Zimmer
AUSTRIA

COLARIS
camouflage printing

content
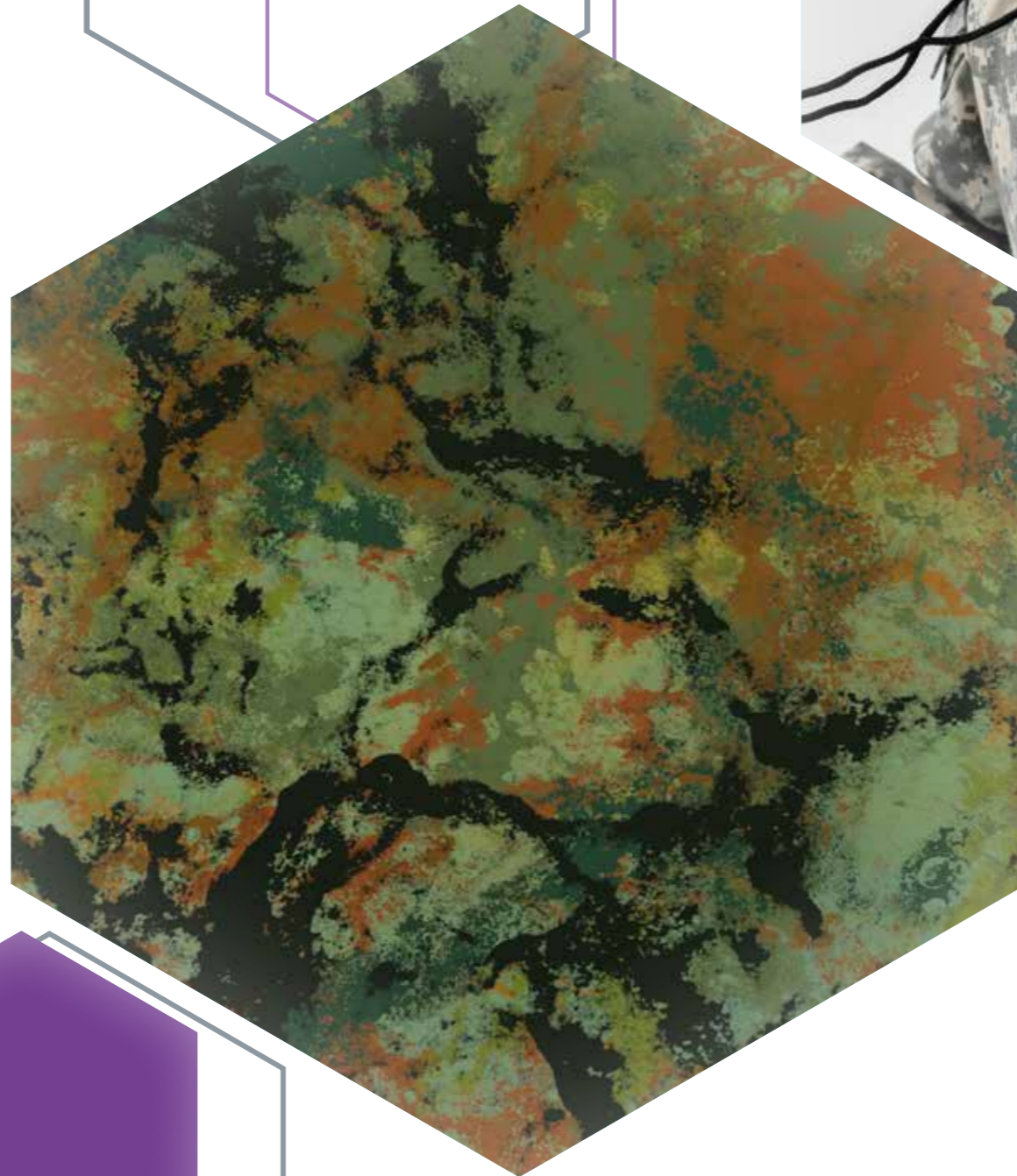
highlights

- fast color matching
- digital IR reflectance control
- unlimited number of colors and shades
- unlimited repeat size
- no minimum order quantity
- environmentally sustainable process

concept

ZIMMER AUSTRIA has years of experience in conventional camouflage printing. Being also manufacturer of digital inkjet printing machinery, the logical consequence is that both technologies are combined for a future-oriented camouflage printing process.

Resulting from intensive research and development we can offer a digital printing solution that matches the requirements for most internationally operating forces and security agencies. COLARIS camouflage printing system offers perfect color adjustment with additional IR reflectance control through imitation of specific reflectance characteristics.

HIGH PERFORMANCE MILITARY TEXTILES

Textiles used for military applications are designed for heavy duty performance under demanding conditions. They need to perform in different terrains, under severe climatical conditions and within extremely tough operational environments. All gear is designed to protect military force or security personnel and equipment. Military textile printing is an extremely challenging task.

FIBERS AND CONSTRUCTIONS

Depending on final application, the fiber and material compositions are selected.

Criteria can be:

- mechanical strength, light-, wash-, crock fastness and price

- polyamide, polyester, cotton, regenerated celluose fiber, aramide and other special fibers are used to match different requirements

- twill, ripstop, plain weave, different kinds of knits and many more constructions are used in military camouflage fabrics

DYE FAMILIES

Depending on fabric composition, different dyes are used for printing.

- polyamide: metal-complex and acid dye inks

- polyester: disperse inks

- cotton and regenerated celluose fiber: Jettex® VAT inks

- substrates from various fiber blends: pigment inks
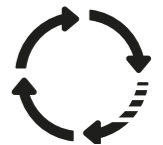
PRINT PROCESS

In most cases, a 3-stage process is required.

1. pre-coating with drying to avoid excessive ink migration

2. printing with drying and HT fixation for IRR carbon black

3. fixation process depending on applied ink type

applications

PRODUCT	FIBER	CONSTRUCTION					INK CLASS				
		plain | twill	ripstop	mesh	ribbon	net	METAL COMPLEX|ACID	DISPERSE	VAT	PIGMENT	IRR CARBON BLACK
Uniforms	cotton | polyester							x	x		x
	cotton | polyamide	x							x		(x)
	re-generated cellulose fiber | polyamide	x							x		(x)
FR fabric for special forces	re-generated cellulose fiber | m-Aramide | polyamide (Kermel, Nomex, Conex, …)	x	x	x					x		(x)
Bulletproof vests	p-Aramid (Kevlar, Twaron,…)			x						x	x
Rain protection	polyamide		x				x				x
Ponchos	polyester			x				x			x
Nettings	polyester FR coated				x	x					x	x

PRODUCT	FIBER	CONSTRUCTION					INK CLASS				
		plain | twill	ripstop	mesh	ribbon	net	METAL COMPLEX|ACID	DISPERSE	VAT	PIGMENT	IRR CARBON BLACK
Tents	polyester FR coated		x					x		x	x
Carrying systems	polyester			x				x			x
	polyamide	x							x		x
Sleeping bags	polyamide		x						x		x
	polyester		x							x	x
Parachutes	polyamide		x						x		x
Webbings	polyamide				x				x	(x)	x
	polyester				x				x	x	(x)
Hook & loop	polyamide				x				x		x

IRR control

PATTERNS AND THEIR USE

Designs may range from a simple 3 color design to highly sophisticated multi color patterns including gradient colors. Each military force or security firm uses a set of various specific designs and color combinations.

COLOR FASTNESS

Camouflage prints require highest industrial standards. Depending on the intended use of the printed substrate, fastness requirements may vary. Nets or tents have different needs compared with sleeping bags, uniforms, ponchos or carrying systems. Fibers play a major role and are the limit for the achievable fastness level. Each fiber used in a textile substrate requires a specific ink.

COLOR MATCHING

Digital color matching takes few minutes only, whereas matching of colors in conventional printing is time consuming. Color matching and IRR control is enabled in a very efficient, new way. Thus, the advantages and boundaries of digital printing technology come to full effect, enabling quick turnaround from sampling into production."

COLORS AND THEIR NEEDS

For military applications, colors and shades are chosen by their dominance in the environment of a potential combat area. They are a selection of sand and stony shades, leaves, bark and soil, etc. mainly covered by shades of black, grey, brown, olive, green, blue and others.

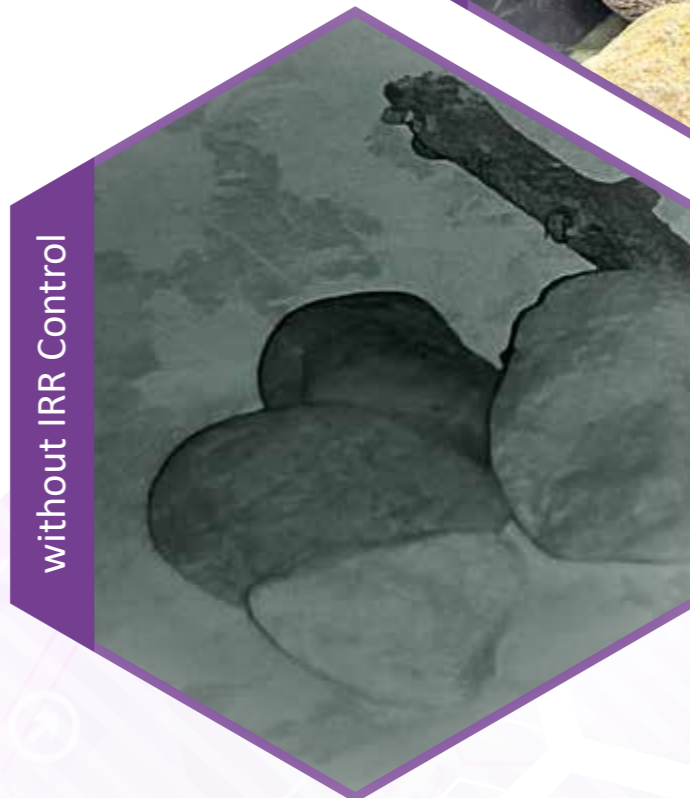print seen at daylight
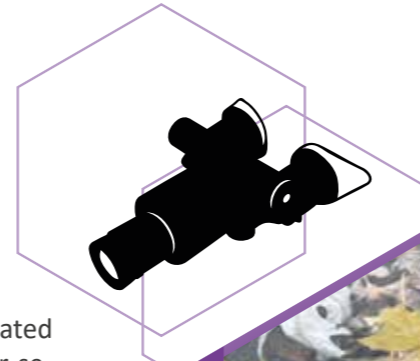
without IRR Control
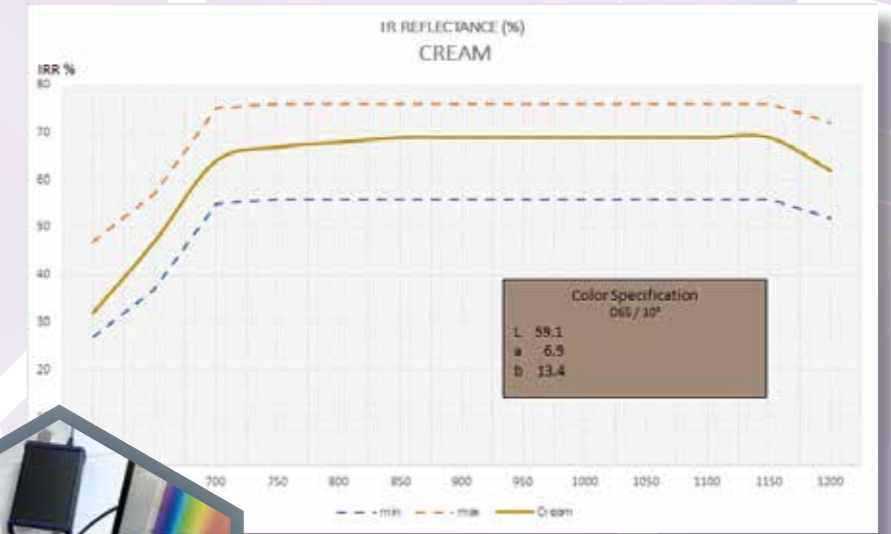
with IRR Control

IRR CONTROL

Patterns and colors selected are relatively easy to match for daylight camouflage. More difficult is hiding of visibility in twilight or at full night darkness.

Through a night vision device, colors without IRR control appear as a light grey. By adjusting the reflectance for each individual color as close as possible to the natural colors of leaves, bark, soil, sand, stone, etc., the detection of an object becomes almost impossible.

ZIMMER has developed a technology for a realistic simulation of a print when seen through a night vision device. A specifically designed workflow allows to match the L*a*b and IRR requirements and to control the inkjet system.

COLARIS *print line*
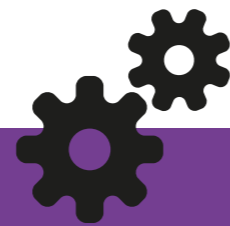
| FABRIC FEEDING SYSTEM | COLARIS PRINTER | DRYER | WINDER |

COLARIS PRINTER

COLARIS is a versatile, industrial inkjet printing system, offering a wide range of applications. The print lines are built in a modular system and can be adapted to different needs of substrates and ink classes as well as capacity requirement.

TECHNICAL DATA

print width: 2200 and 3200 mm

print speed: up to 1200 m²/h

number of colors:

- up to 12 color groups
- up to 3 ink classes at 4 colors each
- or up to 2 ink classes at up to 6 colors
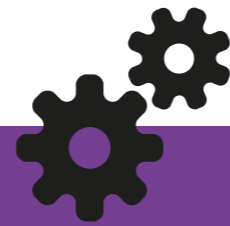
COLARIS-NF
single

| FABRIC FEEDING SYSTEM | COLARIS PRINTER | DRYER | WINDER |

COLARIS-NF SINGLE

The COLARIS-NF Single is a singlepass, one side printing solution for webbings with 100 mm (4") or 300 mm (11,8") width. Webbings are common in military applications. Rigid belts for carrying systems as well as hook and loop strapping for quick fixation are very common products.

TECHNICAL DATA

print width:
available at 100 mm (4") or 300 mm (11,8")

print speed:
up to 50 m/min

Number of colors:
up to 12 process colors

# COLARIS-NF
multi

| FEEDING OUT OF BOX | COLARIS PRINTER | DRYER | DELIVERY INTO BOX |

COLARIS-NF MULTI

The COLARIS-NF Multi is a singlepass doubleside pinter for webbings with a width of up to 65 mm (2,5"). The COLARIS-NF Multi is the only printer in the market that can print front and backside of a web in a single pass. It is possible to print images in mirrored setup (weaving effect), without mirroring or one side printing and backside application of a single solid color (digital dyeing).
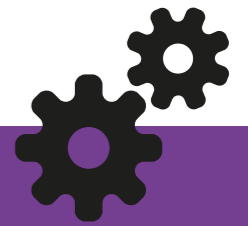
TECHNICAL DATA

print width:
available at 65 mm (2,5")

print speed:
up to 50 m/min

number of colors:
up to 8 process colors

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.