

TTO Snacks White Paper

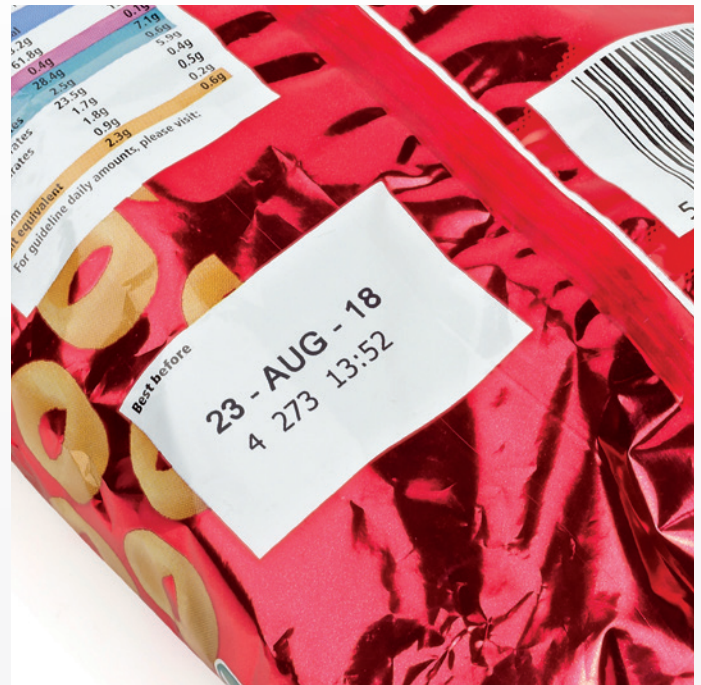
Introduction

As the global Snacks Industry continues to grow, this Paper examines how new developments in Thermal Transfer Overprinting (TTO) coding technologies can deliver increased efficiencies and greater margins for manufacturers and contract packers.

The global Snack Industry has so far proved recession-proof, with demand for pre-packed snacks continuing to grow, and forecasters predicting further healthy growth for the coming years. Recent reports such as the 'Savory Snacks: Global Industry Guide' indicate the snacks market is likely to increase at a compound annual growth rate (CAGR) of 4.5% between 2013 and 2016, rising from total revenues of \$77.3 billion in 2011 to reach a value of \$96.5 billion by the end of 2016.

Characterised by high volumes and low margins, the challenge amongst manufacturers and contract packers in the snack industry remains how to manage production in order to minimise costs and maximise efficiencies. And, with demand for pre-packed snacks looking likely to continue its upward trend, keeping control of such 'hidden' production costs will be key to increasing profit margins.

One such production cost that can impact profitability and yet is an essential part of the packaging process is the application of best before dates, product identification and traceability data onto every product. With a growing requirement for the coding and marking of individual items, demands on coding solutions are becoming more challenging for snack producers and so the issue of choosing the right coding solution has become critical to achieving profitable margins.



Thermal Transfer Overprinting (TTO) in the global Snacks Industry



Wider source of packaging materials in the form of flexible films

There are two main factors that impact on the cost of using traditional coding devices in the snacks sector:

1. Lost production time.

This relates directly to the coding of essential product information onto each pack, such as best before dates, product data and traceability codes.

Traditionally, the snack industry has used non-digital coding devices such as hot stamp or roller coders. While the benefits of using these more conventional devices include lower capital costs and proven reliability, downtime is extremely high and therefore has a huge impact on profit margins.

With traditional coding devices, downtime can be caused by several manual processes:

- **Line changeovers:** With hot-stamp devices for example, the typeface needs time to cool before any changes can be made. Once these changes have been implemented, further time is wasted as the device has to be reheated prior to restart. The total process is rarely completed in less than 5 minutes.
- **Manual Typesetting amendments:** With every code change requiring manual replacement of type characters, the inevitable error does occur. As a result, incorrectly coded product is wasted and further production time is lost while the type is amended and re-started, adding additional production costs.
- **Ink replacement:** Most of the conventional coders require ink in some form (liquid or coated ribbon/foil) and after a fixed period of printing, the ink needs to be replenished. If the ink capacity is small, or the process of replacement is difficult, further production time is lost.

2. Increased Number of Packaging Variations

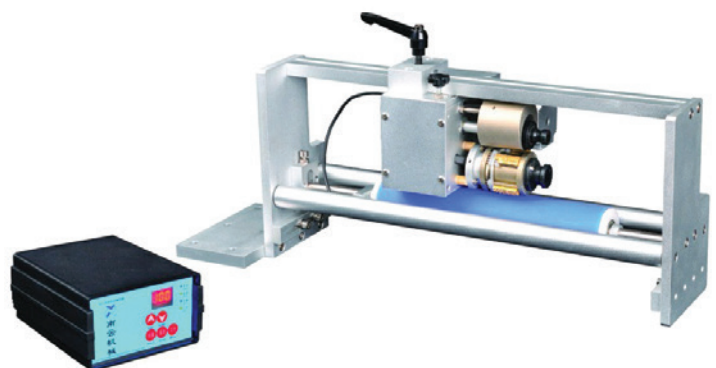
As the range of snack products continues to grow, so too does the need for a wider source of packaging materials in the form of flexible films. Generally these flexible films are pre-printed with ingredient information and a graphic design that is specific to each variety of snack. Therefore, the more snack varieties manufactured, the larger the quantity of packet designs and codes required all resulting in higher costs and a reduction in production time due to:

- an increase in the cost per film - as a large number of smaller batches are required.
- an increase in storage and inventory charges
- an increase in downtime – caused by the changeover of film type every time a different product or product variant is packed on the same production line.

Managing production processes to ensure minimal downtime and maximum production output, paying particular attention to choosing the right coding solution is therefore key for snack manufacturers and packers to achieve a healthy margin and therefore reap the benefits of this growing market.



Hot-Stamp and Roller Coders



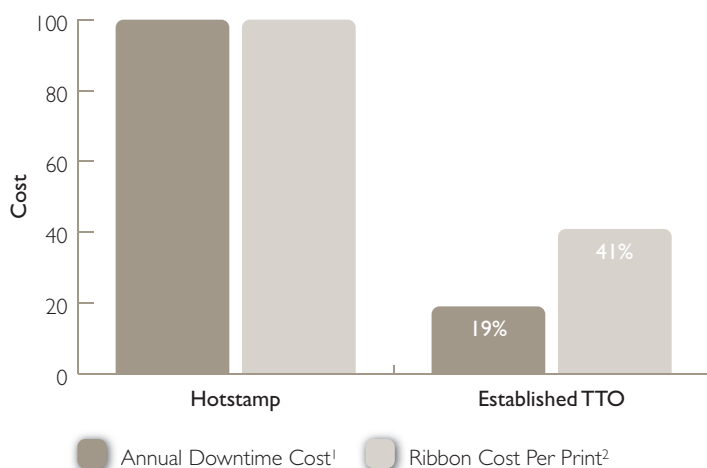
Conventional coding devices have certainly proved to be reliable solutions for many years, but with the increase in demand in terms of both volumes and variety of product, the industry needs to embrace other alternative solutions that can deliver the same or improved reliability but with the added benefit of increased speed and flexibility and a reduction in downtime. Furthermore, the demand for last minute, short-term promotional price changes, for example, and the introduction of additional graphics and QR codes to support marketing campaigns are also driving a move to more capable and 'instantaneous' coding and marking technologies.

The ideal coding solution should offer quick and automatic changeover of codes, more cost effective consumables that are easily changed and require less frequent replacement and a solution that can print a wide range of variable information onto generic substrates at higher speeds.

Thermal Transfer Overprinting (TTO) is one of the most versatile coding solutions that is fast becoming established as the technology of choice for snack manufacturers wanting to address production efficiencies. Compared with hot-stamp or roller coder devices, TTO technology provides a significant reduction in costs associated with downtime and coding errors. It also offers superior code quality and the capability of printing graphics and QR codes.

• Reduced costs associated with downtime

- TTO printers are electronic digital devices, capable of storing hundreds of pre-prepared codes in memory. This allows the operator to change the code to be printed instantaneously at the press of a button, compared with the minimum time of 5 minutes required of a hot-stamp printer.



Assumes 2 production shifts per day printing a 10mm code on 180 packs / min

¹ Downtime associated with message change and consumables replenishment

² Based on current market pricing

The graph shows typical downtime comparisons between hot-stamp and established TTO printers

- The rolls of ribbon used in TTO printers are usually at least twice the length of the foil rolls used by hot-stamp printers (770MVs 300M). This means that the number of line stoppages required to change consumables is reduced by at least 50% if a TTO printer is used. It is also quicker to change a TTO ribbon compared to a hot-stamp foil. TTO ribbon is less expensive and used more economically in TTO systems, offering further savings.
 - While hot-stamps can typically only create a 2 line alphanumeric code, TTO printers can print text, data, graphics and logos over a large area. This enables the use of fewer generic packaging films through printing of product names and ingredient listings as well as best before and production codes. Consequently, downtime due to film changeovers is significantly reduced.
- #### • Reduced costs associated with coding errors and rework
- Pre-prepared TTO code designs can be selected and checked with a WYSIWYG print preview before printing. This failsafe method prevents the coding errors and rework that inherently occurs by manually re-setting the movable type of hot-stamp coders.
 - The low contact force of a TTO printer is much less than a hot-stamp and will not damage the substrate, thus reducing product wastage or costs associated with product compliance.
 - Compliance and rework costs are reduced further by a simple password-based security feature that can be set up to prevent unauthorised access/tampering with TTO printer settings.

• Improved code Quality and Capability

- TTO printers typically deliver 300dpi print resolution on every print compared to the print to print variability that can result as the hot-stamp type face wears.
- TTO printers can automatically generate and print different images or data in each subsequent print, including QR codes, serial numbers, date codes or graphics.

Domino's intelligent V-Series TTO

As a global leader in coding and marking solutions for over 30 years, Domino Printing Sciences has maintained a strong commitment to R&D which has allowed it to develop intelligent coding technologies that push the boundaries of innovation to meet the changing needs of its customers.

The Domino V-Series range of TTO printers (which includes the **V120i**, **V230i** and **V320i**) offers a unique range of **i-Tech intelligent Technology** features developed to deliver a superior and higher value TTO solution for customers. These **i-Tech** functions, (including **i-Tech Ribbon Drive**, **QuickStep** user interface software and **TouchPanel** user interface hardware) combine to deliver a simplified, versatile coding solution with lowest running costs. This is ideally suited to high volume snack manufacturing and other sectors demanding the highest levels of Overall Equipment Effectiveness (OEE).

i-Tech Ribbon Drive

Domino's ground breaking **i-Tech** Ribbon Drive incorporates a host of cost saving features which guarantees the lowest operating costs. These include:

- **Ribbon Economy Mode** – This is one of four ribbon saving modes available and represents a major saving in ribbon costs. The Economy mode facility allows for up to 60% less ribbon usage per print, without compromising print quality. In addition, the way in which the ribbon feeds, improves ink adhesion and scratch resistance allowing a more cost effective ribbon grade to be used compared to other TTO printers. It also reduces wear on the print heads, resulting in lower print head costs and fewer interruptions.

EU 1169/2011 Food Information Regulations compliant printing

The EU 1169/2011 Food Information Regulations have introduced significant changes to how key information is displayed on packaging, in order to make it clearer and more consistent for the customer. One of the key alterations is that now all allergen information must only be displayed within the ingredients panel and nowhere else, with the allergens clearly identified by a separate font. Domino's **QuickDesign** label creation software now allows all V-Series printers to print fields with mixed fonts, therefore allowing businesses to comply with the new regulations even when using generic packaging.



The Four ribbon-saving modes

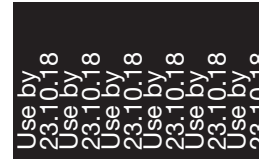
Ribbon Economy mode

Moves ribbon slower than substrate
Save up to 60% without losing resolution

Use by
23.10.18

Use by
23.10.18

Print Sample



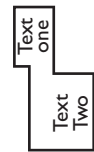
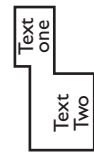
Ribbon Used

Retraction mode

Reduces gap between prints



Print Sample



Ribbon Used

Column mode

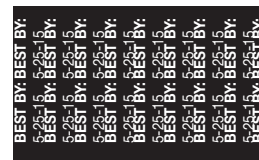
Reduces ribbon use for narrow codes
Printed code moves on substrate

BEST BY:
5-25-15

BEST BY:
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BEST BY:
5-25-15

Print Sample



Ribbon Used

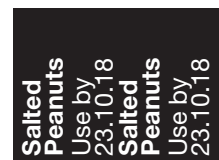
Stop Mid Print mode

Saves unused ribbon in long codes

Salted
Peanuts

Use by
23.10.18

Print Sample

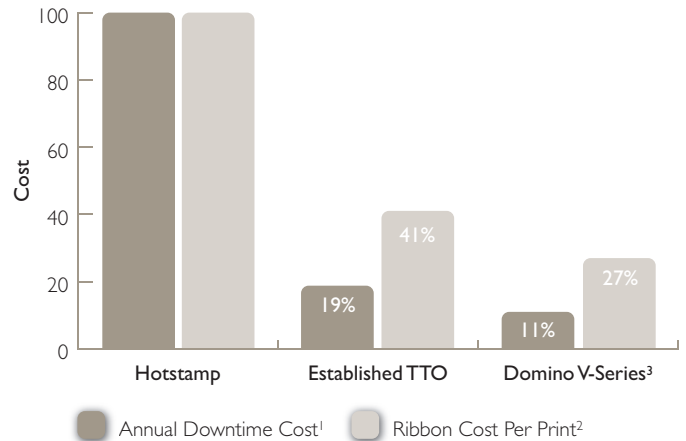


Ribbon Used



Domino's Ribbon Economy mode using 60% less ribbon per print

- **No use of Compressed Air** – The **i-Tech** Ribbon Drive and print head mechanism, operates without the use of compressed air; further reducing the V-Series' running costs and eliminating adjustments required to compensate for fluctuations in factory air pressure.
- **Dancing Arm Tension control** – This unique feature keeps the ribbon in perfect tension, even when under high acceleration at the highest production speeds, to reduce breakages and associated stoppage time.
- **Rapid Ribbon Change & Calibration** – ensures the shortest total time for replenishing TTO consumables.
- **High Production Speeds** – Domino's V-Series offers the highest printing speeds of any equivalent TTO printer on the market, thus maximising manufacturer's productivity.



Assumes 2 production shifts per day printing a 10mm code on 180 packs / min

¹ Downtime associated with message change and consumables replenishment

² Based on current market pricing

³ Assumes V230i using ribbon economy mode at 30%

The graph above shows typical cost savings achieved by Domino V-Series compared to established TTO systems and Hot-Stamp

- **IM and CM capability from the same printer** – The **i-Tech** ribbon drive allows a printer to function in either Intermittent (IM) or continuous (CM) mode according to the packaging machine it is installed onto. This means that only one printer type is required per manufacturing site, simplifying operating and maintenance requirements.
- **Simple replacement** – The **i-Tech** Ribbon Drive is compact, keeping the printer small enough to fit into existing coding spaces and existing TTO brackets with little or no modification. This means that manufacturers can get the cost saving benefits of the V-Series range with little impact or disruption to their existing production line.



Domino's V230i with 32mm and 53mm variants

QuickStep

Domino's **QuickStep** is a simplified graphical user interface that delivers further production efficiencies. With no complex menus or parameters to adjust, it allows the operator to view the printer status through a simple, colourful display and control the printer with a maximum of 3 button presses. **QuickStep** is simple and intuitive to use, increasing the speed and accuracy of job changes, eliminating and reducing coding errors as well as the need for dedicated staff and training.

TouchPanel

The **TouchPanel** (and smaller **TouchPad**) is a hardware interface that can be used to access **QuickStep** and provide control of the printer. However these versatile devices give manufacturers a number of control options that can also reduce their capital expenditure, reduce the clutter on their production lines and provide extra security against tampering.



Use a single user interface of your choice to control one or more V-Series printers via Ethernet connection

- **Reduced Cost and Clutter** – A single **Touchpanel** (or **TouchPad**) can be used to control more than one V-Series printer compared to other TTO printers which must be installed with an equal number of 'controllers'
- **Improved Security** – A Domino V-Series printer can also be controlled without a **TouchPanel** (or) via a networked PC (or PC based interface such as a packaging machine controller), allowing greater consolidation of 'production control' interfaces and /or improved security against tampering.

Summary

This paper highlights that the ideal coding solution for the growing snacks market should offer quick and automatic code changeovers, more cost effective consumables that are easily and less frequently changed as well as having the capability to print a wide range of variable data at high speeds. Having examined the technology in greater depth, and looked at the many cost and labour-saving advantages, it is clear that Thermal Transfer Overprinting (TTO) offers a host of productivity and cost benefits over the more conventional coding solutions that have traditionally been used while satisfying the growing demands in this sector for greater variable data and higher production speeds.

The quality of print, potential capital cost savings, running cost benefits and reduction in product rejection all significantly favour the use of TTO. And, as legislative coding requirements continue to increase, so too will the industry's interest in TTO as its preferred coding and marking solution in the growing snack packaging sector.

Domino's V-Series range, which offers a unique range of **i-Tech intelligent technology** features deliver superior TTO solutions designed specifically to maximise production efficiencies.

To find out more about the benefits of Thermal Transfer Overprinting for the snacks sector and the productivity benefits of Domino's V-Series range, visit www.domino-printing.com