Application note

Continuous Inkjet

Improving coding performance in frozen goods

The challenge:

Continuous inkjet (CIJ) printers are commonly used to print codes on frozen goods because of their versatility. However, the low temperatures and high humidity typical of processing facilities in this industry can lead to printing problems if specialized CIJ inks are not selected and managed appropriately. Picking the wrong printer and ink can lead to a variety of issues. Risks include poor ink adhesion and low print quality.

The Videojet advantage

Frozen goods manufacturers look to Videojet to provide application-specific coding solutions backed by the industry's leading experts in marking technology:

- **With unrivaled application expertise, Videojet can help you identify, optimize and maintain the right ink for your applications**
- **Videojet formulates inks specifically for cold and humid packaging environments**
- **Videojet continuous inkjet printers and inks have been jointly designed to achieve peak performance in these harsh environments. We also offer the services of the Videojet sample laboratory to help determine the best application method.**

What causes coding issues for frozen goods producers?

Cold temperatures

Temperatures in packaging facilities are kept low to maintain optimal shelf life of products. Many inks operate reasonably well over a specific range of temperatures but the operating environment which frozen goods are packaged is typically below these temperatures. Therefore, some inks are specifically formulated to achieve the best adhesion, durability, and printer performance in colder environments.

Condensation

The production environment can be humid. Products and packaging may also be exposed to temperature changes throughout the supply chain. For example, a cold product may be filled into a warmer package or an open door may allow warm air into the cold manufacturing environment. This change in temperature combined with humidity in the air can cause condensation on the products before and after coding. Additionally, the washdown process may leave moisture on the equipment and surrounding production lines. Only certain ink formulations are specifically designed to penetrate the condensation to print clearly, and adhere to the packaging, resisting the tendency for the ink to either transfer onto adjacent products or the production line conveyance systems. Water in the production environment can also act as a solvent, inadvertently removing ink codes before they have a chance to fully dry.

Printer calibration

Many production facilities store inks in a common store room for easier inventory management. This storage room is typically much warmer than the production environment. This warmer ink has a thinner viscosity than the ink within the printer in the cold production environment. Printers are calibrated based on the viscosity of the ink when running in a cooler environment. When the warm ink is added to them, most printers will automatically adjust the viscosity of the ink to its calibrated target. While this occurs, the ink will also cool, naturally adjusting the viscosity of the ink. It may take some time for the ink to settle at the calibrated level since these two processes are happening simultaneously. Until the calibrated viscosity is reached, performance may be impacted and printed code quality diminished.

What can you do to avoid printing problems?

Consider your ink

It is critical to select an ink that has been specifically formulated for your substrate and application. All inks are not created equal. What may seem like small changes to your production environment can significantly impact the type of ink that will work best for you. For example, an ink that may work well at 10° C (50° F) may not work well at 5°C (41° F). If the product has water on it during the printing process, inks with specific condensation-penetrating formulations must be used. Therefore, in addition to other characteristics such as color and packaging material, you must have a detailed understanding of the environment to pick the ink that is best for you.

Consider your printer

Some printers are designed to work in strenuous production environments. These printers are adept at solving some of the ink issues associated with this environment. For example, they are more adept at quickly calibrating ink in changing temperatures in order to help ensure print quality. Videojet 1580 and 1860 CIJ printers store more than one cartridge of ink inside of their core. When a warm ink or makeup cartridge is inserted into the printer, the warm fluid is slowly added in very small increments to the larger volume of ink in the core that has already cooled to the temperature of the environment. As a result, this process has a minimal effect on the viscosity of the ink in the printer thus limiting printing problems.

Consider your processes

It may be possible to alter your production processes for better ink performance. For example, the printer could be moved to a location on the line where condensation is less likely to form on the packaging, no longer requiring an ink that must penetrate condensation. Also, the location of the printer can be moved outside of the cold and humid environment to another location in the facility. Specialized inks for the tough environment may no longer be needed in this new, more temperate environment.

Major process changes can be expensive or impractical, but you may be able to find more practical alternatives. For example, another solution may be to purchase a heater for the printer or contain it in an environmental cabinet to control temperature and humidity.

Videojet® 1580 **Videojet® 1860**

The bottom line

The best advice is to get help. Choose a vendor that has installation expertise and the widest selection of inks. Provide samples of all the materials you'll be printing on, and have your vendor use their expertise to test one or more different inks to help select the best one for the application. Solutions are available to solve potential issues that may be encountered in cold and humid environments, but the key is finding the right one.

Videojet understands ink. With the broadest portfolio of CIJ inks and the industry's leading team of ink application chemists, Videojet has spent years developing specialty formulations ideal for operating conditions just like this. Whether your challenge is freezing temperatures, condensation on your packaging or something entirely different, Videojet likely has the answer.

Ask your local representative for guidance on working in these tough conditions, a production line audit or sample testing in Videojet's specialized samples laboratories.

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