

**DENIM**  
**PROCESSING**



**ACHITEXMINERVA**

The image features a close-up of several cotton bolls on a dark, textured wooden surface. A magnifying glass is positioned over the word 'DYEING', which is written in white capital letters inside a blue circular graphic. The background is a solid dark blue color. The main title 'THE NATURAL ORIGINS OF DENIM' is written in large, white, bold, sans-serif capital letters on the right side of the image.

# THE NATURAL ORIGINS OF DENIM

DYEING

...FROM THE FIBER  
TO THE FINISH

Achitex Minerva Group has been producing chemical specialties and auxiliaries for the textile industry since 1981.

With its wide range of products for denim processing and its qualified team of technicians taking care of R&D, quality control and technical support, it is a reliable partner for all companies involved in the dyeing and finishing of Denim, providing products for the most important process treatments.

Research and develop alternatives with the least environmental weight is a mission for Achitex Minerva Group that constantly redesigns denim processing by making it faster, simpler and most environmentally friendly.

Achisize  
Pigment  
Technology



Eco friendly  
applications



GOTS, ZDHC and bluesign®  
certified products  
for sustainable process



R&D products  
increasingly zero impact

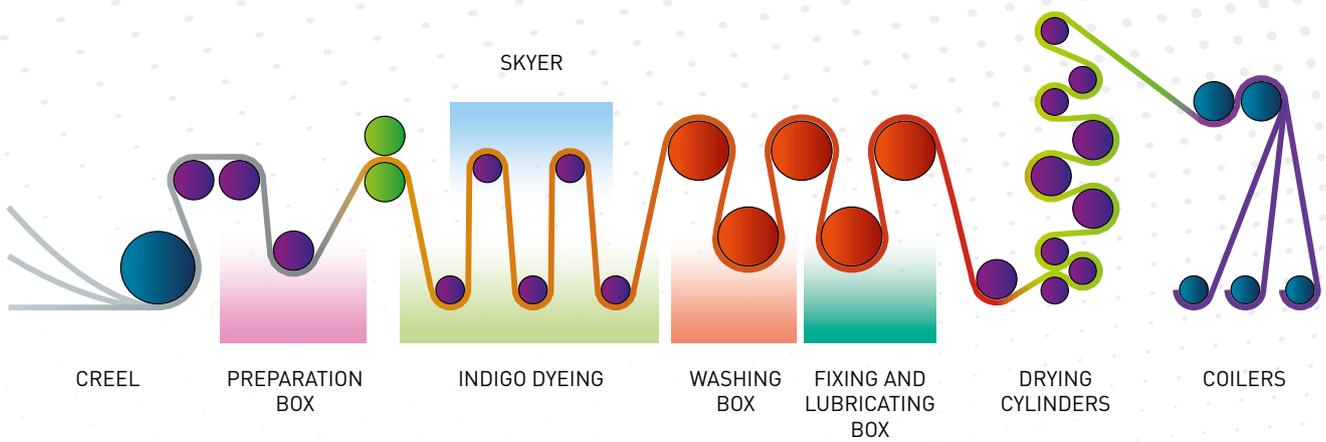


# CHEMISTRY OF DENIM

## DYEING

Dyeing is the process of adding colour, as reactive, sulphur or indigo to yarn. It's done by yarn padding but there are different technologies used in the denim industry, such as slasher, rope and loop dyeing.

### INDIGO DYEING



<b>ACHITINA GO</b>		Wetting agent. Non foaming, stable to alkaline, reductive and oxidative conditions. Acts as a re-wetting agent and improves levelness of dyeing.
<b>ACHITINA F 100%</b>		All-purpose emulsifying, dispersing, levelling agent and detergent of general use. Especially indicated for dispersions of sulphur and indigo dyes.
<b>ACHIFIX GO</b>		Fixing agent that increases wet fastness without affecting the shade.
<b>ACHIFIX IND FF</b>		Fixing agent for indigo dyes, that increases the yield of indigo and reserve the weft during washing process.
<b>DISPERSANT SP</b>		Dispersing agent, protective colloid of vat and indigo dyes.
<b>FINISH GT</b>		Lubricating agent. Improves sliding between fibres, therefore it is useful for wet paraffining of cotton, linen yarns and their blends. Particularly suitable as a lubricant for the rope opening in the dyeing of denim.
<b>MERCERIZING MF</b>		Wetting agent for mercerization and caustic soda operations, cresols-free. Non foaming, has a dispersing and sequestering action against impurities and earthalkaline salts. Stable till 28-30° Bé.
<b>PLEXMET KDM</b>		Ca and Mg sequestering-dispersing agent. Especially developed for cleaning of the yarn.

## SIZING

Sizing is the process to improve the loom efficiency and reduce the yarn breaks by means of polymeric coating.

<b>ACHISIZE ITV</b>		One-shot compound for sizing of denim yarns. The advantages are: plastic film, high abrasion resistance, high lubrication, softening and plasticity characteristics. Desizing without enzyme.
<b>ACHISIZE BE B</b>		Strong sizing product. Beams sized with ACHISIZE BE B have a particularly high resistance to mechanical abrasion and tensile stresses. The main advantage of ACHISIZE BE B is that it eliminates blending operations in sizing recipe preparation, avoiding compatibility problems and mistakes during weighing. Desizing with enzyme.
<b>ACHISIZE VD 50 LC</b>		ACHISIZE VD 50 LC is a synthetic based product especially developed for sizing operation of cotton and its blends with synthetic yarns both as single component or strengthening agent in sizing recipes. Desizing without enzyme.
<b>ACHISIZE K</b>		High quality and high performance adhesive product, characterized by a high adhesive power. Reduced amount of application. Reduce the ecological impact and reduce daily pollution. Given its chemical-physical nature characteristics it's a fixing agent for indigo and sulphur dyes, reduces pilling, does not need to be eliminated from the yarn as it has good stability to bacteria attacks and excellent affinity with dyeing products.
<b>ACHISIZE V3</b>		Unique sizing product, particularly suitable for sizing ring cotton yarns, with a count higher than Ne 24/1. The product is essential to reduce yarn breaks and production stops on the weaving machine.
<b>ACHISIZE O3 ECO</b>		Water soluble bio-degradable sizing agent for cotton, viscose, wool and their blends with polyester. It gives a particularly high resistance to mechanical abrasion and tensile stresses and eliminates blending operations in sizing recipe preparation avoiding compatibility problems and mistakes during weighing.

## ACHISIZE PIGMENT TECHNOLOGY

Achitex Minerva Group has developed a new innovative and sustainable process of dyeing specifically for denim, which allows to size and dye the yarns in one step, rather than two. This operation embraces the philosophy of sustainable: 2 processes in 1!

### SUPER DENIM



This application allows to obtain a washing resistance higher than that obtained with conventional cationic fixing agents, but also a wider range of effects and darker shades on washed denim. Application is made directly in the sizing machine during sizing process.

### DENIM OVER-DYEING



This application differs from the standard one in the starting yarn, which is a denim yarn dyed through the traditional indigo dyeing system. The pigment is applied to this yarn by changing the "matisse" of the fabric, acting exclusively on the warp, guaranteeing the "white texture effect" typical of denim fabrics. This application involves the use of air looms during the subsequent weaving process, different looms are not suitable.

**RUN TO  
THE FUTURE**



Reduced  
processing time



Lower use  
of energy



Water  
saving

## DESIZING

Desizing is the process to remove sizing products. It's an important step before any further treatment to avoid some problems in preparation, dyeing and finishing.

<b>ECOLASE HN</b>		Enzyme for desizing of starchy substances carried out until 100°C.
<b>ECOLASE LF</b>		Enzymatic (alpha-amylase) desizing agent. Suitable for padding application at 40- 70° C, used in pad-batch desizing. Suitable for discontinuous operations.
<b>ECOPON IBS</b>		Non siliconic de-aerating and wetting agent. Very stable under alkaline conditions and high temperature. Can be used as anti-foamer during desizing, scouring and bleaching operations of cotton yarns and fabrics and cotton blends. Increases the efficiency of the surface-active agents used in preparation.
<b>ECOPON LO</b>		Detergent and wetting agent with a high dispersing power. Low foaming, maintains high hydrophily to the fibre. High stability to caustic soda solutions, suitable for cotton desizing, scouring and bleaching and for wool.
<b>PLEXMET BIO SERIES</b>		Bio-degradable acrylic sugar copolymer, with excellent dispersing and sequestering behavior, usable in dyeing without altering colour tones.

## MERCERIZATION

One of main drawbacks of the mercerization process is the staining on weft effect. The following product, applied during the mercerizing treatment or during the washing, provide an effective remedy for this problem.

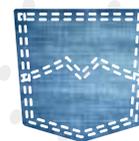
<b>LAVAPAL N 800 B1</b>		Backstaining prevention agent for denim garment process. It preserves weft and pockets from staining.
<b>MERCERIZING MF</b>		Wetting agent for mercerization and caustic soda operations, cresols-free. Non foaming, has a dispersing and sequestering action against impurities and earthalkaline salts. Stable till 28-30° Bé.
<b>OXITON ECO</b>		Ecological oxidizing agent for sulphur, hydron and vat dyes. Improves rubbing fastness, dyestuffs exhaustion and reproducibility.
<b>OXITON S LIQ</b>		Anti-reduction agent. Suitable in reactive dyes dyeing and in vat dyes oxidation.



Fabric treated with oxiton



Untreated fabric



## FINISHING

Fabric finishing is one of the last stage in the production of denim. This is where the final touch is added, and it can make a big difference in how fabric looks and on the aesthetic and sensorial aspect.

### TRADITIONAL FINISHING

<b>ACHITSOFT OZ</b>		Softener used as ozone inhibitor with antistatic properties avoid yellowing.
<b>FINISH 36 L</b>		Silicone slightly reactive micro-emulsion, very stable; it appears as a colloidal solution. It can be used together with resins and not ionic/cationic finishing products, with good bath stability. It gives a slippery and smooth handle to fabrics, and does not have any influence on the degree of whiteness.
<b>FINISH N 46 SERIES</b>		Hydrophilic silicone softener, highly processable, which gives an excellent finishing touch and freshness. Very stable on turbulence.
<b>FINISH SJ</b>		Finishing auxiliary to improve sewability to all natural fibers and their blends, giving soft handle and gloss effect without affecting the shade and the white degree. Confers elasticity to knitted goods.
<b>GLIOFIX B00 CAT NEW</b>		Zero formaldehyde self-catalytic glyoxalic resin. Improves handle and dimension stability, has a slight influence on white degree and hue of dyed substrates.
<b>POLIFINISH PO 40</b>		Polyethylenic emulsion for textile finishing. Gives a soft handle, increases the tear and abrasion strength and improves the sewability. Suitable for padding application.

### FINISHING BY FOAMING/COATING

<b>ACHITFOAM SD</b>		Amide derivative, with foaming effect.
<b>MINERPRINT® BINDER 521</b>		Dispersion of vinyl polymer. It forms a rigid film.
<b>MINERPRINT® BINDER ACM</b>		Dispersion of self-crosslinking acrylic polymer. It forms a soft, transparent and flexible film.
<b>MINERPRINT® BINDER NF</b>		Self crooslinker acrylic soft binder formaldehyde free.
<b>CROSSLINKER M</b>		Blocked diisocyanate, cross-linker, activation temperature at 100-120°C.
<b>FINISH PL LIQ</b>		Polyurethane latex. It provides a glossy effect.
<b>FINISH PNI</b>		Polyurethane latex. It provides an elastic, gummy effect.
<b>MINERPRINT® PIGMENTS</b>		Range of pigment dispersions for coloured effects.





**ACHITEX MINERVA GROUP**  
info@achitexminerva.com  
www.achitexminerva.com

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CERTIFIED MANAGEMENT  
SYSTEMS