EFFECTIVENESS AND PERFORMANCE FOR DIGITAL PRINTING
THANKS TO OUR EXPERTISE, WE CAN SUGGEST A PACKAGE OF PRODUCTS THAT CAN TECHNICALLY SUPPORT THE REQUIREMENTS OF ANY KIND OF DIGITAL PRINTING PROCESS.

OUR SOLUTION FOR DIGITAL PRINTING REPRESENT A VALID SUPPORT TO CONVEY REPRODUCED IMAGES A HIGH DEGREE OF RESOLUTION AS WELL AS COLOURS THAT ARE ALWAYS BRIGHT AND LIGHT-FAST ALL OVER THE TIME.
WHAT’S NEW IN DIGITAL TEXTILE PRINTING COMPARED TO TRADITIONAL PRINTING?

**EXTREME FLEXIBILITY**
- Higher service / faster response
- Print on demand
- Just in time customisation
- Faster introduction of new designs/patterns
- CAD-CAM systems substitute the cylinders and flat screens

**COST SAVING: OPTIMIZATION OF**
- Resources
- Production time
- Supplies
- Samples

**ENVIRONMENTAL FRIENDLY**
- Significant reduction of energy and water
DIGITAL PRINTING ON TEXTILE

CONVENTIONAL TECHNOLOGY vs INK-JET TECHNOLOGY

1. ORIGINAL DESIGN
   - IMAGE DESIGN
2. SAMPLE PRINTING
   - MASS PRODUCTION
   - DISPOSAL OF UNNECESSARY DYES
   - PLATE MAKING
   - DYE MATCHING & DYE MAKING
3. VOLUME PRINTING
   - PLATE WASHING AND STORAGE
4. POST PROCESSING

INK-JET TECHNOLOGY

1. ORIGINAL DESIGN
2. IMAGE LAYOUT
3. SAMPLE PRINTING
4. VOLUME PRINTING
5. POST PROCESSING

> ENERGY SAVING
> SIMPLE OPERATION PROCEDURE
> REDUCED ENVIRONMENTAL BURDEN
DIGITAL PRINTING ON TEXTILE

KEY PARAMETERS OF DIGITAL PRINTING

- **INK & INK SYSTEM**
- **PRINTHEAD**
- **SUBSTRATE**
- **IMAGE PROCESSING**
- **MOTION**

PRINT QUALITY
DIGITAL PRINTING PROCESS

WORKFLOW OF DIGITAL PRINTING PROCESS

100-110°C

Drying

102-105°C

Steaming

130-140°C

Drying

Padding

Printing

Washing

Bozzetto Solutions for Digital Printing
THE CINEMATIC VISCOSITY OF THE INK IS DEFINITELY LOW, 3–15 MM²/SEC.

THE DYES HAVE THE TENDENCY TO EXPAND ON THE TEXTILE FABRIC.

THICKENERS CANNOT BE ADDED IN THE INK BECAUSE OFTEN THE RHEOLOGICAL PROPERTIES ARE STRONGLY AFFECTED.

EVERY FABRIC NEEDS TO BE TREATED WITH SPECIFIC PRODUCT BEFORE PRINTING, IN ORDER TO OBTAIN A SPECIFIC PENETRATION OF THE INKS, AVOIDING IN THE MEANTIME PROBLEMS CONCERNING THE IMAGE SMUDGING.

BOZZETTO ANTI-MIGRATING AGENTS

MIROX P-INK
MIROX CFP
MIROX P-INK

HIGH PERFORMANCE ANTI-MIGRATING AGENT FOR THE PREPARATION OF TEXTILE GOODS BEFORE INK-JET PRINTING.

TECHNICAL FEATURES

- Allows to obtain a **HIGH DEFINITION OF THE PRINTING** with same depth and brightness of the whole fabric width
- Avoids the dyes migration during the drying
- The hand of PES fabrics is not affected
- It **IMPROVES THE STABILITY OF THE PADDING BATHS** by increasing the viscosity
- No residues formations on the guide rollers in the drying room
- It is **EASILY AND COMPLETELY REMOVED FROM FABRIC** by rinsing
BOZZETTO SOLUTIONS FOR DIGITAL PRINTING

MIROX CFP

SPECIAL COMPOUND FOR THE PRE-TREATMENT OF THE FABRICS TO BE DIGITALLY PRINTED WITH PIGMENT INKS

TECHNICAL FEATURES

- OUTSTANDING IMPROVEMENT OF THE COLOR YIELD AND DEPTHNESS (LESS CONSUMING OF THE INKS)
- HIGH DEFINITION OF THE PRINTING AREA
- COLOR SHADES ARE SIGNIFICANTLY BRIGHTER
- BETTER FIXATION AND FASTNESS TO CROCKING AND WASHING; LIGHTFASTNESS IS NOT AFFECTED
- NO RESIDUE FORMATION ON THE GUIDE ROLLERS IN THE DRYING ROOM
IN ORDER TO AVOID A DECREASING OF THE STABILITY OF THE DYESTUFF IS ALWAYS ADVISED TO NOT ADD CHEMICAL SUBSTANCE (E.G. ALKALI) IN THE INKS.

FOR THE PRINTING OF FABRIC WITH CELLULOSIC FIBERS (RAYON VISCOSÉ AND COTTON), TO PREVENT THE HYDROLYSIS OF THE REACTIVE INKS, IT IS USUALLY SUGGESTED AN ANTI-REDUCING AGENT DURING THE PRE-TREATMENT.

BOZZETTO ANTI-REDUCING AGENT

ISOPAL GL POWDER
ISOPAL GL POWDER

ANTI-REDUCING AGENT

TECHNICAL FEATURES

- SULPHONATED ORGANIC DERIVATIVE IN POWDER FORM
- ANTI-REDUCING AGENT FOR DYEING AND PRINTING; PREVENTS UNDESIRED COLOR CHANGES DUE TO INCONSTANT FACTORS SUCH AS STEAM, HIGH TEMPERATURES AND PROLONGED OPERATION TIMES
- ALSO ACTS AS OXIDIZING AGENT, STABLE IN STRONGLY ALKALINE CONDITIONS AND ALLOWS OBTAINING A REGULAR OXIDATION OF REDUCING DYSES WITHOUT OVER-OXIDATION
PRE - TREATMENT
THE KEY STEPS FOR AN EXCELLENT RESULT

3. INCREASE DRYING SPEED

- If the printed fabric has been pre-treated, there is also a benefit concerning the drying timing
- Short period for steaming and/or heatsetting.

4. AVOID CORROSION RISK ON NOZZLES AND DYESTUFFS STABILITY

- Chemical substances added in the inks causes corrosion of jet nozzle; the detrimental effect of the sodium chloride on steel surfaces is well known, for instance;
- Inks for use in ‘charged drop’ continuous printers should have low electrical conductivity.
- If salts is present in aqueous ink, it reduces the solubility of the dyes; (concentrated inks are required in jet printing due to the small droplets size).
DIGITAL PRINTING PROCESS

POST - TREATMENT

**FIXATION BY STEAMING**

**Reactive and Acid Dyes** are steamed under atmospheric pressure at 102°C.

High temperature steam is necessary for the fixation of disperse dyes on polyester. The TG of polyester in steam is lower than it is in dry air, and fixation is more efficient. Usually steam is heated to 170-180°C at atmospheric pressure, but sometimes pressure steaming at 130-150°C is used.

**Pigment Prints** are cured in hot air by a stenter or with a calander.
DIGITAL PRINTING PROCESS

POST - TREATMENT

In order to remove the un-fixed dyestuff, the **post-treatment** carried out with specific auxiliaries by exhaustion or in continuous line is the key to have good fastness and the brilliance.

<table>
<thead>
<tr>
<th>INK</th>
<th>APPLICATION</th>
<th>PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>REACTIVE</td>
<td>SOAPING AGENT</td>
<td>ISOPON HDS PLUS</td>
</tr>
<tr>
<td>ACID</td>
<td>SOAPING AGENT</td>
<td>ISOPON A35</td>
</tr>
<tr>
<td>DISPERSE</td>
<td>DISPERSING AGENT</td>
<td>ISOPON SPO</td>
</tr>
<tr>
<td>PIGMENT</td>
<td>FIXING AGENT</td>
<td>FISSAT DFI</td>
</tr>
</tbody>
</table>
ISOPON HDS PLUS

THE BEST SOLUTION FOR SOAPING PROCESSES

TECHNICAL FEATURES

- Specific low foam washing-off agent of dyed and printed goods with reactive dyes and inks
- Effective in the removal of unfixed reactive dyes, even in presence of hard water; allows to shorten the post-treatment cycles, keeping the shades fastness and their brightness unaltered
- Suitable with all reactive inks
- Environmental friendly: high biodegradability
- Can be used in strongly turbulent systems (i.e. jet machines) thanks to its tendency to low foam formation
- Available in powder form
ISOPON A35

SURFACTANT FOR ALL THE WASHING OPERATIONS OF PRINTED FABRICS (WOOL, SILK, POLYAMIDE AND BLENDS WITH OTHER FIBRES), SPECIFIC FOR PA/EL

TECHNICAL FEATURES

- Used in the soaping of silk, wool, polyamide, polyamide/elastomer fabrics printed with acid inks, it carries out a detergent and anti-redeposition action.
- The un-fixed inks, the auxiliaries and the thickening agents are completely eliminated. High brightness.
ISOPON SPO

DISPERSING AGENT WITH ANTI-OLIGOMER PROPERTIES TO BE USED IN THE POST-DYEING AND PRINTING TREATMENTS OF POLYESTER FIBERS.

TECHNICAL FEATURES

- Dispersion agent, automatic dosable, to be employed during the PES reduction clearing step.
- It allows obtaining both the improvement of the dyeing fastness and the prevention of oligomer stains / deposits at the same time in alkaline medium, allows the oligomers solubilization, avoiding the possible formation of stains on the goods, as well as residues in the machinery.
FISSAT DFI

SYNTHETIC POLYMER SPECIFICALLY DEVELOPED TO IMPROVE DEEPNESS AND FASTNESS OF FABRICS DIGITALLY PRINTED WITH PIGMENT INKS

TECHNICAL FEATURES

- The application has to be carried out by padding after the ink-jet printing.
- Improves the color yield.
- The crocking fastness values (wet and dry) are increased.
- Doesn’t effect the light fastness.
- Can be easily diluted in water and automatically dosed.
## DIGITAL PRINTING ON TEXTILE

### FINAL RESULTS

<table>
<thead>
<tr>
<th>100% PES FABRIC PRINTED WITH DISPERSE INK</th>
<th>TREATED WITH COMPETITOR ANTI-MIGRATING AGENT</th>
<th>TREATED WITH MIROX P-INK</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOVEN</td>
<td>HIGH DEFINITION OF EDGES AND PATTERNS; DEEPER COLOR SHADE</td>
<td></td>
</tr>
<tr>
<td>Knitted</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Times 20 pt

Times 16 pt

4 pt

2 pt

1 pt

0,5 pt
## DIGITAL PRINTING ON TEXTILE

### FINAL RESULTS

<table>
<thead>
<tr>
<th>100% COTTON FABRIC PRINTED WITH REACTIVE INK</th>
<th>TREATED WITH COMPETITOR ANTI-MIGRATING AGENT</th>
<th>TREATED WITH MIROX P-INK</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Times Fabric" /></td>
<td><img src="image2.png" alt="Times Fabric" /></td>
<td>HIGHER DEFINITION OF EDGES AND PATTERNS; DEEPER COLOR SHADE</td>
</tr>
</tbody>
</table>

*Higher definition of edges and patterns; deeper color shade*
DIGITAL PRINTING ON TEXTILE

FINAL RESULTS

ON 100% PES WOVEN FABRIC PRINTED WITH PIGMENT INK

NOT PRE-TREATED

TREATED WITH MIROX CFP
BETTER COLOR YIELD AND HIGHER DEFINITION
## FINAL RESULTS

### ON 100% COTTON WOVEN FABRIC PRINTED WITH PIGMENT INK

<table>
<thead>
<tr>
<th>Color Yield</th>
<th>Not Pre-Treated</th>
<th>Pre-Treated with Competitor</th>
<th>Pre-Treated with Mirox CFP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet Rubbing Fastness</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
</tbody>
</table>

---

*DIGITAL PRINTING ON TEXTILE*

*BOZZETTO GROUP*
## Reactive Inks

### Fabrics
Cotton and viscose: knitted and woven goods

### Pre-Treatment
- 50 – 75 g/l MIROX P-INK
- 100 – 200 g/l UREA*
- 30 – 40 g/l SODA ASH
- 3 – 5 g/l ISOPAL GL POWDER

*Amount dependent on type of fabric and fixation method

### Fixation
- Steaming at 102°C for 7 – 10min
- (Or, only for cotton fabrics, thermofix at 140-150°C for 3 – 5min)

### Washing Off
- Rinsing with warm water
- Soaping at 98°C with 1 – 2 g/l ISOPON HDS PLUS
- Rinsing warm/cold
**BOZZETTO SOLUTIONS**

**INDICATIVE RECIPES AND CONDITIONS**

### DISPERSE INKS

**FABRICS**

PES: KNITTED AND WOVEN GOODS

**PRE-TREATMENT**

50 – 100 g/l MIROX P-INK
0.5 – 1 g/l ACETIC ACID (80%)

**FIXATION**

THERMOFIX AT 190 – 210°C FOR 1 – 2MIN
(OR STEAMING AT 180°C FOR 6 – 8MIN)

**WASHING OFF**

RINSING WITH WARM WATER
REDUCTION CLEARING (WITH CAUSTIC SODA AND SODIUM HYDROSULFITE) AT 80°C
WITH: 1 – 2 g/l ISOPON SPO
NEUTRALIZING AND RINSING WITH WARM/COLD WATER
### ACID INKS

**FABRICS**
WOOL, PA AND SILK: KNITTED AND WOVEN GOODS

**PRE-TREATMENT**
- 100 – 150 g/l MIROX P-INK
- 100 – 150 g/l UREA
- 10 – 20 g/l AMMONIUM SULPHATE
  (OR, ONLY FOR WOOL/PA, 10 – 20 g/l AMMONIUM TARTRATE)

**FIXATION**
STEAMING AT 102°C FOR 20 – 30MIN

**WASHING OFF**
RINSING WITH WARM WATER
SOAPING AT 50°C WITH 1 – 2 ISOPON A35
RINSING WITH WARM/COLD WATER
INDICATIVE RECIPES AND CONDITIONS

PIGMENT INKS

FABRICS
COTTON / CV / PES / PA: KNITTED AND WOVEN GOODS

PRE-TREATMENT WITH MIROX CFP
THE AMOUNT IS STRICTLY RELATED TO THE PICK UP OF FIBERS:
100% COTTON > 150 g/m² = 60-90 g/l
100% COTTON < 150 g/m² = 90-120 g/l
100% PES > 150 g/m² = 60-90 g/l
100% PES < 150 g/m² = 90-120 g/l
100% PA > 150 g/m² = 75-110 g/l
100% PA < 150 g/m² = 110-150 g/l

FIXATION
THERMOFIX AT 150-160°C FOR 1-2 MIN.

POST TREATMENT
APPLICATION BY PADDING 30-50 g/l FISSAT DFI
IF SOFT HANDFEEL IS REQUIRED: 10-20 g/l ALFALINA FWQ 45
THANKS TO OUR EXPERTISE AND THE OPERATING DIGITAL PRINTING LABORATORY IN OUR HQ, WE CAN OPTIMIZE THE RECIPES BASED ON THE FINAL RESULT REQUIRED.
ARE YOU INTERESTED IN OUR PRODUCTS FOR DIGITAL PRINTING?

CONTACT OUR GLOBAL DIGITAL PRINTING PRODUCT MANAGER **ANDREA RIGANTINI** FOR A CUSTOMIZED CONSULTING.

ANDREA WILL PROVIDE FULL ASSISTANCE FOR YOUR SPECIFIC PRODUCTION REQUIREMENTS.
THANK YOU