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Substrate analysis



Application note



Ink

A guide on 'how to select the right ink for your application'.



There are many different factors to consider when using ink jet coding equipment to make sure you choose the right ink that meets your specific application requirements.

The challenge:

Printing equipment suppliers focus heavily on new product design to provide the packaging industry with innovative, class leading coding solutions that support stringent production needs. However, research and development investment should not stop at the coding equipment. The demand for new speciality inks suited to an increasing variety of innovative packaging is both a sign of real customer challenges and an indicator of where hardware suppliers should direct investment and expertise.

Videojet advantage:

With over 40 years of ink development experience, Videojet has invested significant resources to create leading ink solutions for a vast range of substrates and applications. Our team continuously monitors packaging trends and regulations to ensure our ink solutions are ready to address the emerging needs of our customers.

Videojet follows a rigorous ink development process that includes:

- Extensive analytical instrumentation to aid substrate evaluation and testing
- Incorporating comprehensive Voice Of Customer input to establish ink code application and durability requirements
- Rigorous development processes that include full application simulation, including environmental testing
- In-house experts to ensure compliance with environmental and safety regulations including REACH, EuPIA, VOC's and FDA/GMP
- Statistical Process Control to ensure repeatable and reproducible ink composition and performance across all global manufacturing locations.

Our development processes don't end in the ink laboratory. Our ink development activities include customer field trials. In fact, we encourage customers to participate in our testing phases to verify the required ink performance in the targeted application. Videojet's well established approach routinely results in overcoming the toughest printing and coding challenges.

An expert team of ink chemists with a total of 197 years' experience in ink jet, and a portfolio of over 340 different inks, make Videojet the right partner to support you in finding the ideal ink for your application.

We'll help you identify what you need



Manufacturers generally understand that the material being coded influences ink performance. Paper products typically work well with most ink types, but new high-performance plastics using specialized plasticizers are constantly being developed that can present complex challenges to ink code adhesion.

The production environment also plays a significant role in how inks adhere. Factors like moisture, temperature, and humidity can all impact initial ink code adhesion and durability. Drying and curing times afforded by product processes and manufacturing environments (e.g. cooking/retort, wash) must be accommodated. Understanding these fixed 'constraints' is crucial to selecting an ink that can survive the manufacturing process environment.

The time between printing the code and its first contact with a material handling component, like a belt or mechanical guide, or another product may influence the code's adhesion and legibility. These manufacturing process conditions can result in problems such as ink transfer or code smudging, and therefore should be considered when selecting the required ink.

In addition to these considerations, there are other important factors that manufacturers themselves may overlook. All can have a lasting impact on a code's integrity.

A few questions that you should ask in preparation for discussing ink selection with experts are:

1. Exactly what material (e.g., HDPE, PP, PE, PEX) am I coding onto?
2. Are there any surface coatings or contaminants from the manufacturing process present on the product either before or after coding?
3. What product surface color variation exists, and what is your or your customer's requirement for visual or machine readable code contrast?
4. What is the printer operating environment and what temperature extremes will the product itself experience and the code need to endure?
5. When and what components come into contact with the ink code after printing that may impact ink dry time?

Knowing the answers to the above questions will help to quickly narrow down the ink selection to a handful of suitable options.



Sherry Washburn
M.S.

Lead Chemist
Food processing and postal inks

Be sure to ask our experts

Manufacturers should take full advantage of the ink expertise offered by their marking and coding ink and equipment partner.

There are multiple options and considerations to take into account when choosing ink, but by engaging hardware application specialists and ink chemists together, you can achieve a better fit to your exact needs.

Ink specialists can quickly narrow the selection from over 100+ possibilities to as few as one or two potential inks which can then be more closely scrutinized in the final ink selection process. Ink suppliers can also help troubleshoot new problems that may arise years after initial implementation. Perhaps an ink that worked yesterday doesn't work today due to a subtle change in a manufacturing process or an undisclosed change to the substrate by your supplier. An ink specialist and their unique set of tools can help diagnose these problems and recommend solutions that get code performance back to an optimal state.



“All our inks and fluids pass rigorous development tests that prove their robustness prior to release”.

Frank Xiao
Ph.D.

Staff Chemist
Bottling, secondary packaging, 'green' ink,
pigmented wire and cable



What is available to you?

Access to over 340 inks for use in Videojet's continuous ink jet printers, designed for both common and unique applications.

From inks that penetrate thin layers of condensation and withstand the pasteurization process, to those that offer outstanding adhesion to steel, aluminium, glass, metal and wax coated substrates.



Food grade

Ideal for: eggs, pills, capsules, candy and confectionery; certain incidental food-contact products such as flavor packs contained within a food package.

Fast dry

Ideal for: high speed consumer packaged goods including food packages using films and stretch/shrink wraps; for decoration and branding.

Non-transfer/high temperature resistant

Ideal for: PVC, PE, PP, cross-link PE, cans.



Retort & thermochromic black to red/black to blue

Ideal for: soups, vegetables, sauces in aluminum and tin-free steel cans; chopped meat in polyester, nylon, aluminum, and polypropylene film laminated pouches; single serving plastic tubs and trays.

Condensation-resistant/caustic-removable

Ideal for: bottles, cans and bulk water containers.

Solvent/chemical-resistant; heat cured

Ideal for: automotive and aerospace parts exposed to environmental solvents including oil, lubricating fluids, antifreeze, and diesel fuel; electronic components and parts (extruded and molded connectors and housings subjected to cleaning solvents and defluxers); personal care products containing certain soaps and isopropyl alcohol.



Mike Kozee
Ph.D.

Extrusion, security
and product
decoration



Light/fade resistant

Ideal for: extruded window frames, cable/wire temporarily stored outdoors, and building materials.



Invisible Fluorescing UV readable

Ideal for: automotive parts, aerosol cans, pharmaceuticals, retort processed food containers and cosmetic packaging.



Oil penetrating

Ideal for: automotive parts, formed metal extrusions and stampings, and plastic components formed using mold release compounds.



Flexible films/plastics

Ideal for: food packaging bags and pouches, cups and tubs, shrink films, cosmetic and chemical bottles.



High contrast

Ideal for: extruded products including cable, wire, pipe, hoses and belts; glass and plastic bottles and containers.



Heat/steam cure

Ideal for: automotive radiator hoses, transmission belts, tires, and extruded butyl rubber moldings.



Stay on top of new technology



John Garrett
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Substrate analysis

Just as manufacturers are always improving their processes, ink specialists are constantly researching new formulations to meet new coding application challenges.

Manufacturers need to take this into consideration as they upgrade or expand their systems. If a manufacturer plans to add a second production line, they may think about simply replicating the same coding and marking solutions from their first line.

However, they need to ask themselves:

Has a better ink solution been developed in the time since I installed my first production line?

Can a more durable or more visually attractive ink strengthen my brand?



Resist the temptation to cut corners

Printer design engineers and ink specialists work closely together to design the printer and supporting fluids so they work hand-in-hand. This involves concurrently developing inks and designing printers as a finely tuned set. Remove one part of that equation and the system may not run as efficiently. Some packaging teams may be tempted to save money by purchasing fluids from a third party ink supplier. Since these fluids are engineered without taking into consideration the printer specifications, these fluids can degrade a printer's performance and code appearance over time. The result? Off-brand supplies can end up costing much more in the long run due to costs associated with excessive maintenance, premature part failures, and unpredictable downtime.

Mike Kozee
Ph.D.

Extrusion, security
and product
decoration



Pharmaceutical case study

Bausch+Ströbel approached Videojet to identify the right ink for their coding solution. Bausch+Ströbel is a leading international manufacturer of primary packaging systems for pharmaceutical products such as ampoules, bottles, vials, single-use-syringes and cartridges. Its highly-precise material handling solutions, including vacuum starwheels, provided the smooth, vibration-free transport necessary for printing high quality DataMatrix codes.



V459-D UV ink on glass vial bottom

Working closely with Bausch+Ströbel, Videojet proposed the 1510 Continuous Ink Jet printer with 70 micron nozzle and V459-D ultraviolet fluorescing ink. Videojet V459-D ultraviolet ink was selected since it addressed a number of application requirements including high fluorescence, outstanding edge acuity on plastic and glass surfaces, and excellent adhesion and resistance to autoclave processing. The Bausch + Ströbel solution includes an integrated inspection station to provide further assurance of code quality.

The combination of superior material handling, the 1510 advanced printhead design, and Videojet high performance ink has delivered the DataMatrix code quality required for this demanding application.



The Videojet ink development team

A dedicated team of ink specialists, engineers and technicians await your enquiry.



Lin Zhu
Ph.D.
Director - Ink Development
Dept Manager - All of the above expertise



Mike Kozee
Ph.D.
Lead Chemist
Personal care, wire and cable, high contrast, security, UV cure



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Bottling, secondary packaging, 'green' ink, pigmented wire and cable



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Chemist
General purpose ink jet formulation



Esther Barrios
B.S.
Chemist
High resolution formulation and printer/ink environmental qualification



Todd Theurer
B.S.
Chemist
'Green', sustainable ink formulations



The bottom line

Packaging professionals will be well-served by partnering with a coding and marking supplier that can guide their ink selection. The best ink suppliers study the evolution of packaging materials, understand the range of manufacturing environments, and proactively apply rigorous ink development processes to ensure code performance and integrity. With over 40 years of ink jet experience, Videojet is ideally suited to help with your coding and printing needs.

Videojet stands ready to help you determine the best coding solution for your application.

Call **800-843-3610**
Email **info@videojet.com**
or visit **www.videojet.com**

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