COLARIS DIGITAL TEXTILE PRINTING

HOME TEXTILES
APPAREL
DECORATION
AUTOMOTIVE
FLAGS & BANNERS
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www.zimmer-austria.com  
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1. INNOVATION IS IN OUR DNA

1.1. HISTORIC MILESTONES

The broad digital competence of ZIMMER AUSTRIA is based on an innovation introduced more than 4 decades ago.

1976 - ZIMMER has entered the digital age with the introduction of the Chromotronic printer concept to the carpet industry. The CHROMOJET has inherited the technology and become a mind changing milestone for the carpet industry. It turned machine made carpet manufacturing literally upside down. Both the CHROMOTRONIC and the CHROMOJET have been based on high speed electromagnetic valve technology developed by ZIMMER in the city of Kufstein in Austria.

Digital textile printing started with the CHROMOTEX printers in the early days of this Millennium. CHROMOTEX was based on continuous Inkjet technology.

The first real commercial printers have entered the market from 2008 onwards and are sold under the brand name COLARIS. Today COLARIS is best known for economic printing on medium to heavy weight substrates, including upholstery, velour, plush, terry, blanket, needle felt and even heavy weight tufted or woven carpet substrate.
# 2. INK CLASSES

## 2.1. TYPES | PRODUCTS | PROCESS | REQUIREMENTS

<table>
<thead>
<tr>
<th>INK CLASS</th>
<th>USED ON</th>
<th>END PRODUCTS</th>
<th>PROCESS REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>REACTIVE</td>
<td>cellulosic, protein based, and polyamide fibers</td>
<td>fashion, home furnishing, decorative fabrics, terry towels</td>
<td>inkjet pre-treatment printing-drying steaming post print washing drying</td>
</tr>
<tr>
<td>ACID AND METAL COMPLEX</td>
<td>protein based, and polyamide fibers</td>
<td>fashion &amp; lingerie, sports &amp; swimwear, tents, flag &amp; banners, technical textiles, military applications</td>
<td>inkjet pre-treatment printing-steaming-drying post print washing drying</td>
</tr>
<tr>
<td>DISPERSE DIRECT SUBLIMATION</td>
<td>PES fibers</td>
<td>fashion, home furnishing, flags &amp; banners, awnings &amp; parasols, camping &amp; outdoor, automotive, technical textiles</td>
<td>inkjet pre-treatment printing-drying-thermal fixation reductive washing drying</td>
</tr>
<tr>
<td>VAT INDANTHRENE®</td>
<td>cellulosic based fibers</td>
<td>high performance home furnishing, workwear, uniforms, military applications</td>
<td>inkjet pre-treatment printing-drying inline padding-steaming-washing-drying</td>
</tr>
<tr>
<td>PIGMENT</td>
<td>any kind of fibers</td>
<td>fashion, home textiles, outdoor fabrics, awnings &amp; parasols, advertising fabrics, technical textiles, military applications</td>
<td>inkjet pre-treatment printing-drying and thermal fixation</td>
</tr>
<tr>
<td>CATIONIC</td>
<td>acrylic fibers, cationic PES, and aramide fibers</td>
<td>outdoor fabrics, blankets, workwear, military applications</td>
<td>inkjet pre-treatment printing-drying-steaming-washing-drying</td>
</tr>
</tbody>
</table>
## 2. INK CLASSES

### 2.2. TYPES | PRODUCTS | PROCESS | REQUIREMENTS

<table>
<thead>
<tr>
<th>COLOR FASTNESS</th>
<th>APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>light fastness +</td>
<td></td>
</tr>
<tr>
<td>wash fastness +++</td>
<td></td>
</tr>
<tr>
<td>crock fastness ++</td>
<td></td>
</tr>
<tr>
<td>chlorine fastness +</td>
<td></td>
</tr>
<tr>
<td>brilliancy ++</td>
<td></td>
</tr>
</tbody>
</table>

| light fastness + |                          |
| wash fastness ++ |                          |
| crock fastness ++ |                          |
| chlorine fastness + |                          |
| brilliancy +++ |                          |

| light fastness ++ |                          |
| wash fastness +++ |                          |
| crock fastness ++ |                          |
| chlorine fastness + |                          |
| brilliancy +++ |                          |

| light fastness +++ |                          |
| wash fastness +++ |                          |
| crock fastness ++ |                          |
| chlorine fastness ++ |                          |
| brilliancy ++ |                          |

| light fastness +++ |                          |
| wash fastness + |                          |
| crock fastness + |                          |
| chlorine fastness ++ |                          |
| brilliancy ++ |                          |

| light fastness +++ |                          |
| wash fastness ++ |                          |
| crock fastness ++ |                          |
| chlorine fastness + |                          |
| brilliancy +++ |                          |
According to the substrate to be printed and the ink family used, the print technology differentiates in its process steps. Various options and equipment solutions are available to cover all different needs.
For a good color yield and sharp print results the fabric needs inkjet pre-treatment.

Direct print-dry-fixation keeps energy consumption low. PIGMENT printing represents this simple and ecologic print process. No post-print washing required, thus saving a great amount of water and energy.

With REACTIVE and ACID printing, fixation is done in steam condition. A good portion of unfixed dyes remains in the substrate. Post-print washing is mandatory. Washing process consumes a substantial amount of water, detergents and additives. Additional drying pass required.

Washing and drying have an adverse impact on process costs and on the ecology of print production.

Nevertheless, haptics and brillancy are benefits of reactive and acid, compared to pigment prints.
4. REACTIVE PRINTING

4.1. GENERAL INFORMATION

REACTIVE ink is used on fabric made of cellulosic fibers such as cotton, linen, viscose, etc. It may also be used for printing on nylon substrates.

REACTIVE printing requires an alkaline environment for dye fixation. This is provided through inkjet preparation of the substrate. Dependent on substrate, the preparation can be done in an inline or an offline process.

Dye fixation is achieved through a steaming process. As per requirement of the substrate, steaming can be done inline or offline. Dry heat fixation would be possible too.

Unfixed dyes and pre-treatment chemicals need to be removed by a post-print washing process.

REACTIVE prints are known for a good wash fastness, fine haptics and brilliant colors, achieved by thorough cleaning in a post-print washing process.

Typical applications are fashion fabrics, cotton and cotton/viscose blended bed sheets, terry towels and other cellulosic based substrates.
4. REACTIVE PRINTING

4.2. EXAMPLE: TERRY TOWEL PRINT PRODUCTION

TERRY TOWEL PRINT LINE

Typical REACTIVE print applications are terry towels or bathrobes. Such items are more and more fashionable and are considered as a personal statement. Fancy, multi-color designs are economical with the digital print process only.

A typical terry towel layout is an all-inline print process, followed by offline washing. Terry and velour need a perfect penetration control.

Post-print washing for reactive terry towel prints is mandatory.

Aside beach towels, the promotional market as well as the health and beauty segment are creating new demand.

For more details: TOWEL leaflet
5. ACID PRINTING

5.1. GENERAL INFORMATION

ACID ink is used to print polyamide fibers as well as silk and wool. An acidic environment for fixation of dyes is provided through digital inkjet preparation of the fabric.

When printing polyamide pile substrate, it is recommended to raise and open the pile by pre-washing or through a steam treatment to achieve a homogeneous print result with good penetration.

Polyamide substrates printed as piece goods need a special sandwich washer for removal of unfixed dyes and acidic chemicals.

ACID prints are known for good fastness properties. Nevertheless, if special requirements on wash or light fastness are required, pre-metallized inks are available. Such inks are good for improved light and chlorine fastness.
ACID print lines are more complex than a simple print and dry process. Most important criteria for velour or loop fabric is penetration and sharpness of the print. Typical ACID print applications are upholstery and fabrics for public transport vehicles or transport fabrics made from wool or polyamide, or a blend of these fibers.

“Wet in Wet” print process, followed by inline steaming, reduces energy consumption to a minimum, as steaming time is reduced by more than 50%.

Proper washing and adjustment of pH level of the printed substrate is essential to achieve good rub fastness and durable print results.

Typical applications are upholstery velour and seating fabrics for the public transport such as train systems, cable cars, buses and aircrafts.
6. DISPERSE / SUBLIMATION PRINTING

6.1. GENERAL INFORMATION

DISPERSE or SUBLIMATION inks are categorized by their molecular structure. They are also known as low, medium and high energy disperse inks. The denomination DISPERSE is referring to the ink characteristics, as solid dye particles are kept evenly distributed within the ink by a dispersion to reduce risk of sedimentation/aggregation/agglomeration to a minimum. SUBLIMATION INK is the more accurate denomination, as it describes the dye and its physical fixation process. Solid dye particles – by heating at sublimation temperature - go from their solid state (without liquid) into their gaseus state, which is the physical description of sublimation. Dye in a gaseous state diffuses into the fiber and is locked in its solid state inside the fiber after cooling.

Sublimation inks are used for PES fiber based substrates and may also be used for EDP (Easy dyable PES) and CDP (Cationic dyable PES).

Low energy DISPERSE dyes are typically used in transfer sublimation process. Printing is done on transfer media (paper). The image is later transferred by contact of paper and substrate under heat and pressure onto the substrate. This process is ideal for fashion, advertisements and similar substrates with high brilliancy requirement and acceptance of limited light fastness.

Medium energy (direct sublimation) dyes are typically used on medium heavy substrates incl. velour and Raschel fabrics. Such fabrics need deep penetration for which transfer printing has its limitation. Direct sublimation inks achieve a good color yield, with bright colors and improved light fastness.

High energy dyes require more energy to sublime. The more energy required to sublime, the better is the light fastness, as it also needs more energy to fade out. High energy disperse inks are used for long lasting outdoor and automotive products.

PES DISPERSE printing covers a wide range of products incl. shower curtains, window fashion, flags & banners, etc.
6. DISPERSE / SUBLIMATION PRINTING

6.2. EXAMPLE: PES BLANKET PRINT LINE

The typical representative for a medium energy disperse application is a PES blanket print line.

Dye fixation is commonly done in a hot air condition and may also be done in superheated steam at 180 °C, reducing the risk of ghost prints with delicate designs. For high temperature steam fixation, a loop steamer is the most commonly used equipment to achieve excellent prints and good dye penetration and fixation.

Deep penetration is mandatory to achieve deep colors on both sides of the blanket, although they are printed from one side only.
7. VAT INDANTHRENE® PRINTING

7.1. GENERAL INFORMATION

VAT PRINT LINE

VAT printing is based on INDANTHRENE® dyes which are known for unsurpassed fastness properties on any kind of cellulosic and regenerated cellulose fibers. Prints with VAT dyes easily withstand natural UV light exposure, boil washing and even resist chlorine bleach to a great extent.

VAT printing is more complex compared to other direct-to-fabric printing solutions, but the achieved properties of end products are paying well for the additional steps in processing.

After drying, the dyes need to be fixed on the substrate. Dyes can only merge into the fiber and fix in liquid shape at a pH 14 condition inside a steamer. As fixation needs to be free from oxygen and in a super-heated condition of 125 to 130 °C, fixation is mostly done in a flash ager.

For final fixation, the substrate undergoes an oxidization process by passing through a peroxide bath, before final boil washing and soaping, followed by rinsing and drying.
Through the wet finishing process, VAT dyes also provide excellent penetration, which improves abrasion resistance. Together with resistance against daylight, wash and chlorine bleach, this makes VAT the ideal dye for cellulosic based home furnishing incl. upholstery, window fashion and table linen.

Workwear is frequently washed using concentrated detergents. For hygienic reasons, washing is often supported by chlorine as an additive. No other but VAT dyes withstand such cleaning procedure. VAT INDANTHRENE® on cellulosic fibers is the only solution for products including institutional textiles, medical workwear, shoe fashion and airline uniforms.

Due to its high performance, VAT INDANTHRENE® prints are ideal for heavy duty environments and are also used for clothing in the security and special forces segment incl. camouflage fabrics for technical equipment.
Ecologic needs are forcing the industry to look out for environmental-friendly processes. PIGMENT printing is the most eco-friendly print method today. Energy consumption is less than one third of a print process that requires steaming and washing. Water consumption and effluent discharge for post-print finishing is more or less completely eliminated. With the latest ink developments, dry and wet rub fastness are in line with conventional pigment printing and the haptics has drastically improved.

As Pigment inks fix on almost any fiber, they are perfect to print multifiber blended fabrics.

As Pigment inks fix on almost any fiber, they are perfect to print multifiber blended fabrics.
Due to the simple and environmental-friendly process, PIGMENT printing becomes very attractive and the applications grow rapidly. It is not just used for textile substrates with demand of high light fastness such as window fashion or outdoor use, but also gets its share in fashion, bedding, as well as for technical applications.
9. CATIONIC PRINTING

9.1. GENERAL INFORMATION

CATIONIC dyes, especially when used in combination with acrylic fibers are well resistant against UV light and severe weather conditions and are therefore ideal for outdoor use such as canopies, shadowing systems.

Acrylic fiber printing may include artificial fur, acrylic blankets as well as outdoor fabrics. Additionally, printing of CDP (cationic dyeable polyester) becomes popular too, as the dyes do not require high temperature fixation but can easily be fixed in saturated steam condition. The printing machine includes 2 separate ink systems and separate print heads on the same carriage, which enables printing with ACID or CATIONIC inks and complete processing on the same production line.
## COLARIS MODELS

<table>
<thead>
<tr>
<th>Model</th>
<th>COLARIS 12-1200T</th>
<th>COLARIS 12-2200</th>
<th>COLARIS 24-2200</th>
<th>COLARIS 48-2200</th>
<th>COLARIS 48-2600</th>
<th>COLARIS 48-3400</th>
<th>COLARIS 96-2200</th>
<th>COLARIS 96-2600</th>
<th>COLARIS 96-3400</th>
<th>COLARIS 96-2400</th>
<th>COLARIS 96-5200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. conf. (color groups × heads)</td>
<td>12 × 1</td>
<td>12 × 1</td>
<td>12 × 2</td>
<td>6 × 8</td>
<td>12 × 8</td>
<td>6 × 8</td>
<td>12 × 8</td>
<td>6 × 8</td>
<td>12 × 8</td>
<td>6 × 8</td>
<td>12 × 8</td>
</tr>
<tr>
<td>Max. print width [mm]</td>
<td>1200 × 1200</td>
<td>2200</td>
<td>2200</td>
<td>2600</td>
<td>3400</td>
<td>2200</td>
<td>2600</td>
<td>3400</td>
<td>4200</td>
<td>4200</td>
<td>5200</td>
</tr>
<tr>
<td>Max. number of colors</td>
<td>12</td>
<td>12 or 6</td>
<td>12 or 6</td>
<td>6</td>
<td>12 or 6</td>
<td>6</td>
<td>12 or 6</td>
<td>6</td>
<td>12 or 6</td>
<td>6</td>
<td>12 or 6</td>
</tr>
<tr>
<td>Print heads per color</td>
<td>1</td>
<td>1 or 2</td>
<td>2 or 4</td>
<td>8</td>
<td>8 or 16</td>
<td>8</td>
<td>8 or 16</td>
<td>8</td>
<td>8 or 16</td>
<td>8</td>
<td>8 or 16</td>
</tr>
<tr>
<td>Booster ink supply system</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
</tr>
<tr>
<td>Thermoplastic gluing device</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
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<td>opt.</td>
</tr>
<tr>
<td>PVA wet gluing device</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
</tr>
<tr>
<td>Integrated unrolling</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
</tr>
<tr>
<td>Moving press roller</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
</tr>
<tr>
<td>Belt washing device</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
</tr>
<tr>
<td>Tile positioning device</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
<td>opt.</td>
</tr>
<tr>
<td>CHROMOJET Inline applicator</td>
<td>opt. 256/512</td>
<td>opt. 256/512</td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Refillable ink tanks</td>
<td>2 l</td>
<td>5 l</td>
<td>5 l</td>
<td></td>
<td></td>
<td>10 l</td>
<td></td>
<td></td>
<td>10 l</td>
<td>10 l with refill-pump</td>
<td></td>
</tr>
<tr>
<td>Print heads</td>
<td>FUJIFILM Dimatix StarFire™</td>
<td>XS with 7 pl; SA with 12 pl; MA with 30 pl; LA with 80 pl</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Ink circulation system</td>
<td>Permanent ink circulation with 3-stage filtration to avoid blockage and sedimentation - especially needed for pigment-, disperse-, and vat inks</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Print head temperature control</td>
<td>To keep the temperature of the print head constant to avoid thermal expansion effecting print precision</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Ink temperature control</td>
<td>Operated at 24°C ±/− 2°C</td>
<td>The ink and the carriage are kept at a constant temperature to guarantee constant viscosity</td>
<td></td>
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</tr>
<tr>
<td>Ink system</td>
<td>From ZIMMER AUSTRIA, certified ink can be used (from different suppliers)</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Print head cleaning</td>
<td>Manual</td>
<td>Automatic cleaning, wiping, spraying and vacuum system</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Head access</td>
<td>Access single heads from front</td>
<td>Slide-out frames to access all heads of one color</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Pattern handling</td>
<td>Unlimited number of patterns with any length can be loaded (just limited by memory)</td>
<td></td>
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<tr>
<td>File format to print</td>
<td>TIFF layers generated by most commercial RIPs</td>
<td></td>
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<td></td>
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<tr>
<td>Print server</td>
<td>High performance PC with Windows 10, 10 GB Ethernet; 1TB SSD; 64 GB RAM</td>
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<tr>
<td>Conveyor belt</td>
<td>Table Endless Kevlar belt for highest precision with needles for carpet or thermoplastic/permanent gluing system</td>
<td></td>
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<td></td>
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<tr>
<td>Roller diameter [mm]</td>
<td>n.a.</td>
<td>300</td>
<td>300</td>
<td>400</td>
<td>400</td>
<td>300</td>
<td>400</td>
<td>400</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Head drive</td>
<td>Belt drive</td>
<td>Linear motor drive</td>
<td></td>
<td></td>
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<tr>
<td>Data transfer</td>
<td>Glass fiber cables between print server and print head driver</td>
<td></td>
<td></td>
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<tr>
<td>Online service</td>
<td>Remote access</td>
<td></td>
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<tr>
<td>Ink systems</td>
<td>Pigment, VAT, Disperse, Acid, Reactive, Direct Sublimation, Cationic</td>
<td></td>
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</tr>
</tbody>
</table>
11. COLARIS FEATURES AND COMPONENTS

11.1. INTEGRATED MACHINE COMPONENTS

1. Easy access to all printheads and electronic boards on the print carriage facilitates maintenance and service.

2. Ergonomic HMI (human-machine interface) offers comfortable print operation. Print job controls, machine parameter settings and status indications are permanently displayed together.

3. FUJIFILM Dimatix Starfire® print heads are robust and repairable, reducing operational costs to a minimum.

4. The layout of the ink supply tanks, the filter cartridges and the pump systems offer comfortable ink refilling and color system maintenance from outside of the machine.
11. COLARIS FEATURES AND COMPONENTS

11.2. INTEGRATED MACHINE COMPONENTS

Print blanket washing unit is easy to remove for maintenance purpose. An integrated water reservoir allows to recirculate wash water for an eco-friendly operation.

Permanent glue for fixing of printing substrate can be activated by IR heater for fine adjustment of stickiness.

Traversing fabric press roller is synchronized with transport belt to accommodate sensitive fabric without leaving pressure marks in printed image.

Automatic capping and wet cleaning with spray wash and vacuum extraction, not only for the print head, but for print carriage base plate alike, secures optimum print head performance over long service intervals.
12. PROCESS EQUIPMENT

12.1. INLINE COMPONENTS

Fabric feeding and guiding systems are designed individually as per need of printing substrate. They may include A-frame unwinder, J-box, roller compensator, weft alignment device, pre-steamer, draw frame or lattice guiding rollers and other specialties to guarantee best fabric control.

The SupraFIX SHS combined steam fixation and drying system is the most economic, one pass fixation system developing reactive dyes in a wet on wet print process. As fixation is done before drying, the energy consumption and handling is reduced to a minimum.

Inline Inkjet pre-treatment systems for wet on wet print technology can be supplied as per fabric requirement. Digital inkjet pre-treatment by CHROMOJET is used for heavy pile substrates. Low add on system MAGNOROLL-6R is ideal for surface application where only a slight wetting and functionalization of the substrate is required.

The big variety of substrates and inks has different requirements for processing. IR dryers as well as single-pass and multi-pass hot air nozzle dryers – with or without conveyor – cover all the technological needs for best print results.
12. COLARIS FEATURES AND COMPONENTS

12.2. OFFLINE COMPONENTS

Laboratory piece good printers can be used for design development, small strike-off prints and sampling to keep production printer free from sampling load. Pieces of maximum 120/120 cm can be placed on the printer.

The CHROMOJET TableTop Printer is a perfect laboratory applicator, especially for chemical manufacturers, to test and develop digital functionalization chemistry.

Post print finishing lines are common in velour and voluminous substrate sample printing. Without intermediate handling the fabric is passing through steaming-washing and drying process to finish products in one go.

Reactive post print washing machine used for terry towel washing. A short and compact washer is ideal for the capacity of a small terry towel print line.
13. PRINT HEAD

13.1. TECHNOLOGY

**StarFire™ PRINT HEAD**

**TECHNICAL FEATURES**

- Robust and reliable construction
- Coated metal nozzle plate - to withstand abrasion and resist damage
- High firing frequency - for high productivity
- High drop velocity - distance between print head and fabric can be up to 6 mm
- VersaDrop™- incorporated binary and greyscale jetting modes
- RediJet™- continuous ink recirculation system to avoid nozzle blockage and to reduce ink waste
- 4 interchangeable print head models with different drop sizes for a wide range of applications

**TECHNICAL DATA**

ZIMMER AUSTRIA offers 4 different models of the new high performance industrial inkjet print heads from FUJIFILM Dimatix.

The StarFire™ SG1024 (XSA/SA/MA/LA) is a compact, self-contained unit built to withstand demanding industrial textile printing and other applications. It uses field proven materials to deliver consistent output over a long service life with continuous ink recirculation and single color operation at 400 dpi. Equipped with a single replaceable metal nozzle plate that is designed to withstand abrasion and to resist damage.

**INK SUPPLY & CIRCULATION SYSTEM**

<table>
<thead>
<tr>
<th>StarFire™ Print head models</th>
<th>1024/XSA</th>
<th>1024/SA</th>
<th>1024/MA</th>
<th>1024/LA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop sizes</td>
<td>7 - 21 pl</td>
<td>12 - 35 pl</td>
<td>30 - 75 pl</td>
<td>80 - 240 pl</td>
</tr>
<tr>
<td>Applications</td>
<td>light fabrics i.e. wash labels, lanyards, deco tapes, fashion</td>
<td>medium fabrics i.e. belts, camouflage, home textiles</td>
<td>heavy fabrics i.e. heavy duty belts, technical webbings, terry towels, velours</td>
<td>pile production i.e. carpets, blankets, felts</td>
</tr>
</tbody>
</table>
13. PRINT HEAD

13.2. RECONDITION CENTER

Print heads are a significant cost factor in digital printing systems. Nevertheless, our experience shows that rather deposits or mechanical damage result in malfunctioning printheads than natural aging. Usually, clogged printheads are no longer usable and must be replaced. To relief our customers and to extend the print head’s lifetime significantly, ZIMMER AUSTRIA built up a great deal of knowledge and technology to understand, clean and repair StarFire™ print heads. Depending on the error pattern and ink used, different approaches, chemicals and procedures are applied to restore print heads. It also required significant investments in a cleanroom, exhaust, pumps, tanks, process controls, specialized tools and equipment, microscopes, databases, and more.
Our TECHNOLOGY CENTER is the heart and source of all our developments and innovations. New technologies and processes are developed and tested on individual textiles, carpets, narrow fabrics and other materials.

We are equipped with all our technologies including CHROMOJET, COLARIS, coating systems and a comprehensive range of testing and laboratory equipment. But most important is the staff working there - all of them are specialists in their field.

ZIMMER AUSTRIA laboratories are furnished with state of the art facilities including equipment for ink development and ink evaluation.

The dropwatcher evaluates the qualification of inks from different manufacturers for COLARIS printers and also controls ink samples provided by certified manufacturers for additional customer protection.
14. ZIMMER TECHNOLOGY & APPLICATION CENTER

14.2. EQUIPMENT & FACILITIES

The Technology & Application Center supports machinery and technology development. It further gives proof to customers about results on their own fabrics.

It is also used as a training center for customer personnel in case of new product developments.
All machines and components from ZIMMER AUSTRIA are strictly inspected and tested before shipping to customers to ensure efficient installation and best performance with 100% satisfaction.

COLARIS on-site customer support is guaranteed by service partners and ZIMMER AUSTRIA engineers and technologists.

This setup guarantees a short response time on a service call from a customer.