

SoftONE CNC V 2.0

Description of application

SoftONE-CNC generates NC-code from **TRIBON** “gen” files and **AUTOCAD** “dxf” files for computer controlled burning machines with plasma arc cutting, gas cutting, laser cutting and other manufacturing applications.

SoftONE-CNC is designed to run in Windows 2000/XP.

The graphical user interface (GUI) makes it easy to learn. A new user can produce reliable NC-code within the first ten minutes of using SoftONE-CNC.

SoftONE-CNC offers the following main features:

- Converts **TRIBON** “gen” CAD files to reliable NC-code for 2 axis cutting machine.
- Converts **CAD** “dxf” files to reliable NC-code for 2 axis cutting machine
- Conversion times including user selection is fast
- Automatic error correction features
- Automatic path generation.
- Manipulation of “V” bevel codes (from tribon files)
- Easy to learn graphical user interface

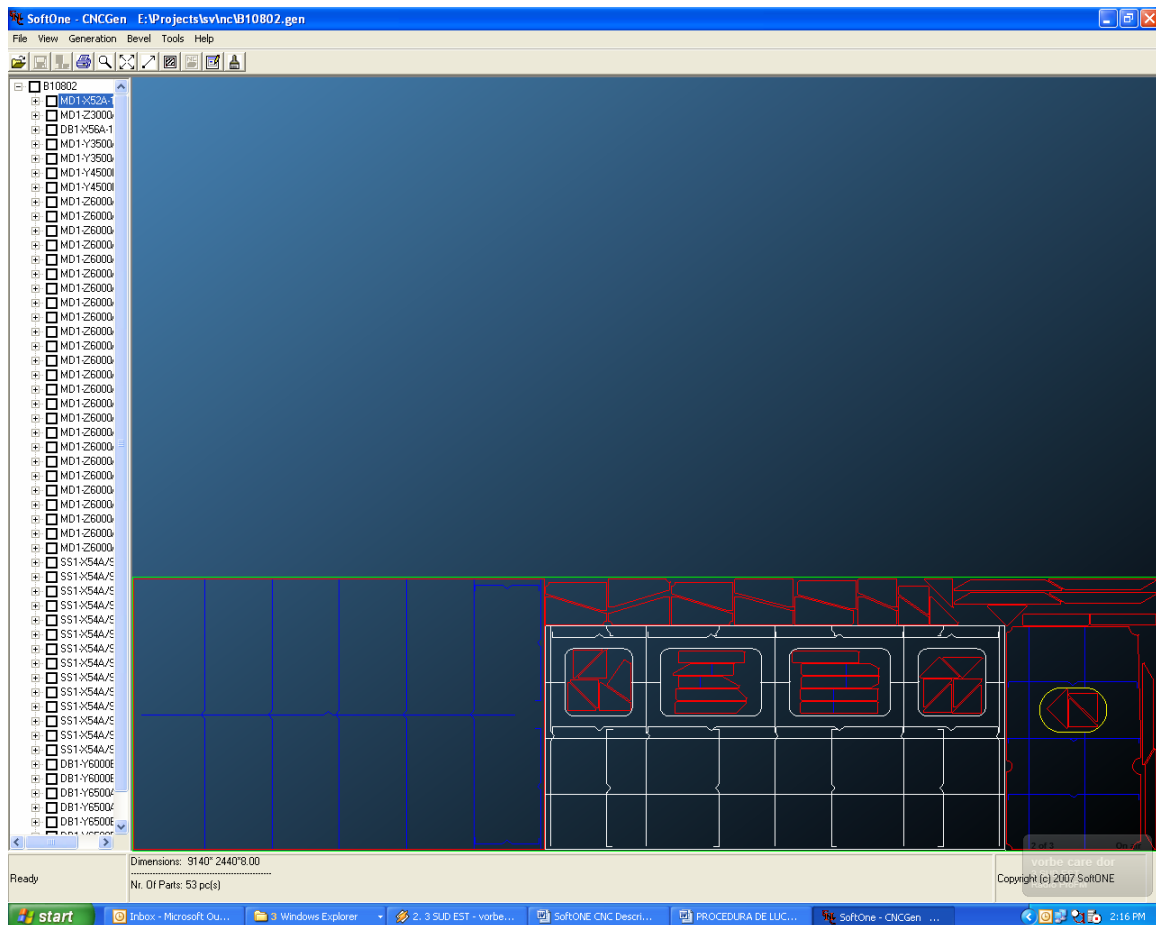
SoftONE–CNC features:

- Works like a graphical NC postprocessor for Tribon users
- Read and convert to NC codes bevel instruction from Tribon “.gen” files
- Read and convert to NC codes Autocad or other software which can export DXF files.
- Easy to change bevel codes.
- Separating process entity by colors
- Export nesting plates to Autocad DXF performing different layers and colors for each process.
- All duplicate entities, i.e. identical lines or arcs, are automatically deleted.
- Allows the user to set the lead-in and lead-out length independently. You can create NC-code with no leads, lead-ins only or lead-ins and lead-outs.
- Optimize the complete path automatically from the DXF file for reducing the cutting time process. The shapes on each layer are processed from the bottom left corner to the upper right corner.
- Calculates the area of the processed parts, minus any holes. Generate a report for the nesting plate with all necessary information for production Simulation on the screen of all processes
- Mark using rapid travel speed.
- Generate marking or cutting path only.
- Allow the user to set-up the input filters, extension of the output NC files, motion settings as well as bevel settings of the resulted file.
- Works with both standards :**ESSI or G-codes** with or without bevel

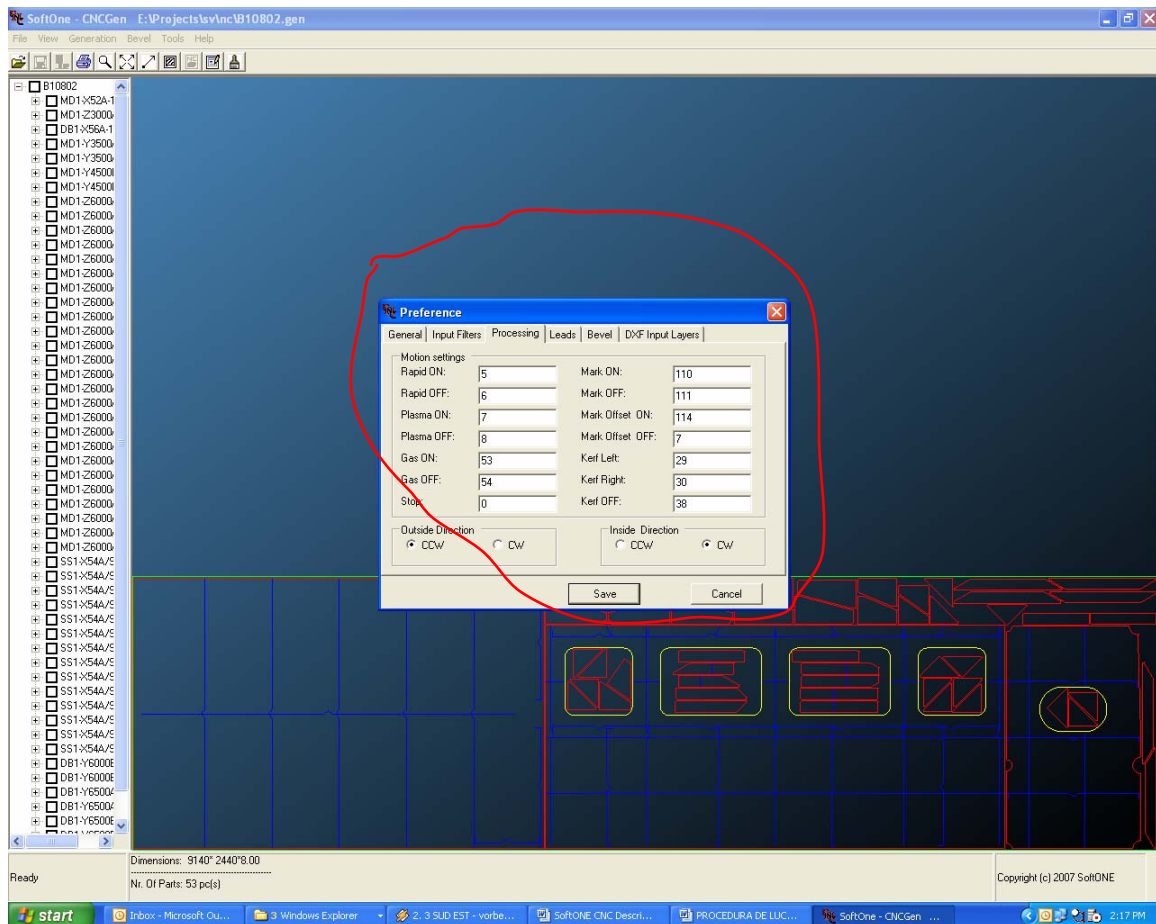
For Tribon users ,the main application workflow is as follow:

After arrange the nesting parts in Tribon Nesting Module and adding starts, run “Verify” function. Depending of the “SB_TAPE” Tribon environment variable, you should find in “NC” directory, the corresponding “.gen” file associated with Tribon nesting job. For each Tribon nesting job you should have a “.gen” file.

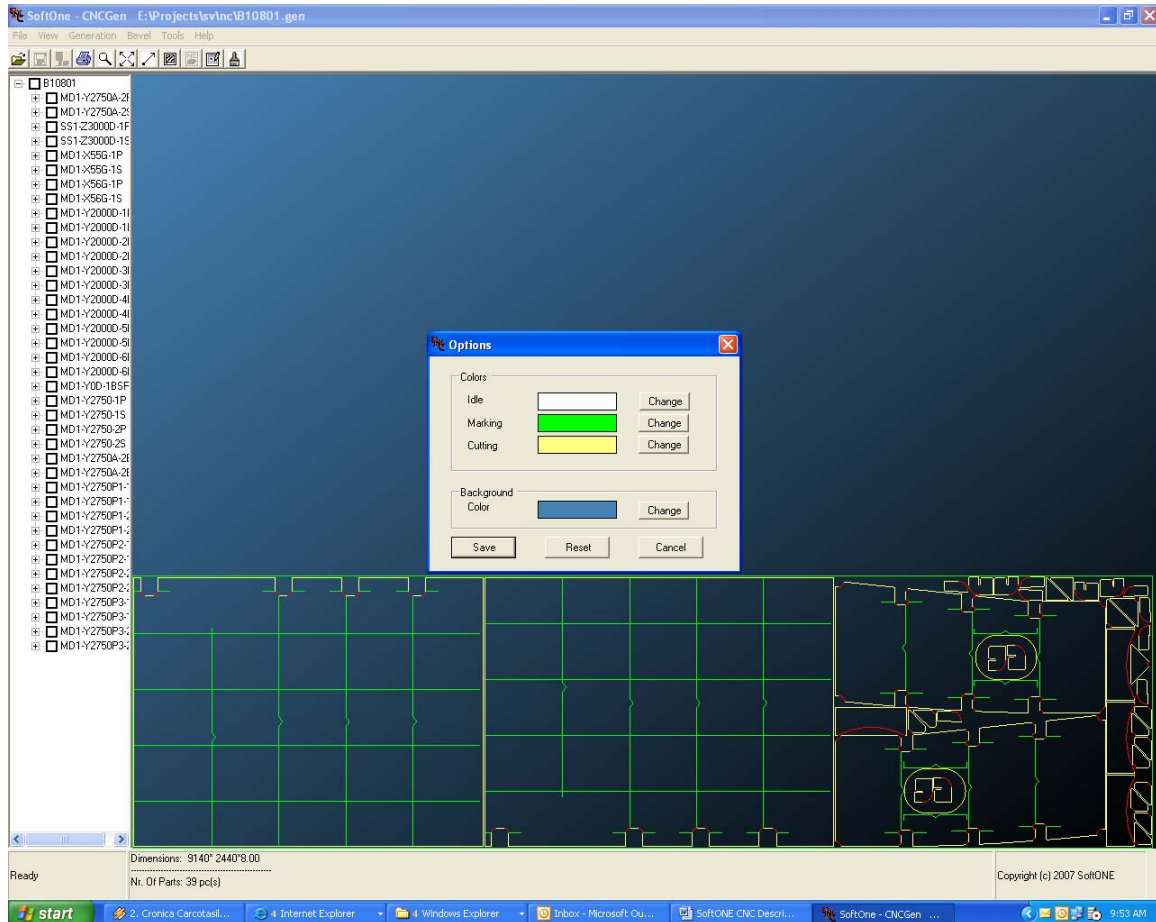
Open the desired “.gen”file with Soft-One-CNC application. In the left side a tree view with arranged parts name and its position numbers will appear which help you to identify easy the parts on the plate. In the status bar you will find information about the nesting plate. For visual checking of the nesting ,Zoom In, Pan and Autoscale functions are also available. If the parts has also bevel, the color of bevel segments are changed to “Cyan” color for easy identification.



In 'Tools, Preference' menu you can adjust the output code (ESSI or EIA) and save the settings for future use for different machines type. The settings files are located in "def" folder of the application. The default files for CNC machines are "XML" files, so can be edited and created new ones for new machines types. SoftONE uses a controller code file for every type of controller to handle the variations. You can modify or make your own controller files with any text editor or XML editor to support any controller. Use a text editor like Write or Notepad to change the individual codes in a controller file. Just select the code that you wish to change and type in a new value for the specific code. It is good practice to open a file that represents your needs most closely and to save it under a different name and modify and save the settings through interface (Tools, Option sub-menu). Make sure that "ControllerType" record is not empty and has one of the following values: essi or eia.

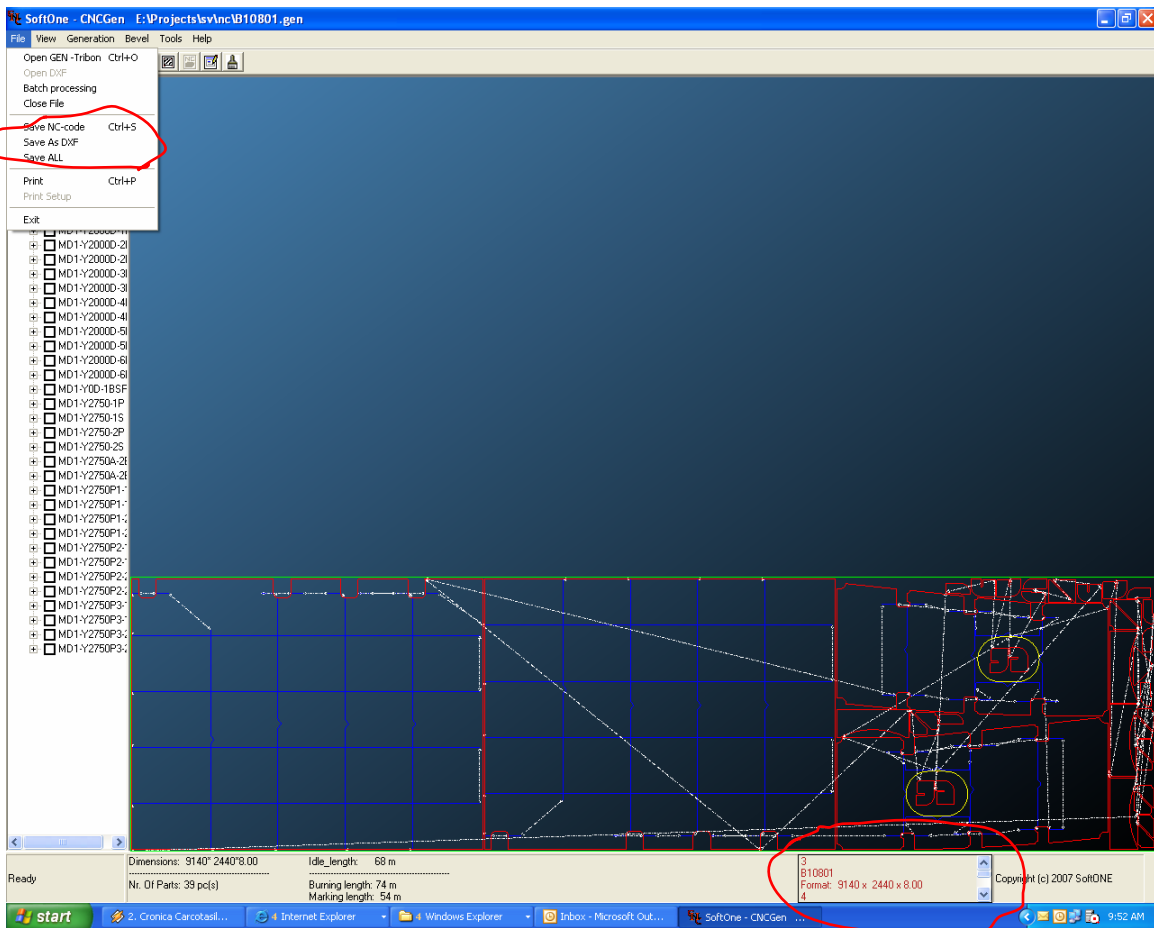


In 'Tools, Option' menu you can change the color for the cutting processes. Also you can change the background color of the main application.



Next step is to run Generation → Complete path function. The idle path of the machine are shown on the screen together with a preview of the codes. With File → Save command the NC file will be created automatically. Autocad dxf output files can be obtained with “Save as DXF” and “Save All” functions. Also, batch generation of Tribon “gen” files are available for quick postprocessing of the files.

After finishing this function, the View → Simulation function can be used for graphical simulation of the paths.



For CAD “dxf” (Autocad) users ,the main application workflow is similar, but some important things should be taking into account:

1) How SoftONE-CNC Organizes CAD Geometry

Entities are the lowest level of geometric information. SoftONE-CNC presently supports the following CAD entities:

- lines
- arcs
- circles

If you use CAD blocks or polylines to group your drawing data, please explode them just before you write the DXF file. You can then use the undo command to restore the grouped state.

Leads are short straight lines at the start and end of a shape. They are used to avoid piercing directly on the edge of a part. SoftONE-CNC places leads automatically at the appropriate location of a shape. The cutting cycle is started at the beginning of the lead-in and terminated at the end of the lead-out; thus ensuring that a 'dirty' cut does not ruin the edges of the shapes.

Connectors are straight lines that connect the shapes with each other. Between cutting and marking, the burner head travels along connectors at high speed (fast travel). Connectors can be automatically created by SoftONE-CNC for you .

Shapes consist of a number of connected entities. Shapes may be closed, i.e. the end of the last entity connects with the start of the first entity, or a shape may be open. Closed shapes can be checked for direction of travel, i.e. clockwise or counter clockwise. Open shapes cannot be checked for direction. It is the operator's responsibility to check the shapes. These paths will be deleted from the tool path automatically!

Layers are logical levels in a CAD drawing. They contain entities. SoftONE CNC assigns a meaning to each layer. The following default layer names are recognized by SoftONE. You can change the default layer names to suit your needs.

- MARK shapes are marked on the plate with a scribing unit.
- INSET shapes are OUTSIDE shapes cut from the waste inside through holes.
- INSIDE shapes are cut with the kerf towards the inside of the path. This layer is used for through holes.
- OUTSIDE shapes are cut with the kerf set towards the outside of the closed shapes.
- REFERENCE (PLATE) layer shapes are used to show plate edges, clamping information or text showing nest names. No processing occurs for reference shapes. However lead collision checks are performed.

Entities on other layers are omitted.

2) Nest Preparation within a CAD Program

SoftONE-CNC converts DXF files to NC instructions for computer controlled 2D tables for plasma arc, gas burning, laser cutting, wood router, and others. You can use any CAD program that can export the drawing in DXF format and support layers. The CAD drawing has to meet certain specifications to be able to be processed. The operations described here are specific for using SoftONE-CNC together with AutoCAD, but are essentially the same for any other CAD program that can export DXF files.

Steps involved:

1. Prepare the CAD drawings for all parts.
2. Nest the parts into a single drawing. This can often be done manually using AutoCAD or by a third party nesting program.
3. Explode all blocks and polylines that you might have in your drawings.
4. Export the drawing to a DXF file.
5. Use SoftONE-CNC to convert the DXF drawing to NC-code.

3) Nesting

You can use a third party nesting program or nest the parts manually. A skilled CAD person can nest the parts efficiently using AutoCAD alone. This manual procedure is often economical if the parts are complex and many different parts of greatly different complexity have to be nested, as it is often the case for shipbuilding.

Open a new drawing for the nest. Place one or more rectangles on the reference layer (plate layer) that indicates the size of your stock plates. Insert the all blocked parts randomly on the drawing. Nest the parts starting with the largest ones using the move and rotate commands until all parts are nested. You may want to place some parts in through holes, such as small brackets. All entities with outside cuts within a through hole have to be changed to the INSET layer. They cannot contain any inside cuts!

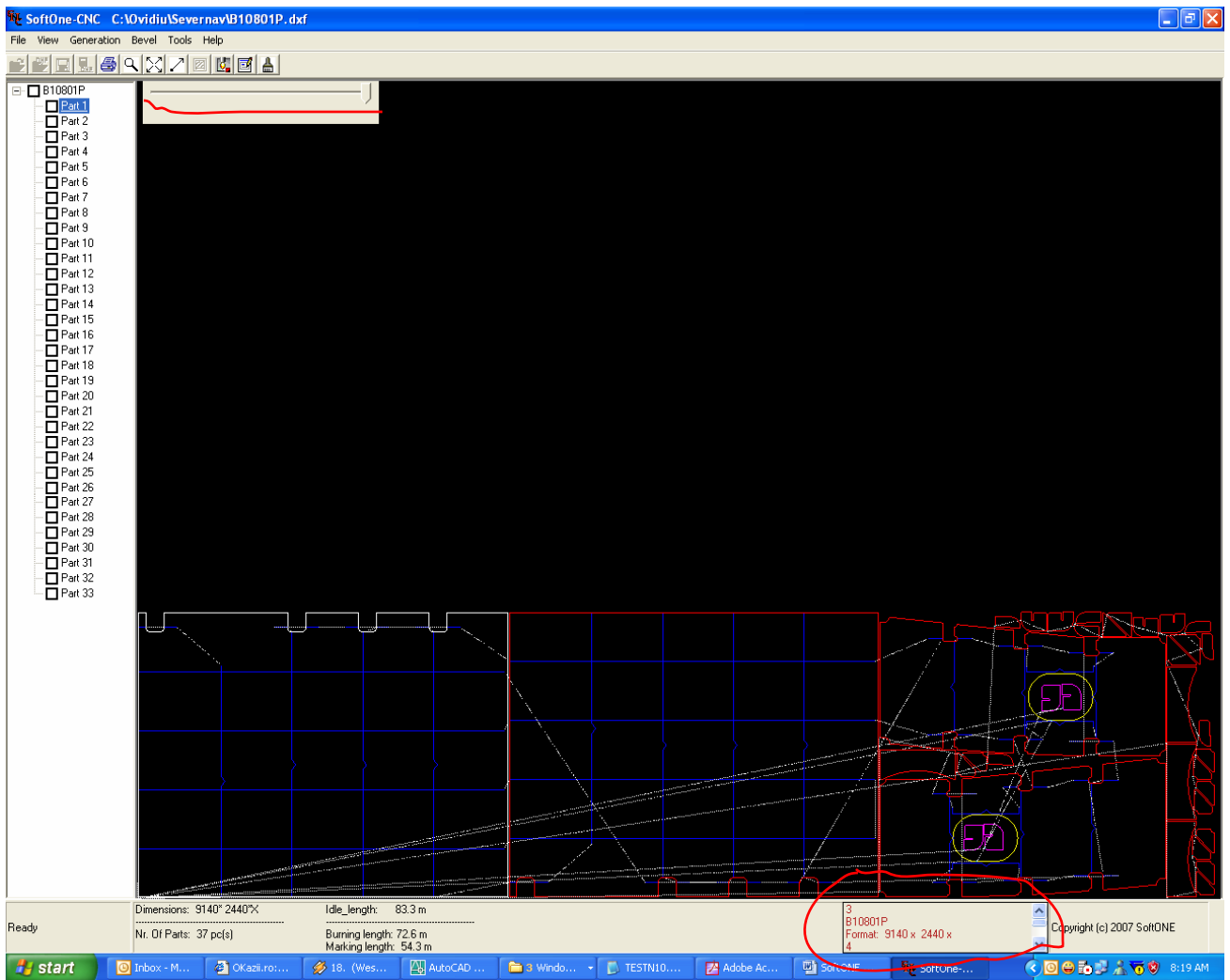
The resulting drawing contains all the required information to produce the NC-Code for a number of parts to be cut from one plate.

Before exporting the drawing to a DXF file explode all blocks and polylines! It is advisable to turn off or freeze all layers that are not required for NC processing. You can save disk space and time by writing just the entities to the file. When prompted by AutoCAD for 'Number of decimal places / (Entities)' enter 'E' ('O' for objects in AutoCAD 13) and select the entities by dragging a rectangle. This way only entities will be written and no header information. The resulting file will be lot smaller. However, the header information may be required if you want to read the DXF file back into a CAD program.

You can now use SoftONE-CNC to create NC-code for the nested drawing!

3) Start execution of SoftONE-CNC for generation of NC code with the following steps:

- a) Generation → Complete path /Marking path/Cutting path for generation and optimization of all paths/markings paths/cutting paths. A file with the same name as NC program but with "lst" extension will be generated in the same folder This file contain production information: i.e. area of processed parts, cutting length
- b) File → Save NC code - for saving CNC code according to preference settings from "Tools" menu
- c) View → Simulation for checking the tool path.



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