



world of denim

# Non-fade, life long black

A collection described as 'dedicated to all black denim aficionados' was shown by Bossa. It included rigid, stretch and super stretch fabrics for black jeans that 'never fade'.



The launch of the Ultranero range followed more than 6 months of development trials to provide 'a black jean that stays truly black - even after 40 home washes and beyond.'



Bossa has created a unique process that combines the use of special dyestuffs and processes together with a specially developed

technique for finishing the fabric.

The result is an intense black shade of black that retains its colour for the lifetime of the jean.

# Indigo sunshine

'Bringing back the sunshine' for its indigo range with the introduction of a bright yellow bottom indigo colour, formed part of UCO Raymond's collection.

A mix of several stretch and rigid denims with different construction and weights was also featured.

The company also introduced four new colours for its Chambray indigo shirts - Blue Lagoon (100% indigo); Key West (75% indigo); Panama (50% indigo) and Santa Fe (50% indigo and 50% black).

UCO Raymond produce speciality ring colour and stretch denim with a capacity of 47 million metres.





## Denim forever

As the global economy begins to show signs of improvement, denim producers are seeing better opportunities for export.

Indian producers, for example, are, according to reports, poised for rapid growth.

Denim players in India produce around 700 million metres of fabric every year of which 32% is for export.

In the year 2013 exports were expected to see an increase.

The global denim market saw 8% growth in terms of value between 2012-2013. Currently totalling \$51 billion growth is predicted to increase to \$56 billion by 2018.

1.8 billion pairs of jeans are thought to have been sold between 2012-2013. It is also estimated that 60 pairs of jeans are sold globally every 60 seconds.

In order to help denim producers maximise their quality, efficiency and profitability, Monforts are committed to ensuring energy cost savings and new finishing solutions.

**Roland Hampel,**  
*Managing Director*

# More than just jeans

'Jeans are more than just jeans' was clearly apparent following a visit to Denim at Premiere Vision in Paris - graduated effects; bleached, painted or woven; bi-stretch or extra stretch for sculptable silhouettes; raised or flat textures; two toned or tonal effects; and contrasts within the garment construction - to say nothing of styles, cuts and colours.

**Denim** by Premiere Vision gave almost 80 exhibitors, including weavers, garment manufacturers, finishers and trim makers from 19 countries, the opportunity to present their Summer 2014 collections.

Record visitors were able to see premium-brand specialists, fashion brands as well as luxury names for 'edgier' products.

Trends were to include new blends of fibres including cotton and rayon or tencel for a shiny aspect with a silky 'look'; two-way stretch for new hold and ultra-shaping; plus new methods of recycling and more eco-friendly manufacturing techniques.

New cuts, washes, enriched tones and a wide variety of prints also ensured key influences in fashion by the denim industry.

The resulting lively atmosphere provided an escape from the global economic crises, generating a buoyant mood and eager anticipation for a return to improved trading by 2014 for the denim sector - good news for the 20 participating producers with Monfort's denim finishing lines, which included:

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## Absolute Denim Artistic Milliners

Arvind  
Berto  
Bossas  
Çalık  
Denim Valley by Royo  
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İSKO  
Italdenim  
Kipas  
Matesa  
Orta Anadolu  
Tavex  
Textil Santanderina  
UCO Raymond



# Finishing of Denim

by: Dipl. Ing. Kurt van Wersch,  
A. Monforts Textilmaschinen GmbH & Co. KG

## Introduction

The fashion-driven fluctuations and national crises in recent years have had absolutely no impact on denim production. The range of denim products is more varied today than ever.

Denim is still highly fashionable. Denim is 'forever young'. Denim is unrivalled in form, colour and design.

The denim industry is striving to further expand its market share with new variants and even higher quality.

At the same time this means a worldwide modernisation and expansion of the production facilities. Particular attention should be paid here to elastic denim with its growing market shares.

## Overview: Monforts - possibilities for finishing denim

Monforts offers a wide variety of processes and ranges for the finishing of denim.

For the finishing of grey denim fabric after cleaning and singeing, for example (e.g.), padders, foam applicators, minimum-liquor applicators, numerous versions of stretching- and skewing-units, dryers and compressive shrinkage ranges.

Processes and ranges are offered for desizing, mercerising, bleaching, stripping, continuous dyeing, washing, drying and coating in order to create special effects.

The Matex ECO-Applicator allows two-sided finishing and over dyeing with two different dyestuffs or finishing liquors being applied in a single passage.

Monforts denim ranges are tailored to the customer's needs and are in operation with practically all leading denim producers.

A sophisticated denim concept can be offered, from individual machines through to full-scale continuous finishing ranges.

## The 'classic' configurations include:

The padder-stretching unit-cylinder dryer-shrinkage range version and the energy-saving foam applicator-stretching unit-shrinkage range version. The foam applicator can be replaced with a Matex ECO-Applicator. This also eliminates the need for a foam mixer. [Fig.1] shows all 3 versions.

## Finishing of elastic denim fabric

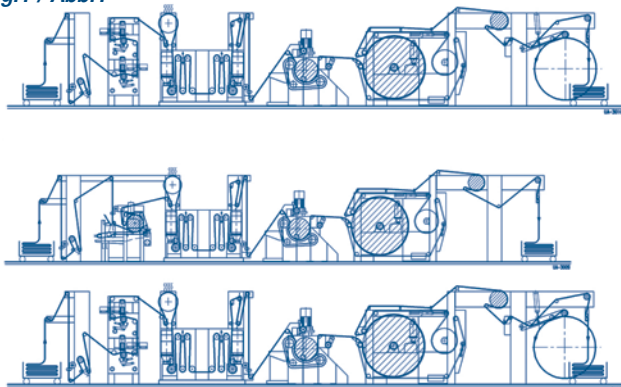
Elastic denim fabric has already established itself in the denim industry with growing market shares. Many premium denim brands employ modern stretch denim.

These articles today have a more natural appearance and are far less shiny (1). These articles require a few treatment steps more than for normal classic denim finishing. The finishing process is therefore slightly more costly, but the prices that can be achieved are also somewhat better than for the class denim fabric.

Apart from elastic textured PES, for example, 'xpend' from Trevira (D) with approximately 20% stretch, and yarns of elastane fibres with approximately 40% stretch, are frequently used to maintain the form stability and to improve the wearing comfort.

Of the elastane fibres Dorlastan®, Lycra®, Linel®, Glospun®, Roicka®, Teplon®, etc., can be used.

Fig.1 / Abb.1



# Veredlung von Denim

Dipl. Ing. Kurt van Wersch,  
A. Monforts Textilmaschinen GmbH & Co. KG

## Einleitung

Modisch bestimmte Schwankungen und länderspezifische Krisen konnten der Denimproduktion in den letzten Jahren nichts anhaben. Das Denimangebot ist derzeit so facettenreich wie noch nie. Denim ist wie immer wieder stark in Mode. Denim ist „ewig jung“. Denim ist in Form, Farbe und Gestaltung unerreicht. Die Denim-Industrie versucht mit neuen Varianten und noch besserer Qualität den Markt weiter auszubauen. Das bedeutet ebenfalls eine weltweite Modernisierung und Steigerung der Produktionsanlagen. Besondere Beachtung verdient unter anderem elastischer Denim mit seinen wachsenden Marktanteilen.

## Überblick: Monforts - Möglichkeiten zur Veredlung von Denim

Monforts bietet eine Vielzahl von Verfahren und Anlagen zur Veredlung von Denim an.

Für die Veredlung von Denim-Rohware nach dem Putzen und Sengen zum Beispiel:

Foulards, Schaumaufragsanlagen, Minimalauftragsanlagen, Reck- und Schrägstellwerke in verschiedenen Ausführungen, Trockner und kompressive Krumpfanlagen.

Zur Erzielung von Effekten werden Verfahren und Anlagen zum Entschlichten, Mercerisieren, Bleichen, Abziehen, Kontinüefärben, Waschen, Trocknen und Beschichten angeboten.

Mit dem Matex ECO-Applicator lassen sich zweiseitige Ausrüstungen und Überfärbungen erzielen, wobei in einer Passage zwei unterschiedliche Farben oder Ausrüstungsflotten aufgebracht werden können.

Monforts-Denimanlagen werden auf die Belange der Kunden zugeschnitten und sind bei fast allen namhaften Denim-Herstellern im Einsatz. Von Einzelmaschinen bis hin zu großen kontinuierlichen Veredlungsanlagen kann ein ausgereiftes Denim-Konzept angeboten werden.

## Zu den „Klassikern“ gehören:

die Foulard-Reckwerk-Zylindertrockner-Krumpfanlage-Version und die Energie sparende Schaumaufragsanlage-Reckwerk-Krumpfanlage-Version, wobei auch heute die Schaumaufragsanlage durch einen Matex ECO-Applicator ersetzt werden kann. Hier wird dann auch kein Schaummixer mehr benötigt. [Abb.1] zeigt die Prinzipien der drei Anlagenvarianten

## Die Ausrüstung von elastischer Denimware

Elastische Denimware hat sich in der Denim-Industrie bereits etabliert mit wachsendem Marktanteil. Viele Premium Denim Brands setzen modernen Stretch-Denim ein. Diese Artikel haben heute ein natürlicheres Aussehen und sind nicht mehr so glänzend (1). Diese Artikel brauchen einige Behandlungsschritte mehr als bei der üblichen klassischen Denim-Veredlung. Die Veredlung ist damit etwas teurer, aber auch die erzielten Preise sind etwas besser als bei der klassischen Denimware.

Neben elastischem texturiertem PES, z.B. „xpend“ von Trevira (D) mit ca. 20 % Dehnung, werden zur Erhaltung der Formstabilität und zur Verbesserung des Tragekomforts häufig Garne aus Elastanfasern mit ca. 40% Dehnung eingesetzt.

Bei den Elastanfasern können Dorlastan®, Lycra®, Linel®, Glospun®, Roicka®, Teplon® usw. zum Einsatz kommen.

Vom Molekülaufbau ist Elastan ein Gebilde aus einem Polyurethan-Hartsegment und einem Polyether- oder Polyester Weichsegment, wobei das, Weichsegment“ für die Eigenschaften der Faser verantwortlich ist. Da eine Vielzahl von diesen Fasertypen anzutreffen sind, ist es unumgänglich, dass die Hinweise der entsprechenden Faserhersteller in Bezug auf kontrolliertem Schrumpf und guter Faserfixierung beachtet werden. Die Abweichungsbereiche der jeweiligen zum Einsatz kommenden Elastanfasern sollten beim Hersteller erfragt werden, um optimale Bedingungen für die Ausrüstung zu schaffen. Bei der Auswahl der Ausrüstungsparameter (pH-Wert, Behandlungszeit und Mechanikeinfluss) muss aus Sicht der eingesetzten Elastanfasern darauf geachtet werden, dass die angestrebten Fertigwarendaten des Artikels nicht beeinträchtigt werden. Für Denim-Artikel kommen Baumwollmischungen mit unterschiedlichen %-Anteilen an Elastan zum Einsatz.

## Finishing of Denim

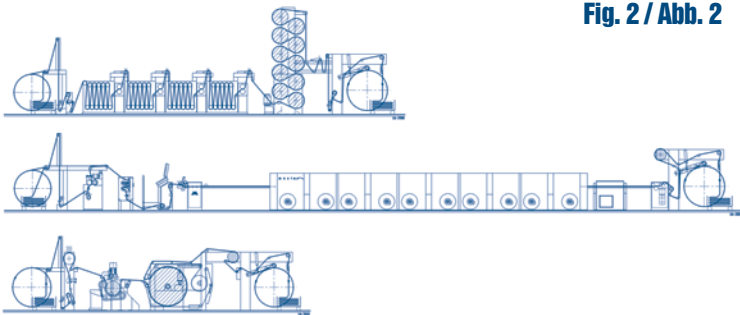


Fig. 2 / Abb. 2

From its molecular structure, elastane is a fibre with a polyurethane hard segment and a polyether or polyester soft segment, whereby the 'soft segment' is responsible for the properties of the fibre.

As a large number of these fibre types are encountered, it is essential to observe the information provided by the respective fibre producers with respect to controlled shrinkage and good fibre fixing.

The producer should be consulted on the deviation ranges of the elastane fibres to be used in order to create optimum conditions for finishing. When selecting the finishing parameters (pH value, treatment time and mechanical influence), care must be taken from the point of view of the elastane fibres that the intended finished product data of the article are not impaired.

For denim articles, cotton blends with different percentages of elastane are used.

### The behaviour of weft-elastic denim fabric

A classic denim fabric without elastane content normally has a grey width of 158 - 160cm. The washing tests on such articles show on average a shrinkage of 15% in warp direction and 6% in weft direction.

The weft-elastic denim fabric with elastane content can have a grey width of e.g. 180cm. It also shrinks during the washing test on average by 15% in warp direction and by 34% in weft direction.

This means that the fabric still has an approximate width of 119cm after washing and with a desired finished width of 151cm. The weft-elastic denim fabric always has therefore to be stabilised.

### It is stabilised, i.e. heat-set in order to achieve:

- A desired stretch,
- A desired weight per square metre,
- A desired finished width,
- A desired improvement in the dimensional stability
- Avoid cold creep shrinkage

Fixing ranges at 180 to 200°C lie in the order of 15 - 60 seconds dwell time. Within this range, the fabric reacts under optimum conditions. The times cited in this article are empirical values from the respective finishers.

### The discontinuous finishing method for weft-elastic denim fabric

After singeing, the weft-elastic denim grey cloth (180 cm fabric width) undergoes hot washing on a washing machine where the fabric is washed and the majority of the size removed.

The fabric is then predried, padded (liquor application) and then dried and fixed on a stenter. Drying and fixing temperature 190°C, stentering width 152cm.

The third finishing step is the compressive shrinkage process.

The fabric to be shrunk is sprayed with water, passed over a steaming drum, skewed on a weft straightener and then fed to the rubber calender with a defined rubber blanket pressure, before finally being dried on the felt calender.

Instead of the spray system, the Matex-ECO-Applicator can also be used for a selective moisture application.

The fabric width before the rubber calender was 150cm. The fabric width after the felt calender is also 150cm.

### The washed shrinkage values after treatment showed:

Residual shrinkage in warp direction - 1%

Residual shrinkage in weft direction - 1.5%

and therefore lies within the range of the international standards of, for example, Levis, Lee, Wrangler, Maverick and Mustang, etc.

## Veredlung von Denim

### Das Verhalten von schusselastischer Denimware

Eine klassische Denimware ohne Elastananteil hat normalerweise eine Rohbreite von 158-160cm. Die Waschproben solcher Artikel ergeben durchschnittlich

einen Krumpf von: - 15 % in Kettrichtung  
und - 6 % in Schussrichtung.

Die schusselastische Denimware mit Elastananteil kann eine Rohbreite von z. B. 180 cm haben und krumpft bei der Waschprobe ebenfalls durchschnittlich

um: - 15 % in Kettrichtung,  
aber um - 34 % in Schussrichtung.

Das heißt, die Ware hat nach der Wäsche noch eine Breite von ca. 119 cm, und das bei einer gewünschten Fertigbreite von 151 cm. Die schusselastische Denimware muss also unter allen Umständen stabilisiert werden.

### Es wird stabilisiert, d. h. thermofixiert, um:

- eine gewünschte Dehnbarkeit,
- ein gewünschtes Quadratmetergewicht,
- eine gewünschte Fertigbreite,
- eine gewünschte Verbesserung der Dimensionsstabilität und
- ein Vermeiden von Kaltkriechschumpf zu erzielen.

Fixierbereiche liegen bei 180 bis 200 °C mit 15 - 60 sec Verweilzeit.

In diesem Bereich reagiert die Ware unter optimalen Bedingungen.

Die in diesem Artikel genannten Zeiten sind Erfahrungswerte der betreffenden Ausrüster.

### Die diskontinuierliche Veredlungsmethode von schusselastischer Denimware

Nach dem Sengen wird die schusselastische Denim-Rohware (180cm Warenbreite) auf einer Waschmaschine einer Heißwasserpassage unterzogen, wobei hier die Ware gewaschen und grob entschlichtet wird. Danach wird die Ware vorgetrocknet, foulardiert (appretiert) und auf dem Spannrahmen getrocknet und fixiert. Trocknungs- und Fixiertemperatur 190 °C, Spannbreite 152 cm. Als dritte Behandlung erfolgt der kompressive Krumpfpfprozess.

Die zu krumpfende Ware wird mit Wasser besprüht, über eine Dämpftrommel geführt, in einem Schussrichter schräg gestellt und dann dem Gummikalender mit einer definierten Gummituchanpressung zugeführt, um danach auf dem Filzkalender fertig getrocknet zu werden. Anstatt des Sprühsystems kann auch der Matex-ECO-Applicator zum gezielten Feuchteauftrag eingesetzt werden. Die Warenbreite vor dem Gummikalender war 150cm, die Warenbreite nach dem Filzkalender war ebenfalls 150cm.

### Die Waschkrumpf-Werte nach der Behandlung ergeben:

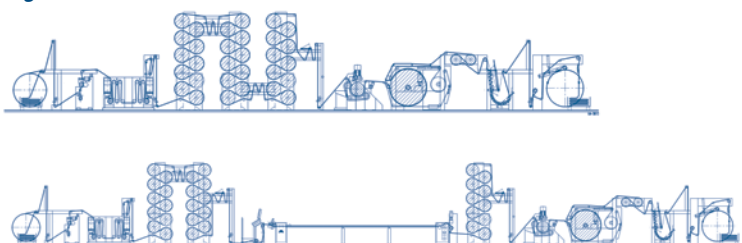
Restkrumpf in Kettrichtung: - 1 %

Restkrumpf in Schussrichtung: - 1,5 %

und liegen damit im Bereich der internationalen Normen, z. B. von Levis, Lee, Wrangler, Maverick, Mustang, General usw.

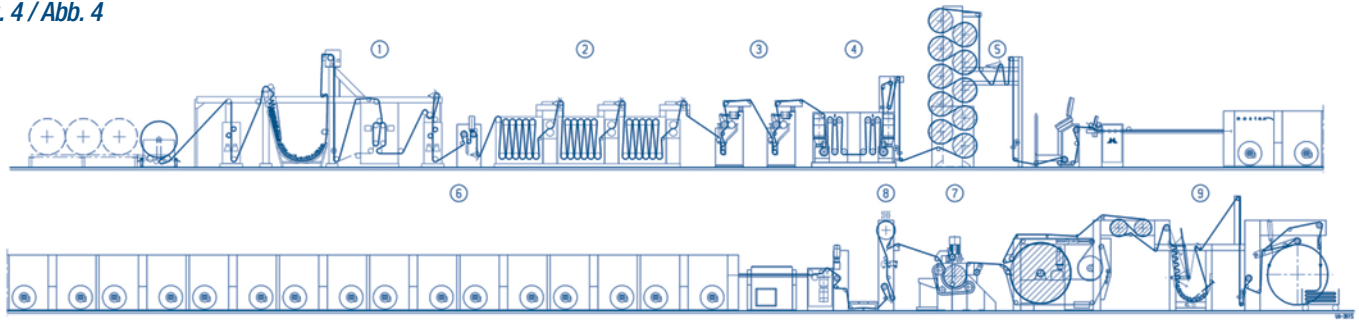
Diese respektablen Restkrumpfwerte wurden in drei separaten Ausrüstungsschritten erzielt. [Abb. 2] zeigt die drei Teilschritte der diskontinuierlichen Veredlung. Waschen und Teilentschlichten auf einer Waschmaschine mit anschließender Trocknung, Appretieren, Schußrichten, Trocknen und Fixieren auf dem Spannrahmen Krumpfen auf der kompressiven Krumpfanlage.

Fig.3 / Abb. 3



# Finishing of Denim

Fig. 4 / Abb. 4



These respectable residual shrinkage values are achieved in three separate finishing steps. [Fig. 2] shows the three steps of the discontinuous finishing process. Washing and partial desizing on a washing machine with subsequent drying, Liquor application, weft straightening, drying and fixing on the stenter. Shrinking on the compressive shrinkage range.

### The semi-continuous finishing method for weft-elastic denim fabric

Denim finishers with a classic denim finishing range [Fig. 3] can finish stretch denim on the existing range if they first wash and fix the fabric after singeing. The fabric, washed and pre-fixed at 180-190°C, can then be fed to the denim finishing range.

Only part of the whole range configuration is used. The range configuration is explained here taking the example of the finishing of stretch denim (240g/m<sup>2</sup>) [Fig. 3b].

The fabric is fed from the staple or roll. Fabric width 160cm. A scray with fabric web guides can simplify roll changing without a line stop. The finishing liquor is applied with the padder. The stretcher is not in operation.

The fabric is predried on cylinder driers and then while still warm and damp passes through the weft straightener. Width control and width correction are performed on a levelling stenter frame with needle chain and overfeed device.

The residual drying is again performed on the cylinder driers. With a monitored and controlled residual moisture, the fabric is fed to the rubber blanket shrinkage range and to the felt calender.

A corresponding number of cooling cylinders ensure the necessary fabric cooling. Here again, a delivery scray with fabric web guides and Sochor/Folder combinations allows roll changing without a line stop. The desired residual shrinkage values are achieved in two finishing steps: Washing, drying and pre-fixing, Finishing and shrinking on the denim range.

### The fully continuous finishing method for weft-elastic denim fabric

When planning new denim finishing ranges, the wish is frequently expressed to be able to finish non-elastic and weft-elastic denim fabrics on the same range.

For the non-elastic denim fabric, washing compartments have been part of the denim range for many years. For weft-elastic denim fabrics, however, not only the washing process but also the fixing process to stabilise the fabric is required.

[Fig. 4] shows a range configuration for normal denim articles with the possibility of continuous finishing of large production quantities of weft-elastic denim fabric.

### Description of the fabric passage through the range

After unrolling, cleaning and singeing (1) the fabric is washed (2), squeezed and padded again (3) (a suction bar can increase the moisture difference for the second padder passage).

The Matex ECO-Applicator can also be used as the second padder. Non-elastic denim fabric is stretched and skewed (4) and fed from the cylinder drier (5) with controlled residual moisture to the width control via the stenter (6). It is then fed to the rubber and felt calender (7). The elastic denim fabric has to be heat-set on the stenter.

After the fixing process, the over-dried fabric is cooled and moistened again (8) so that the fabric again has the required moisture necessary for shrinking.

The delivery combination (9) with scray and Sochor winder ensures strain-free winding of the shrunk, weft-elastic fabric.

Compared with the discontinuous method, the investment costs for the fully continuous method are slightly higher, but this is the less expensive method in the costs per metre.

# Veredlung von Denim

### Die halbkontinuierliche Veredlungsmethode von schusselastischer Denimware

Denimveredler, die eine klassische Denim-Ausrüstungsanlage haben [Abb. 3], können Stretch-Denim auf der vorhandenen Anlage veredeln, wenn sie die Ware nach dem Sengen vorher waschen und fixieren. Die gewaschene und bei 180 - 190 °C vorfixierte Ware wird dann der Denim-Ausrüstungsanlage vorgelegt.

Die gesamte Anlagenkonfiguration wird nur zum Teil genutzt. Die Anlagenkonfiguration soll an einem Ausrüstungsbeispiel für Stretch Denim (240 g/m<sup>2</sup>) erläutert werden [Abb. 3b].

Die Warenvorlage erfolgt vom Stapel oder ab Kaule. Warenbreite 160 cm. Eine Mulde mit Warenbahnführern kann den Kaulenwechsel ohne Stopp erleichtern. Mit dem Foulard wird die Ausrüstungsflotte aufgetragen. Das Reckwerk ist nicht im Einsatz.

Mit Zylindertrocknern wird die Ware vorgetrocknet; danach erfolgt im warmen und noch feuchten Zustand die Schussrichterpassage. In einer Egalisiermaschine mit Nadelkette und Voreinrichtung erfolgt die Breitenkontrolle bzw. die Breitenkorrektur. Die Resttrocknung erfolgt wiederum auf den Zylindertrocknern. Mit einer überwachten und geregelten Restfeuchte gelangt die Ware zur Gummibandkrumpfanlage und dem Filzkalender.

Eine entsprechende Anzahl von Kühlzylindern sorgt für die benötigte Warenkühlung. Auslaufmulde mit Warenbahnführern und Sochor-/Taflerkombinationen sorgen auch hier für den Kaulenwechsel ohne Anlagenstopp.

Die gewünschten Restkrumpfwerte werden hier in zwei Ausrüstungsschritten erzielt:

Waschen, Trocknen und Vorfixieren, Ausrüsten und Krumpfen auf der Denimanlage.

### Die vollkontinuierliche Veredlungsmethode von schusselastischer Denimware

Bei Neuplanungen von Denimaustrüstungsanlagen wird immer häufiger der Wunsch laut, nichtelastische und schusselastische Denimware auf der gleichen Anlage zu veredeln.

Für die nichtelastische Denimware haben Waschabteile schon seit längerer Zeit Einzug in die Denimanlage gehalten. Für schusselastische Denimware wird aber nicht nur der Waschprozess, sondern auch der Fixierprozess zur Stabilisierung der Ware gebraucht. [Abb. 4] zeigt eine Anlagenkonfiguration für normale Denimartikel mit der Möglichkeit, große Produktionsanteile schusselastischer Denimware, vollkontinuierlich zu veredeln.

### Beschreibung des Warenlaufes auf der Anlage

Nach Abrollung, Putzen und Sengen (1) wird die Ware gewaschen (2), abgequetscht und wieder foulardiert (3) (ein Saugbalken kann die Feuchtedifferenz für die zweite Foulardpassage vergrößern). Als zweiter Foulard kann auch der Matex ECO-Aapplicator eingesetzt werden.

Während nichtelastische Denimware gerade und schräggestellt (4) vom Zylindertrockner (5) mit geregelter Restfeuchte zur Breitenkontrolle über den Spannrahmen (6) und dann dem Gummi- und Filzkalender (7) zugeführt wird, muss die elastische Denimware im Spannrahmen thermofixiert werden.

Nach dem Fixierprozess wird die übergetrocknete Ware gekühlt und wieder befeuchtet (8), damit die zur Krumpfung benötigte Feuchte wieder in der Ware vorhanden ist.

Die Auslaufkombination (9) mit Mulde und Sochoraufrollung sorgt für eine spannungsarme Aufrollung der gekrumpften schusselastischen Ware.

Gegenüber der diskontinuierlichen Methode ist die vollkontinuierliche Methode in den Anschaffungskosten etwas höher, in den Kosten pro Meter aber die günstigere Methode.

## Finishing of Denim

The following points favour the use of the fully continuous method for the finishing of weft-elastic denim fabrics:

- Higher utilisation of the range
- Higher production speed
- Lower space requirement
- Lower personnel costs

### The latest fully continuous finishing method for classic and elastic denim fabrics

The most modern, most ecological and most economical denim range version is shown in [Fig. 5].

This range allows fabric webs of 100% cotton and of cotton blends with elastane to be finished. Different setting parameters are selected, depending on the quality.

#### The fabric passage is as follows:

After unrolling, the grey fabric is cleaned and singed. In the following washing machine, the fabric is partly desized and the first shrinkage in the length and width of the fabric web takes place. Depending on the size of the washing machine, other processes can be integrated.

A high-performance squeezing unit optimally dewateres the fabric web for a wet-in-wet process. Minimal amounts of finishing liquor are applied with the ECO-Applicator. A concentration check of the finishing liquor (as is necessary with the wet-in-wet process with two paddlers) can be eliminated here. When using the ECO-Applicator, the finishing liquor is not diluted.

The fabric is then predried in the cylinder drier unit. Residual drying, stretching and skewing are performed on the Thermex 6500 stretching and skewing-unit.

The fabric is thereby carefully stretched in stages by passing it over rollers while skewing and stretching in small steps. The process takes place in a defined temperature and moisture climate and achieves better fabric appearances.

Compared with the conventional denim stretching technique this means: significantly lower stretching forces, less fabric tension, better 'look and feel' with higher production speed and simpler residual moisture control.

The fabric width, skew and number of filling threads is monitored by a special camera and the measured values are converted into corresponding control pulses for the range control.

The following stenter with upline Matex ECO-Applicator and a coating range is then used either for finishing, drying of the coating or surface stabilisation (fixing), depending on the article.

The machine settings depend on the process to be employed. The fabric arrives at the range for the compressive shrinking process with a controlled residual moisture content or with moisture application using the Matex ECO-Applicator.

Two rubber calenders and two felt calenders ensure a high production speed with gentle use of the rubber blanket and effective energy consumption.

Two rubber calenders and two felt calenders are required to produce, for example, denim of 14.5oz/yc<sup>2</sup> with 1-2% residual shrinkage with at least 7m/min.

Low-tension guidance of the fabric during rolling is important for the end of the process.

#### Conclusion

When we look at the 'flyers' of the department stores and the catalogues from the leading suppliers of leisure wear, the classic denim fabric and weft-elastic denim fabric take up a good proportion of the pages.

It is really quite remarkable what the 'denim mafia' comes up with year after year to boost the market growth.

Denim finishing and jeans production are among the most innovative segments of the textile industry.

## Veredlung von Denim

Folgende Vorteile schlagen für die vollkontinuierliche Methode zur Behandlung von schusselastischer Denimware zu Buche:

- höherer Nutzeffekt der Anlage,
- höhere Produktionsgeschwindigkeit
- geringerer Platzbedarf und
- geringere Personalkosten.

### Die neueste vollkontinuierliche Veredlungsmethode für klassische- und elastische Denimware

Die modernste, ökologischste und ökonomischste Denimanlagen-Version zeigt [Abb. 5]. Mit dieser Anlage lassen sich Warenbahnen aus 100 % Baumwolle und aus Baumwollmischungen mit Elastan veredeln. Je nach Qualität werden unterschiedliche Einstellparameter ausgewählt.

#### Der Warenlauf ist wie folgt:

Nach der Abrollung wird die Rohware geputzt und gesengt. In der nachfolgenden Waschmaschine wird teilentschlichtet und der erste Krumpf in Länge und Breite der Warenbahn findet statt. Je nach Größe der Waschmaschine lassen sich noch andere Prozesse einbinden.

Ein Hochleistungs-Quetschwerk entwässert die Warenbahn optimal für einen Nass-in-Nass-Prozess. Die Ausrüstungsflotte wird im Minimalauftrag mit dem ECO-Applicator aufgebracht. Eine Konzentrationskontrolle der Ausrüstungsflotte (wie bei dem Nass-in-Nass-Verfahren mit zwei Foulards nötig) kann hier entfallen. Beim ECO-Applicator-Einsatz wird die Ausrüstungsflotte nicht verwässert.

Mit dem Zylindertrockenteil wird die Ware vorgetrocknet. Die Resttrocknung, Reckung und Schrägstellung erfolgt auf dem Thermex 6500 Reck- und Richtwerk. Die Ware wird dabei behutsam stufenweise gereckt, indem sie über Walzen geführt und in kleinen Schritten schräggestellt und gereckt wird. Der Vorgang läuft in einem definierten Wärme- und Feuchteklima ab und erzielt bessere Warenausfälle.

#### Dies bedeutet im Vergleich zur herkömmlichen Denim-Recktechnik:

Signifikant geringere Reckkräfte und weniger Warenspannung, besserer „Look and Feel“, höhere Produktionsgeschwindigkeit und eine einfachere Restfeuchteregeleung.

Die Warenbreite, die Schrägstellung und die Schussfadenzahl werden von einer speziellen Kamera aufgenommen und die Messwerte in entsprechende Regelimpulse zur Anlagensteuerung umgewandelt.

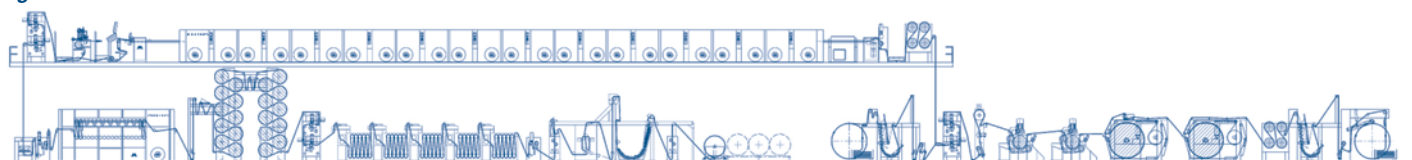
Der nachfolgende Spannrahmen, mit vorgeschaltetem Matex ECO-Applicator und einer Beschichtungsanlage, wird dann je nach Artikel wahlweise zum Ausrüsten, Trocknen der Beschichtung oder Flächenstabilisierung (Fixierung) eingesetzt.

Die Maschineneinstellungen richten sich nach dem zu fahrenden Prozess. Mit einer geregelten Restfeuchte oder mit einem Feuchteantrag mittels Matex ECO-Applicator erreicht die Ware die Anlage für den kompressiven Krumpfprozess. Zwei Gummikalender und zwei Filzkalender sorgen für eine hohe Produktionsgeschwindigkeit bei schonendem Gummiteucheinsatz und effektivem Energieverbrauch. Zwei Gummikalender und zwei Filzkalender werden benötigt, um z. B. Denim von 14,5 oz/syd mit 1-2 % Restkrumpf mit mindestens 70 m/min zu produzieren. Eine spannungsarme Warenführung zur Aufrollung ist für das Prozessende wichtig.

#### Schlussbetrachtung

Schaut man einmal in die Auslagen der Kaufhäuser und in die Kataloge namhafter Anbieter von Freizeitkleidung, so nehmen die klassische Denimware und die schusselastische Denimware schon einige Angebotsseiten in Anspruch. Es ist recht bemerkenswert, was sich die „Denim-Mafia“ Jahr für Jahr einfallen lässt, um dem Markt Wachstum zu verschaffen. Denim-Veredlung und Jeans-Fertigung gehören zu den innovativsten Gebieten der Textilindustrie.

Fig. 5 / Abb. 5





“...lots of Turkish, Italian and French customers”

**Nana Houzanna,  
Hellenic Fabrics**

# Hellenic

**From** Hellenic Fabrics, a new range of ladieswear featuring 98% cotton and 2% elastane, offering comfort-stretch with 40 - 62% stretch; plus three new colours including satin.

The Greek company specialises in premium denim fabric. A new collection also featured a wide variety of denim fabrics in terms of weave, composition and finishing.

## Culture of sustainability

**Launched** just last spring, the Viking range of denim from Arvind saw four new colours and three new shades of brown, blue and green introduced.

For its Cruiser range, Arvind launched a top side with either a colour or transfer coating and a coating or multiple colours on the backside of the denim.

“Another debut with the latest collection was a ‘leather look’ 11oz denim, offering up to 36% stretchability,” announced Arvind’s Country Manager Bangladesh, Anil Kumar.

Arvind was formed in 1930 and pioneered the manufacture of denim in India during the 1980’s. It currently produces 110 million m/year making the company a leading global producer. Core competencies features design, innovations and sustainability with the company exporting to 70 countries worldwide.

Leading clients include GAP, Levi Straus, Abercrombie & Fitch and Calvin Klein.



“...a leather look denim with up to 36% stretchability.”

**Anil Kumar**  
Country Manager Bangladesh,  
**Arvind**



# comfort-stretch jeans

Available in fabric weights between 7 - 14 oz/yd<sup>2</sup> for female, male and children's jeans, the collection also featured a wide range of colours.

In summing up the show, Hellenic's Nana Houzanna, confirmed that "despite these difficult economic times, it has been a very good show with lots of Turkish, Italian and French customers."



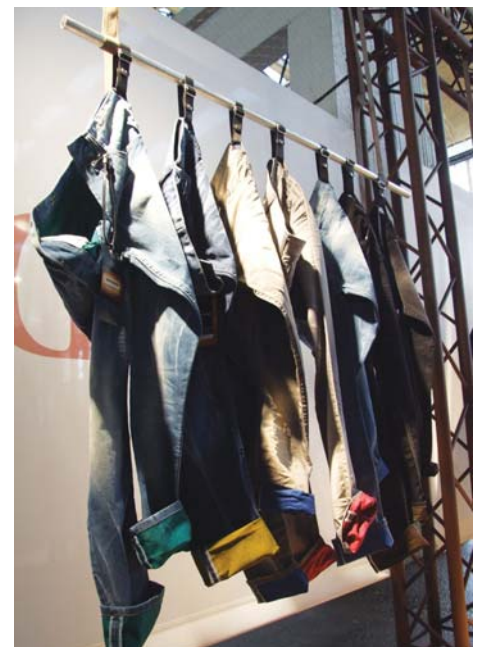
## Two-sided denim from **Absolute**

**Introduced** in Munich last year, Absolute Denim received "great feedback to its two-sided denim," according to the company's Sales & Marketing Spokesman.

As a direct result, the Thai company has extended the range with another five new colours on the inside and five different colours on the backside; creating a two-sided denim jean.

A new 'washed look' for the Polar and Newton collections also saw five new colours introduced.

Absolute Denim's production facilities in Thailand are ranked as one of the most modern mills in the world with a 90,000 m<sup>2</sup> building; producing up to 2 million m/month under a single roof.



# Four new collections from Çalık Blue

Turkey's Çalık Blue was formed in 1987 to offer a 'new perspective to the textile industry with innovation, creativity, quality, concepts and textile technology'. And they did not disappoint, launching four new collections - Classic, Vintage, de-luxe and non-denim.

"For the denim Classic range, for example, rather than the all-over bleached and splattered looks of recent seasons, we have created a more controlled approach to 'painterly' jeans with flecks of white carefully applied," explained Sales and Marketing Director, Fatih Türk, adding, "The denim is treated like an artist's canvas."

The company has retained its principles and has rapidly become a fully integrated denim producer; starting production of gabardine fabrics in 2004.

Today it is recognised as an international player with markets across Europe, the USA, China, Singapore, Israel and North Africa.



“The denim is treated like an artist's canvas”

**Faith Türk**  
Sales & Marketing  
Director,  
Çalık Blue

## Tri-blend technology from Tavex

A new generation of stretch fabrics, based on innovative technology offers a 'renewed vision of stretch.'

It features a tri-blend yarn structure, Lycra dualFX, which features the high stretch properties of Lycra fibre and the recovery and low shrinkage power of Lycra T400 fibres, plus the versatility of cotton.

The result claims Tavex is maximum elasticity and resistance, high recovery and low shrinkage; providing super stretch denim that is comfortable to wear and retains its shape.

Tavex's collection also featured a new evolution of pastels in bright impressionistic colours including pinks, clear translucent turquoise and kiwi, plus sky blues from pale to the deepest blue.

In 2006 Tavex and Brazil's Santista Textil merged to form the Tavex Corporation offering a consolidated background of more than 150 years in the production of denim, flats and workwear textiles.

The company today produces over 185 million m/year from its 10 factories worldwide and is considered to be the world's biggest denim producer.



# Super soft and shape retention from İSKO

İSKO, extended its popular jegging range of denim with İSKO Recall technology to offer improved recovery.

The Turkish company also introduced super stretch and shape retention for 'skinny' jeans combining Lycra and Lycra T400 fibres in a single fibre.

This latest innovation, 'Reform,' offers, according to Banu Yenici, Senior Marketing Executive, "incomparable holding and stretch."

"It looks one size smaller - a key word for ladies - with recall technology using İSKO yarns."

"For menswear however, Lycra has been difficult to market as being considered as unmanly. This is all set to change soon with a new weaving innovation, LoomFX," she disclosed.

Also making its debut, Bluegeox, made in collaboration with Geox, and offering super soft-touch jeans made with a thermo regulating denim; using carded yarns with the same techniques employed for wool.

Considered as a leader in the production of denim fabric technologies globally, İSKO offers a wide range of innovative textile products to meet the diverse needs of the denim sector. It has offices in 35 countries around the world.



# Culture of sustainability

With a strong culture of sustainability, Pakistan's Artistic Milliners collection focussed on its finishing side of jeans - reducing the overall water consumption and energy demands in the manufacturing processes.

The company was established in 1949 and is recognised as a vertical integrated textile producer and one of the world's largest denim producers.

It prides itself by offering premium quality denim fabrics to meet client needs with package deals featuring product development, design support, reduced lead times and on-time deliveries.

With a new 'state of the art' denim mill AM-5, the company's production capacity will be increased to 3 million metres.



# New denim shirts

**Turkey's** Matesa Denim was formed in 1989 producing yarns and knit fabrics and starting production of denim in 2006. Today it is a fully vertical integrated producer, specialising in lightweight special denim fabrics using tencel, cupro, elastane, mixed polyester and cotton.

The new collection featured denim shirts and 4.5 oz/yd<sup>2</sup> lightweight denim.

The company's reputation is synonymous with quality. Its mill is equipped with the latest technology to produce the latest fashionable rope-dyed denim fabrics with special finishes.



## Lightweight collection

A wide range of 5 - 6 oz lightweight denims for ladies tops and shirts featured highly in Berto Industria Tessile's collection with super stretch, double twist and special coatings.

Formed in 1889, and originally producing sail cloth for Venetian sailing boats, Berto expanded its range to include woven fabrics for work garments, table linen, shirtings and, in the 1980's, denim.

Continuous investment has been the key company's continued success. As denim output grew, the company installed an indigo dyeing plant and recently took delivery of a new Montex stenter featuring the country's first Monforts ECO-Applicator unit; allowing the company to undertake new denim treatments and effects.

Leading European designer brands supplied by the Italian producer include; Armani, Dolce & Gabbana and Valentino.



# Sustainable lifestyle and production

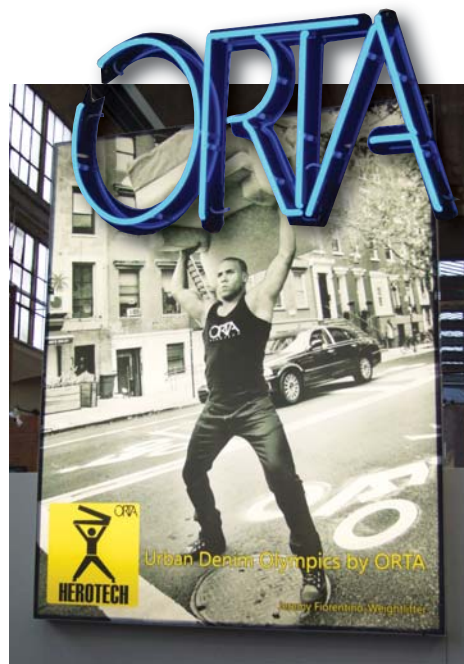
The collection from Orta Anadolu collection introduced a range of exceptional inky blue denims and a brand new authentic green shade,

incorporated with an exclusively designed, second-hand 'look.'

The Turkish company started denim production in 1985 and remains one

of the primary manufacturers in the marketplace, producing over 60 million metres/year.

As a leading denim brand, Orta pursues a sustainable lifestyle and production. It founded its sustainability division in 2010 and already uses a 5% improved cotton in production.



# New era of Tencel

From Textil Santanderina, Tencel fabrics have been processed with Eco-Sandye ecological dyeing process to offer improved colour fixing, more effects and colour

contrasts plus compatibility with coating, drying and personalized finishing

The new process's development was led by the company's sensitivity

to the environment and desire for high quality fabrics - giving innovative, functional and fashionable features, including wrinkle free, faster drying and wash resistant.

Located in Northern Spain, Textil Santanderina has been awarded certification for OEKO-Tex Standard 100.



# Montex stenter increases production of stretch denim

Tavex Corporation has upgraded its manufacturing facilities in Mexico to increase sales to the US market with a new Montex stenter for the production of stretched denim.

**Tavex** Corporation, the world's largest manufacturer of denim, has installed a Montex stenter at its Tlaxcala factory in Mexico to increase production of stretched denim.

Tavex Corporation acquired Mexican denim manufacturer Acotex, with its plants in Puebla and Tlaxcala, as a move designed to increase access to the US market.

Founded more than 150 years ago, Tavex also has denim manufacturing plants in Spain, Morocco, Brazil and Argentina.

Adalberto Avendano, Tavex's manager for dyeing and finishing at Tlaxcala, said that the installation of the Montex was part of the company's programme to upgrade facilities at the factory, which is devoted to denim production.

"We already had two Sanforisors at Tlaxcala, and there are Monforts stenters at other plants within the group", he says. "We are therefore familiar with the technology and maintenance support.

"There is one stenter here from another manufacturer, which dates back to the time when this was an Acotex factory, but our familiarity with Monforts meant that we were happy to invest in a Montex to extend our production range."

Stretch denim is the biggest volume trend in the market and in Mexico Tavex is putting considerable emphasis on expanding the stretch business. The strategy is, says Mr Avendano, to emulate the premium European

stretches but manufactured much closer to the US market.

The eight-chamber Montex is able to handle material to a width of 200cm and was delivered and installed by Sattex, the Monforts

representative for Mexico.

Mr Avendano added that the Montex has features which make the machine particularly suitable for denim manufacture, allowing the elimination of several traditional process steps.



# reases denim

"This really is a stenter that is perfect for denim," he says. "Monforts and Sattex installed and commissioned the machine, and trained our operators and maintenance staff. Now the machine is practically handling itself."



The Montex is handling materials widths of between 170 and 180cm, at weights that range between 290gm/m<sup>2</sup> and 460gm/m<sup>2</sup>.

"We decided to split the production of denim types between our existing stenter, which is producing standard denim, and the Montex, which is producing stretched denim," said Mr Avendano.

"The machines are working Monday to Thursday on a 24-hour basis, with two 12-hour shifts, and on Friday, Saturday and Sunday they are not working.

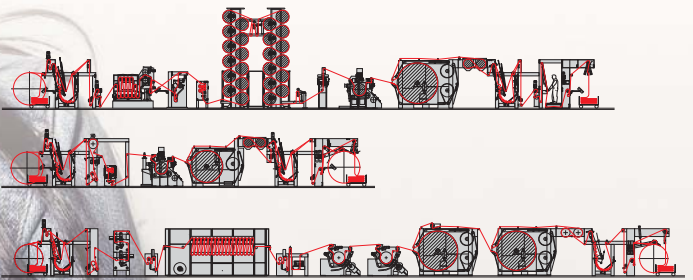
"On this basis, the two machines are processing at the rate of 17 million metres of denim per year. During the period March to December 2011, starting from the time the Montex came on-line, it processed 6 million metres of stretched denim. So on a yearly basis, production is evenly divided between the two."

Mr Avendano says that 90% of Tavex's Mexican production is going to the US, the world's largest market for denim. Tavex's total denim capacity at its Mexican plants is more than 20 million metres per year.





# Competence in Denim Finishing



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