figure 2. Cross-sectional figures of specimen C without (15× left) and with (10× right) an electrospun nanofibre web.

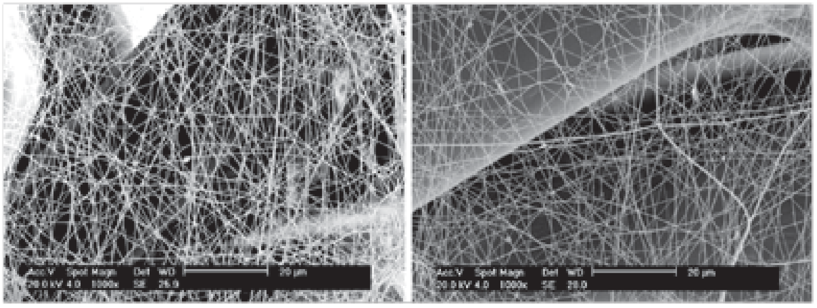

Figure 3. Specimen C coated with a nanofibre web of 1 g/m² (left) and specimen A2 coated with a nanofibre web of 0.25 g/m² (right). In both cases the spinning distance was 150 mm (1,000×).

Characterisation

Scanning electron microscopy (SEM) figures were used to observe the attachment and quality of the nanofibre webs, Philips XL-30 equipment, for SEM imaging of the webs, and a Zeiss ULTRA-plus was used for imaging electrospun fibres. Before the SEM imaging, the press felt specimens were gold sputtered. The weight per unit area, thickness (M 034A, SDL International Ltd.) and air permeability (L13, Karl Schöder K.G.) of the felt specimens were measured under standard conditions. The humidity was 65 ± 5% RH and the temperature 20 ± 2 °C. Parallel measurements were not performed due to the small specimen size.

The topography of the four press felt specimens was measured by µScan (NanoFocus Inc.) at VTT (Espoo, Finland) using a confocal sensor. The area measured was approximately 45 × 45 mm for each of the specimens, which were attached to the metal background plate. The measuring accuracy was 20 points/mm - 810,000 points for each measurement. After topographical measurement irregularities, such as the buckling of the specimen, were filtered from the data, then RMS (root mean square, i.e. standard deviation) values were calculated.

The diameter of the nanofibres and the surface pore size of the four specimens were estimated from the SEM figures using an ImageTool program. The fibre diameter was calculated from 120 measurements of individual fibres (10,000× and 20,000×). In the measurements of the surface pore size, the circumference of holes was outlined, and then the program automatically measured and calculated the area of holes in the nano- and non-woven webs. The average was calculated from 675 measurements of individual holes (1,000×) in the nanofibre webs, as well as from 240 measurements of individual holes (75×) in the non-woven webs.

Results and discussion

The nanofibre webs attached to the press felt specimens are shown in ***Figures 2 - 4***. Images were taken of cross-sections and the paper side, shown at several different magnifications.

Based on the SEM figures, we observed that the PA 6 nanofibre web was only attached to some of the uppermost staple fibres. Nanofibres were randomly placed and formed a thin 3-D web. Several contact points were between nanofibres, and some drops and holes had appeared in the web (***Figures 2*** and ***4***). It also seemed that single nanofibres were axially stretched, and their diameter varied. The increased amount of the nanofibre web raised the number of contact points between the nanofibre web and staple fibres (***Figure 3***). Unwanted holes were generated randomly with smaller fibre quantities; however, several electrospinning cycles smoothed the surface. Moreover, the thicker nanofibre layers seemed to have more durable nanofibre webs. The solution drops in-

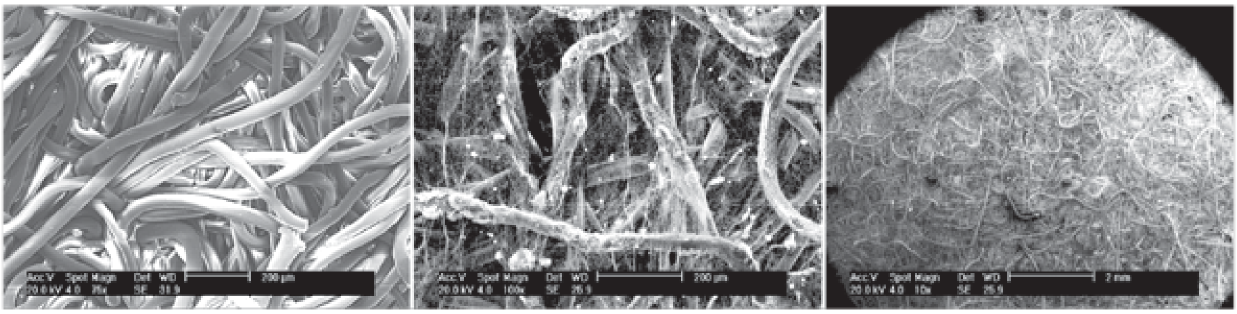

Figure 4. Paper side of the uncoated (75× left) and nanofibre coated specimen C (100× middle and 10× right).

Table 1. Felt type, electrospinning voltage, distance, and the amount of nanofibre.

Specimen	Base fabric	Voltage, kV	Distance, mm	Amount of nanofibre, g/m^2
A1	double-layer	30	150	1.0
A2	double-layer	30	150	0.25
A3	double-layer	30	150	0.5
A4	double-layer	30	150	0.75
A5	double-layer	10	50	0.5
A6	double-layer	20	100	0.5
A7	double-layer	40	200	0.5
B	double-layer	30	150	1.0
C	laminated	30	150	1.0
D	single-layer	30	150	1.0
E	single-layer	30	150	1.0

ty as well as the properties of current materials and press-felt structures. The work is challenging and complex because of the varied end uses and large number of different press felt structures. Totally innovative and new PMC products are rarely mentioned in the literature.

Electrospinning of nanofibres

Non-woven nanofibres are typically used in technical textiles, such as air filters and sound absorption materials, and in biomedical applications due to the improved capacities of end-use [11, 12]. In air filtration, especially, the use of nanofibres enhances separation efficiency without increasing the weight, because as the number of fibres increases, their diameter decreases [13]. Thin nanofibre layers can have a dramatic impact on filtration efficiency for small particles (diam. below 0.5 μm) without a large increase in the pressure drop [14]. Typically an electrospinning device (***Figure 1.a***) consists of a collector, a high-voltage power supply, a metallic needle and a syringe. An electric field is generated between the needle and the collector with a positive or negative charge. The collector is earthed, or has an opposite charge to that of the needle. The electrical forces attract the solution towards the collector, and jetting occurs from the Taylor cone. After a short stable stage, instabilities start to bend the jet, which eventually leads to 3-D looping within the conical envelope. Secondary and tertiary looping can also occur before the jet reaches the collector. The process thus produces thin polymer-based fibres using an electrostatic field. Electrospinning parameters such as the polymer concentration, polymer flow, spinning voltage and the distance all have an impact on the nanofibre diameter and porosity of nonwoven materials [15 - 17].

The purpose of this study was to modify a press felt structure using the electrospinning method. We assumed that nanoscale fibres on the surface of the press felt would improve its surface smoothness and other properties affecting papermaking parameters, such as retention and the risk of paper fibre penetration. We were aware of the poor adhesion between nanofibres and the press felt surface, as well as the poor mechanical properties of the nanofibres.

Press felt specimens were coated with electrospun fibres by varying the nanofibre amount. The surface topology and pore size distribution were studied in order to evaluate the impact of nanofibres on the surface smoothness. The impact of nanofibres on other felt properties was evaluated using air permeability measurements.

Experimental

Materials

The press felt specimens (A - E) consisted of several types of woven base fabric, which had a single-layer, double-layer or laminated structure, as well as batt layers on both sides of the base fabric(s) (***Table 1***). Carded and pre-needled batt layers were formed from 3-D curled staple fibres, whose fineness varied between 11 - 44 dtex. The batt layers and woven base fabrics were connected by punch-needling. Specimens A - C were commercial press felts, and specimens D and E were prepared in the Fibre Materials Science laboratory. The preparation of the specimens is reported in [4]. Specimens A were used in the experiments with varying electrospinning parameters, and specimens B - E were for comparison. The size of the specimens was about 90 × 100 mm (A2 - A7) or 210 × 297 mm (A1, B-E). The thickness of the specimens varied from 3.43 to 4.30 mm and the weight per unit area - from 960 to 1710 g/m^2; these values were related to the felt designs. The cross-sectional structure of a press felt specimen is shown in ***Figure 2***.

The polymer for electrospinning was a PA 6 of high molecular weight (Ultramid B5 Natur) from BASF. According to gel permeation chromatography (GPC) analysis, the molecular weights, Mn and Mw, were around 86,000 and 198,000, respectively. The formic acid used (98%) was from Merck.

Cellulose-based nonwoven material was used as a base material in the electrospinning. The press felt sheet specimens were attached to the continuous base material.

Electrospinning

Before electrospinning, a polymer solution was prepared by dissolving the PA 6 in formic acid. The viscosity of the polymer solution was approximately 1,500 cP (measured using a Brookfield DV-II+ viscometer), and its polymer concentration was about 12 wt%. Additionally, the end-taped felt specimens were wetted on their paper sides by spraying before the electrospinning process, which made the specimens more conductive, allowing the electrospinning coating process to take place with these thick, porous specimens. Finally, the wet specimens were quickly attached to the dark base material with tapes.

The continuous electrospinning equipment (***Figure 1.b***) consisted of a multinozzle system, a nonwoven base material, a collector plate, and a voltage source (Simco Chargemaster BP 50). The parameters of the electrospinning process were based on previous electrospinning trials [18]. We used two plastic tubes, each of which had 10 nozzles pointing in a horizontal direction - the inner diameter of each nozzle being 0.4 mm. The strength of the electric field was kept constant at 2 kV/cm, while the spinning voltage varied from 10 to 40 kV, and the spinning distance - from 50 to 200 mm. The velocity of the base material was adjusted according to the targeted amount of PA 6 nanofibre web. The parameters used in the calculations were the solution consumption, the concentration and density of the solution, and the width of the electrospinning zone. The amount of nanofibre produced in one electrospin-

Tomi Hakala,
Pirjo Heikkilä

Press Felts Coated with Electrospun Nanofibres

Abstract
Press felt specimens were coated with nanofibres using the electrospinning process. The coating weight of the nanofibre layer and the spinning distance were varied in order to study the homogeneity and coverage of the nanofibre web. The specimens were studied by scanning electron microscopy (SEM) and laser profilometry to understand how the nanofibre web attaches to the press felt, and how nanofibres improve the surface smoothness. The surface pore size, thickness, weight per unit area and air permeability of the specimens were measured. The surface smoothness improved and the air permeability decreased slightly. The adhesion of the nanofibre web to the press felt and the mechanical strength of the nanofibre web were poor. The study showed, however, that the combination of electrospinning and felt structures has the potential to enhance press felt performance.

Article

Introduction

Paper machine clothing (PMC) suppliers produce special textiles which are tailor-made to transfer, support and dewater paper webs on a papermaking line. Each PMC product is designed for a certain machine section and position. In particular, continuous press felts are subjected to mechanical stress in the wet pressing section for several weeks, where they go through over-lapping rollers (a nip) a million times. Their water handling capacity decreases and the risk of marking increases owing to the wear, compaction and contamination of the press felt [1]. The structure and material properties are key factors in reducing these unwanted phenomena in order to increase the life of press felt.

A press felt typically has a multilayer structure consisting of batt layers on the roll (underside) and paper side (upside), and a woven base fabric in the middle. The base fabric can vary from a woven single-layer to a multilayer structure. The other structures are laminated (two separated woven base fabrics) or non-woven (non-crimped yarn layers) structures. The raw materials of the yarn and staple fibres, the fibre fineness, and the amount and density of the filament can be different in the various press felt designs. The finest staple fibres are usually located on the paper side in the topmost batt layer to support wood fibres, improve retention, and minimise the risk of textile marking and rewetting. Below the topmost batt layer the staple fibres are slightly coarser, thereby increasing the mechanical strength and allowing rapid water removal from the press felt when the maximum pressure in the nip has been passed. Typical materials for press felt are synthetic polyamide polymers, such as PA 6, PA 6.6 or PA 6.10, due to their good abrasion resistance and hydrophilic properties. The structure and materials for press-felt products are chosen according to the paper or board grade to be produced, and the press section configuration to be used [1 - 3].

Press felt designs have been developed to improve felt performance and properties, such as durability and dewatering, in the harsh papermaking process. The connection between the nip and press felt wear (ageing) has been studied using wet-pressing simulators [4, 5]. Nip simulation is a practical and time-saving test method for researching new raw materials and structures for press felts. The material properties of staple fibres and yarns, such as the abrasion resistance, have been improved by blending and high-molecular-weight polymers in order to increase the life of press felts [6, 7]. Such structural properties as homogeneity on a microscopic scale and the void volume determine the pressure uniformity, compressibility and flow resistance of the press felt. The uniformity of the press felt structure as well as the surface topography and porosity were discussed in [8 - 10], in which their connection with energy consumption, marking and vibration problems was explored.

Examples of real life and research results reveal the current state of PMC research and development work (R&D). The aims of R&D work are to improve productivi-

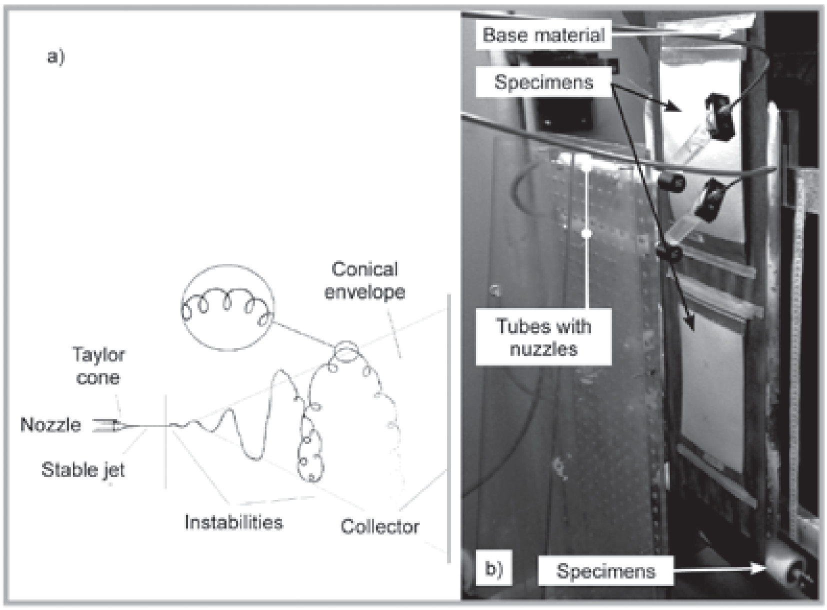

Figure 1. Principle of the electrospinning process (a), from which can be seen the different phases of a jetting. Our electrospinning device is also shown (b) with a nozzle system (tubes containing 10 nozzles each), two press felt specimens, a dark nonwoven base material and a collector plate.

IRAN Textile News

Iran Ups Carpet Exports by over 12%

Iran boosted annual exports of hand-woven carpets by 12.27% in the last Iranian year (ended March 20), an official announced on Tuesday.

We exported $556mln worth of hand-woven carpets in the last Iranian year, which shows a 12.27% growth compared with its previous year," Head of Iran's National Carpet Center Feysal Mardasi told reporters on Tuesday.

He also announced that the country's carpet exports showed 4% of growth in terms of weight in the last Iranian year, compared with its previous year.

Mardasi described Germany as a top importer of Iran's hand-woven carpets, saying that 19% of Iran's carpet exports were destined for Germany last year, while the UAE and the US ranked the second and the third.

Iran is the leading exporter of hand-woven carpets in the world. Persian rugs are highly sought out for their intricate design and skilled craftsmanship, and that's why Iran exports carpets to more than 100 countries in the world.

Carpet-weaving is undoubtedly one of the most distinguished manifestations of the Persian culture and art and dates back to ancient Persia.

There is an estimated population of 1.2 million weavers in Iran producing carpets for domestic markets and international export.

The country produces about five million square meters of carpets annually, of which 80 percent are sold in international markets.

Iran to Boost Crude Oil Production Capacity Early in 2012

Iran plans to increase its crude production capacity by 100,000 barrels a day by the end of the current Iranian calendar year (March 2012), a senior Iranian oil official announced.

Managing-Director of the National Iranian Oil Company (NIOC) Ahmad Qalebani said on Friday that Masjed Soleiman, Yadavaran, Mansouri and Hengam oilfields are the main four drilling projects that will contribute to the hike.

Oil was struck for the first time in the Middle-East at Masjed Soleiman in Khuzestan province some 102 years ago. More than one billion barrels of oil have been drilled from the oilfield so far.

The Yadavaran oilfield is estimated to have 17 billion barrels of reserves. Production is expected to reach 300,000 barrels per day over two phases.

Mansouri oilfield is located about 60 kilometers north of the Persian Gulf and near the southwestern city of Ahvaz.

Hengam joint oilfield, discovered in 1975, contains almost 700 million barrels and is located between Iran and Oman in the Strait of Hormuz.

Iran shares 18 oil and gas fields with neighboring countries, including Oman, in the strategic oil-rich region of the Persian Gulf.

Last year Qalebani had said that the country has a comprehensive plan to accelerate implementation of oil and gas projects in shared onshore and offshore fields.

He noted that the company intends to accelerate implementation of the upstream projects, to develop shared fields and to increase output.

Iranian Scientists Develop New Nanosensor for Detecting Toxic Gases

Iranian researchers managed to introduce a nanosensor for the detection and adsorption of toxic gases produced in chemical and biochemical processes.

"Considering the fact that OCN- anion is used as a toxic gas in chemical bombs, producing a nanosensor able to adsorb this substance is very important," Dr. Mohammad Taqi Bayee, faculty member at Azad Islamic University, Azadshahr branch, said in an interview with the INIC.

"We did this research to find an answer for the question of if carbon nanotubes can be utilized as absorbers for the adsorption of OCN- anion," he said.

"We chose carbon nanotubes of approximate length of 10 A° with chiralities (6,0), (0,7), and (0,8) and drew OCN- radical to the nanotube surface at different directions and carried calculations on these nanotubes," Bayee said.

The results imply that carbon nanotubes could be used as an adsorber for the adsorption of this anion. The diameter of carbon nanotube doesn't influence its adsorption. It was also revealed that OCN- anion could be adsorbed by nanotube better from its nitrogen tail.

"The detection of gas molecules resulted from the chemical and biochemical processes are of great importance to the industrial, peripheral and medical displays," he concluded.

a standard single phase supply (110V or 240V).

Tatham Ltd. Introduces TSX Control System

United Kingdom-based Tatham Ltd. — a global supplier of drive and control equipment for woolen and nonwovens processing — has developed a system that provides higher production speeds and improved product weight distribution for crosslapper control while offering substantial energy savings.

The TSX control system, which can be retrofitted to all makes of crosslappers, uses ABB high-performance machinery drives and servomotors. Depending on the existing crosslapper configuration, several panel combinations are available. The system is linked to the master process control using Profibus, an ABB AC500 programmable logic controller (PLC) that provides positioning data to the drives, which then convert the data into control signals to maintain servomotor speed.

According to Tatham, when the TSX system was retrofitted to an existing crosslapper, the energy usage dropped from 60 Amps to 15 Amps. The company reports the software offers precise, repeatable positioning to provide complete control of the batt profile. The ABB PLC, drives and servomotors are used to vary the speed at which the batt is laid down, offering a more accurate and controllable buildup of the layers. The TSX system can adjust carriage speed at the edges of the batt to avoid distortions and maintain the required density across the entire width. The parameters may be adjusted using the touchscreen operator interface, and the batt density may be adjusted across its width to suit the product requirements with coefficient of variation values of around 1 percent.

Tatham also offers a closed loop control system to automatically adjust the batt profile to the preset requirements. The system can be extended to link with Tatham's own TS weight control system if required.

Tatham has installed TSX systems at a geotextile manufacturer in Malaysia, papermaker felt producer in China, and an automotive textile producer in the United States, among numerous other installations globally.

Sari made from 25 natural fibres makes it to record book

The Limca Book of Records has registered a new record for producing saris from 25 different kinds of natural fibres like banana stem, cotton, bamboo, jute, pineapple, aloe vera, hemp, sea grass, recycled silk, flax, silk, lemon grass, wool and messa fibre.

The achievement has been registered in name of weavers of Anakaputhur, a town 20kms to the south of Chennai in India.

Not only are these saris ecological but even reasonably priced.

Anakaputhur weavers have been experimenting with several natural fibres like pineapple, silk, banana, jute and aloe vera. In 2009, they succeeded in producing fabrics from banana stem fibre, while in 2010; they came up with fabrics produced from bamboo fibre.

Despite cheaper cotton, denim makers to not cut prices

Denim fabric producers had hiked their prices by almost 30 percent, due to the almost doubling of cotton prices in the last one year. However, cotton prices have fallen by around 22 percent in the last one month. But denim producers do not intend to lower their prices, atleast not immediately.

Shankar-6 raw cotton prices which were quoting at Rs 61375 per candy on April 3 were quoted at Rs 47,625 per candy on May 3, down 22.40 percent.

“The main reason for denim producers not being able to reduce prices is because currently we are consuming cotton bought at a higher price two months back. If the median price will sustain for another one month, then we may mull reducing the price”, Mr Utsav Pandwar, CFO - Aarvee Denims told fibre2fashion.

Ms Revati Kasture, Head – Industry Research, Care Ratings said, “Care does not foresee any likelihood of prices moving up from here as the cotton prices have eased a bit from its highs in the last month or so. At the same time, the companies are not looking to reduce prices in the near future as demand scenario is appearing favorable at this stage”.

Elaborating further, Mr Pandwar said, “Denim prices have witnessed an uptrend during FY’10 as well as during FY’11, primarily driven by the rise in prices of cotton which the denim manufacturers have been able to pass on to the customers.

“Denim fabric price realizations averaged in the range of Rs 110-150 per meter during FY’11. Presently, the denim fabric is selling at an average rate of Rs 130-170 per meter in the domestic market and around Rs 180 per meter in the export market”, he wrapped up by saying.

new industry contacts.

In 2010, German exports of textile machinery and accessories to Vietnam increased by almost 114 percent to EUR 33.5 million (VND 995.8 billion) compared to 2009. The Vietnamese government is working for a development of its textile export volume by the year 2020 that can only be realized by investments in the modernization of its production process and the training of employees, according to Pham Xuan Hong, AGTEK chairman.

The VDMA represents the interests of 3,000 manufacturers in more than 30 different machinery and manufacturing sectors; it is Europe's largest industrial association, representing 90 percent of all German machinery companies as well as members from other EU countries.

Pakistan - Value-added textile exports surge

Value-added textile exports rose to a record 74 percent in overall textile exports in March from historical average of 56-60 percent thanks to the depression in yarn market.

Out of total $1.249 billion textile exports in March, the exports of basic textiles comprising fabric and yarn of all types was $250 million, while the value added exports amounted to $988 million.

"Decline in yarn rates was a welcome relief for the apparel sector just when it succeeded in obtaining higher prices from foreign buyers," said Adil Butt, a leading apparel exporter.

He said since the apparel orders are negotiated three months in advance the low yarn rates would compensate the losses the value added sector suffered when yarn rates went up sharply last year.

Knitwear exports increased by 81.1 percent in March 2011 over the same month in 2010. Knitwear exports increased by 70.2 percent in March 2011 to 15.69 million dozen compared with 9.16 million dozen in March 2010.

Bedwear exports increased by 66.3 percent in March 2011 to $239.295 million from $143.913 million in March 2010. The quantity of bedwear exports rose to 35.51 million kg, an increase of 35.2 percent over the same period last year.

Towel exports grew 101.6 percent in March 2011 to $118.693 million from $58.868 million in March 2010. The quantity of towel exports rose by 95.1 percent to 31.16 million kg in March 2011 from 15.97 million kg in the same month of last year. Readymade garments exports posted an increase of 73.1 percent in March 2011 to $184.935 million from $106.816 million in March 2010. These exports grew by 70.9 percent in March 2011 to 3.54 million dozen from 2.07 million dozen in the same month of 2010.

Export of other textile made ups increased by 105.6 percent.

Export of Art, Silk and Synthetic Textiles increased by 3.2 percent and that of other textile materials by 85.2 percent in March 2011 compared with exports of these items in March 2010. As there are restrictions on export of tents, canvas, and tarpaulin due to domestic demand, it was the only value added textile category where the exports declined. Adil Butt said that the most heartening fact about this robust increase in value added exports is that after a long time the exports have started picking up in quantity as well.

Safe and Cost-Effective Personnel De-Dusting

WINDSOR, Maine — Air Control Industries' 'Jetblack' blower-powered personnel and localised cleaning system provides a safer and more cost-effective alternative to compressed air. It is available as a wall fixed unit and portable one, and is ideal for use throughout industry, particularly in textiles for removing fibres and fabric dust adhering to clothes.

Unlike compressed air systems, which deliver low air volumes at high pressure, ACI's Jetblack employs high volumes at low pressure. The JetBlack delivers air at less than 3psi and is totally safe even when air is blown directly at the skin. Fan speed can be varied to suit different applications and the air delivered is clean because it has been drawn in via a filtered inlet.

Being powered by an electrically driven blower, the Jetblack is significantly cheaper to run than compressed air systems because it offers the double saving of requiring less energy (1.4kW input) to operate and being easy to turn on/off as required to help eliminate waste. There is also the additional bonus of noise output being less than 78dB.

The Jetblack has 1.42m flexible hose (2.44m option) between the power unit and hand-gun, and requires just world news

World Textile News

India - SIMA appeals to PM for not allowing cotton export till Jan

SIMA, the apex body of textile mills, has appealed to Prime Minister Manmohan Singh for not allowing further cotton exports till January 31 next year to enable the country to build necessary buffer stock and overcome the raw material crisis.

In a memorandum submitted to Singh during his visit here yesterday, SIMA also requested that raw cotton export should be permitted only after January every season, so that a realistic assessment of the exportable surplus could be made on the basis of reliable data on cotton production and consumption.

To have a level playing field on cost of funding, Indian Textile mills need to be provided with special working capital assistance for purchase of raw cotton at the rate of 7 per cent interest rate, nine months credit period and 10 per cent margin money as against the present level of 14 per cent, three months and 25 per cent, respectively.

This was very essential to enable the Indian mills to procure adequate cotton during December-March every cotton seaon and pay remunerative prices to the cotton farmers and also to have a level playing field with traders, Southern India Mills'' Association (SIMA), said in the memorandum.

This would also help in arresting hoarding and speculation of cotton prices and ultimately strengthen the entire cotton textile value chain, J Thulasidharan, Chairman, SIMA, said.

The Centre has allowed export of 5.5 million bales of cotton and Agriculture Minister Sharad Pawar had recently requested to enhance the quantity by 1.5 million bales.

German VDMA textile conference in Vietnam

More than 300 delegates from the Vietnamese textile industry attended the conference and exhibition “German Technology for the Vietnamese Textile Industry” on April 6–7 in Ho Chi Minh City, Vietnam. Decision makers as well as textile technicians learned about the latest technology trends for efficient textile production, in terms of reduced energy consumption and economical ways of using raw material.

The two-day conference, themed “Innovation for successful business,” and initiated by the German VDMA Textile Machinery Association, was officially supported by the Ministry of Economics and Technology as well as by AGTEK, the Association of Textile and Apparel in Ho Chi Minh City. In 20 technology lectures, noted textile companies and institutes presented the latest developments in the areas of spinning, weaving, knitting, finishing, technical textiles and textile testing. The conference underlined the long-lasting business relationships between German textile machinery manufacturers and Vietnamese textile producers, and allowed participants to build valuable