

# CNC MACHINING OF HALFTONE AND LITHOPHANE IMAGES INTO WOOD-BASED PANELS

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CNC machining of images into wood-based materials allows production of high value products to be used as decorative elements in interior design.

The aim of the current research was to develop the processes of CNC-machining of halftone and 3D lithophane images into wood-based panels.

Firstly halftone images were machined into wood-based materials with the use of a special freeware named Halftoner V1.4 (by Jason Dorie). The output of this program being a G-code it had to be converted into\*.ply file format to allow the insertion of the toolpaths into Weeke CNC machine. For that purpose necessary converter was written in Visual Basic programming language. Halftone technique was used for reproducing images in two different styles – in a line and in a dot style. Tests showed that the dot style is four times more time consuming. Nevertheless the dot style proved to work with several materials when the line style only produced satisfactory results for melamine faced MDF. Secondly the lithophane technique was used to produce 3D photograph effect by CNC machining lines with different width, spacing and depth into plywood. To convert images to lithophanes Vectric's PhotoVCarve program was used. Desired material chosen for testing was plywood and thus the use of plastics and solid surface materials (Corian) was set aside. After tests with different plywoods the 4 mm thick II/III quality birch plywood was selected for further testing. Back lit light was used to make CNC milled lithophane image visible, where thicker areas let less light through thus representing darker tones of the original image and thinner areas in contrast let more light through hence portraying the lighter tones.

As a result processes of CNC machining of halftone and lithophane images were worked out, yielding in creation of several successful test pieces. The results of the research are applicable for customizing the developed processes for other specific CNC machines besides the used Weeke CNC as well.

