

## → Photo Engraving Tips & Tricks

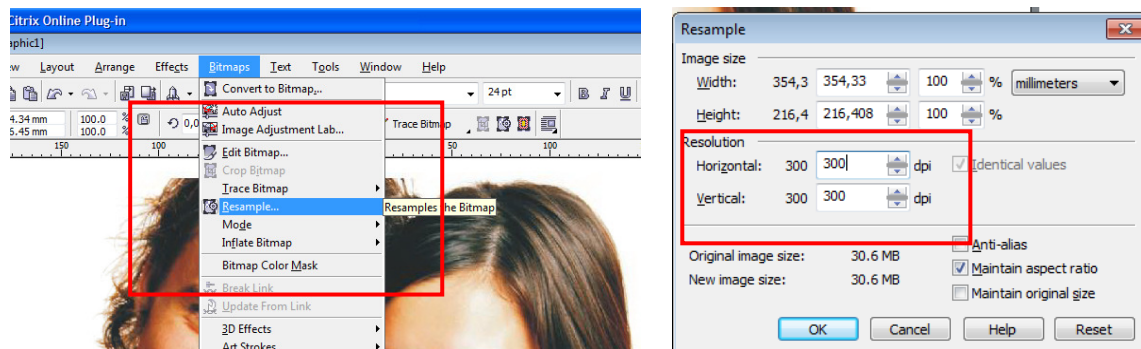
Photo engraving is considered to be the fine art of laser engraving. But it is very easy if your laser software supports you well. Some additional tricks can be pretty helpful. Read here how to become a photo engraving pro!

### 1 → General information about selection of images and laser parameters

The best results can be achieved with images that show many grayscales. The „technical“ image quality is also very important. Images from the internet have a resolution of 72 dpi. However, they can be processed well with a laser if the image is big and can be reduced to the work piece size.

In no case small images shall be enlarged, because it delivers a lower resolution and reduces the engraving quality.

In general images for laser engraving should have a resolution of at least 300 dpi. If necessary, you can increase the resolution in your graphic software by resampling it (Example CorelDraw: Bitmaps – Resample)



**Rule of thumb for photo engravings: less is more!** Best results can be achieved with appropriate material parameters. Very often too much laser power is used which ends up in a “flat” engraving with little details, because the raster dots overlap. Ideally the material should only be slightly “scratched” on the surface.

The **process resolution** is another important factor. Anodized aluminum for example can be engraved with 600 – 1000 dpi, because on this material the dots do not overlap. On wood on the other hand, 333 dpi are sufficient, because on this material every raster dot is larger than in the graphic. In general lower resolutions (333 - 500 dpi) result in more sculptural photo engravings, because the raster dots do not overlap.

A 1.5” **lens** is in most cases the best choice. One exception are objects that shall be regarded from the distance. In this case use a 2” or 2.5” lens and a lower process resolution. This saves time.

#### Tip:

To find perfect parameters for a material, you can engrave a grayscale wedge. If the engraving is too dark, reduce the power or increase the speed. If it is too light, increase the power or reduce the speed.

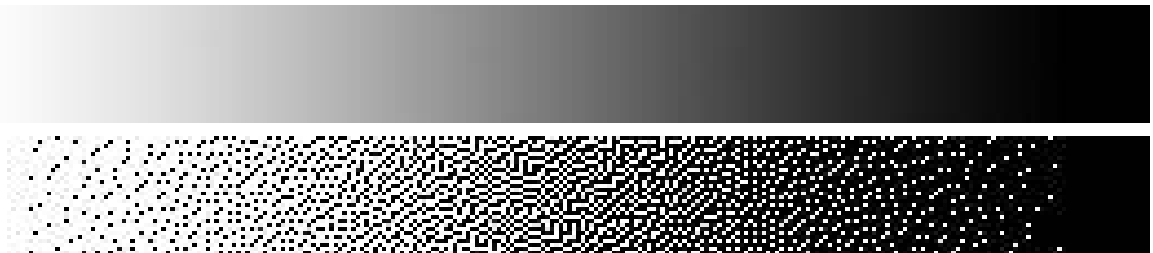
**2** → **Error Diffusion vs. Ordered Dithering**

**Ordered Dithering:** Ordered dithering is an organized raster structure. The darker the grayscale, the larger the raster dot. Position and density of the raster dots remain unchanged.



This raster algorithm is suitable for materials that are easy to engrave (anodized aluminum, acrylic, engravable plastics) and soft step courses.

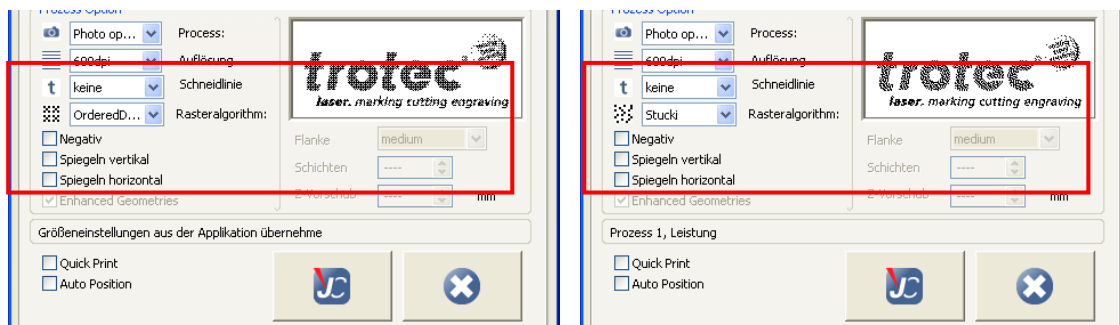
**Error Diffusion (Stucki, Jarvis):** This raster algorithm is a „chaotic“ raster structure. The darker the grayscale value, the denser the raster dots. The size of the dots, however, does not change.



This method is suitable for materials that are difficult to engrave (wood, leather, glass) or if images with a lot of details (architecture, animals with thick fur) or little contrast (babies, bad or very small images).

**Error Diffusion algorithms increase the contrast of the image!**

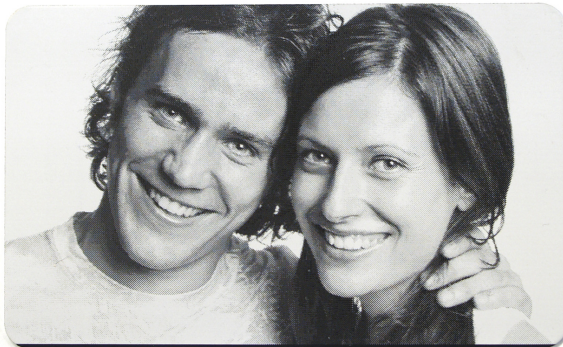
Both kinds of raster algorithm are implemented in the JobControl X driver. In addition there is a new process “photo optimized”. With this process type, the image for laser processing is automatically transferred to the JobControl X following an intelligent algorithm. You therefore always receive good results during photo engraving.



3 → Example: Photo engraving on anodized aluminum



Original image 90x55 mm 300 dpi



1. Anodized aluminum 600 dpi Ordered Dithering



2. Anodized aluminum 600 dpi Stucki



3. Anodized aluminum 1000 dpi Ordered Dithering



4. Anodized aluminum 1000 dpi Stucki

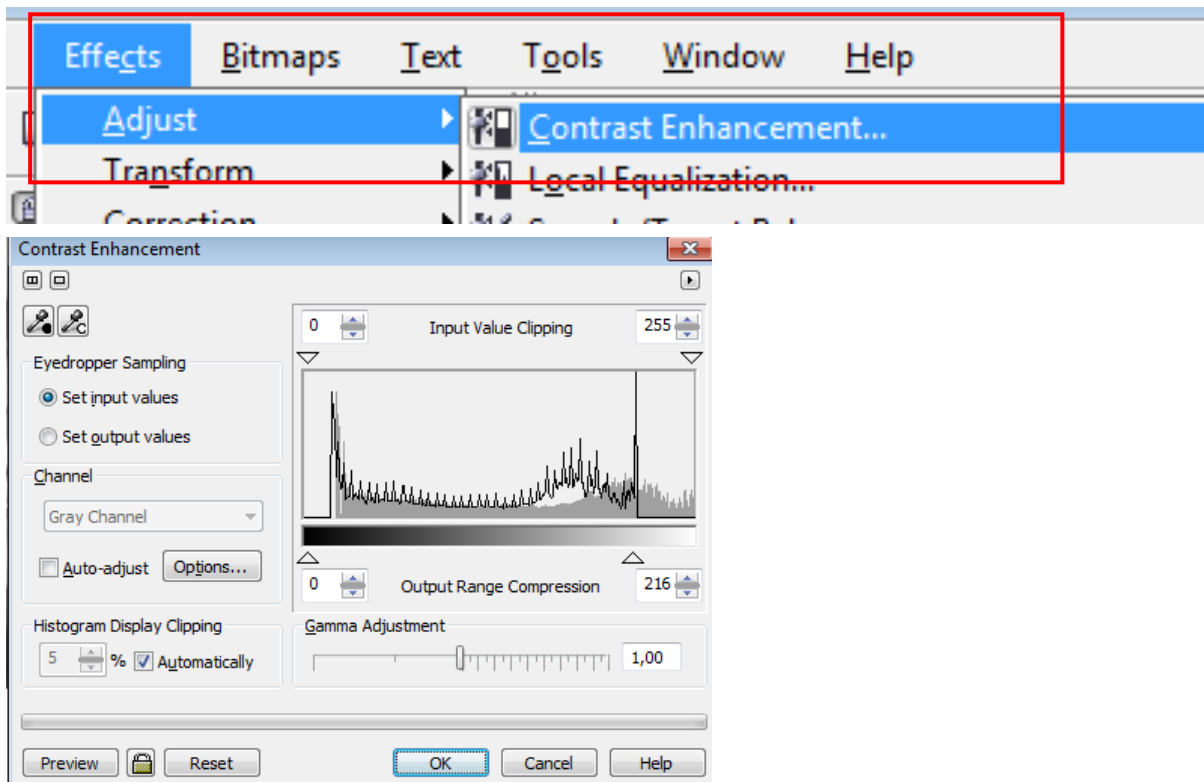
Engraving on anodized aluminum allows high resolution and needs no additional photo processing. This image has been inverted in a graphic program and printed to the JobControl X software using the "Photo optimized" process.



4 → Tools for image processing

Not all materials can be engraved as well as anodized aluminum. There are several possibilities (e.g. additional software packages) to optimize the engraving results. CorelDraw offers the same possibilities, but with no additional expenses. Two functions are particularly useful. .

1. Contrast enhancement (Effects – Adjust – Contrast Enhancement)



**Input Value Clipping:** Increases the contrast of the image. The darkest and brightest grayscale values are defined as black resp. white. Very helpful for images with bad contrast.

**Output Range compression** does exactly the opposite. The darkest and brightest grayscale values are removed from the image, no black and white remains. Very useful for images with a good contrast on “difficult” materials (e.g. wood).

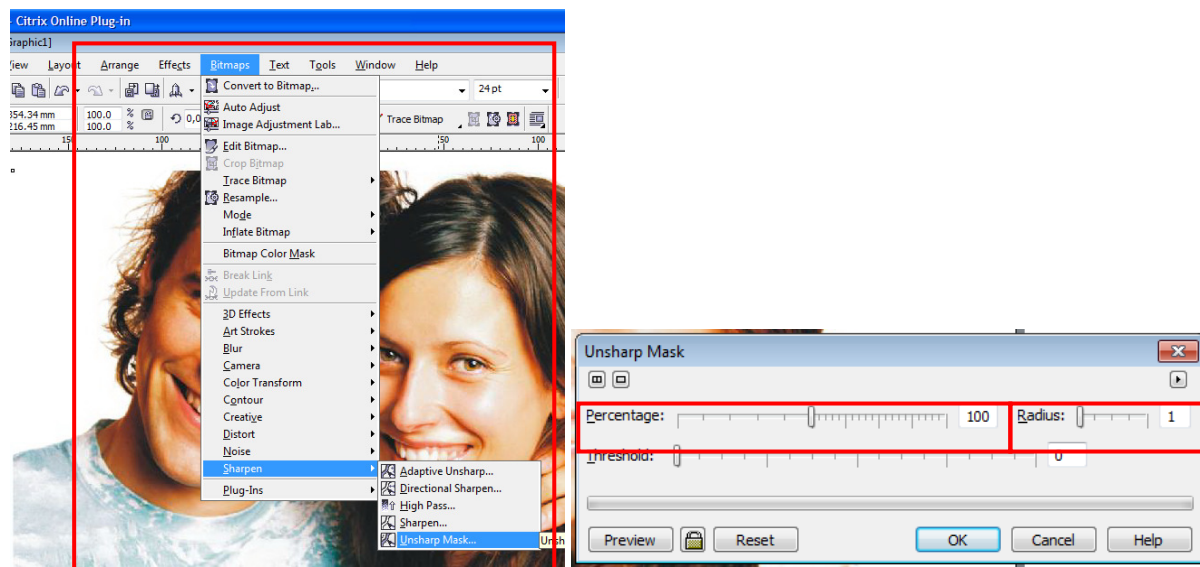
**Example:** Engraving faces on coated wood. The white areas in the graphic are not engraved (nose and forehead appear unengraved), because they have no raster filling. Removal of 30 of the brightest grayscales (255 to 225) means, that all white and therefore unengraved spots are now give a decent raster filling. The material is slightly engraved and therefore no longer shows unengraved areas.

## 2. Unsharp Mask (Bitmaps – Sharpen – Unsharp Mask)

Unsharp mask increases the contrast at the transition point between bright and dark pixels. The details in the image (e.g. hairs, eyelashes, etc.) become clearer.



An unsharp mask has been applied on the lower sections.



The percentage defines how much brighter resp. darker the affected pixels become. The radius decides how many pixels are affected. In most cases the radius is used. The higher the radius, the more the image looks like a drawing.

Pay attention to the unsharp mask on materials that can be engraved easily (e.g. anodized aluminum). If the radius is too high, eventually all sin imperfections are transferred onto the material.

5 → Example: Photo Engraving on Wood

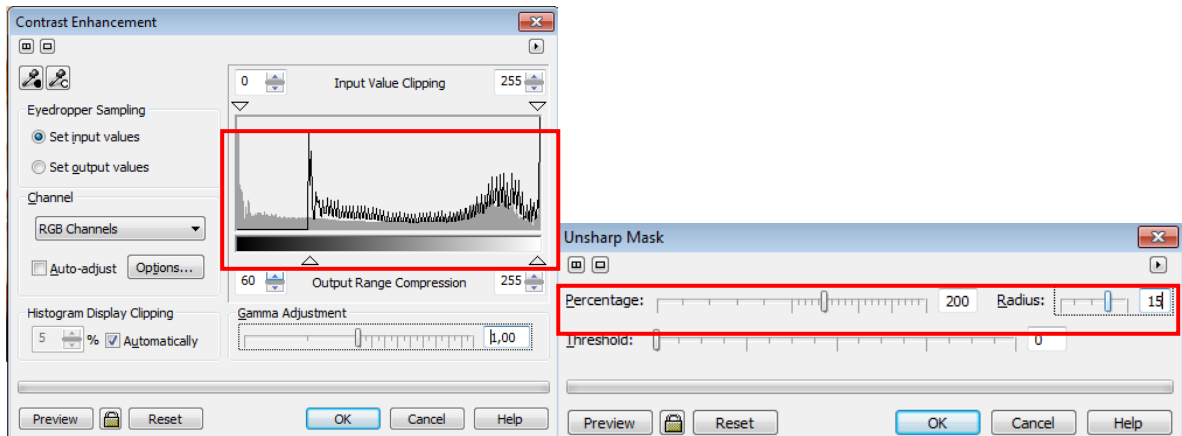
Images 1 and 2 have been rastered with the JobControl X printer driver without any additional image processing.



1. Maple 333 dpi Ordered Dithering

2. Maple 333 dpi Stucki

To optimize the result both tools mentioned above have been used as shown below.



The 60 lowest grayscales have been removed from the image to remove dark spots (especially when looking at the hair). Unsharp mask with very high radius makes the details and facial features clearer. Images 3 and 4 have been engraved with the same machine settings as images 1 and 2.



3. Maple 333 dpi Ordered Dithering

4. Maple 333 dpi Stucki

**6** → **Example: Photo Engraving on Black Acrylic**

Images 1 and 2 have been rastered with the JobControl X printer driver without any additional image processing.

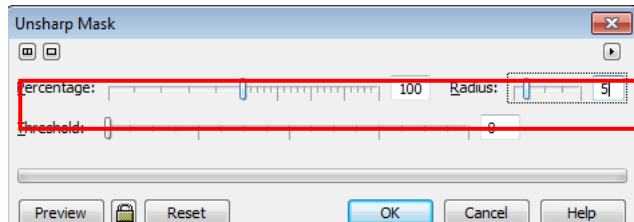
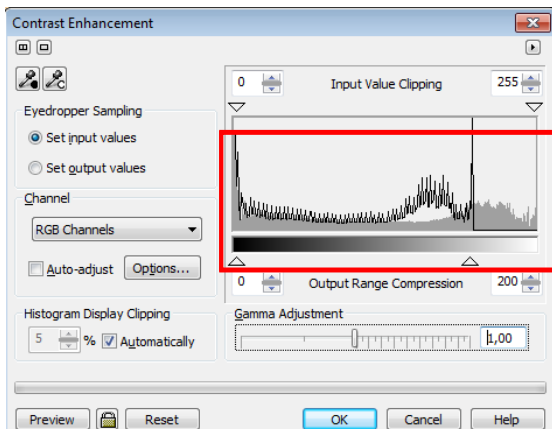


1. Acrylic GS 600 dpi Ordered Dithering

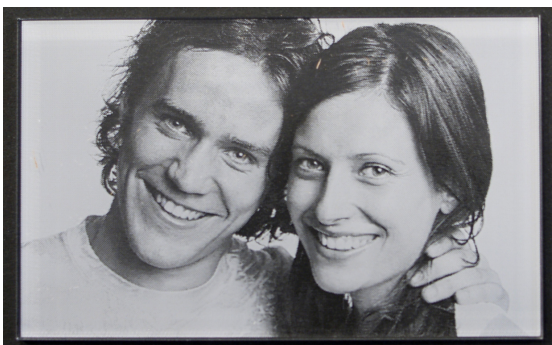


2. Acrylic GS 600 dpi Stucki

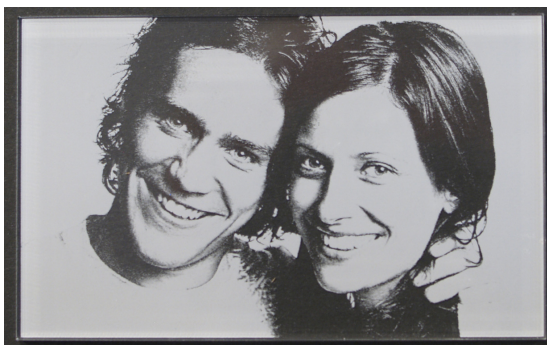
To optimize the result both tools mentioned above have been used as shown below.



For engraving on acrylic the image needs to be inverted. In this case – contrary to wood – the upper grayscale values have been cropped. Slight unsharp mask makes the details clearer.



3. Acrylic GS 600 dpi Ordered Dithering



4. Acrylic GS 600 dpi Stucki