

# MACHINEMATE®

Laser Cutting  
with  
Distance or Gap Control

CNC Software



Picture of a successful Laser Cutting Application

By Krueger International  
With MachineMate CNC

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## MACHINEMATE Punching/Nibbling Option

Krueger International (KI), based here in Wisconsin, is a manufacturer of office furniture. Their engineering division in Bonduel, Wisconsin, develops the custom machines for their manufacturing facilities. This machine with the **MACHINEMATE** CNC was installed in Manitowoc, Wisconsin.

The **MACHINEMATE** runs the laser that cuts the part (a piece of the office furniture) whose program is based on the operator defining the pattern to be cut. The pattern consists of the size of the cut sheet and the definition of the corners to be removed (to allow the remaining material to be folded) as well as an optional number of rectangular cut-outs (for outlets). KI used several **MACHINEMATE** features to successfully complete this project.

1. Laser power control – to control the laser output voltage  
KI programmed the optional laser feature for the laser voltage to be proportional to the path velocity so that as the laser decelerates/accelerates at corners no excessive burning will occur at those points.
2. Distance control – to control the distance of the laser head above the part  
This optional feature was required because the thin metal sheet would not lie completely flat on the machine table. The KI engineers determined the optimum distance between the laser cutter and the sheet. The CNC automatically moves Z up and down to maintain this distance as the sheet is cut. Because this distance in Z is the gap between the laser and the part this feature is often called gap control.
3. Part rotation – to provide the flexibility for the part's orientation on the table.  
This standard feature allows the part's coordinate system to be rotated. This feature was required because the part had to be cut precisely aligned with the actual grain of the pattern in the sheet. By correctly rotating the part coordinates based on an optic sight with crosshairs for proper alignment (the pattern variation is usually within a few degrees), the part was cut for the correct cosmetic appearance.
4. MM Visualizer – to provide customized operator data entry displays  
This optional feature was required because the operator would run a custom part each time. It was not practical for KI to write the multitude of part program variations. The operator would enter the specific part's dimensional requirements into the data entry screen created by the KI engineer. The data on the screen is automatically read by the soft PLC running in the CNC. The PLC would pass those data entry values to the CNC cycle parameters. The part program's path was defined by these cycle parameters.

With this system design, the KI engineers had to develop only a small number of part programs, based on the general part types. Specific variations in those general part types, such as changes in the cut-out locations, would be handled by the operator data entry rather than by a new part program.

KI reports that with their custom operator displays the machine is so easy to operate that the operators require no CNC background or special training.