

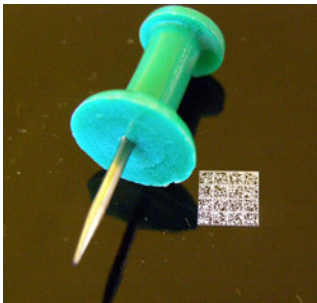


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Press Release

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Laser Marking 3-mil Codes on 3M™ Label Stock



3M™ laser-markable labels are specifically designed for laser ablation or kiss-cutting applications. These two-layer labels, typically a 10-micron (0.0004") thick contrasting top layer bonded to a 50-micron (0.002") thick base layer, allow customers to laser mark very high-resolution images as demonstrated by this application.

The customer requirement is to mark a 2D Data Matrix code containing 347 characters - in a space no larger than 5.0 mm (0.197") square! This means the final 2D code will contain a 64 x 64 array of cells with each individual cell measuring 3-mils (0.003" or 0.078 mm) in diameter. To create this very small mark, the setup consisted of a Synrad 48-1 (10 watt) laser, an FH Flyer marking head (equipped with an 80 mm lens), and a copy of Synrad's WinMark Pro laser marking software.

The 2D code shown here measures five millimeters square and contains 4096 individual cells measuring 3-mils (0.003") in diameter. Each cell is five times larger than the tip of the push pin!

After creating a 2D code in WinMark and entering the 347-character text string as the object's *2D Barcode Text*, the code was sized to 5 mm square using the *Object Transformation* dialog. On the *Marking* tab, a *Velocity* of 2000 millimeters per second was entered (78.7 in/sec), a *Power*, duty cycle percentage, equivalent to 2 watts, and a *Resolution* of 600. Then the *Spot Marking Style* property was set to Yes and entered a *Spot Mark Duration* value of 2 (0.2 milliseconds). On the *Format* tab, the *2D Barcode Bitmap* was set to No and specified a *2D Barcode Circle Radius* of 40%.



Using the parameters described above, enabled the customer to mark and read the 3-mil (0.003" or 0.078 mm) diameter cells in this 2D code. Overall cycle time to create each code was 22.2 seconds. Because the 3-mil cell size is smaller than the focused spot size (0.005"), a tip-writing effect can be seen due to the choice of *Velocity*, *Power*, and *Spot Mark Duration* settings. As well as helping to achieve the small cell size, these settings also prevent the laser from drilling into the white base layer.

A close-up view of the 2D code that we marked using 2 watts of power at a speed of 78.7 inches per second. The code received "A" grades for both axial uniformity and print growth.

All Synrad lasers and marking heads are available from Laser Lines Ltd. For more information please contact Gary Broadhead on 01295 672500 or email garyb@laserlines.co.uk.

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