Large character marking inks
Inks for printing bar codes

Printing good quality bar codes requires optimizing several variables. Most of these variables are controlled by the printer and set up, but ink selection also plays a role. Ink selection is important to assuring bars with good contrast and sharpness are printed. The Videojet 2351 and 2361 large character inkjet printers are commonly used for printing bar codes on cases and cartons, and Videojet offers inks for these printers that can print high quality bar codes.

GS1 grading

Grading bar codes using objective measurements helps ensure consistent results as a product travels through the distribution chain. A commonly accepted standard is the GS1 standard. The GS1 standard covers many aspects of a bar code, including what information is present in the bar code and how the bars are translated to information. Not all bar codes are part of the GS1 standard, but its method of grading bar codes can still be useful, even if the bar code itself is not part of the standard.

The GS1 standard grades a bar code on either a 0-4 scale (ISO) or a letter grade (A,B,C,D,F – ANSI). The grade is based on seven different attributes. The lowest grade for any single attribute will be the overall grade. Most of the attributes are not affected by the ink used, but a few can be affected by ink selection.

- Adhesion – An ink that doesn't smear or rub off will not have missing or damaged information

- Drop sharpness – Drops that print sharply will present a sharp perimeter to a bar

- Contrast – The ink's contrast to the substrate background is a direct attribute in the GS1 grade

GS1 grade requirements vs. scannability

As stated above, the GS1 grade provides an objective assurance of getting good bar code scans throughout the distribution chain. GS1 grade requirements have been issued by some users. A requirement for bar codes on cases that has been put out by a large retail chain requires GS1 grades of 2.5/B on white cartons and 1.5/C on brown cartons. Of the seven GS1 attributes, meeting these requirements for contrast is the biggest challenge for the ink. It is important to note that grades below these requirements do not necessarily mean the bar code cannot be read. Individual scanners may read bar codes with lower grades accurately.

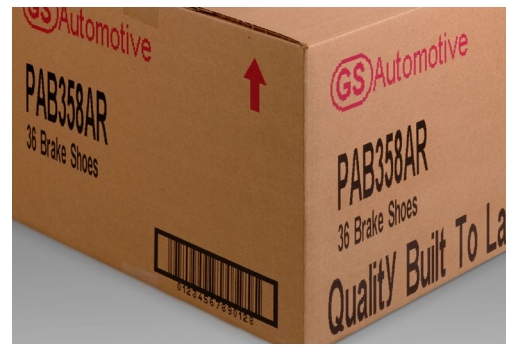## Using 2300 Series printers and inks to print bar codes

A common application for Videojet 2300 Series printers and their inks is for printing bar codes on cases, cartons and shipping containers. A common bar code type for this application is the Interleaved 2 of 5 (ITF) bar code. ITF is not a standard GS1 bar code because it does not contain all the information required for GS1 codes, but the GS1 grading system can be used to determine scannability. Videojet recommends two black inks for printing bar codes with the 2300 Series printers.

- M512-K – General purpose

- M533-K – Higher visual contrast

M533-K will print a bar code with higher visual contrast, even if the GS1 contrast grade is only slightly higher. For various reasons, end users still may prefer the darker appearance of codes with M533-K. For food packaging end users who have concerns about mineral oil on their packaging, M533-K also provides the benefit of a mineral oil-free formulation (M512-K does contain mineral oil).

Meeting GS1 minimum grade requirements

In applications that do require a minimum GS1 grade, M512-K and M533-K typically can meet the requirement of 2.5/B grade on white corrugate. On brown corrugate, however, these inks do not always meet the requirement of 1.5/C grade. Brown corrugate can also vary from shipment to shipment as to the shade of brown, so codes that pass the requirement on one shipment of boxes may fail on other shipments. Sample printing will establish the likelihood of passing consistently. On substrates where meeting the requirement consistently does not seem likely, an alternative printing technology such as label print & apply (LPA) may be a better option.

GS1 bar code on brown corrugate

High-resolution large character inkjet on white corrugate

Ask your local Videojet representative for more guidance, a production line audit, or sample testing in our sample laboratories.

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