

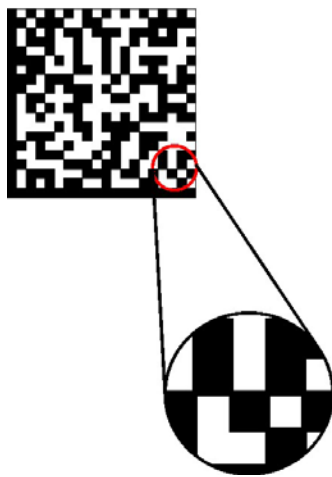
BARCODES AND DATAMATRIX CODES

The primary issue with laser engraving or marking barcodes is print growth.

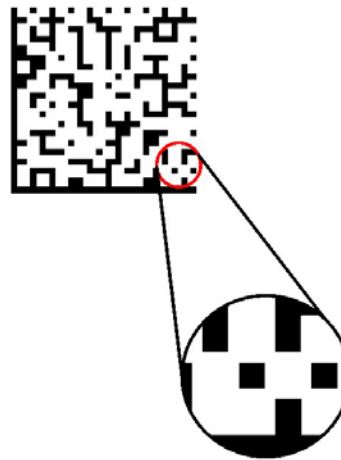
Print Growth is the effect of the engraved or marked area increasing in size due to the application of laser power to a given material.

The black cell on the barcode or the engraved area can be as much as 25% smaller than the non engraved white area and still verify with the reader. However that same black cell can only be 4% larger than the white cell or it will not verify, see example.

Failed Barcode
5% or more print growth



Passed Barcode



Print growth can also occur with standard barcodes (such as Code 39). Any standard barcode should be rotated 90 degrees (engrave the barcodes horizontally) to eliminate print growth. If the barcode is not rotated, the laser system must be tuned properly to avoid print growth.



When running small barcodes or data matrix codes, you should run the laser system no faster than about 20-30% speed. Small is about 1/4" (3mm) square.

Codes can be scaled larger or smaller but you can not shrink or enlarge in the x-axis only.

When marking anodized aluminum, you need to have 'quite zones' when marking a standard bar code. This is simple to do by inverting the image once it is created. This is not done with 2D codes.



For 2D data matrix codes you must use the tuning feature. Enhancements are not relevant since we are usually running at 20-30% speed.

A data matrix smaller than ¼" (3mm) square can not be created with the laser system. Be careful of the amount of data as large amounts of data will sometimes create a data matrix that is equal to four squares. In this case the ¼" (3mm) size would be too small and you would have to have a matrix of about ½" (6mm) to engrave properly with the laser system.

To create a 2D data matrix code that will laser well, create the 2D code and import into CorelDraw. This code will be a bitmap.

Trace the bitmap in CorelDraw and use the 'High Quality Image Trace'.

You may need to specify the color. (Make it all black and white).

The completed trace is now a 'Group' of objects in CorelDraw.

Set your outline tip to 0.3 points (0.0042").

Select the group of objects and right click on the white outline. This will reduce the square size of the matrix code and compensates for print growth.

You will have to do this for each data matrix that you create. This may cause problems if you are trying to serialize codes as you will be unable to do this for the many matrices that would be created when serializing.

Large data matrix codes of ½" (6mm) or larger do not usually have to compensate for print growth.

Most data matrix codes are generated in third party software and need to be imported into CorelDraw. Do not save these codes as JPEG files as they are usually of poor resolution. It is best to save them as a .wmf file and then to import that file into Corel.

Most data matrix codes work well at 20-30% speed, PPI of 1000, Image Density 6 and a tuning setting of -2 for the M, V and X Platform systems.