MACHINERY MANUFACTURER

Zimmer AUSTRIA

PIONEERING INNOVATIONS
150 YEARS

COLARIS
textile prints

DIGITAL PRINTING SYSTEMS

04/2024

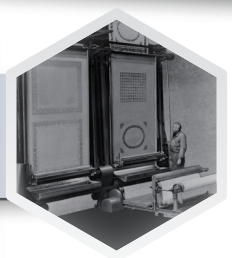
content

highlights

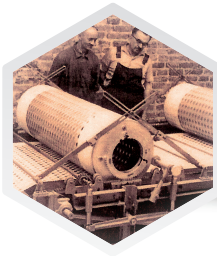
- digital workflow from design through output
- open ink system allows free selection from certified ink suppliers
- permanent ink circulation system for efficient production
- automatic printhead cleaning system
- printhead re-condition center for extended printhead service life
- modular concept for wet-on-dry offline or wet-on-wet inline print production
- environmentally-friendly, sustainable process

milestones

1874 QUALITY SINCE 1874
Factory Franz Zimmer´s Erben KG Warndorf

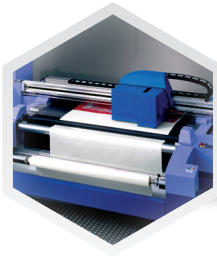


1951 Start of ZIMMER AUSTRIA -
first duplex blanket printing machine



1955 RSD rotary screen printer

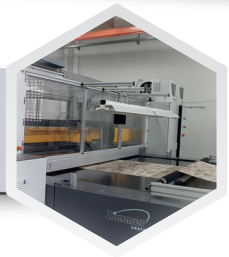
1976 CHROMOTRONIC digital carpet printer



2001 CHROMOTEX digital inkjet printer
for special applications

2008 COLARIS digital inkjet printer for textile

2012 COLARIS-NF
narrow single-pass printer for webbings



2022 COLARIS digital camouflage printing system

decision guidance

1. Which fiber, size or target market do you seek for and what's your fastness requirement?
2. Do you have equipment available, which you would like to integrate into a new print line?
3. Is there a specific ink supplier you wish to work with? Will you require technical and technological support from the ink supplier?
4. Is your plant and the environment prepared for a fully digital workflow? Industrial production requires process stability.
5. Which software is most suitable for your business and how do you convert the design into a printable color?
6. How do you define, measure and communicate the colors internally and with the costumer? Do you have a measuring system such as spectro-photometer?
7. Which requirements or skills are needed to operate a digital print line at a given capacity, regarding to the utilities or the operator?

R&D SUPPORT
APPLICATION TECHNOLOGY

MACHINERY
ENGINEERING & MANUFACTURING

SERVICE
SOFTWARE & TECHNICAL SUPPORT

ink classes

THE INK SELECTION DEPENDS ON FIBER AND FINAL APPLICATION.

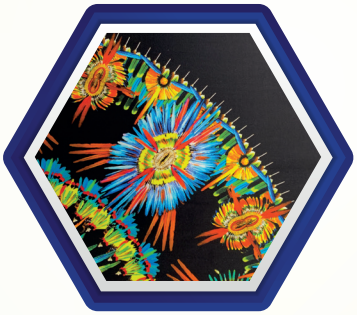
REACTIVE

cellulosic, protein based, and polyamide fibers

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

PROCESS REQUIREMENTS
- pre-treatment
- inkjet printing, drying
- steaming
- post-print washing
- drying

END PRODUCTS
fashion,
home furnishing,
decorative fabrics,
terry towels



ACID | METAL COMPLEX

protein based, and polyamide fibers

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

PROCESS REQUIREMENTS
- pre-treatment
- inkjet printing, drying
- steaming
- post-print washing
- drying

END PRODUCTS
fashion & lingerie,
sports & swimwear,
flag & banners,
umbrellas

CATIONIC

acrylic fibers, cationic PES

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

PROCESS REQUIREMENTS
- pre-treatment
- inkjet printing, drying
- steaming
- washing
- drying

END PRODUCTS
outdoor fabrics,
blankets,
fashion

DISPERSE | SUBLIMATION

PES fibers

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

PROCESS REQUIREMENTS

- pre-treatment
- inkjet printing, drying
- thermal fixation
- reductive washing
- drying

END PRODUCTS

fashion,
home furnishing,
flag & banners,
parasols,
blankets

VAT

cellulosic based and polyamide fibers

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

PROCESS REQUIREMENTS

- pre-treatment
- inkjet printing, drying
- inline padding, steaming, washing
- drying

END PRODUCTS

high performance
home furnishing,
workwear,
terry towels

PIGMENT

any kind of fibers

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

PROCESS REQUIREMENTS

- pre-treatment
- inkjet printing, drying
- thermal fixation

END PRODUCTS

fashion,
home textiles,
outdoor fabrics,
sunshades,
advertising fabrics

pre-print process

Digital printing is a complex task for which the entire workflow has to match. From design, color management and communication up to printer calibration - all must be perfect for a superb result.

Essential tools are fast computers with fast networks, a lot of memory space and well trained operators.

PRINTER CALIBRATION

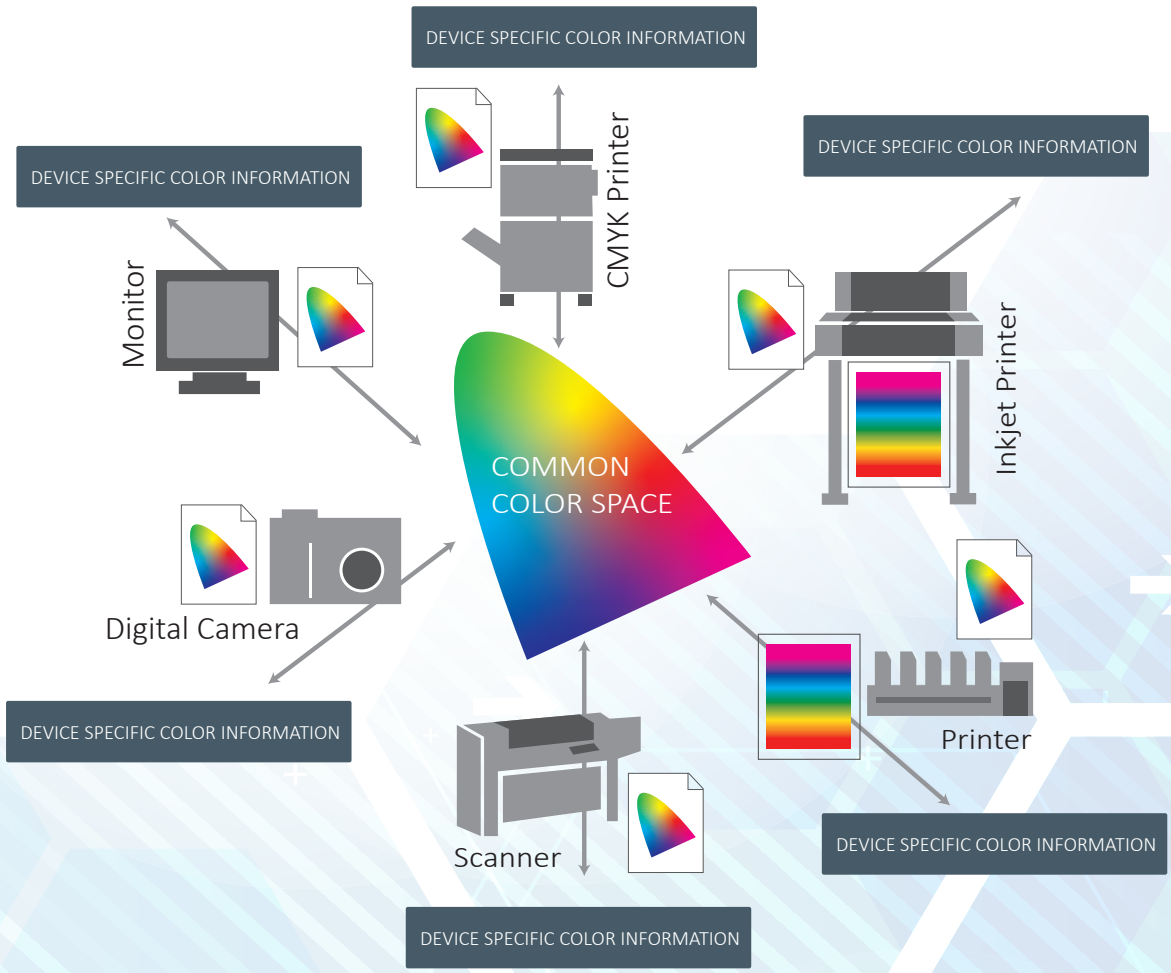
Basic process setup and print resolution must be defined and stable before a calibration is made.

Calibration is a software supported process made in several steps (linearization, printing and measuring targets, generating of printer and ICC profiles).

COLOR MEASUREMENT

Digital printing needs digital information to communicate. Color measurement is essential. Different measuring devices can be used - depending on substrate and surface.

Color is normally communicated within the L*a*b color-system.



COLOR CALIBRATION

Color calibration is needed to communicate and match colors. This makes sure that colors appear identical on different devices and printers.

A re-calibration is normally needed if a major parameter (base material, ink, fixation process, ...) is changed within the total process.

DESIGN SOFTWARE

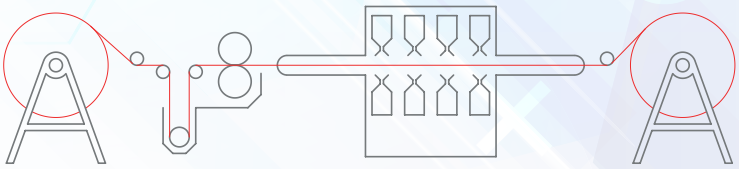
There are a number of pixel- or vector- based software tools on the market: Photoshop®, Gimp®, Nedgraphics®, Illustrator®, Corel Draw®...

RIP PROCESS

During the RIP process the color information from the art-work file is transformed and split into channels. For each process color (ink) one channel is used.

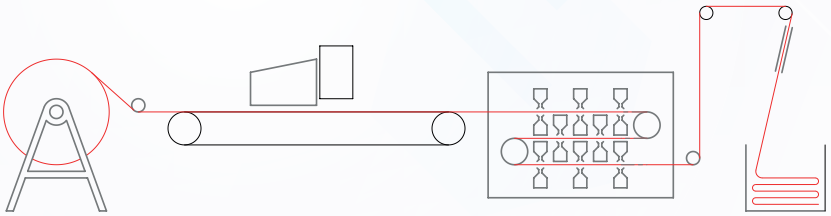
reactive printing

Reactive ink is used on fabrics made of cellulosic fibers such as cotton, linen, viscose, etc. It may also be used for printing on nylon substrates. For control of penetration and to achieve bright and brilliant colors the fabric needs a special inkjet preparation. Depending on the substrate, the preparation can be done as an inline or an offline process.



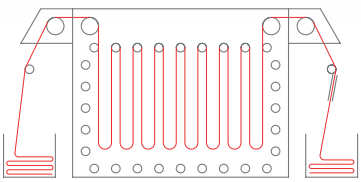
1

OFFLINE INKJET PRE-TREATMENT:
padder application followed by stenter drying
is required for wet-on-dry print process



OFFLINE DIGITAL PRINTING:
printing and drying on ready for inkjet prepared fabric

2



3

OFFLINE DYE FIXATION PROCESS:
saturated steam

TECHNICAL DATA

working widths:
2200 | 2600 | 3400 mm

print substrates:
woven, nonwoven, knitted fabrics

color groups:
up to 12

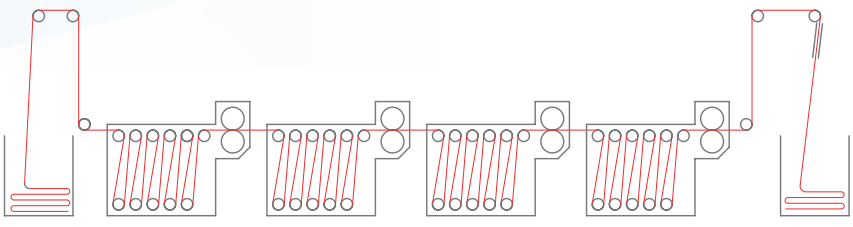
ink class per printer:
1 ink class at up to 12 colors
2 ink classes at up to 6 colors
3 ink classes at max. 4 colors

number of printheads:
up to 8 per color group, or 16 per color, max. 96 possible

production capacity:
from 60 to 1100 m²/h

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

Typical applications are fashion fabrics, cotton and cotton/viscose blended bed sheets, terry towels and other cellulose-based substrates.

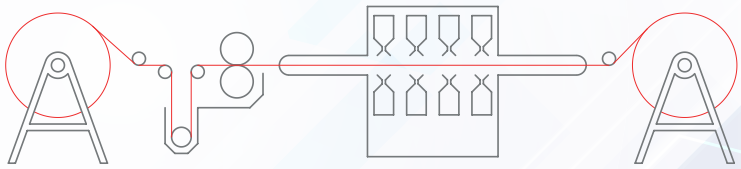


OFFLINE POST-PRINT WASHING:
multi-step washing system

4

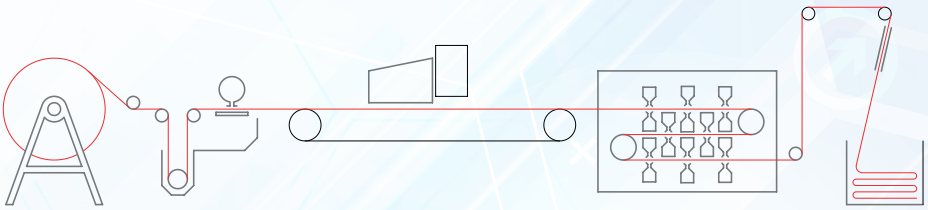
towel printing

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. COLARIS printers with automatic seam detection can adjust the print image to a slightly varying towel length.



1

OFFLINE INKJET PRE-TREATMENT:
padder application followed by stenter drying
is required for wet-on-dry print process

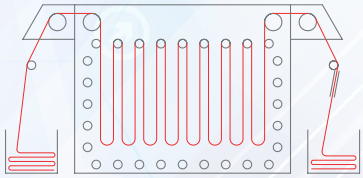


2

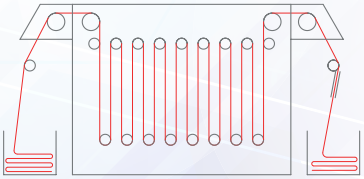
DIGITAL PRINTING:

a) INLINE wet-on-wet process – integrated inline fabric pre-treatment, followed by inkjet printing and drying
b) OFFLINE: printing and drying on ready for inkjet prepared fabric

STEAMER



THERMOSOL



3

OFFLINE DYE FIXATION PROCESS:
saturated steam or thermosol hot air fixation

TECHNICAL DATA

working widths:
2200 | 2600 | 3400 mm

print substrates:
woven, nonwoven, knitted fabrics

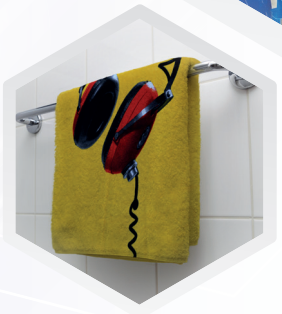
color groups:
up to 12

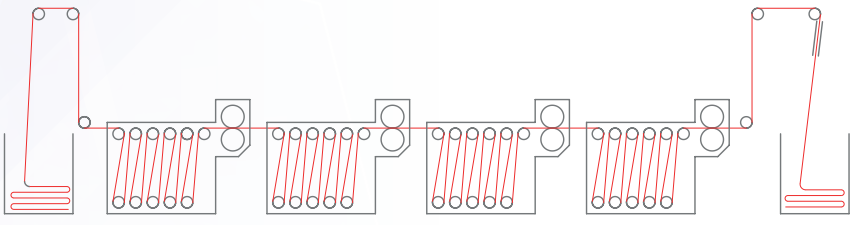
ink class per printer:
1 ink class at up to 12 colors
2 ink classes at up to 6 colors
3 ink classes at max. 4 colors

number of printheads:
up to 8 per color group, or 16 per color, max. 96 possible

production capacity:
from 60 to 1100 m²/h

Post-print washing is mandatory for reactive towel printing. Only through removal of unfixed dyes, good fastness properties can be achieved.

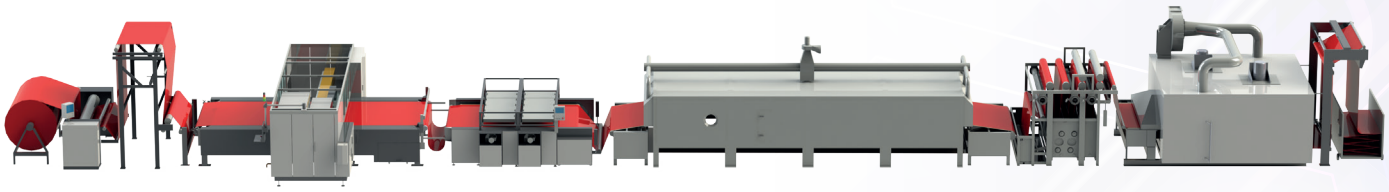




OFFLINE POST-PRINT WASHING:
multi-step washing system

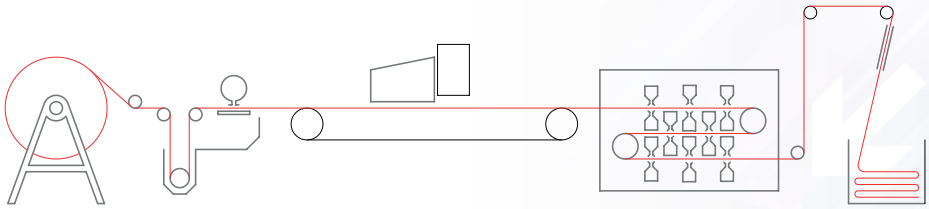
4

acid printing

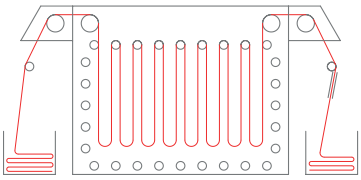


ACID print lines are more complex than a simple print and dry process. Most important criteria for velour or loop fabric are penetration and sharpness of the print. Typical acid print applications are upholstery and fabrics for public transport vehicles which are fabrics made from wool or polyamide, or a blend of these fibers.

1

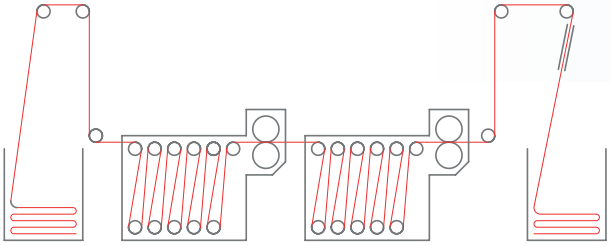


INLINE PRE-TREATMENT & DIGITAL PRINTING:
wet-on-wet process - integrated inline pre-treatment, followed by printing and drying.



2

DYE FIXATION PROCESS:
a) OFFLINE: saturated steam
b) INLINE: saturated steam



3

OFFLINE POST-PRINT WASHING:
multi-step washing system

Typical applications are upholstery, velour and seat furnishings for public transport vehicles such as train systems, cable cars, buses and aircrafts with high seat load.

ACID prints are known for good fastness properties. For extended fastness pre-metallized inks are available. Such inks are good for improved light and chlorine fastness.

TECHNICAL DATA

working widths:
2200 | 2600 | 3400 mm

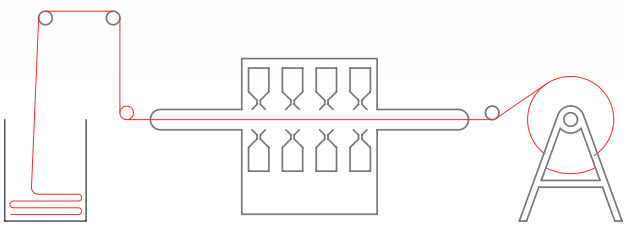
print substrates:
woven, nonwoven, knitted fabrics

color groups:
up to 12

ink class per printer:
1 ink class at up to 12 colors
2 ink classes at up to 6 colors
3 ink classes at max. 4 colors

number of printheads:
up to 8 per color group, or 16 per color, max. 96 possible

production capacity:
from 60 to 1100 m²/h

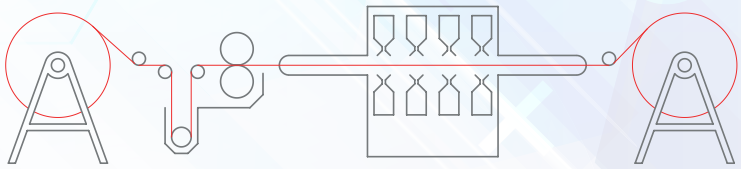


OFFLINE DRYING / FINISHING
plait - stenter dry - roll

4

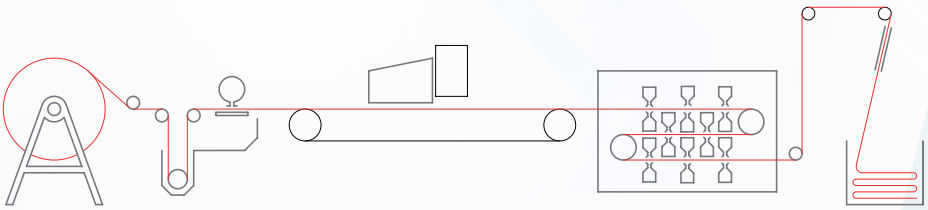
cationic printing

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 and awnings.



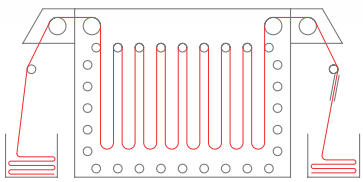
1

OFFLINE INKJET PRE-TREATMENT:
padder application followed by stenter drying
is required for wet-on-dry print process



2

DIGITAL PRINTING:
a) INLINE wet-on-wet process – integrated inline fabric pre-treatment, followed by inkjet printing and drying
b) OFFLINE: printing and drying on ready for inkjet prepared fabric



3

OFFLINE DYE FIXATION PROCESS:
saturated steam or thermosol hot air fixation

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.

TECHNICAL DATA

working widths:
2200 | 2600 | 3400 mm

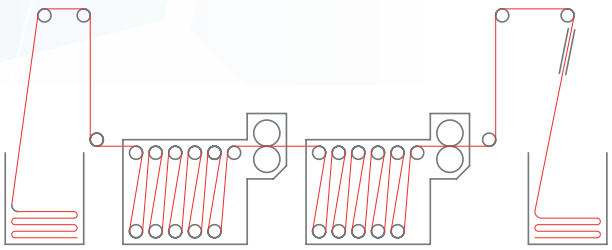
print substrates:
woven, nonwoven, knitted fabrics

color groups:
up to 12

ink class per printer:
1 ink class at up to 12 colors
2 ink classes at up to 6 colors
3 ink classes at max. 4 colors

number of printheads:
up to 8 per color group, or 16 per color, max. 96 possible

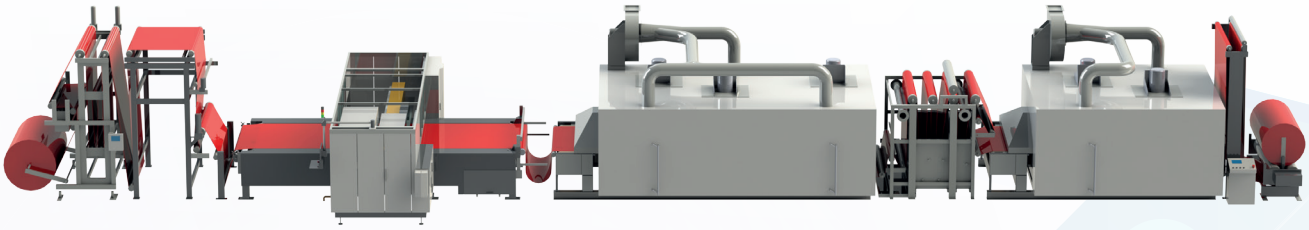
production capacity:
from 60 to 1100 m²/h



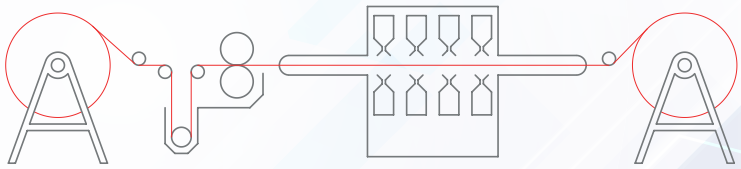
OFFLINE POST-PRINT WASHING:
multi-step washing system

4

disperse printing

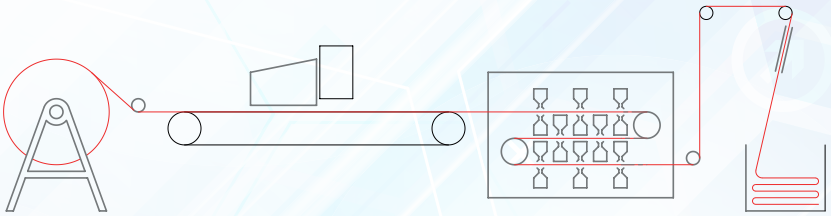


DISPERSE or SUBLIMATION inks are categorized by their molecular structure. They are also known as low, medium and high energy disperse inks. Disperse is referring to the ink characteristics, as solid dye particles are kept evenly distributed within the ink by a dispersion to reduce the risk of sedimentation/aggregation/agglomeration to a minimum.



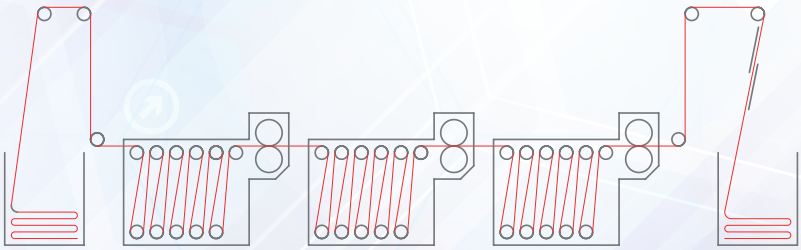
1

OFFLINE INKJET PRE-TREATMENT:
padder application followed by stenter drying
is required for wet-on-dry print process



2

OFFLINE DIGITAL PRINTING:
printing, drying and fixation of inks on ready for inkjet prepared fabric



3

OFFLINE POST-PRINT WASHING:
multi-step washing system

TECHNICAL DATA

working widths:
2200 | 2600 | 3400 mm

print substrates:
woven, nonwoven, knitted fabrics

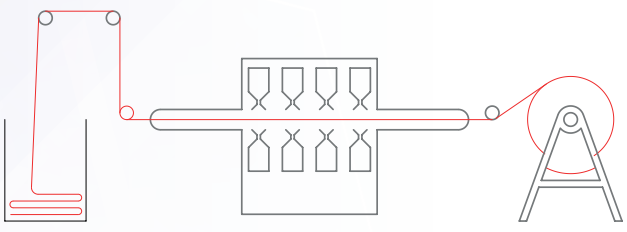
color groups:
up to 12

ink class per printer:
1 ink class at up to 12 colors
2 ink classes at up to 6 colors
3 ink classes at max. 4 colors

number of printheads:
up to 8 per color group, or 16 per color, max. 96 possible

production capacity:
from 60 to 1100 m²/h

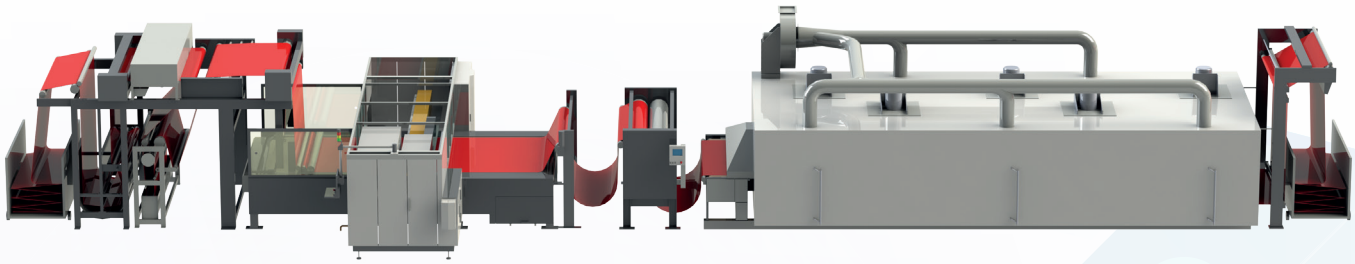
PES DISPERSE printing covers a wide range of products incl. shower curtains, window fashion, flag & banners, various outdoor fabrics, etc.



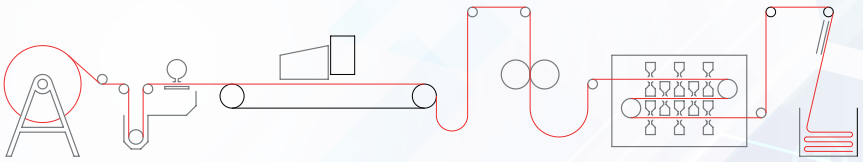
OFFLINE DRYING / FINISHING
plait - stenter dry - roll

4

blanket printing

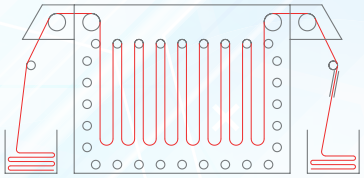


The typical representative for a medium energy disperse application is a PES blanket print line. PES blanket substrates, especially raschel blankets, need good penetration. COLARIS blanket printers may be configured a stand-alone printers or as a complex, fully integrated, all-inline production plant.



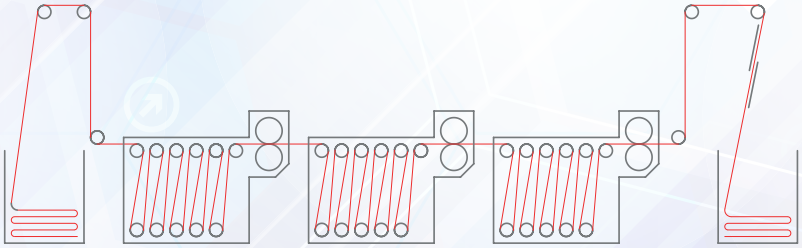
1

INLINE DIGITAL PRINTING:
wet-on-wet process – integrated inline fabric pre-treatment, followed by inkjet printing, penetration enhancer and drying



OFFLINE DYE FIXATION PROCESS:
saturated steam or thermosol hot air fixation

2



3

OFFLINE POST-PRINT WASHING:
multi-step washing system

Dye fixation is commonly performed in a hot air condition or using 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 at 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.

TECHNICAL DATA

working widths:
2200 | 2600 | 3400 mm

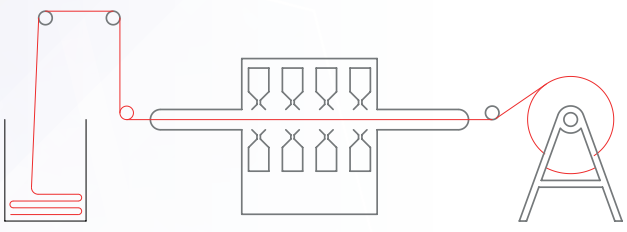
print substrates:
woven, nonwoven, knitted fabrics

color groups:
up to 12

ink class per printer:
1 ink class at up to 12 colors
2 ink classes at up to 6 colors
3 ink classes at max. 4 colors

number of printheads:
up to 8 per color group, or 16 per color, max. 96 possible

production capacity:
from 60 to 1100 m²/h



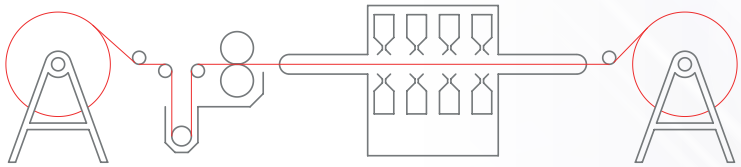
OFFLINE DRYING / FINISHING
plait - stenter dry - roll

4

VAT printing

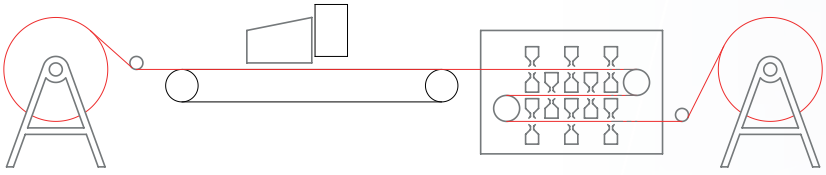
VAT printing is known for unsurpassed fastness properties on any kind of cellulosic and regenerated cellulose fibers. Prints with VAT dyes easily withstand natural UV light exposure, boil washing and even resist chlorine bleach to a great extent.

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.



1

OFFLINE INKJET PRE-TREATMENT:
padder application followed by stenter drying is required for wet-on-dry print process



2

OFFLINE DIGITAL PRINTING:
printing on ready for inkjet prepared fabric followed by infrared- or hot air drying

Due to their high performance VAT prints are ideal for heavy duty environments and are also used for clothing in the security and special forces segment incl. camouflage fabrics.

TECHNICAL DATA

working widths:
2200 | 2600 | 3400 mm

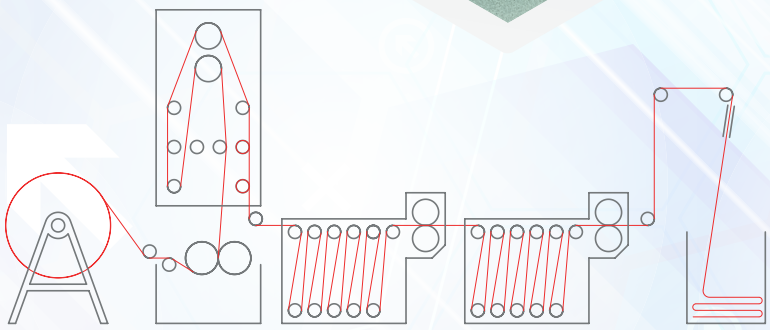
print substrates:
woven, nonwoven, knitted fabrics

color groups:
up to 12

ink class per printer:
1 ink class at up to 12 colors
2 ink classes at up to 6 colors
3 ink classes at max. 4 colors

number of printheads:
up to 8 per color group, or 16 per color, max. 96 possible

production capacity:
from 60 to 1100 m²/h



3

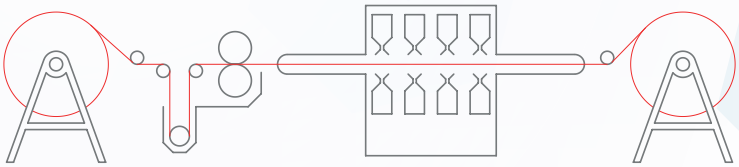
OFFLINE POST-PRINT PROCESSING:
padding, steam fixation, oxidizing, washing

After printing and drying the substrate needs to undergo a padding process where a reducing agent is applied to solubilize the dye. Through a steam fixation the dye develops on the substrate and is permanently fixed by undergoing an oxidation process after leaving the steamer.

pigment printing

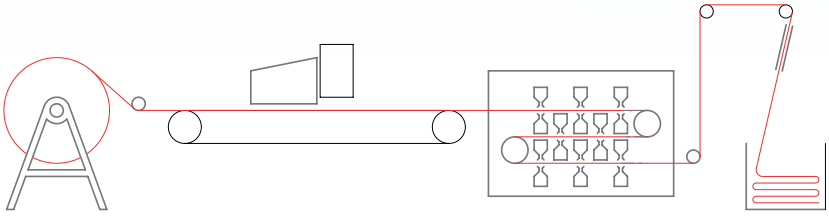
Ecological needs are forcing the industry to look out for environment-friendly processes.

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 are 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 have drastically improved.



1

OFFLINE INKJET PRE-TREATMENT:
padder application followed by stenter drying
is required for wet-on-dry print process



2

OFFLINE DIGITAL PRINTING:
printing on ready for inkjet prepared fabric
followed by infrared- or hot air drying, with optional inline polymerization

TECHNICAL DATA

working widths:
2200 | 2600 | 3400 mm

print substrates:
woven, nonwoven, knitted fabrics

color groups:
up to 12

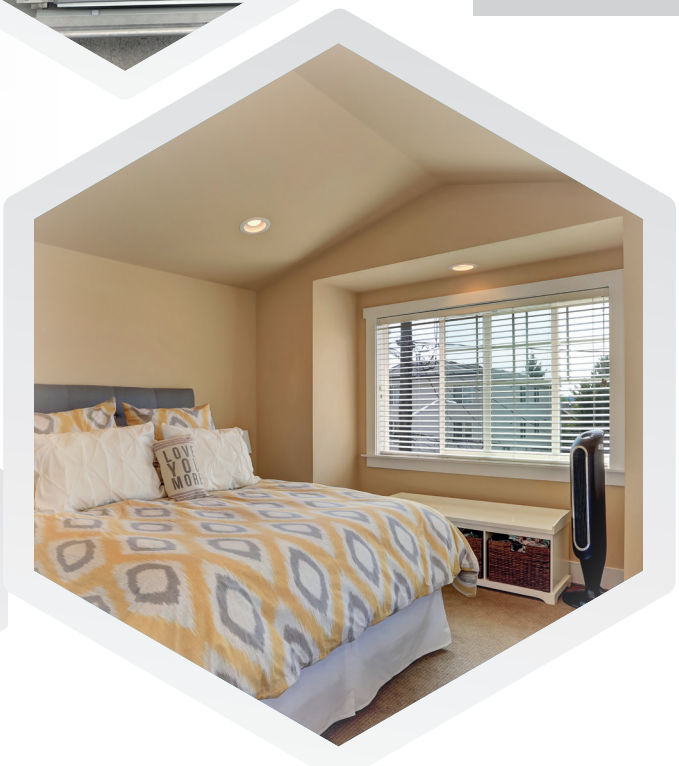
ink class per printer:
1 ink class at up to 12 colors
2 ink classes at up to 6 colors
3 ink classes at max. 4 colors

number of printheads:
up to 8 per color group, or 16 per color, max. 96 possible

production capacity:
from 60 to 1100 m²/h

Pigment prints are suitable for almost any fiber class and are therefore the only ink suitable for multi-fiber-based substrates.

Pigment prints are known for high light fastness. Accordingly, window fashion, sun blinds and outdoor fabrics including various technical textiles, are the key products printed with pigment inks. The simple and environment-friendly process is rapidly growing - not just for the afore-mentioned end products, but also within the fashion and home textile market.



machine components

The large variety of substrates suitable for COLARIS Digital Inkjet Printers requires various processes. The simplest option is stand-alone inkjet pre-treatment followed by a stand-alone print process and stand-alone post-print fixation.

Various machine components are available from ZIMMER AUSTRIA, which can be installed as offline or inline components.

For inline post-print washing, ZIMMER AUSTRIA can offer various combinations and dimensions of single-step or multi-step washing systems.

The ZIMMER AUSTRIA MODUS loop steamer is known for excellent color yield and perfect color fixation with saturated steam for reactive, acid or cationic dyes. It also is available as a loop polymerizer to cure pigment, or with superheated steam to fix disperse dyes on polyester substrates.

For inkjet pre-treatment ZIMMER AUSTRIA can provide MAGNOROLL coating units to be installed with a stenter as well as for inline pre-treatment. Applicators with vacuum extraction are used for inline pre-treatment of velour and other voluminous substrates as they are the best option to control moisture and chemical application at the same time.

Dryers are mostly installed inline, but can also be offered as a stand-alone unit or in combination with other machine components. Heating source may be electric IR heating, indirect steam, or thermal fluids. Also gas direct heated solutions are offered.

laboratory components

In addition to complex print lines, ZIMMER AUSTRIA offers a large range of laboratory equipment like sample printers or evaluation devices for process development by our customers.

COLARIS 12-1200T

TECHNICAL DATA

max. printable size:
1200/1200 mm

printhead model:
FUJIFILM Dimatix Starfire™
nozzle versions: XSA, SA, MA, LA

color groups:
up to 12 possible

ink setup:
1 ink class at up to 12 colors
2 ink classes at up to 6 colors
3 ink classes at max. 4 colors

POST-PRINT PROCESSING LINE

TECHNICAL DATA

working width:
1200 mm

Operation options:
for individual pieces or continuous processing

processing options:
steam fixation for dyes, post-print washing or pre-treatment application, drying or hot air curing

dyestuff classes:
reactive, acid, cationic, disperse, direct sublimation, pigment

COLARIS-IPT

Ink Performance Tester

TECHNICAL DATA

max. printing width:
65 mm

printhead model:
FUJIFILM Dimatix Starfire™
nozzle versions: XSA, SA, MA, LA

purpose of COLARIS-IPT:
ink development, ink & printheads performance testing

customers:
ink manufacturers,
textile and carpet printers

TECHNICAL DATA

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

The StarFire™ SG1024 (XSA/SA/MA/LA) is a compact, self-contained unit built to withstand demanding industrial textile and carpet 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. It is equipped with a replaceable metal nozzle plate.

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

printhead

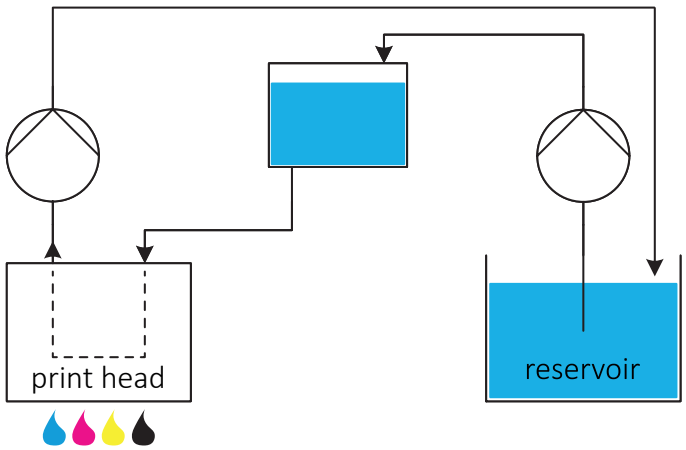
1024 XSA
DROP SIZES
7 - 21 pl
APPLICATIONS
light fabrics
i.e. wash labels, lanyards, deco tapes, fashion

1024 SA
DROP SIZES
12 - 35 pl
APPLICATIONS
medium fabrics
i.e.belts, camouflage, home textiles

1024 MA
DROP SIZES
30 - 75 pl
APPLICATIONS
heavy fabrics
i.e. technical webbings, terry towels, velours, transport fabrics

1024 LA
DROP SIZES
80 - 240 pl
APPLICATIONS
pile production
i.e. carpets, blankets

INK SUPPLY & CIRCULATION SYSTEM



recondition center

PRINTHEADS CAN BE COMPLETELY DISMANTLED

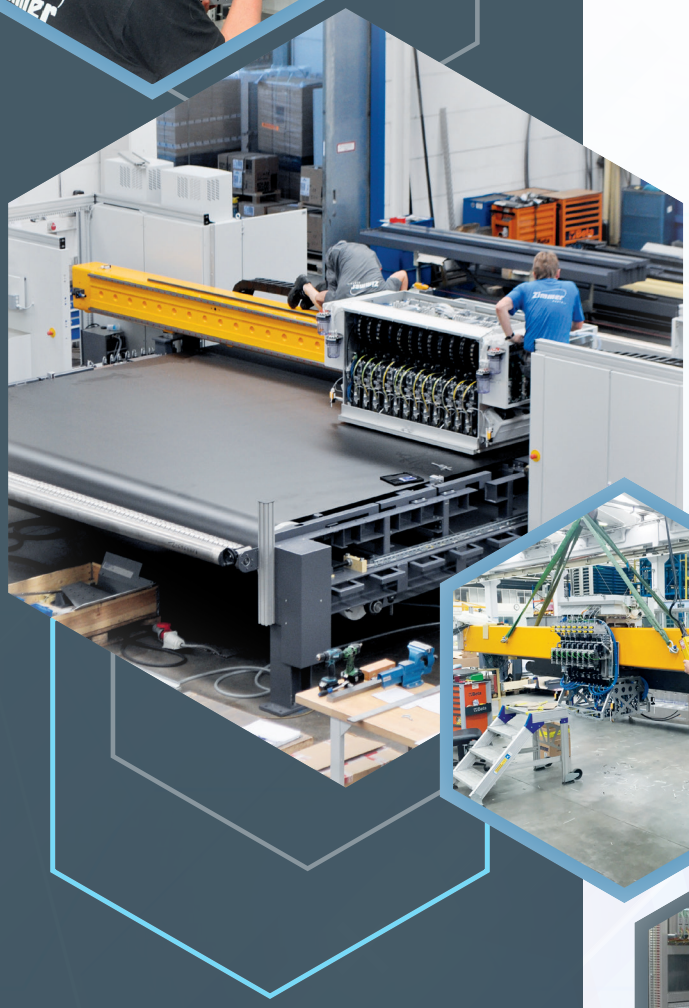
AUTOMATIC CLEANING PROCESSES

Printheads 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 relieve our customers and to extend the printheads service life, 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.

PACKING, BILLING, SHIPPING

manufacturing



ZIMMER AUSTRIA Digital Printing Systems is known for flexibility and for building tailor-made machines and systems. This is the reason why we remain one of few textile machine manufacturers with a deep, vertical inhouse manufacturing capability.

Starting from engineering to mechanical manufacturing, electronic and software development, machine and control cabinet assembly, programming, internal testing, we also provide shipping, on-site installation, start-up and training of customer personnel and most important: after sales service through our own team.

Additionally, we can offer on-site process development and optimization for a wide range of digital printing and coating applications.

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

The drop-watcher evaluates the qualification of inks from different manufacturers for COLARIS printers and controls ink samples provided by certified manufacturers for customer safety.

technology center

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.

Our facilities are fitted with all technologies including CHROMOJET, COLARIS Printing and Coating Systems, as well as with a comprehensive set-up of laboratory equipment. But most important is the staff working in the Technology Center: Each of them is a specialist in his field.

The technology and application center supports machinery and technology development. Furthermore, it gives proof to customers about results on their own products.

It is also used as a service center for our customers´ personnel in case of new product development, as well as for operator training .

COLARIS

MACHINERY
MANUFACTURER

chromojet

DIGITAL PRINTING
SYSTEMS

INNOVATION | QUALITY | SERVICE

Zimmer
AUSTRIA

ZIMMER MASCHINENBAU GMBH
DIGITAL PRINTING SYSTEMS

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Your competent partner for process development, engineering, manufacturing and implementation of industrial printing and coating systems.