



**PASSION
FOR DENIM**

Creating colors and effects
to boost your inspiration





/ How do we **bring** creativity, sustainability and performance, for **denim** **beyond denim?**

CREATING SUSTAINABLE SOLUTIONS

At Archroma, we continuously challenge the status quo in the deep belief that we can make our industry sustainable.

Archroma is committed to developing innovative products and processes that are safer for the consumer and for the environment. We strongly believe, based on our extensive experience in textile processing, that sustainability can generate innovation, performance and can even lead to cost reductions for our customers. For this reason, our clear ambition is to offer our customers the best possible product solution package for them in each textile segments.

Innovation is a core competence of Archroma, which ensures that our products and services meet future demands, foster future technologies and contribute to a more sustainable textile industry.

As a global leader in color and specialty chemicals, together with our trusted heritage, our new product solution packages and innovations, we aim to be a reliable partner for textile mills as well as major retailers and brands for the whole textile chain – **from the first idea to the final garment.**

Brand owners and retailers around the world are taking action to evaluate the environmental impact of textile treatment, dyeing and finishing processes in response to consumer concerns. We can help textile manufacturers with this, our exclusive **ONE WAY Process Simulator** can be used to mimic and compare products and processes, and thus calculate the ecological and economical profile of the final end-product.

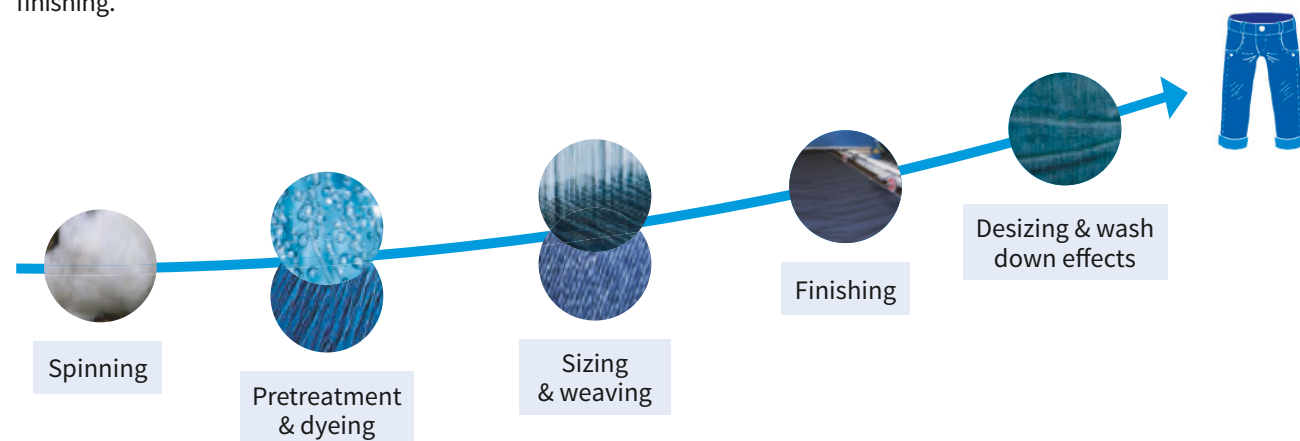
/ ABOUT US

Archroma is a **global color and specialty chemicals** company committed to innovation, world-class quality standards, high service levels, cost-efficiency and sustainability.

From fiber to finish, Archroma's Brand and Performance Textile Specialties plays a key role throughout the entire textile supply chain, with special package solutions for spinning, pretreatment, dyeing, sizing, coating and finishing.

Denim is so special. Maybe no other piece of our closet has the power to tell the world how we feel or who we are.

At Archroma, we share your passion for denim, and we bring our expertise, innovation power and our commitment to sustainability into developing cutting-edge dyeing technologies and products to support your creativity.



At Archroma, we continuously challenge the status quo in the deep belief that we can make our industry sustainable.

The majority of Archroma's products are endorsed by some of the most important eco-standards.

• bluesign® • Oeko-Tex® • GOTS • ZDHC • REACH • EU Ecolabel • C2C • RSL • MRSL

Archroma's ONE WAY Process Simulator allows customers to assess the cost, performance and environmental profile of the evaluated products and processes.

GLOBAL DENIM SERVICES

Benefit from Archroma's denim expertise and networks for:

- Mill and brand marketing partnership collaboration;
- Innovative solutions for improved performance and sustainable production;
- New trends in the denim market;
- Collaboration network with market leaders in machinery manufacturers, denim producers, laundry specialists, universities, textile industries, training centers and brands.

/ SPINNING

Spinning is the process of making fibrous material into yarn or thread.

At the beginning of the textile chain, Archroma's spin finishes provide outstanding processing performance for all kinds of filaments and fibers.

Influence of a type of yarn on dyeing

Generally, open-end yarns have a good absorption capacity in short periods of bath-material contact in dye vats. Ring spun also has a good absorption capacity, although lower than that of open-end yarn. If the ring spun is additionally combed (with greater orientation of fibers in the same direction), absorption capacity is even lower, although yarn quality is the best.

Influence of the type of yarn on the finish effects

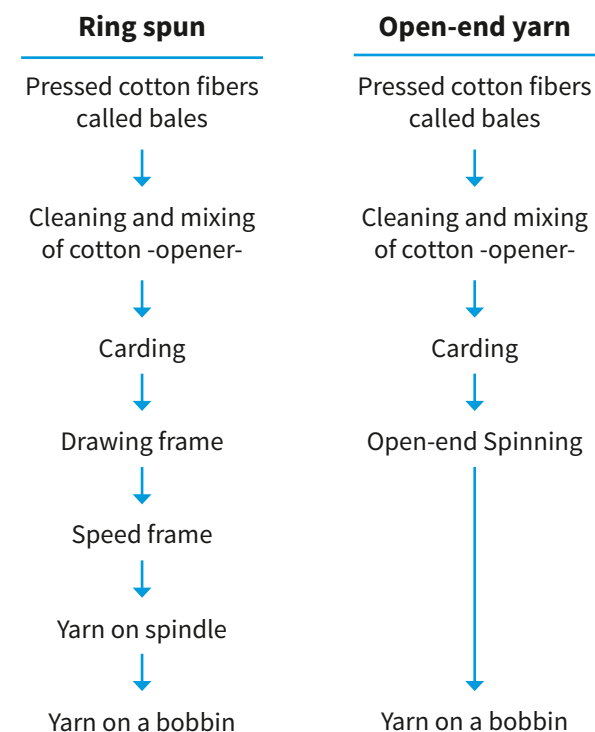
The use of yarn that display certain irregularities or slubs is related to the current tendency to produce final garments with worn-out or 'old' appearance. Attempts are also made to manufacture jeans using methods that were used in the past, when the operation of weaving was selvage and the irregularities were produced accidentally or by chance.

Archroma's spinning agents

- Spin finish **Afilan®**
- Softeners, lubricants and antistatic agents **Leomin®**

PRODUCTION PHASES OF THE TWO MOST IMPORTANT TYPES OF THREAD

DIAGRAM 1



/ PRETREATMENT & DYEING

The **Archroma Denim portfolio** offers a scope of possibilities in effects and colors, from the traditional to the most innovative solutions; while maintaining high standards of quality and sustainability.

An old saying states that “well prepared is half dyed”. Pretreatment is indeed a key step in textile production. The diversity of fibers and quality variations are major

challenges in consistently obtaining a perfectly prepared fabric, ready for the next processing steps.

Archroma is a recognized leader in integrated solutions for dyeing. Archroma offers the best-in-class specific package of auxiliaries for dyeing. Our portfolio is comprised of products designed to address the specific dyeing requirements of all types of effects.

Archroma's dyestuffs

- Pre-reduced indigo solution
Denisol® Indigo 30 liq
- Pre-reduced sulfur dyes
Diresul® RDT Blue Specialties liq
Diresul® RDT Black & Grey liq
Diresul® RDT Colors liq

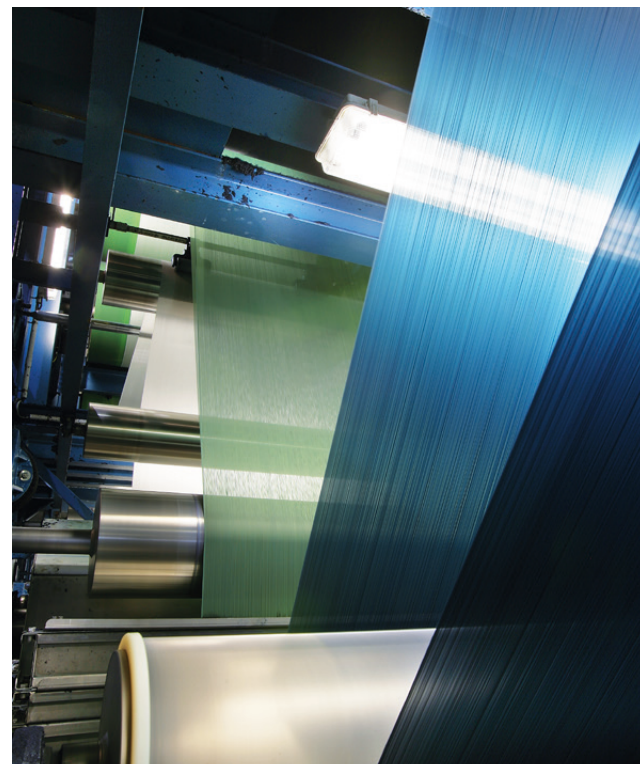
Archroma's chemical auxiliaries

- Mercerizing
Mercerol® QWXL liq
- Wetting
Primasol® NF liq
Leonil® EHC liq c
- Dispersing agents
Ekaline® F liq
Setamol® WS p
- Sequestering agents
Dekol® SN 100 liq
Dekol® 2005 liq c
- Reducing agents
Reducing agent DE liq
Reducing agent D p
Rongalit® DNM p
- Peroxide oxidation booster
Direfix® GPAN liq
- Cationic fixing agents
Direfix® SD liq
- Lubricant (Rebeaming)
Humectol® Denicomb Ro liq

Archroma has made remarked contributions to the denim industry with cutting-edge dyeing technologies and products that bring together creativity, performance and sustainability.

We re-engineered denim processing by making it faster, simpler and kinder to the environment with its multi-award winning **ADVANCED DENIM** dyeing technology, a sulfur blue specialties dyes concept allowing significant water and resource savings in yarn dyeing, which can be evaluated by the **ONE WAY Process Simulator**.

For designers and brands who long for authentic indigo inspiration, Archroma designed **Denisol® Indigo 30**, a pre-reduced indigo solution manufactured in Archroma's “zero water discharge” production facility, a GOTS and bluesign® certified option.



/ SIZING & WEAVING

The sizing process is necessary to achieve highest weaving efficiency.

The aim of this process is to provide the yarn with a protective coating in order to:

- Protect the yarn from friction;
- Increase resistance to traction;
- Prevent the warp threads from entangling or sticking to each other;
- Increase the tensile strength to avoid breakages in the loom;
- Reduce fiber dusting (formation of fiber clusters);
- Facilitate the use of a single yarn.

Neither classical weaving nor modern high speed weaving can be carried out without sizing agents. These adhere to the individual fibers in the yarn to each other and form a protective film on the fiber surface, which enables the yarn to survive the extreme mechanical stress during weaving without damage.

Archroma supplies sizing package solutions that meet all requirements of modern weaving technology. This includes more ecological and economical products for all types of looms and size recovery technologies.

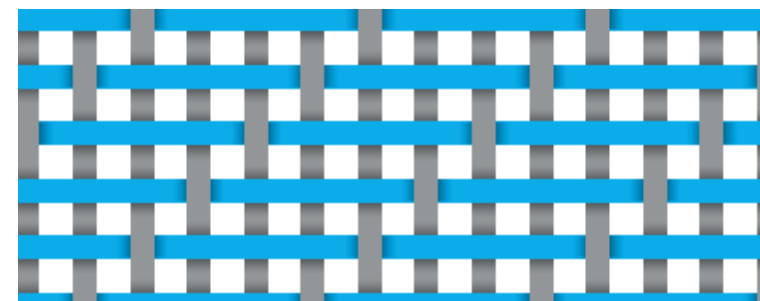
Archroma's sizing agents selection

- Carboxymethylcellulose
Arkofil® CMC 20 gr
Arkofil® CMC 300 gr
- Polyvinyl Alcohol & copolymers
Arkofil® PFM gr
Arkofil® G1 gr
- Sizing wax
Trefix® MSW fla
Trefix® P liq
- Starch & compounds
Arkofil® S60 p
Arkofil® UCF-4 gr
- Polyacrylates
Arkofil® CE liq
Arkofil® CO p/liq
- Others (Pad/Sizing-Ox)
Arkofil® DEN -FIX IN

DENIM STRUCTURE

The structure is the particular way in which the warp and the weft ends cross and interlace each other. Denim fabrics are distinguished by a colored warp yarn and raw or uncolored weft.

The weaving process is achieved by using looms, which are mechanical devices that maintain the warp tension in order to facilitate the interweaving of the weft. There are different shapes and mechanical looms according to the type of fabric produced. In the case of denim fabric, the type of looms used are called plane looms.



From denim performance to the jeans look

Finishing of denim fabrics has been largely developed over the past years. Apart from the conventional treatments that assure quality standards, there are also special finishing treatments which improve the

performance of the fabric and the final effect on the garment. The finishing treatments of the denim garments are based on current fashion trends and desired effects.

Archroma's color effects solutions

COATING

- Sulfide-free solubilized sulfur dyes
Optisul® C liq
- High quality pigment printing preparation
Printofix® T p
Printofix® Blue T-WD p (Indigo look)
- Binders, thickeners and auxiliaries (including Zero Formaldehyde Add-on solutions)
Appretan® N, E (ultra low FA)
Appretan® NF, Lurapret® N (FA-free)

OVERDYEING

- Pre-reduced sulfur dyes & DAX
Diresul® RDT liq
- Sulfide-free solubilized sulfur dyes
Optisul® C liq
- Reactive dyes & DAX
Drimaren® Ultimate HD
Drimaren® HF
- Direct dyes
Indosol®

Archroma's thermo-control & protection solutions to help make your garment more resistant to extreme weather conditions; from heatwaves to rain pours.

Archroma's care effects solutions bring softness and comfort to your garment whilst looking good at all times.

Archroma's polymers allow tailor-made solutions for customer specific requirements; from soft to hard, from elastic to rigid, from hydrophilic to hydrophobic and impermeable to breathable.

Discover more information in our 'Functional Finishing' brochure.



Archroma's performance and care effects solutions

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| <ul style="list-style-type: none"> Thermocontrol
Hydroperm®
coldblack® Care effects (including softeners that help to prevent yellowing caused by ozone during fabric storage)
Arkofix®
Ceralube®
Ceraperm®
Solusoft® | <ul style="list-style-type: none"> Protection
Smartrepel® Hydro
Nuva® N
Sanitized® Water-based solvent-free polymers for elastic, soft and flexible surfaces
Appretan®
Lurapret®
Texapret® | <ul style="list-style-type: none"> Actigard®
NanoSphere®
Pekoflam® |
|---|--|--|

The cornerstone of fashion effects

SPECIAL GARMENT FINISHING

During the last few years new mechanical (dry) as well as chemical (wet) effects for garments have been developed. By combining both a series of unique and individual looks in each pair of jeans, a vintage denim effect can be obtained.

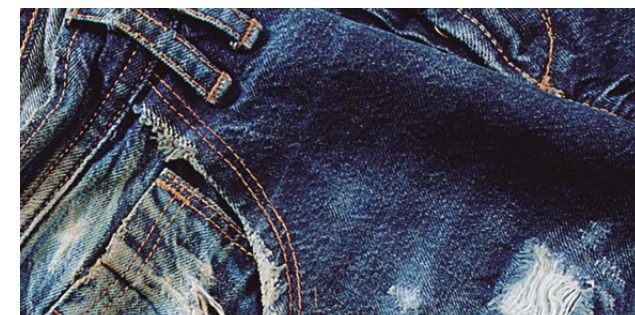
DRY PROCESSING

- Grinding
- Tagging & clipping
- Damages & breaks
- 3D effects with resin applications
- Patch and repair
- Laser effects
- Ozone effect

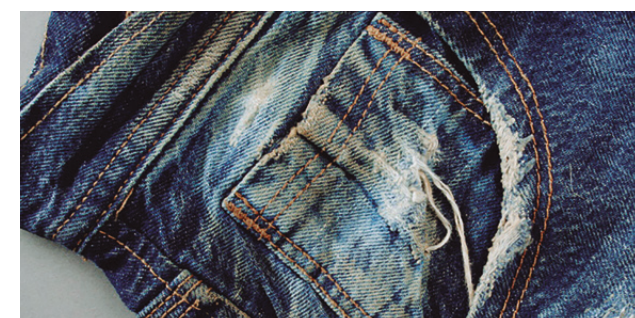
WET PROCESSING

- Desizing
- Stone wash
- Enzyme washing & biowashing
- Bleached effect
- Acid wash effect
- Spray & pulverizing effect
- Tie effects
- Tinting on garment

Damages/breaks



Grinding effects in pockets



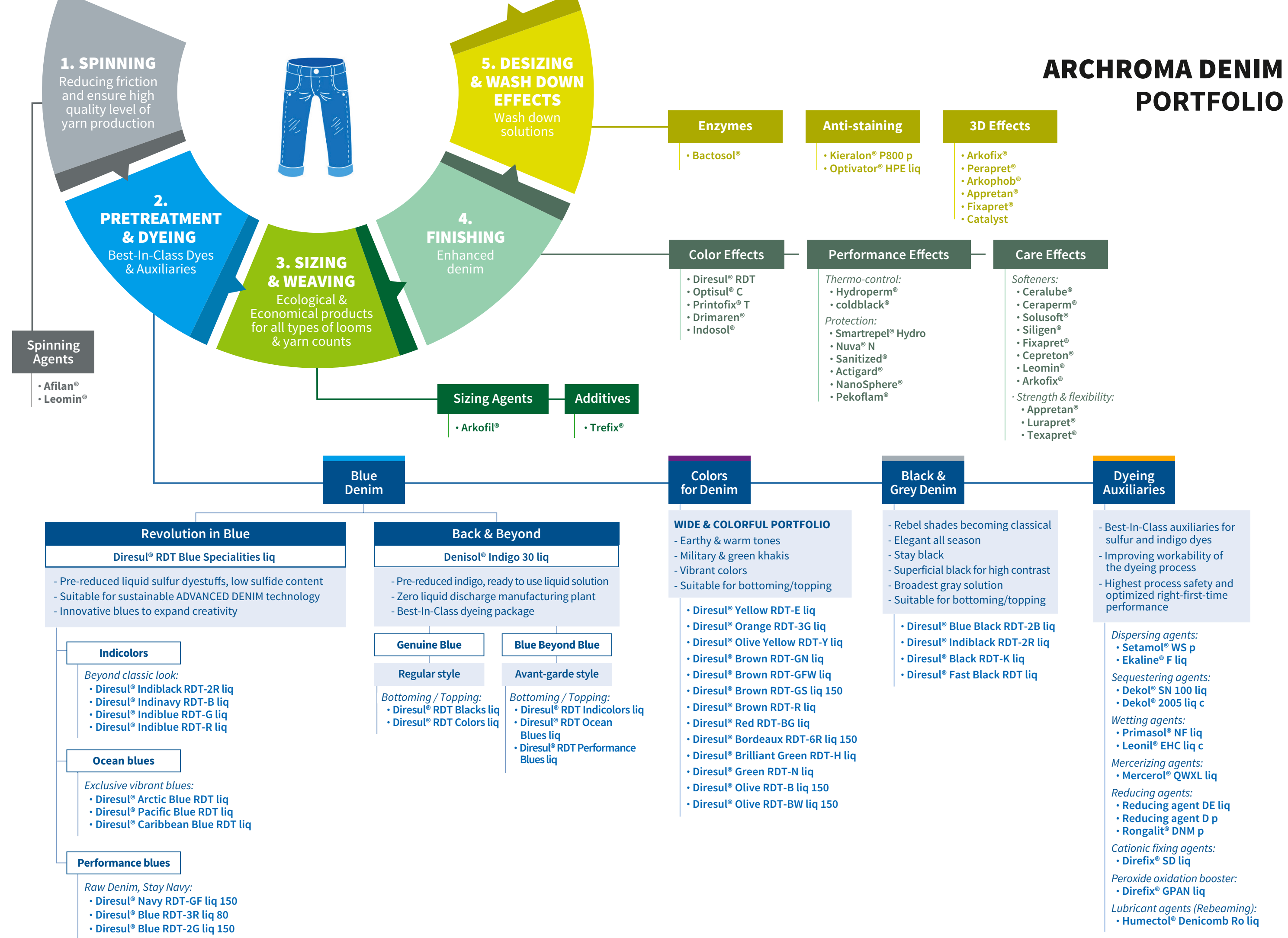
Denim, of course, is in constant evolution and new developments and regulations will surely influence the future of the industry. Archroma aims to be the best partner in this journey.

Archroma's desizing & wash down solutions

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| <ul style="list-style-type: none"> Desizing enzymes
Bactosol® PHC liq hc
Bactosol® HPA liq Wash down enzymes
Bactosol® CA liq c
Bactosol® CNX liq c Anti-back staining agent
Kieralon® P800 p
Optivator HPE liq Garment dyeing
Diresul® RDT liq
Drimaren®
Indosol®
Printofix® T | <ul style="list-style-type: none"> 3D effects (bleachable resins, FA-free*, low curing)
Arkofix® NZF New liq
Arkofix® NZK liq (self catalyzed)
Arkofix® NF liq
Catalyst FF
Catalyst NKD 3D effects (non bleachable resins)
Fixapret® NEC Plus | <ul style="list-style-type: none"> 3D improvers (FA-free*)
Perapret® PU New (grey cast**) Arkophob®DAN New (wash fast improver)
Appretan® NF (grey cast**) Appretan® TT (blue cast**) Appretan® MB extra (blue cast**) Appretan® MB extra (blue cast**) |
|---|---|--|

*formaldehyde-free
**after chlorine bleach

/check our latest updates at
www.denim.archroma.com





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