
VARIABLE PRINTING & BARCODING

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A WHITE PAPER BY
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CAPABILITY

Variable data and barcode labeling applications include brand security and protection, personalization, game pieces and variable coding for security, pharmaceutical and industrial markets. There are many applications for variable data printing, but the most common use in the label industry is variable barcodes for tracking inventory.

Short Runs of Variable Printing & Barcoding

With digital printing, 4-color process short runs with black variable data can be economically produced. At Repacorp, we offer as few as 100 labels with black variable printing and barcoding. There are no plate charges, and our laser cutting capacities eliminate the cost of expensive tooling.

High Volume Runs of Variable Printing & Barcoding

Large high volume orders of 50,000+ labels are printed at high speeds on our 13" wide flexographic press and our 20" wide flexographic press. 600 x 600 dpi digital variable inkjet presses are attached to the flexographic presses. A 4" x 6" label runs 3 across on the 13" wide press, 4 across on the 20" press, and runs 150-200 feet per minute. The black variable data does not only have to be barcodes or text, it supports a range of linear, 2D barcodes (including QR codes), numbers, graphics, logos and personalized data. Our equipment has software that verifies that the barcode will scan, and it makes sure there are no duplicate numbers. We can produce barcodes as small as 1/2" x 1/2", and as large as 20" wide and with unlimited length.



Variable RFID Barcode Labels

Repacorp's proprietary printing process allows us to produce RFID enabled labels with accuracy, improved quality, and increased capacity with low rejection rates. We can print variable barcodes, insert the RFID inlay, encode the RFID chip, and verify that the barcode matches the RFID chip data—all in one pass. Our customers use variable RFID barcode labels to track assets, in their supply chain, or to create omnichannel customer experiences (a multichannel approach to sales that provides the customer with a seamless shopping experience).

Personalization & Hyper-Personalization

Repacorp's HP presses and software offer personalization and hyper-personalization capabilities; 4-color process variable printing to make each label, shrink sleeve or flexible package unique. This type of variable data printing is usually used in advertising and marketing campaigns to personalize products and for games that engage the consumer. An example of personalization variable printing is the Coke® campaign. Armed with a database of popular names, Coke printed a different name on each can. If you found a can with your name on it, you had a "personalized" Coke.

Service Bureau

Repacorp's Service Bureau prints static or variable data on a variety of thermal transfer and direct thermal facestocks. We provide 100% barcode verification, ensuring no missing or duplicate numbers.

BARCODES

A barcode is an optical machine-readable symbol that quickly and accurately captures information. When read with a scanner, barcodes identify information such as the manufacturer, product category, location, size, and so on. A scanner reads the vertical bars of varying widths, and the white spaces between the bars. Different combinations of bars and spaces represent different characters. A barcode scanner is used to decode the barcode data by reflecting the barcode pattern and sending it to a central computer. Barcodes are commonly utilized for tracking and inventory control.

Every barcode is comprised of 5 zones. There is a "quiet" zone at each side of a barcode. This blank area is at least ¼" wide. The "start" zone tells the scanner when to start reading data. The center of the barcode is the "data" zone, which holds the important encoded information that is read by the scanner. The "stop" zone tells the scanner when to stop reading data. Another "quiet" zone is at the end of the barcode. With quiet zones on both ends of a barcode, the barcode can be scanned either in a left or right direction.

For a good scan, barcodes need contrast between the bars and the space between the bars. Therefore, barcodes are usually printed with black ink on a white background. There are several types of linear and 2-D barcodes that can be printed on a label or tag.

LINEAR BARCODES

UPC: (Uniform Product Code) UPC barcodes are used in the U.S. and Canada on virtually every product sold in the supermarket and retail store.



UPC WITH SUPPLEMENTS: 2-Digit Supplement barcodes are used on magazines, newspapers, and other periodicals to identify the issue number, month or week published. 5-Digit Supplement barcodes are used on book for suggested retail pricing.



CODE 39: The Code 39 barcode uses all 128 ASCII characters, including upper case, numbers and some symbols. The asterisk is used as the start and stop bars. It is used by the US Government and military and is required on all DOD applications. The health industry commonly uses a check digit Mod 43 to this barcode. (The last digit of a barcode number is a calculated check digit. The check digit takes all numbers in the barcode and calculates them to confirm the integrity of the barcode. This check digit appears in the barcode itself, not the human readable.)



CODABAR: Limited to 16 characters and 4 stop and start characters; the Codabar is used in blood banks, libraries, photo labs and on Fed Ex bills.



CODE 128: The Code 128 barcode includes all 128 ASCII characters and can be encoded with large amount of data. Code 128 barcodes are used worldwide in the shipping and packaging industry.



INT 2 OF 5: The INT 2 of 5 is limited to numeric data only and an even number of digits. Interleaved 2 of 5 is used in warehouse, distribution, airline and photo finishing industries.



EAN & JAN: These barcodes are used on retail items sold in Europe, Japan and other parts of the world. EAN was originally known as European Article Number, and JAN known as Japanese Authority Numbering.

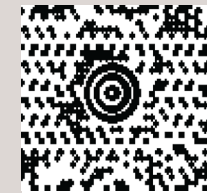


2-D BARCODES

DATAMATRIX: With the ability to encode approximately 50 characters of data in a symbol 2 or 3 mm, this error-correcting barcode is designed to pack a lot of information in a very small space. The most popular applications are marking small items such as circuit boards.



MAXICODE: This symbology is made up of interlocking hexagons, which can hold approximately 100 ASCII characters. The center bullseye allows the scanner to locate the label. Maxicode was designed for UPS sortation and tracking applications.



PDF417: The PDF stands for portable data file and was created to hold information when a database is not available. This error correcting high capacity symbology allows for about 2000 characters. It is used in logistics, transportation, retail, healthcare, identification, manufacturing and DOD labels for the military and government.



QR CODE: The quick response code is designed for rapid reading. It gained attention with smart phone technology by encoding website addresses. The QR Code can be identified by its square shape and dark and light squares located in three corners.



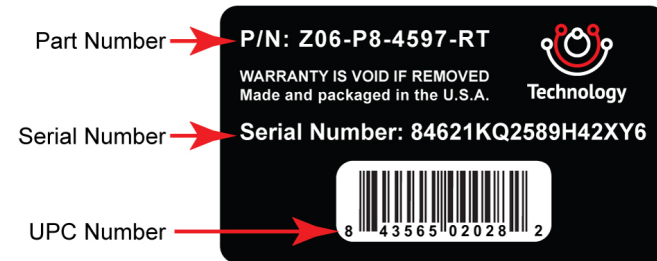
DATABASE

Variable data is fed through the press using what is referred to as a "database". This kind of "database" is really just a simple file, usually in .CSV or .TXT format, of the data for every label that will be printed. Database data formats can vary based on the label type.

Databases are composed of records; each containing data for multiple labels depending on the number of "lanes" (columns) designated for a given label print run. The database also includes additional records containing data not related to labels that provide control information on handling of label rolls. If you are creating a literal database for mailing labels, your lanes or columns might consist of first name, last name, address, city, state and zip code. The records, or rows of the database, would be each person and their mailing information.

Sequential databases are used to identify a unique item. An example of unique identifiers, or sequential data, would be a serial number.

Most variable-data application databases are straightforward, using both sequential numbering data and/or supplied label-content data. Repacorp has database-creation processes in place that provide databases for print runs based on the data and label-type definitions. If you don't have a database, our in-house programmers will write a program for you that meets your application's needs.



Above Graphic

An example of a unique identifier would be a serial number.

Illustration Page 7

Printed labels are shown next to the variable database used for the print run.

	A	B	C
1	2F220374D3456360000A09CD		
2	2F220374D3456360000A09CC		
3	2F220374D3456360000A09CB		
4	2F220374D3456360000A09CA		
5	2F220374D3456360000A09C9		
6	2F220374D3456360000A09C8		
7	2F220374D3456360000A09C7		
8	2F220374D3456360000A09C6		
9	2F220374D3456360000A09C5		
10	2F220374D3456360000A09C4		
11	2F220374D3456360000A09C3		
12	2F220374D3456360000A09C2		
13	2F220374D3456360000A09C1		
14	2F220374D3456360000A09C0		
15	2F220374D3456360000A09BF		
16	2F220374D3456360000A09BE		
17	2F220374D3456360000A09BD		
18	2F220374D3456360000A09BC		
19	2F220374D3456360000A09BB		
20	2F220374D3456360000A09BA		
21	2F220374D3456360000A09B9		
22	2F220374D3456360000A09B8		
23	2F220374D3456360000A09B7		
24	2F220374D3456360000A09B6		
25	2F220374D3456360000A09B5		
26	2F220374D3456360000A09B4		
27	2F220374D3456360000A09B3		
28	2F220374D3456360000A09B2		
29	2F220374D3456360000A09B1		

T-SHIRT, TACTICAL **SIZE: M** PGC: 03164

NSN: 8415-01-533-9887

UPC: 7 18020 09574 5

CAGE: 7M4V6

EPC: 2F220374D3456360000A09C5

T-SHIRT, TACTICAL **SIZE: M** PGC: 03164

NSN: 8415-01-533-9887

UPC: 7 18020 09574 5

CAGE: 7M4V6

EPC: 2F220374D3456360000A09C4

T-SHIRT, TACTICAL **SIZE: M** PGC: 03164

NSN: 8415-01-533-9887

UPC: 7 18020 09574 5

CAGE: 7M4V6

EPC: 2F220374D3456360000A09C3

T-SHIRT, TACTICAL **SIZE: M** PGC: 03164

NSN: 8415-01-533-9887

UPC: 7 18020 09574 5

CAGE: 7M4V6

EPC: 2F220374D3456360000A09C2

T-SHIRT, TACTICAL **SIZE: M** PGC: 03164

NSN: 8415-01-533-9887

UPC: 7 18020 09574 5

CAGE: 7M4V6

EPC: 2F220374D3456360000A09C1

MATERIAL

For short runs of variable barcoding on our digital presses, you can use any of our digital facestocks that are suited for your application. Due to our very opaque white ink on our digital presses, you can use clear or colored material and print a white block beneath your barcode. This will ensure your barcode will have enough contrast to be easily read by a scanner.

For our high speed inkjet presses, Repacorp offers a variety of facesocks. Papers are usually lower cost and lower performance than synthetic materials or films that are more durable in harsh environments. I am listing materials, with basic characteristics, that we offer on our high speed inkjet presses. If you are unsure of what facestock you need for your application, our Account Managers can provide recommendations and material to test before you go to print.

PAPER: Use a paper material for indoor product labeling and if the label does not need to be protected from moisture, chemicals, flexing or abrasion.

TAGS: Tags are simply labels without adhesive. They can be either made of paper or synthetic film. After printing, tags can be perforated and kept on a roll, or sheeted.

POLYPROPYLENE: Also known as BOPP (bilaterally oriented polypropylene), it is designed to be water and oil resistant, making it ideal for wet environments. Polypropylene is less costly than polyester, but offers many of the same benefits. Polypropylene is generally less durable than polyester and has a shorter lifespan. Polypropylene is a popular choice for retail products.

POLYESTER: Polyester is the dominant facestock used for durable applications due to its high strength, durability, dimensional stability, chemical resistance, and environmental resistance. In particular, polyesters provide high temperature resistance, and have U.L. recognition.

TYVEK®: Tyvek is registered trademark of the DuPont Company. It is a synthetic material made from flashspun high-density polyethylene fibers. Tyvek is difficult to tear, but can easily be cut with scissors or a knife. Water vapor can pass through Tyvek, but water cannot. Tyvek provides strength, durability and is light-weight. It is puncture, tear and abrasion resistant. It is weatherproof, water and chemical resistant. Its low lint content makes it ideal for sterile environments.

RETRO-REFLECTIVE: A retro-reflective material uses ground glass or man-made prisms that reflect light back to the scanner. This reflective property allows barcodes to be scanned from 30 to 40 feet away. This is very useful in warehousing where a barcodes located on the top rack can be scanned from the floor without the use of a ladder.

PAINT MASK LABELS: Paint mask labels are not a type of material, but a label construction that needs to be mentioned. Paint mask labels are used to track product throughout the manufacturing process. The multi-layer construction provides a top layer that is removable. The barcode is placed on the item at the beginning of the manufacturing process and can be read before the item is painted, stained, power coated, or in some way finished. The coating application covers the barcode, making it unreadable. The coated top layer of the label is removed to reveal the barcode beneath, making it readable again.

Photo Page 9

Variable paint mask labels with a silver tab for easy removal of top layer.



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