

CONSIDERATIONS FOR INKJET CODING ON PLASTICS

Plastic is a general term that covers a large variety of materials with different code adhesion challenges. Excellent code durability can be achieved by matching the ink formulation to the plastic type and product-use environment.



WHAT AFFECTS INK ADHESION TO PLASTIC?

HARSH OR HUMID ENVIRONMENTS

Small amounts of surface contamination from water/condensation, oil, or dust can prevent the ink from achieving 100% contact with the substrate. Air knives can be used to blow off contamination to improve adhesion.



WET OR COLD ENVIRONMENTS

Some products are used in wet environments which can erode a code over time. Others may need to endure cold temperatures from storage in commercial freezers and refrigerators. This can be mitigated through ink formulation.

TRANSPORT

During stacking and production line transport, products can come into contact with each other or experience abrasion from their case packaging. Certain inks are designed for excellent adhesion and abrasion resistance.

SPILLAGE

Many plastic containers hold ingredients that can easily remove ink codes. Fragrances, cleaning products, oil, lubricants, and other chemicals, if spilled, often smear or remove ink codes on plastic.

TREATMENTS

Poor drop spreading

Substrates with high surface energies will exhibit good drop spreading, while low surface energies will have poor drop spreading. Using surface treatments such as corona or plasma treatment can raise the surface tension of many types of plastics and promote improved adhesion.

Good drop spreading

SURFACE TEXTURE

A rougher or more textured surface will allow the ink more surface area to adhere and improve adhesion.

PLASTIC TYPE

Flexible

Glossy substrates and flexible films such as low-density polyethylene (LDPE), metallized polypropylene (PP) and bi-axially oriented polypropylene (BOPP).

New biodegradable and compostable films as well as matte-finished ones have also become popular.

These materials are non-porous and have different adhesion characteristics. Without inks that perform well on these substrates, customers may experience codes being rubbed or scratched off after printing.

RIGID

Polyethylene (PE), polyethylene terephthalate (PET) and high-density polyethylene (HDPE) are among the most common plastics used for rigid packaging.

These substrates pose coding challenges due to material surface, shape, and color and adherence on slick plasticizers which support plastic flexibility but make coding adhesion difficult.

With relatively low surface energy, printing on plastic containers can be challenging but is easily achievable with Videojet solutions.

RESILIENCE LEVEL

Codes need the ability to withstand the challenges of your distribution channel. The optimal coding solution takes into consideration your required ink resiliency.

There are different methods to test for code adhesion, and some can be more severe than others.

THUMB RUB

Rub thumb across the code and look for smearing or removal of ink drops

TAPE TEST

Apply a piece of tape on top of the code and pull off rapidly. Look for removal of ink drops.

ABRASION TEST

Rub an abrasive material across code. Most common is kraft paper or cardboard, but also can be done with cloth, tissue or a fingernail scratch

CHOOSING THE RIGHT INK

Since there are a multitude of different plastic materials available, Videojet offers a number of different ink formulations to help achieve good adhesion to the widest variety of plastic material types. The following chart is a good starting point for choosing the right Videojet ink for your application. The inks are listed from top to bottom in order of best choice.

TEST CRITERIA	BOPP FLEXIBLE FILM	POLYPROPYLENE	RIGID HDPE
Thumb rub	V4230 (Excellent)	V4230 (Excellent)	V4230 (Excellent)
	V4262 (Very good)	V4231 (Excellent)	V4231 (Very good)
	V4263 (Very good)	V4262 (Excellent)	V4262 (Very good)
	V4231 (Good)	V4263 (Excellent)	V4263 (Very good)
Tape test	V4231 (Good)	V4230 (Excellent)	V4231 (Excellent)
	V4230 (Good)	V4231 (Excellent)	V4230 (Very good)
	V4262 (Good)	V4262 (Good)	V4262 (Very good)
	V4263 (Good)	V4263 (Good)	V4263 (Very good)
Abrasion test	V4230 (Best)	V4230 (Very Good)	V4230 (Very good)
	V4231 (Good)		
	V4262 (Good)		
	V4263 (Good)		

For more information on how Videojet coding technology can help you code on plastics, visit our website.

Videojet experts are here to help

Visit www.videojet.com

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