

Thermal Transfer Overprinter Coders Built Tough for Meat & Poultry Washdown



THERMAL TRANSFER OVERPRINTER CODERS BUILT TOUGH FOR MEAT & POULTRY WASHDOWN

Protecting thermal transfer overprinting (TTO) coders in the harsh washdown environment common in meat and poultry plants can be time consuming and costly. A better alternative is to use TTO coders that are specially designed for washdown environments. This whitepaper describes the various ways in which specially designed TTO coders can help meat and poultry manufacturers save time and reduce costs.



Statistics from the Food and Agriculture Organisation of the United Nations (FAO) shows that the volume of meat and poultry production globally has increased ~20% over a 10 year period. Unfortunately the increased production has also meant an increase in food related illnesses, reported to represent ~30% of the food borne illness in industrialized nations. To limit the spread of these illnesses, it is common

place to implement stringent hygiene controls including frequent cleaning processes requiring chemical washes to remove hazardous waste products. Although washing the packaging equipment has many hygiene benefits for the consumer, unfortunately it can be less beneficial to the packaging equipment. Incorrectly designed equipment can easily become severely damaged in these harsh operating conditions and although some precautions can be taken in an attempt to protect vulnerable equipment, it only takes a moment of operator error for an expensive piece of packaging equipment to be irreparably damaged.

Inconvenience and Costs of Washdowns

In many meat and poultry facilities, washdown spray and chemicals can harm thermal transfer overprinter (TTO) machines that are installed on the production line to print variable date and lot codes. Required for production, working coders are essential in almost all meat and poultry plants due to the high perishability and value of codes on meat and poultry products. Yet TTO coders contain sensitive electronic components and advanced controls that can be damaged by water and caustic chemicals. While TTO coders are usually classified as sensitive equipment (which do not directly touch food and therefore are subject to less stringent cleaning), TTO machines are still susceptible to damage due to their integration in the packaging line.



Protecting TTO Coders During Washdown Shifts

Protecting TTO coders can be time consuming and costly for meat and poultry producers. In some instances, a manufacturer will uninstall a coder before performing the area washdown and then re-install it. In other cases, coders may be covered with a plastic bag, which takes less time, but leaves them vulnerable to damage due to moisture and dust. Finally, some producers purchase expensive environmental enclosures to protect the equipment. By handling TTO coders during washdown in this manner, two key factors cause additional time and costs:

- Hassle and cost of removal and re-installation of printer and/or brackets for washdown
- Damage to the printer from accidents, overspray and steam

A better alternative is to use TTO coders specially designed for washdown environments. This whitepaper describes the various ways in which specially designed TTO coders can help meat and poultry manufacturers save time and reduce costs.

Costs of Removal and Re-installation of Coders

TTO coders are usually integrated in other packaging equipment, often in tight, hard-to-reach spaces. Removing the coder prior to a washdown shift takes time and can potentially result in inadvertent printer damage. On average, it takes 30 minutes to uninstall a printer or the entire printer assembly (including the bracket that holds the printer) on a production line. Once the washdown is completed, it also takes 30 minutes to re-install and another 30 minutes to realign and test the printer. Generally, a meat and poultry company has several production lines resulting in significant time invested in the preparation for a washdown shift. Also, if there is the slightest of variation in the printer integration to a bagger, flow wrapper or labeler, it could take additional time to set-up the printer in order to get an acceptable level of print quality.

This time investment can result in significant costs. For example, in a facility that has 10 production lines, the removal and re-installation process can represent \$156,000 per year in direct cost, using the following assumptions:

- 10 printers
- 1 washdown per day
- 1.5 hours of labor to remove, install and align each printer
- Labor cost of \$40 per hour
- 5 days of operation per week for 52 weeks per year



In addition to the costs and hassle of removing and re-installing a TTO for washdown, this process significantly increases the risk of additional damage to the printer. Removing and installing a printer daily dramatically increases the risk of accidental damage from bumping or dropping and increases equipment wear, which can result in significant downtime for repair and increased cost of ownership. Service and repair costs can cost thousands of dollars per printer.

TTO Damage from Residual Water and Steam

As an alternative to removing the printer, some meat and poultry producers use plastic bags or environmental cabinets to cover the printer before the washdown shift. While bagging potentially saves time, bags are often not sufficiently sealed or can be damaged by frequent handling or by sharp edges on the production line resulting in moisture and water damaging the coder. Similarly, many environmental



enclosures are not designed for water protection and either have an exposed gap for passage of the TTO ribbon and printhead or are not adequately sealed from steam, overspray and chemicals. Environmental cabinets also are often bulky and can take up significant space on a tight production line.

Any moisture that reaches the printhead or PCB in the printer or controller could easily end up costing several thousands of dollars in replacement and significant downtime. The table below outlines key components which are frequently damaged from water and steam due to washdown procedures. Additionally, caustic steam, which can often seep through unsealed bags, can wear away internal components. Moisture or internal damage to a TTO coder may not always be immediately apparent and is often not attributed to washdown procedures but rather to normal wear and tear on the machine. However, if parts exposed to steam and water breakdown over time, code quality and printer performance can degrade. Damage can result in missing or bad date codes and if these are not discovered quickly, a company can be faced with rework or recalls. Degradation of parts can also lead to quicker printer replacement that can be costly.

Key Component	Approximate Replacement Cost
Printhead	\$600 - \$1,100
PCB (Printer Circuit Board)	\$2,500 - \$3,200
Controller	\$3,700 - \$6,200

The Importance of Ingress Protection Ratings

Ingress Protection (IP) is an international rating system developed by the International Organization for Standards (ISO) under IEC 60529 used to indicate how well industrial equipment is protected from dust and liquids. An IP rating consists of two digits: the first digit refers to a system's ability protect against solid objects and dust and the second digit indicates the protection level against liquids, such as those used in a washdown. For instance, a coder that is IP65 rated is fully protected against dust, and against low pressure jets of water. Please refer to table below for an explanation of different ratings.

Dust Protection		Water Protection		
First #	Definition	Second #	Definition	Tests
0	No protection	0	No protection	None
1	Protection against objects > 50 mm (hands)	1	<u>Dripping</u> : Vertically falling drops of dripping water shall have no harmful effect.	<u>Test duration</u> : 10 minutes <u>Water volume</u> : equivalent to 1mm rainfall per minute
2	Protection against objects > 12 mm (fingers)	2	<u>Tilted Drops</u> : Vertically dripping water shall have no harmful effect when the enclosure is tilted at an angle up to 15° from its normal position.	<u>Test duration</u> : 10 minutes <u>Water volume</u> : equivalent to 3mm rainfall per minute
3	Protection against objects > 2.5 mm (tools/wires)	3	<u>Spraying</u> : Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect.	<u>Test duration</u> : 5 minutes <u>Water volume</u> : 0.7 litres per minute <u>Water Pressure</u> : 80–100 kPa
4	Protection against objects > 1 mm (small tools)	4	<u>Splashing</u> : Water splashing against the enclosure from any direction shall have no harmful effect.	<u>Test duration</u> : 5 minutes <u>Water volume</u> : 10 litres per minute <u>Water Pressure</u> : 80–100 kPa
5	Dust protected but not air tight	5	<u>Water Jets</u> : Water projected by a nozzle (6.3mm) against enclosure from any direction shall have no harmful effects.	<u>Test duration</u> : at least 3 minutes <u>Water volume</u> : 12.5 litres per minute <u>Water Pressure</u> : 30 kPa at distance of 3m
6	Dust tight - Totally protected against dust	6	<u>Powerful Water Jets</u> : Water projected in powerful jets (12.5mm nozzle) against the enclosure from any direction shall have no harmful effects.	<u>Test duration</u> : at least 3 minutes <u>Water volume</u> : 100 litres per minute <u>Water Pressure</u> : 100 kPa at distance of 3m
		7	<u>Immersion</u> : Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in water up to 1 m.	<u>Test duration</u> : 30 minutes <u>Water volume</u> : Immersion at depth of 1m
		8	Equipment is hermetically sealed such that continuous immersion in water more than 1 m shall have no harmful effects.	Continuous immersion in water

The IP rating of equipment is an important factor for meat and poultry manufacturers who operate in wet washdown environments. **It is important to ensure that a TTO coder has at least the same IP rating as the packaging equipment that it is integrated with.** In meat and poultry processing facilities, this is usually IP55. As most TTO coders available today are not IP rated, many suppliers sell environmental cabinets to enhance protection of the coder. However, unless the cabinet is also IP rated at or above IP55, it does not offer any washdown protection. Environmental cabinets can create a false sense of protection. Many are not IP rated and therefore are not adequately sealed. A superior solution

is to purchase a TTO coder which itself is IP rated at or above IP55. The equipment rating ensures all proper gasket and sealing are in place so that the unit is protected from steam and residual washdown overspray.

Conclusion: Save Time and Reduce Cost with an IP65 rated TTO

Meat and poultry plants incur significant hassle and costs protecting their TTO coders due to the wet environment from washdown and sanitation procedures. It is important to choose a TTO coder that is specifically designed for the specific washdown environment in the plant. Unlike un-rated coders, an IP65 rated TTOs can withstand overspray, splash and steam and are build more robust than other printers. Purchasing the properly protected TTO coder for the production environment ensures quality codes, decreased maintenance and service costs, and reduces total cost of ownership. An IP65 rated TTO:

- **Saves the hassle and significant costs of removing / re-installing**
- **Generally has a positive pay-back of under 6 months**
- **Reduces the risk of damage from water or accidents**
- **Prevents costly parts replacements and service calls**
- **Preserves protection against overspray, splash and steam**
- **Maintains a small equipment footprint**



More information

Videojet can help you find the right TTO printer for your environment.

For more information about thermal transfer printing for meat and poultry applications, please contact Videojet Technologies Inc. at 800-843-3610 or visit our website at www.videojet.com.

Videojet Technologies Inc.

1500 Mittel Boulevard • Wood Dale IL 60191
Phone 630-860-7300 • Fax 800-582-1343

www.videojet.com • info@videojet.com

