markem·imaje
a DOVER company

How to store
Store in a cool dry place away from direct
sunlight. Packaged in a protective atmosphere.

recyclenow.com
BAG – FOIL
not currently recycled

Produced in the UK

Best before

03 JAN 2022
L 02191
17:36

2725 FL 3000948 S03/18 5341229-01
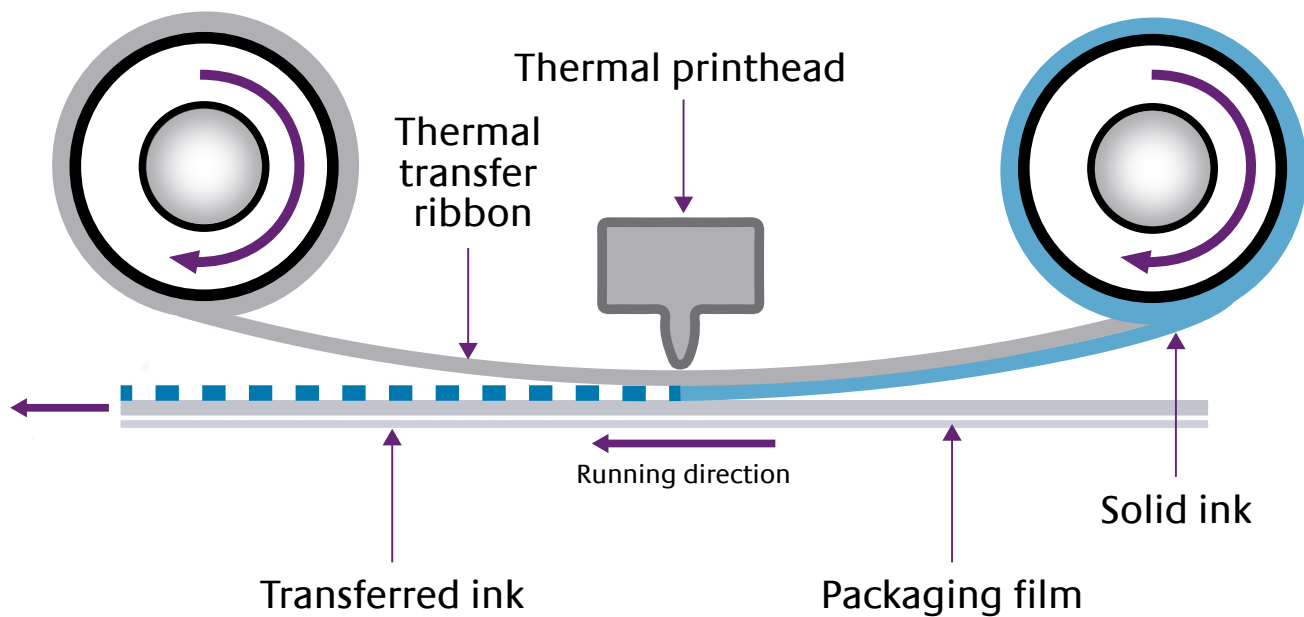
Flexible film and foil packaging coding

Printing capabilities of Markem-Imaje
Thermal Transfer Overprinter (TTO) coders

Understanding Thermal Transfer Overprinting (TTO)

While other coding methods have multiple uses, TTO is a digital printing technology that has been developed specifically to be used with flexible materials, making it ideally suited for this process.

Thermal Transfer Overprinting is a contact coding process which transfers ink from a ribbon to the material, using a thermal printhead.

Thermal transfer technology combines a thermal printhead and a polyester ribbon coated with ink on one side. Ink is transferred from a ribbon to the packaging material using a thermal printhead. This is made up of a row of independent tiny heating elements, mounted on a ceramic support. The different heating elements are activated based on the characters to be printed, melting the ink on the ribbon and transferring the selected characters to the packaging film. The printhead and the ribbon move with the material during this process.

Thermal printhead

Thermal transfer ribbon

Running direction

Solid ink

Transferred ink

Packaging film

There are two types of thermal transfer coders depending on the application

Intermittent mode

In an intermittent mode the packaging film advances and then stops, such as on a Vertical Form Fill and Seal (VFFS) machine, labeller or tray sealer. The printhead lowers, moves along the packaging film and ribbon. The printhead prints. The printhead is raised, and returns to the home position, the ribbon advances and the process is repeated.

Continuous mode

In a continuous mode the packaging film is constantly moving such as on a Horizontal Form Fill and Seal (HFFS) machine. When triggered, the ribbon accelerates to the film speed, the printhead is lowered and printing begins. At the end of printing the printhead is raised to the home position and the ribbon stops moving.

With a typical output of 300 dpi, TTO offers very high print quality that blends in with the overall design of the pre-printed film. In addition to printing variable information such as best-before dates, barcodes and promotional information, it can also help reduce pre-printed stock by printing static information, such as the product name.

Applications

The Markem-Imaje SmartDate® Series offers the versatility you expect at a lower cost of ownership for coding on flexible packaging films, foils and labels. Reliability combined with unique ribbon saving options ensure significant savings in consumables and maintenance costs. Use the Systech Packaging Intelligence Suite™ to network and manage your coders with message management, verification and line control solutions.
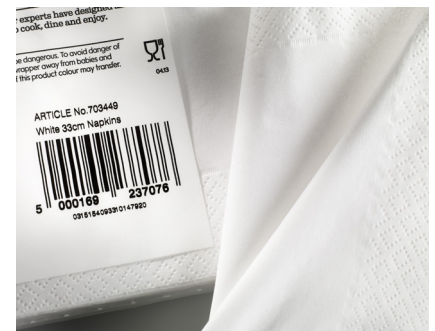

Food

Designed to print crisp, clean codes on a variety of substrates used in retail food and food service, even on packaging lines that run around the clock.

Pharmaceutical

High quality, permanent codes on pharmaceutical packaging materials such as labels, blister packs and films.

Household

Whether you are producing trial sizes or family packages, SmartDate® thermal transfer coders are ideal for printing directly on labels or flexible film.

SmartDate® Series coders

For over three decades, Markem-Imaje has pioneered thermal transfer coding technology. Our comprehensive SmartDate® Series of coders provides the most reliable high-quality codes on flow-wrappers, bags, tray seals, pouches, sachets, vacuum packs or labels.
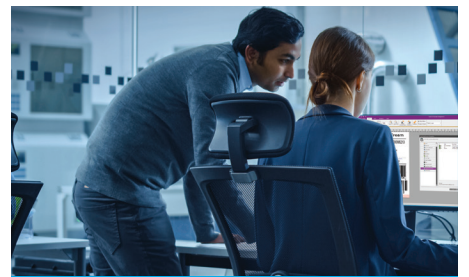

Printer and cassette

Durable wear resistant design. Adaptable for intermittent or continuous line configuration. Left- or right-hand operation. Meets extreme production line speeds. Multiple ribbon save features. Industry leading 0.5 mm gap between prints. Capable of serialized 2D codes.

Controller

Multiple user interface options including color touch screen and web pages. Dedicated buttons for frequently used functions. USB for image and file data transfer. Equipped with power save mode.

Packaging Intelligence solutions

If you require complex message design with logos or networking and data management linked with your ERP, our scalable Packaging Intelligence Suite can help reduce your overall running costs and operator error, achieve compliance and maximize productivity.

		SmartDate X30	SmartDate X45	SmartDate X65	SmartDate® X65/128
Print area	Width	32 mm	32 mm or 53 mm	53 mm	128 mm
	Length (Continuous or combined mode)	50 mm	250 mm	750 mm	150 mm
	Length (Shuttle printer)	N/A	N/A	100 mm	N/A
	Length (Intermittent mode)	40 mm	75 mm	75 mm	75 mm
Print speed (mm/sec)**	Normal	Up to 600 mm/s	Up to 600 mm/s	Up to 1000 mm/sec (at full 300 dpi resolution)	700 mm/s
	Hi-speed mode	N/A	N/A	1,000 mm/s (combined mode) 1,200 mm/s (shuttle printer)	N/A
	Digital ribbon save	N/A	N/A	1,800 mm/s	N/A
Ribbon length		Up to 700 m	Up to 1,100 m	Up to 1,100 m	Up to 1,100 m
Ribbon width (min)		22 mm	20 mm	20 mm	80 mm
Ribbon width (max)		33 mm	55 mm	55 mm	130 mm
Ribbon save options	Digital ribbon save (DRS) mode	N/A	Yes	Yes	Yes
	Interlaced mode	Yes	Yes	Yes	Yes
	Radial interlaced mode	N/A	Yes	Yes	Yes
	Radial ribbon save mode	Yes	Yes	Yes	Yes
	Radial whitespace mode	N/A	Yes	Yes	Yes
	Step advance mode	N/A	Yes	Yes	Yes
	Whitespace mode	N/A	N/A	Yes	Yes
Intermittent/ continuous		Intermittent or continuous	Intermittent or continuous	Combined	Combined
Left or right hand		N/A	Easily change from left to right hand with no additional parts	Easily change from left to right hand with no additional parts	Easily change from left to right hand with no additional parts
Minimum print speed		50 mm/s	30 mm/s	10 mm/s	10 mm/s

*Maximum, minimum print speeds and the suitability of ribbons and ribbon saving techniques are dependent on the individual application - if in doubt please contact your local presales team for further advice.

Examples of prints created in CoLOS®

TTO is ideal for printing dates, product information, logos, nutritional information, ingredient lists, barcodes and other information.

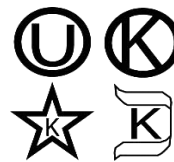|	
Capability to mix different character heights (Including bold, italics or underline) **Date & time formats** (Automated, calculated, offset and linked dates)	Produced **FEB 19 25 14:15:20** Shift 3 26 03 2025 10:50:19 A 26 03 25 10:50:19 A **Coffee Company** *Product of Columbia* French Vanilla
True type fonts	Best By 19 02 25 **Best By 19 02 25** 最好的 ベスト Best By **2025 02 25** Best By 25/03/12 **1,25€**
Logos	markem·imaje a DOVER company Ⓤ Ⓚ ★K Ⓚ USDA
Barcodes (Code 128, Code 39, EAN 128, EAN 8 & 13, ITF, UPCA, UPCE)	0 12345 67890 5 — UPCA (01)95012345678903 — EAN 128 0 123456 789128 — EAN 13
2D barcodes (Datamatrix, GS1 Datamatrix, GS1 DataBar™ (formerly RSS), QR, PDF 417)	Datamatrix or GS1 Datamatrix GS1 DataBar Expanded Stacked QR
Unlimited text fields	(Nutrition Facts panel)

Nutrition Facts
Serving Size
1 Cookie
Calories 210
Calories from Fat 45
*Percentage daily Values (DV) based on a 2,000 calorie diet.

Amount/Serving	%DV*	Amount/Serving	%DV*
Total Fat 5g (8%)		**Total Carb. 38g (13%)**	
Saturated Fat	0g (0%)	Fiber	less than 1g (2%)
Trans Fat	0mg (0%)	Sugar	19g (0%)
Cholesterol	0mg (0%)	**Protein**	2g (0%)
Sodium	160mg (7%)		

Vitamin A 10% • Vitamin C 0% • Calcium 0% • Iron 10%
Thiamin 10% • Riboflavin 10% • Niacin 10% • Vitamin B 10%
Folic Acid 10%

Ingredients:
Enriched Flour (Wheat Flour, Niacinamide, Reduced Iron, Thiamin Mononitrate (Vitamin B1), Riboflavin (Vitamin B2), Folic Acid), Vegetable Oil (Soybean, Cottonseed and Hydrogenated Cottonseed Oil with TBHQ and Citric Acid for Freshness), High Fructose Corn Syrup, Brown Sugar, Corn Syrup, Dextrose, Sugar, Corn Syrup Solids, Cracker Meal, Contains Two Percent or Less of Salt, Caramel Color, Cornstarch, Wheat Starch, Natural and Artificial Flavors, Leavening (Baking Soda, Sodium Acid Pyrophosphate, Monocalcium Phosphate), Cinnamon, Gelatin, Modified Corn Starch, Soy Lecithin, Yellow 5 Lake, Potato Starch, Niacinamide, Reduced Iron, Yeast, Vitamin A Palmitate, Pyridoxine Hydrochloride (Vitamin B6), Riboflavin (Vitamin B2), Thiamin Hydrochloride (Vitamin B1), Folic Acid.

SmartDate® X Series printheads

Proven printhead design for more uptime

Choose from three genuine printhead solutions specially designed, developed and tested with our SmartDate Series coders and ribbons to offer you the best print quality and durability in the market. All Markem-Imaje thermal transfer printheads are certified 6 months or 40 km as standard.

A market-first solution.

World market's fastest high resin thermal transfer coding. The advanced design of the SmartDate® Xtreme Plus printhead enables the print of high quality, durable codes at up to 600 mm/s using high resin ribbons.

SmartDate® Xcel printheads

Category	Specification	Printer compatibility	Ribbon compatibility	Typical speed (standard thermal transfer ribbon)	Typical speed (high resin thermal transfer ribbon)	Typical application
Best-class	SmartDate Xcel printhead	SmartDate X60 SmartDate X65 SmartDate X65-128 SmartDate X40 SmartDate X45	SmartDate Xpert SmartDate Xtra SmartDate Xceed	1,200 mm/s	300 mm/s	Versatile printhead that can be used for various applications.
	SmartDate Xcel Plus printhead	SmartDate X60 SmartDate X65 SmartDate X40 SmartDate X45	SmartDate Xpert SmartDate Xtra SmartDate Xceed	1,200 mm/s	300 mm/s	Ideal for harsh application environments requiring high abrasion resistance.

SmartDate® Xtreme printhead

Category	Specification	Printer Compatibility	Ribbon Compatibility	Typical Speed (Standard Thermal transfer Ribbon)	Typical Speed (High Resin Thermal transfer Ribbon)	Typical Application
High-end	SmartDate Xtreme Plus printhead	SmartDate X60 SmartDate X65	SmartDate Xpert 3910 Ribbon	N/A	600 mm/s	Designed for the most challenging applications that require maximum durability and superior rub resistance even on difficult surfaces, such as in the Pharmaceutical and Food industries.

SmartDate® X Series ribbons

An array of thermal transfer ribbon solutions

Choose from three ribbon solutions to cover all your flexible packaging coding needs, whether basic or complex while guaranteeing you the best quality code, more production uptime and best-in-class Markem-Imaje service. All Markem-Imaje ribbons are designed, developed, and tested with our SmartDate coders to offer you the best quality on the market.

SmartDate Xceed Ribbons are the most cost-effective ribbons to secure your code, ensure readability and make the most of your SmartDate coders without compromising on quality.
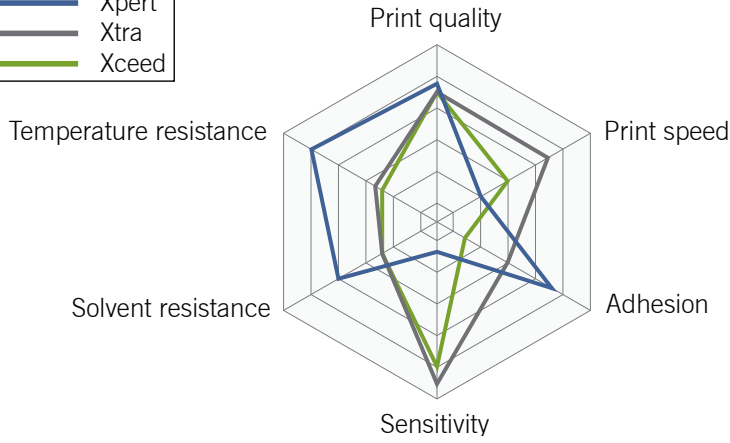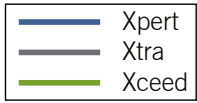

The SmartDate Xtra Ribbons raise the standards for thermal transfer coding. They offer a high level of versatility to code on most of your flexible packaging while ensuring durable codes from the production line until customer purchase.
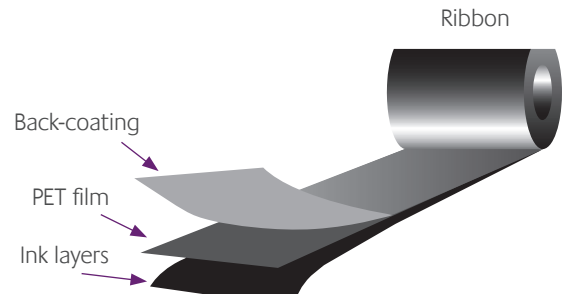

The SmartDate Xpert Ribbons provide maximum durability and high rub resistance, even in the most challenging applications.

Xpert
Xtra
Xceed

Print quality
Print speed
Adhesion
Sensitivity
Solvent resistance
Temperature resistance

Thermal transfer ribbon composition

Ribbon
Back-coating
PET film
Ink layers

	Category	TTR Grade	Formula	Colors	Typical Speed (mm/s)	Typical Application
SmartDate Xceed Ribbons	Standard	3610	Wax/Resin	Black	600	Economy grade, up to 900 m length.
		3410	Wax/Resin	White, Red, Green, Blue. More colors on request	800	A general-purpose ribbon for colors.
SmartDate Xtra Ribbons	Best-Class	3520	Wax/Resin	Black	900	High performance ribbon for general purpose applications, up to 1100 m length.
		7810	Wax/Resin	Metallic White	700	Metallic White ribbon for general purpose applications.
SmartDate Xpert Ribbons	High-End	3750	Wax/Resin	Black	400	Excellent printing quality ribbon for smooth and rough substrates.
		3910	Resin	Black, White, Red, Green, Blue	Up to 600*	Superior mechanical resistant ribbon for the most demanding environments, up to 800 m length. *Only with the SmartDate Xtreme Plus Printhead
		4910	Resin	Black	350	Superior heat and water-resistant ribbon for the most challenging environments.
		6910	Resin	Black	350	Exceptional heat and solvent resistant ribbon for the harshest environments, even at high speeds.

Unique combination of ribbon saving modes

The Markem-Imaje SmartDate® Series offers numerous ribbon saving modes which allows you to optimize the amount of ribbon used per p
The ribbon saving modes available are: **Interlaced, Radial Ribbon Save, Digital Ribbon Save (DRS), Whitespace, and Step-Advanc**

Interlaced mode

First print uses every other pixel; the second print utilizes the unused ink leftover from the first print

Without Interlaced print

With Interlaced print

Best by 12/11/25

Best by 12/11/25

Interlaced print - enlarged

Ribbon - First print

Ribbon - Second print

Best by 12/11/25

Best by 12/11/25

Radial Ribbon Save mode

Moves image across ribbon in radial direction using the entire width of the ribbon

First print

13 May 25

Second print

13 May 25

Third print

13 May 25

Printed ribbon with Radial Ribbon Save mode

13 May 2513 May 2513 May 25
13 May 2513 May 2513 May 25
13 May 2513 May 2513 May 25

Printed ribbon without Radial Ribbon Save mode

(WASTED RIBBON)
13 May 2513 May 2513 May 25

print and to reduce your costs.

ce modes, some of which can be combined to further increase the amount of ribbon save options.

Digital Ribbon Save Print mode

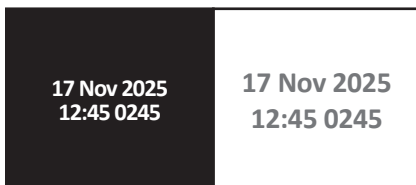Save on ribbon usage by assigning the Digital Ribbon Save Print Mode in advanced settings

Normal print

Ribbon used	Printed image
17 Nov 2025 **12:45 0245**	**17 Nov 2025** **12:45 0245**

17 Nov 2025
12:45 0245

Digital Ribbon Save Print mode

Ribbon used	Printed image
17 Nov 2025 **12:45 0245**	**17 Nov 2025** **12:45 0245**

17 Nov 2025
12:45 0245

In Digital Save Print mode quality is equivalent to normal mode with a savings of up to 67%
Advantages of the Digital Ribbon Save Print mode:
- Up to 67% ribbon savings
- Printing on materials at higher speeds

Whitespace mode

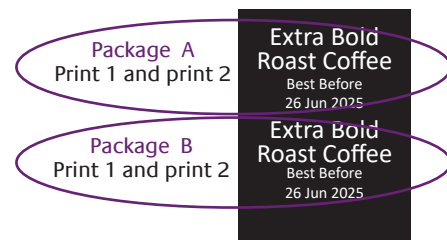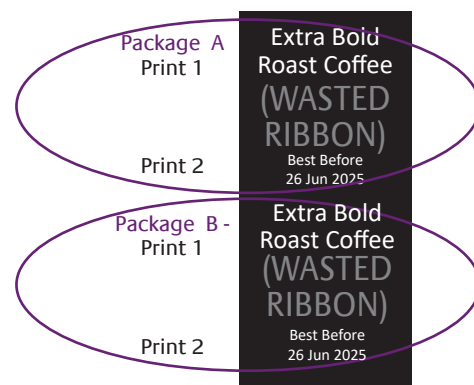Print different images on same substrate without additional adjustments

Package A   Package B

Print 1   Print 1

Extra Bold   **Extra Bold**
Roast Coffee   **Roast Coffee**

Print 2   Print 2

Best Before   **Best Before**
26 Jun 2025   **26 Jun 2025**

Printed ribbon with Whitespace Mode

Package A
Print 1 and print 2

Extra Bold
Roast Coffee
Best Before
26 Jun 2025

Package B
Print 1 and print 2

Extra Bold
Roast Coffee
Best Before
26 Jun 2025

Printed ribbon without Whitespace Mode

Package A
Print 1

Extra Bold
Roast Coffee
(WASTED RIBBON)
Best Before
26 Jun 2025

Print 2

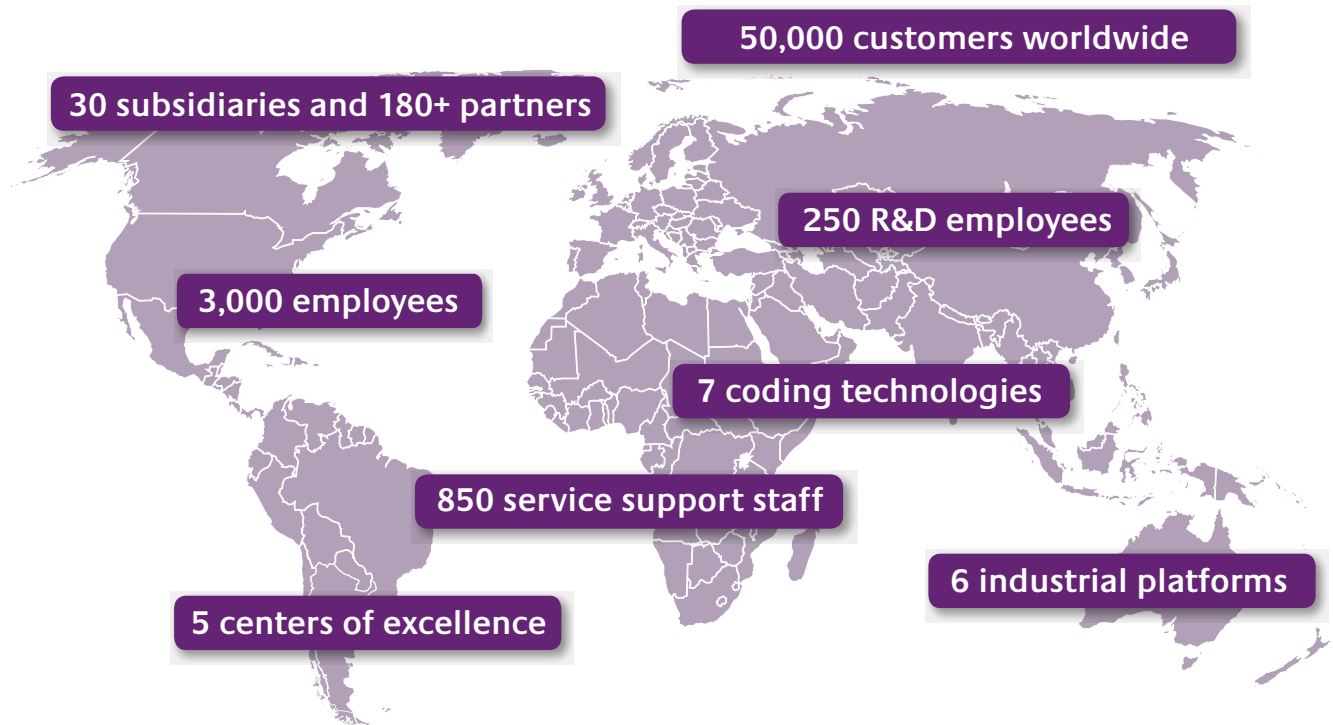Package B -
Print 1

Extra Bold
Roast Coffee
(WASTED RIBBON)
Best Before
26 Jun 2025

Print 2

About Markem-Imaje

Markem-Imaje is a wholly owned subsidiary of the US based Dover Corporation and a trusted world manufacturer of product identification and traceability solutions. We offer a range of market-leading inkjet, thermal transfer, laser and print and apply systems along with the software and consumable solutions to go with them so you can streamline all your printing needs from one supplier. We provide a global reach to over 50,000 customers worldwide.

With decades of technical experience in hardware and software implementation and the most extensive global network coverage in the industry we can meet your needs, however big or small. Plus, with our extensive and ongoing research, development and testing activities you can be assured of using a world-class solution that is at the forefront of technology.

50,000 customers worldwide

30 subsidiaries and 180+ partners

250 R&D employees

3,000 employees

7 coding technologies

850 service support staff

6 industrial platforms

5 centers of excellence

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