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**GRAVOGRAPH**

EDUCATIONAL ARTICLE

# What are 2D, 2.5D & 3D Engraving Processes?

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# Features of the 2D, 2½D and 3D Engraving Processes

Engraving is used for many purposes. It lends style and elegance to personalized items. It also provides quality and permanence for signage and industrial plates and parts. Today's computerized engraving equipment capabilities include engraving, cutting, milling, drilling and routing. These processes range from simple to complex in 2 or 3 axes of simultaneous motion for flat work or cylindrical items.



**In the 2D engraving process**, the cutter is programmed at a specific depth for each pass. This is a simple process for engraving on flat items such as signage, plates, awards, gift items and the like.

For diamond drag engraving, depth need not be programmed in the software as the spindle spring keeps constant tension on the item. When engraving subsurface with a carbide tool, the depth is usually set with a micrometer and chosen to expose the core color of the material being engraved or to hold paint. When filling areas, the choice of cutter tip size is important. If the tool tip

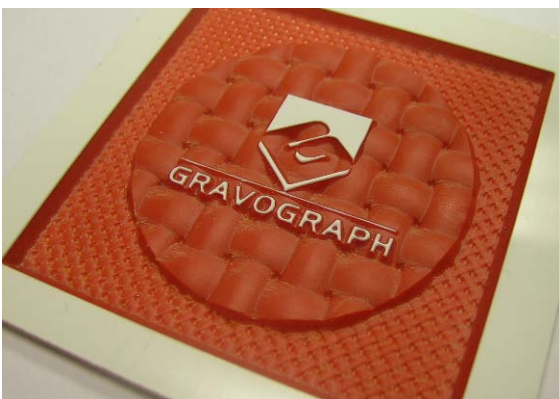
cannot fit into the design at the prescribed depth, then that area is not engraved. Fortunately, with GravoStyle software, you can preview the job to avoid wasting material.

**The term 2½D engraving** can have different meanings. 2½D engraving could be a job consisting of multiple 2D engraving paths each engraved at a specific depth. Or, the way it's defined in GravoStyle, 2½D engraving utilizes a conical shaped tool that lifts up out of corners and between letters. Because the cutting width becomes smaller as the tool lifts, the result is greater detail and sharper corners. The tool actually moves in three dimensions in the finish pass and for Intaglio engraving.

The finish pass moves the tool around the design contours while the Intaglio toolpath moves the tool up and down to vary the cutting width in order to fill the closed contour (similar to a hand-carved effect).



**In 3D Engraving**, the tool moves in three axes across the entire design as required. True 3D volumetric designs can be engraved with this process. Unlike 2½D engraving which leaves the top surface flat, 3D engraving results in contoured surfaces. GravoStyle 3D provides the designer tools to create and manipulate surfaces in an artistic fashion. 2D designs such as text can be projected onto these 3D surfaces.



These 3D designs can be converted into grayscale bitmaps which can then be engraved with GravoGraph lasers. The power output of the laser, and therefore the depth, is controlled by the density of the gray level. Materials such as wood respond very well to this process. **Find out more online at [www.gravograph.us](http://www.gravograph.us)**