

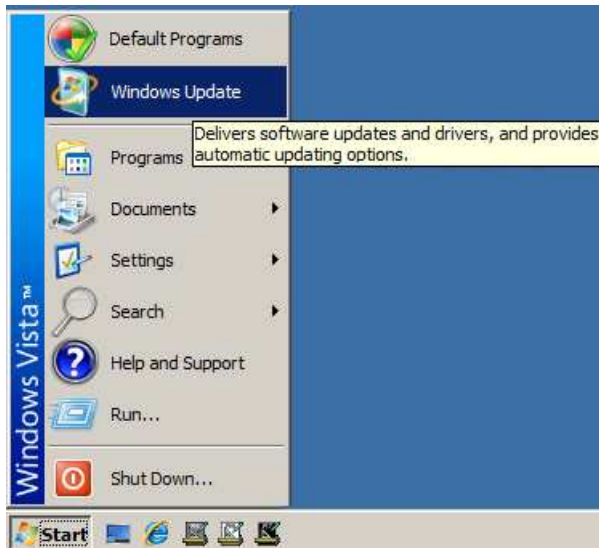
**What's new in IGEMS R7**

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# Chapter 1. Installation

## System requirement

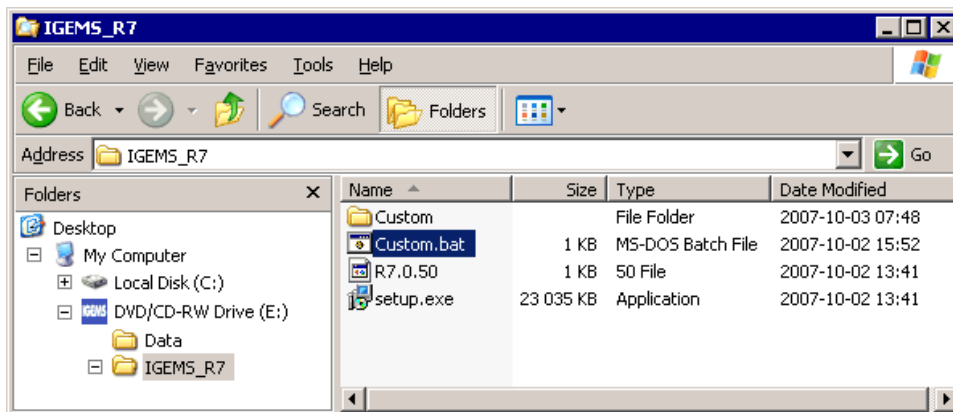
Some functions in IGEMS\_R7 need functions available in .NET 2.0 This environment is standards in Windows XP and Windows Vista. Be sure that you have .NET installed in your computer. In other case .NET can be downloaded from the Windows Update.



Picture 1

## Customized installation

It is now possible to make a customized IGEMS installation. This feature can be used by machine manufacturer that want to use other files than provided with the standard version of IGEMS.



Picture 2

To prepare a customized installation do like follows:

1. Create a BAT-file in the IGEMS\_R7 directory on the CD. The name of the file must be "Custom.bat"
2. Create a folder with the name "Custom". This folder should be used for the customized files.

### Customization files

Following files are suitable for the customization

File name	Copy to	Do what
splash.bmp	..\IGEMS_R7	Shows a splash screen every time IGEMS starts.

machines.lua	..\IGEMS_R7\Shared\Machines	The machine settings data..
abrquality.cfg	..\IGEMS_R7\Shared\Machines	Information about abrasive quality.
piercing.cfg	..\IGEMS_R7\Shared\Machines	Information about piercing types.
nozzle.cfg	..\IGEMS_R7\Shared\Machines	If exist, then a list of nozzles.
materials.lua	..\IGEMS_R7\Shared\Material	Material data for metric mode
materials_inch.lua	..\IGEMS_R7\Shared\Material	Material data for inch mode.
materials_us.lua	..\IGEMS_R7\Shared\Material	Material data for metric mode in US version.
materials_inch_us.lua	..\IGEMS_R7\Shared\Material	Material data for inch mode in US version.
leads_0.cfg	..\IGEMS_R7\shared\Leads	Leads for AWJ-cutting.
leads_1.cfg	..\IGEMS_R7\shared\Leads	Leads for pure water cutting.
leads_2.cfg	..\IGEMS_R7\shared\Leads	Leads for laser cutting.
leads_3.cfg	..\IGEMS_R7\shared\Leads	Leads for oxyfuel cutting.
leads_4.cfg	..\IGEMS_R7\shared\Leads	Leads for plasma cutting.
leads_inch_0.cfg	..\IGEMS_R7\shared\Leads	Leads for AWJ-cutting in inch mode.
leads_inch_1.cfg	..\IGEMS_R7\shared\Leads	Leads for pure water cutting in inch mode.
leads_inch_2.cfg	..\IGEMS_R7\shared\Leads	Leads for laser cutting in inch mode.
leads_inch_3.cfg	..\IGEMS_R7\shared\Leads	Leads for oxyfuel cutting in inch mode.
leads_inch_4.cfg	..\IGEMS_R7\shared\Leads	Leads for plasma cutting in inch mode.
Report.lur	..\IGEMS_R7\shared\postprocessors	The postprocessor that create the report file.
*.LUA	..\IGEMS_R7\shared\postprocessors	Postprocessors
*.LUS	..\IGEMS_R7\shared\postprocessors	Encrypted postprocessors.

### The syntax in the CUSTOM.BAT-file

The IGEMS installation program is starting the CUSTOM.BAT file with two arguments:

%1=Directory of the IGEMS\_R7 installation program

%2=Directory of the IGEMS\_R7 program directory.

Use following syntax if you want files always to be copied.

**COPY %1"\CUSTOM\*filename*" %2"\SHARED\POSTPROCESSOR"**

The example above copy the *filename* to the postprocessor directory.

Use following syntax if you want files to be copied only on the first installation.

**IF NOT EXIST %2"\SHARED\MATERIAL\MATERIALS.LUA"**

**COPY %1"\CUSTOM\ MATERIALS.LUA %2"\SHARED\MATERIAL"**

(The text above must be written on one single line).

This example will only copy the file if the files don't exist. Use this syntax to avoid replacing files that could have been changed by the user, when re-installing in the same directory.

## Chapter 2. The CAD system

---

### Support for Window Vista

---

IGEMS R7 is now supporting Windows Vista operating system. At the same time we have also support for different users in Windows XP.

### Support for AutoCAD 2008

---

We can now read DWG-files made in AutoCAD 2008.

### Plot command

---

When using the window option, the command always asks for two corner points. If you want to use the previous point, then you can accept the point just by pressing space or Enter.

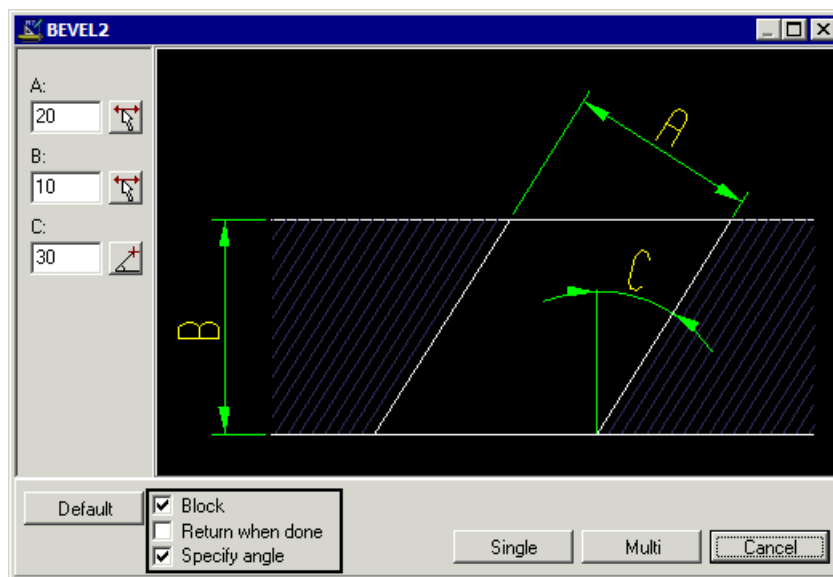
**Specify first point [110.000, 210.525]**

**Specify second corner [298.500, 480.000]**

### Parametric parts

---

The parametric parts have some checkboxes that control if the geometry should be inserted as a block and if the insert should be rotated.

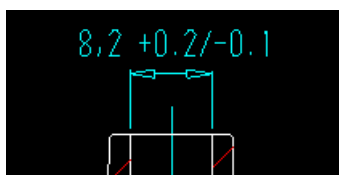


Picture 3

This has been confusing, because some types of parts needs to be inserted as block and others not. The default settings of this checkboxes are now controlled from the program.

### Tolerances in DWG/DXF-files

---

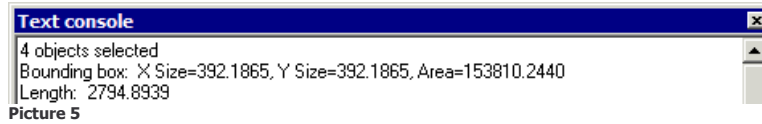


Picture 4

R7 now supports tolerances and other special characters made in AutoCAD

## Info

---



Picture 5  
The Info command now also shows a summary of length of all selected objects. This makes it very fast to calculate a cutting distance.

## Chapter 3.

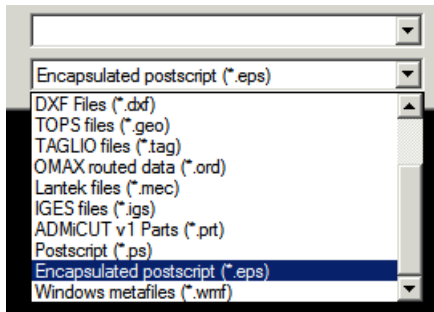
# The Data exchange module

---

The Data Exchange module makes it possible to import different kind of files. IGEMS R7 will now support following file types.

## Postscript and Encapsulated postscript files (\*.ps) (\*.eps)

---



Picture 6

These files are often used by design companies and have been an important request from many users.

## ORD-files (\*.ord)

---

IN previous version of IGEMS we only support ord-files from Omax. In IGEMS R7 we also support Ord-files from Flow.

## Chapter 4.

# The CAM-Tools module

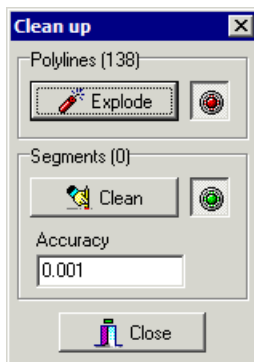
---

The CAM-Tools module is used for optimizing and to prepare geometries to be used as geometry for toolpaths.

## Clean Up

---

The user interface in this command has been changed and it is now more easy to understand. The algorithm that clean up the geometry has also been optimized, for a faster and more accurate result. It also has a better algorithm when cleaning up overlapped arcs and circles

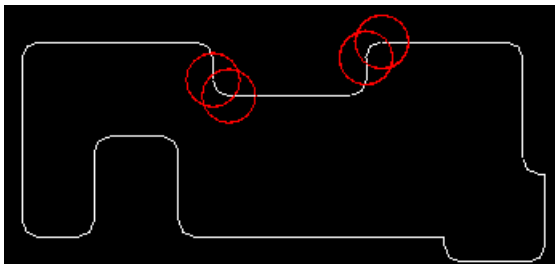


Picture 7

One other change is that the geometry is automatically converted to a polyline.

## Error contour analyzer

---



Picture 8

This command now creates circles (that indicate the error position). The circles are now joined to a block. By selecting one circle and press delete, you can easily delete all circles at the same time.

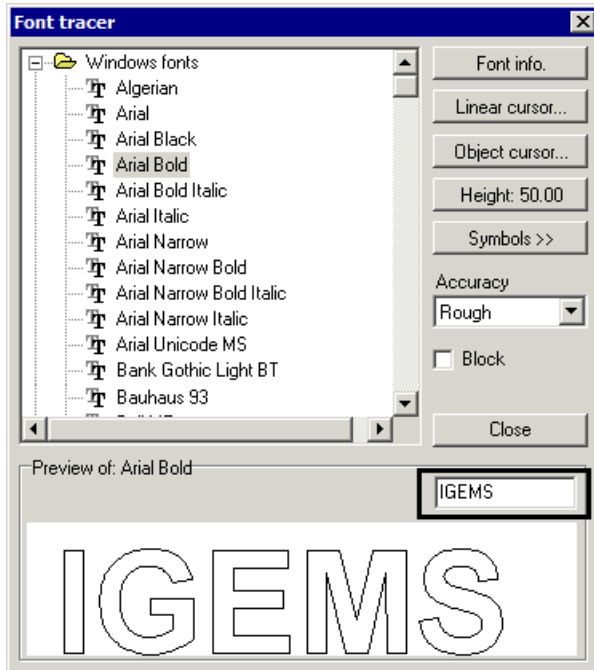
## Chapter 5. The SignMaker module

---

### Preview in Font tracer

---

You can now preview optional text in the Font tracer. This makes it easier to find a good font for a particular text.

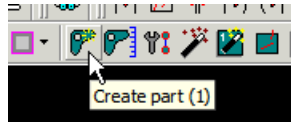


Picture 9

## Chapter 6. The 2D-CAM module

### Short keys

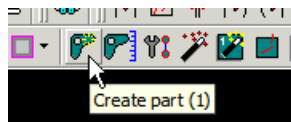
Following short keys has been added to the 2D-CAM module.



Picture 10

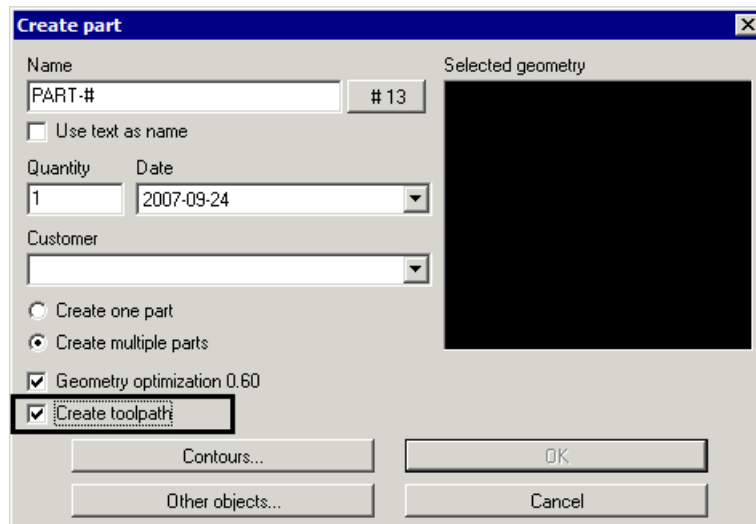
- Create part (1)
- Auto (2)
- Single (3)
- Sheet prepare (4)
- Post process (5)

### Shorter workflow



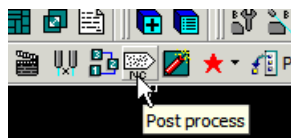
Picture 11

Some customers are only making toolpaths for single parts. In this case IGEMS R7 can use a shorter workflow than previous versions.



Picture 12

By activate the checkbox "Create toolpath" then the command will add a toolpath automatically. The toolpath will be created with the current settings of the Auto command.



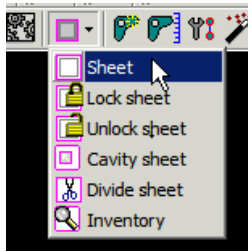
Picture 13

If you start the Postprocess command then a cut order will be added automatically. The command asks for parts to be postprocessed.

This change reduce the number of steps from 4 to 2.

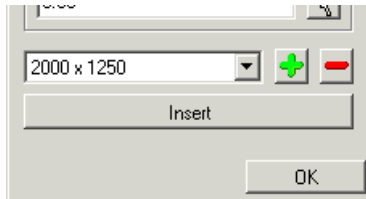
## Create sheet

---



Picture 14

The Create sheet has been improved. You can now define your own library of standard sheets.

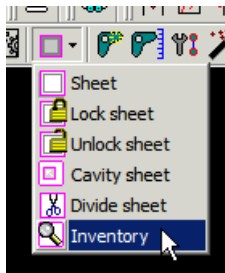


Picture 15

You can select the sheet size in the list. By clicking on the Insert button you can insert the sheets to the drawing. The sheet can be inserted on 0 or in 90 degree.

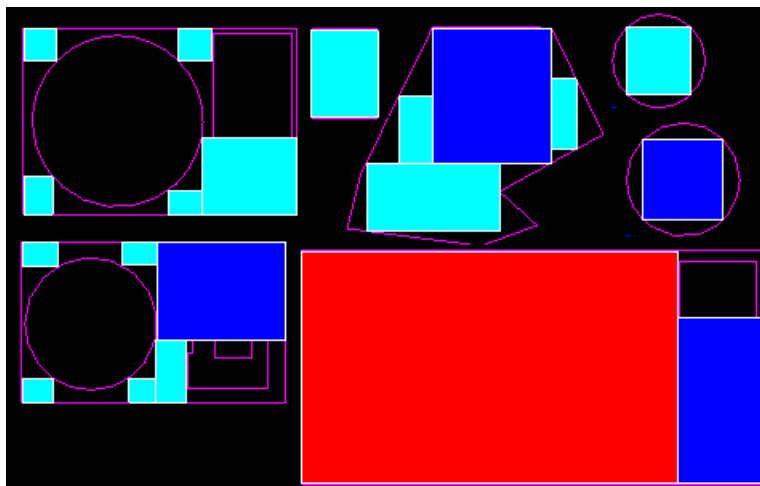
## Sheet inventory

---



Picture 16

This command has been renamed from Analyze sheet to Inventory. It is also changed so you can select multiple sheets.



Picture 17

The command makes a summary of unused areas on the sheets.

Size	Quantity	Area	Weight
Large	0	0.000 m <sup>2</sup>	0.000 Kg
Medium	12	1.448 m <sup>2</sup>	78.179 Kg
Small	32	1.636 m <sup>2</sup>	88.366 Kg
Sheet	2	4.341 m <sup>2</sup>	234.435 Kg

Report Draw Close Settings

Picture 18

By clicking on the report button, you can make a complete report of all selected sheets.

IGEMS Report - C:\IGEMS\_R7\shared\Reports\SheetInventory\report.rtf

File Edit View Insert Format Table

Arial 12 B I U

Sheet inventory

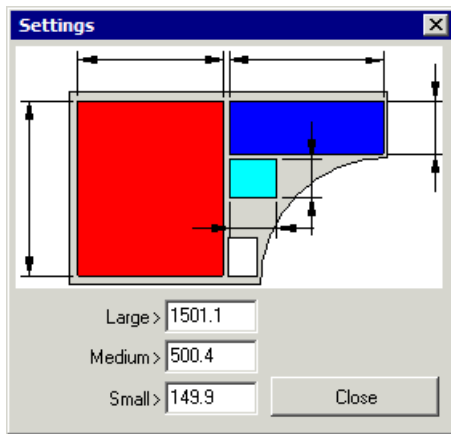
Material Aluminium [20,00 mm]  
 Large 1400,0 mm  
 Medium 500,0 mm  
 Small 150,0 mm

	Area [m <sup>2</sup> ]	Weight [Kg]
<b>SHEET-26</b> 1654,9x1411,7 mm		
Large	0,000	0,000
Medium	0,883	35,821
Small	0,539	29,128
Sheet	1,520	82,084
<b>SHEET-24</b> 729,3x729,3 mm		
Large	0,000	0,000
Medium	0,285	14,317
Small	0,000	0,000
Sheet	0,418	22,559
<b>SHEET-24</b> 1698,3x1038,4 mm		
Large	0,000	0,000
Medium	0,519	28,041
Small	0,210	11,353
Sheet	1,057	57,085

1 1 0 59%

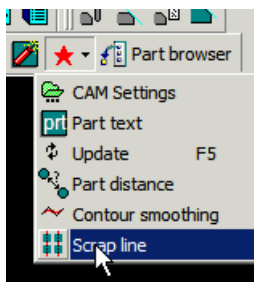
Picture 19

By clicking on the Settings button you can change the definition of what is considered to be Large, Medium or Small areas.



Picture 20

## Scrap line



Picture 21

The scrap line command breaks objects between parts. The object can later be used for a toolpath that will cut the material between the parts and make a rapid transport over the already machined parts.



Picture 22

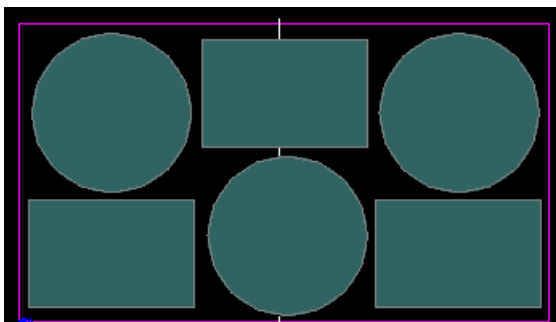
Start by drawing an object (line, arc or polyline) on the positions where the scrap line should be located. Start the command.

**Specify offset distance [1.500]**

**Min distance [2.000]**

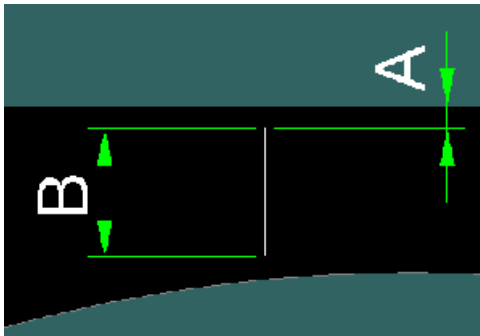
**Select objects**

The result will be following



Picture 23

The meaning with the "Offset distance" and the "Min distance" is following.



Picture 24

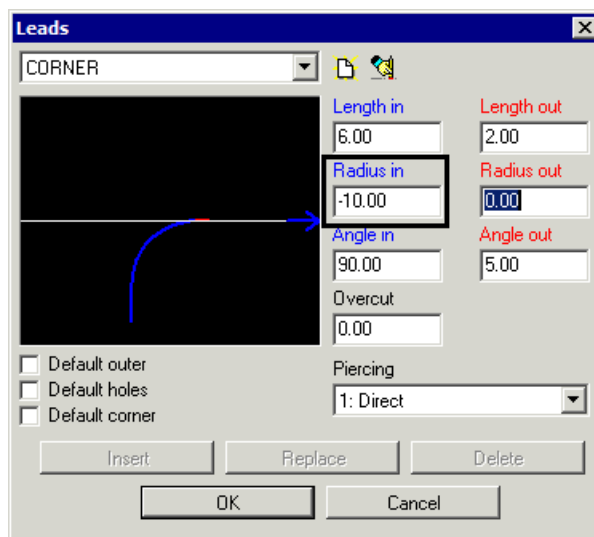
The "Offset distance" (A) is the distance from the part edge to the Scrap line. A good value may be  $1.5 \times \text{actual tool diameter}$ .

The "Min distance" (B) is the minimum acceptable length of the scrap line. If the distance is shorter no scrap line will be created.

By this command you can create the scrap cut before or after cutting the parts. You can use the "Scrap cut" or the "Quick cut" command for making toolpaths of the scrap lines.

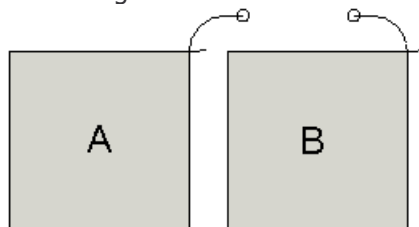
## Special lead for corners

It is now possible to make a lead with arc in opposite direction. This can be done by making a negative radius. This special lead option is designed for Gas and Plasma cutting.



Picture 25

Following picture illustrates how it works. A is cut with a positive radius. B is cut with a negative radius.



Picture 26

This kind of leads can only be used on some locations at the geometry (outside corners). In all other cases this lead causes a collision with the part.

## Cost estimate

It is now possible to enter a border width when calculating the area.

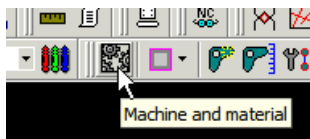
Border	5.000	Weight	Area [m²]
Sheet	0.000		0.00
Enclosing	26.109		0.38
Outer	12.874		0.19
Net	12.022		0.18
<b>Cost</b>	<b>78.33</b>		

Picture 27

The calculation also takes care about Acceleration parameters and the cutting order between the parts.

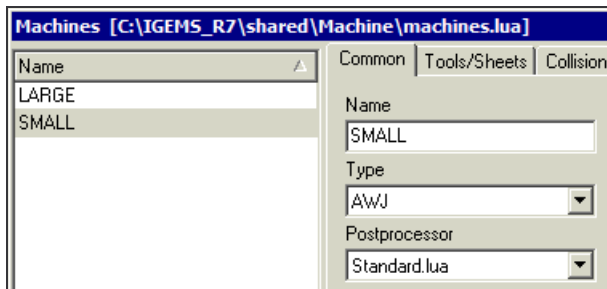
## Multiple postprocessor configurations

The easiest way to explain this feature is to make an example.



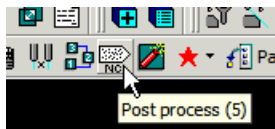
Picture 28

In the machine settings, you can create optional number of machines.



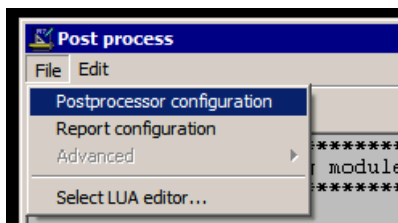
Picture 29

In this example we have two machines, LARGE and SMALL. They are both using the same postprocessor Standard.LUA.



Picture 30

If you start the post process command and select the configuration.

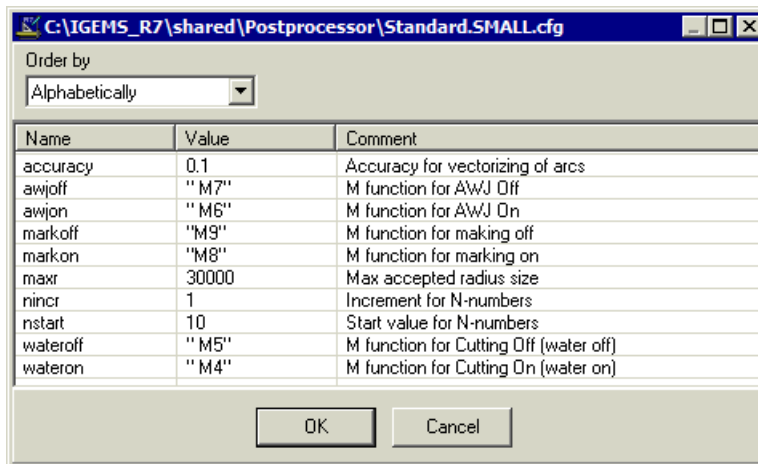


Picture 31

The CFG-file for this postprocessor is named by following rules.

- The first part of the name is the postprocessor name.
- The second part is the name of the Machine.

This means that you can use multiple configurations of the same postprocessor. In our example the postprocessor "STANDARD.LUA" will use two configurations. "Standard.SMALL.cfg" and "Standard.LARGE.cfg".



Picture 32

When you change machine, you will also change the configuration.

## Support for Encrypted postprocessor files

IGEMS R7 now also supports encrypted postprocessor files. This is a good feature for a company with very special postprocessor functionality, to avoid other to share secret information.

## Chapter 7. The Machine settings

### Hint values for metric and inches

Abrasive flow [0.882 lbs/min]  
 400 g/min  
 Pressure [55114 PSI]  
 3800 bar  
 Orifice diameter  
 0.254 (10) mm (in)  
 Nozzle diameter  
 0.762 (30) mm (in)

Picture 33

As information there is always a calculation between metric and inch mode.

### Hint values for AWJ-settings

Machines [C:\IGEMS\_R7\shared\Machine\machines.lua]

Machine Type	Orifice	Nozzle	Abrasive flow
Pu	0.179 [7]	0.508 [20]	100-250g/min [0.220-0.551]lbs
3E	0.204 [8]	0.508 [20]	125-300g/min [0.276-0.661]lbs
Ab	0.229 [9]	0.762 [30]	150-400g/min [0.331-0.882]lbs
Gi	0.254 [10]	0.762 [30]	200-450g/min [0.441-0.992]lbs
Ab	0.279 [11]	0.762 [30]	250-475g/min [0.551-1.047]lbs
4C	0.304 [12]	1.016 [40]	300-500g/min [0.661-1.102]lbs
Pre	0.330 [13]	1.016 [40]	400-600g/min [0.882-1.323]lbs
3E	0.356 [14]	1.093 [43]	450-650g/min [0.992-1.433]lbs
Or	0.381 [15]	1.270 [50]	500-750g/min [1.102-1.653]lbs
0.	0.406 [16]	1.270 [50]	550-800g/min [1.213-1.764]lbs

Close

Abrasive 269 (269) g/m  
 Cost 1.48 (0.86) /m

Cutting speed interpolation  
 Taper angle control

OK Cancel

Picture 34

We have now added a list of common combination of Orifice, Nozzles and Abrasive Flow.

### Support for more nozzles sizes

IGEMS now support more nozzles sizes.

Nozzle diameter  
 0.762 (30) mm (in)  
 0.508 (20)  
 0.635 (25)  
 0.762 (30)  
 0.889 (35)  
 1.016 (40)  
 1.092 (43)  
 1.143 (45)  
 1.270 (50)  
 1.397 (55)  
 1.524 (60)

Picture 35

Nozzle diameters 25, 35, 45, and 55 has been added.

### Custom list of nozzles

By adding a file "Nozzle.cfg" in the machine directory, you can add your own size of nozzles. The file should have following syntax:

Example:

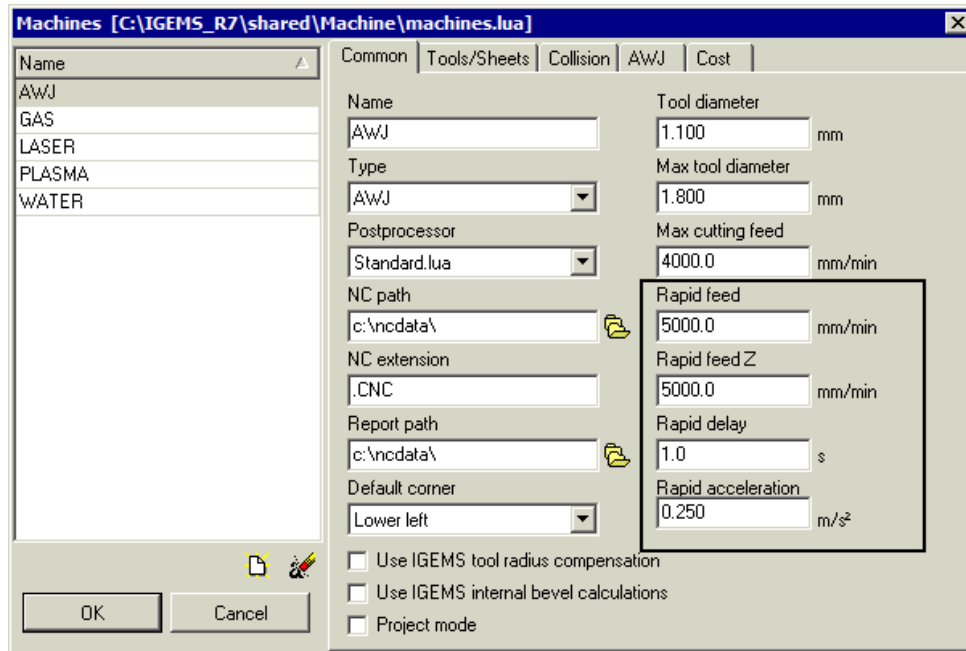
**0.762 [30]**

**1.016 [40]**

If this file do not exist then IGEMS are using the standard list defined in the program.

## Parameters for Rapid transport

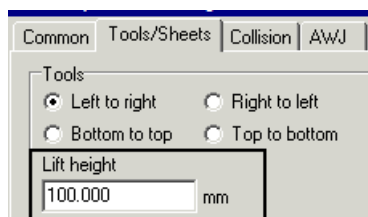
The calculation of the production time now depends on more parameters than previous versions.



Picture 36

### Rapid feed Z

This information is used for calculation of the time it takes for moving the cutting tool up and down. The tool up/down distance is still controlled by the Lift height value



Picture 37

### Rapid acceleration

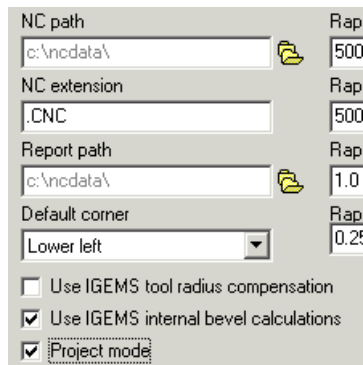
To make a better estimate of the cutting time, we have now added an acceleration parameter for the rapid transport in XY-plan and Z-axis. If you have a part with many holes (many rapids) then IGEMS R7 will calculate a more accurate cutting time.

### Rapid delay /Cutting delay

In previous versions we have two values Rapid delay and Cutting delay. These two values is now controlled by Rapid delay only. The value is only used for fine tuning the time calculation.

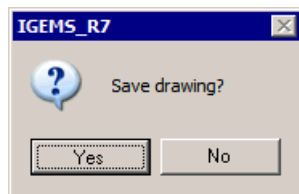
## Project mode

If you activate the Project mode, then the NC-path and the Report path will change to the same path as used for the drawing file.



Picture 38

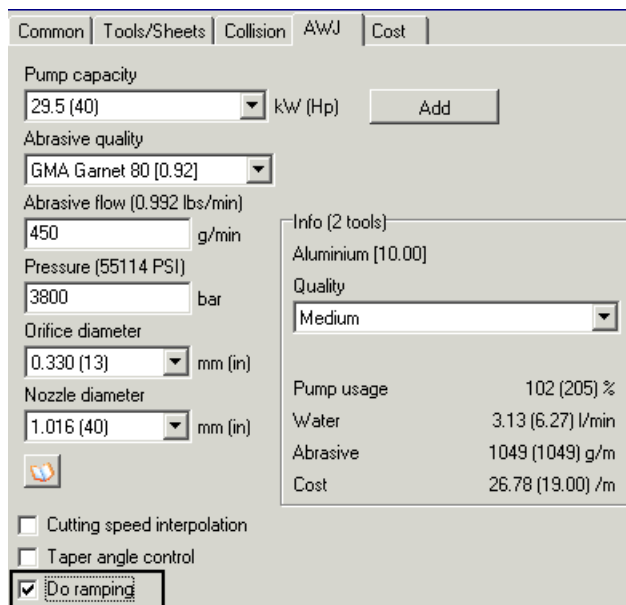
If you try to postprocess and you have an unsaved drawing then IGEMS ask you to save the drawing file.



Picture 39

## Do ramping

In AWJ-cutting it is important to reduce the cutting speed when changing cutting direction. This is normally handled by IGEMS. The checkbox "Do ramping" should be activated in the most cases.



Picture 40

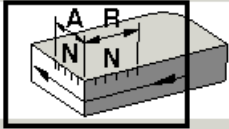
If you have a machine that handles the speed changes by an internal acceleration and retardation functionality then it is possible to turn off the ramping for the postprocessing. The ramping is still used for simulation and cost estimation.

Note! All features in IGEMS can not be used if the "Do ramping" is deactivated. If you have a postprocessor that needs this feature, then you must include the postprocessor name in the file "NORAMPING.CFG". The file should be located in the IGEMS\_R6/SHARED/MACHINE folder.

## Chapter 8. The Material setting

### Total acceleration and retardation distance.

In this version we have changed from the length of each step to the total acceleration and retardation distance. The material database is compatible between the old and the new version, the changes is how we present the information.



	X-Rough	Rough	Medium	Fine	X-Fine
<b>Quality level</b>	1.50	2.00	3.00	4.00	5.00
<b>High feed</b>	1183.1	849.8	533.1	383.0	296.3
<b>Low feed</b>	598.2	492.5	360.6	282.3	230.7
<b>Steps (N)</b>	3	3	5	3	3
<b>Acc dist (A)</b>	3.000	3.000	5.000	3.000	3.000
<b>Dec dist (R)</b>	3.000	3.000	5.000	3.000	3.000
<b>High fac</b>	1.00	1.00	1.00	1.00	1.00
<b>Low fac</b>	1.00	1.00	1.00	1.00	1.00

Picture 41

Example: If the Acc dist (A) is 5.00 and steps is 5, then each step should be 1mm.

### Optimized cutting speed for AWJ-cutting

The algorithm for Low feed is changed. We are now cutting faster in corners and small arcs in thin material. We are now cutting with a slower speed in thick materials. The example below is done in Aluminium, 3800 bar, 400g abrasive and a 10/30 orifice/mixing tube combination and medium quality.

Thickness	In IGEMS R4 to R6		In IGEMS R7	
	High feed	Low feed	High feed	Low feed
<b>3.00</b>	F1270	F523	F1270	F843 (faster)
<b>15.00</b>	F200	F190	F200	F90 (equal)
<b>20.00</b>	F143	F65	F143	F57 (slower)
<b>35.00</b>	F75	F34.0	F75	F21.7 (slower)
<b>60.00</b>	F40.5	F18.3	F40.5	F7.9 (slower)

If you import your old settings from previous version, then they will be optimized to the new algorithm.

Note! This optimizing is not possible in the US version.

The US version only uses a database.

### Optimized ramping length for AWJ-cutting

Also the length of the ramping and the number of ramping steps has been optimized. If you have IGEMS\_R3 to R6 you can use the same settings as before. If IGEMS\_R7 is the very first installation then you will have optimized database as default.

	X-Rough	Rough	Medium	Fine	X-Fine
<b>Quality level</b>	1.50	2.00	3.00	4.00	5.00
<b>High feed</b>	185.8	133.4	83.7	60.1	46.5
<b>Low feed</b>	52.5	46.5	37.7	31.6	27.1
<b>Steps (N)</b>	8	8	8	8	8
<b>Acc dist (A)</b>	7.500	7.500	7.500	7.500	7.500
<b>Dec dist (R)</b>	7.500	7.500	7.500	7.500	7.500
<b>High fac</b>	1.00	1.00	1.00	1.00	1.00
<b>Low fac</b>	1.00	1.00	1.00	1.00	1.00
<b>Arc factor</b>	1.00	1.00	1.00	1.00	1.00
<b>Kerf deviation</b>	0.000	0.000	0.000	0.000	0.000
	Default				

Picture 42

By clicking on the "Default" button you will automatically optimize the number of steps (N), the Acc dist (A) and the Dec dist (R). Also the High and Low factor values are set to 1.0

Note! This optimizing is not possible in the US version.  
The US version only uses a database.

## Calculate Machinability

In this version we have removed a lot of unnecessary inputs in the user interface for the calculating Machinability.

Calculate machinability [X]

Depth  
24.000 mm

Feed  
140.0 mm/min

Machinability  
**83.0**

Close

Picture 43

All other values are used from the actual machine.

Note! This option is not activated in the US version.  
The US version only uses a database.

## Chapter 9.

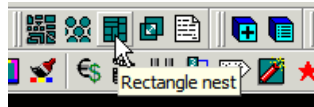
# The Nesting module

---

Following commands are changed in the Nesting module.

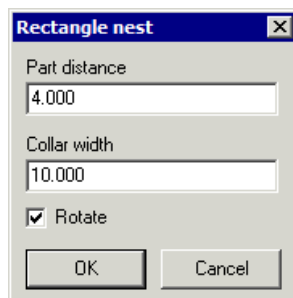
## Rectangle nest

---



Picture 44

This command has now a dialog box.



Picture 45

### Collar with

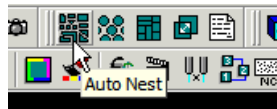
You can now use a "Collar width". This value controls the distance from the sheet edge to the part edge.

### Rotation

Sometimes it is important to have the possibility to nest parts without rotation. By the Checkbox "Rotate" you can allow or disallow rotation of the nested parts.

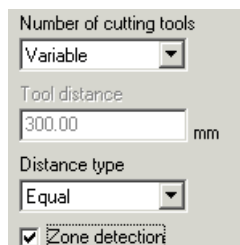
## Auto nest

---



Picture 46

It is now possible to nest with variable number of cutting tools and equal distance type.



Picture 47

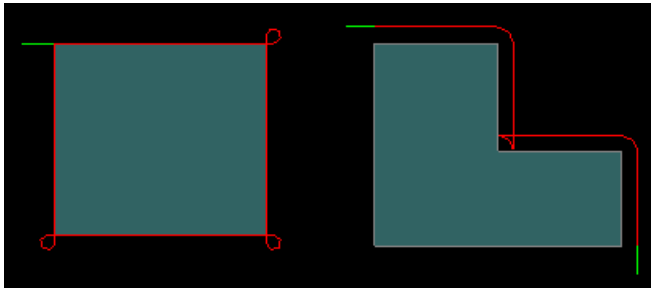
The new possibility will use as many tools as possible. The distance will be the sheet size divided in "Max tools" settings that can be found in the machine settings.



Picture 48

This combination is very nice if you have a machine where you can turn different tools ON/OFF but do not want to change the distance between the tools while cutting.

### Loops and Bevel cut toolpath



Picture 49

This kind of toolpath is now supported by the Auto nest function. Distance to other parts are calculated from the edge of this parts.

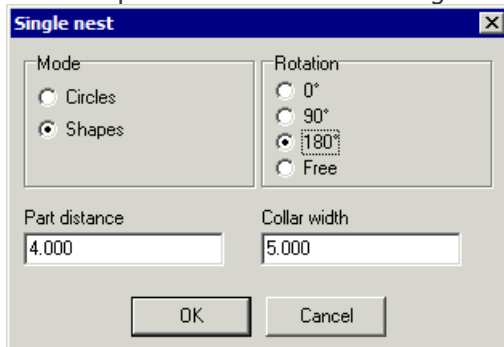
## Single nest

---



Picture 50

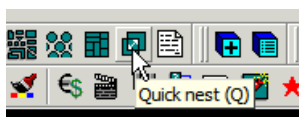
It is now possible to also set 180 degree rotation.



Picture 51

## Quick nest

---



Picture 52

When using the Quick nest command you can see the different options on the upper left corner of the screen.

S: Rotate 180  
 F: Rotate 45  
 G: Rotate -45  
 R: Rotate [A]  
 T: Rotate -[A]  
 K: Reset  
 M: Toggle move/copy  
 U: Undo  
 O: Configure  
 A: Align  
 P: Toggle accuracy [Normal]  
 D: Toggle part distance  
 Part distance: 4.0000

Picture 53

By pressing the key "D" you can toggle between two distances.

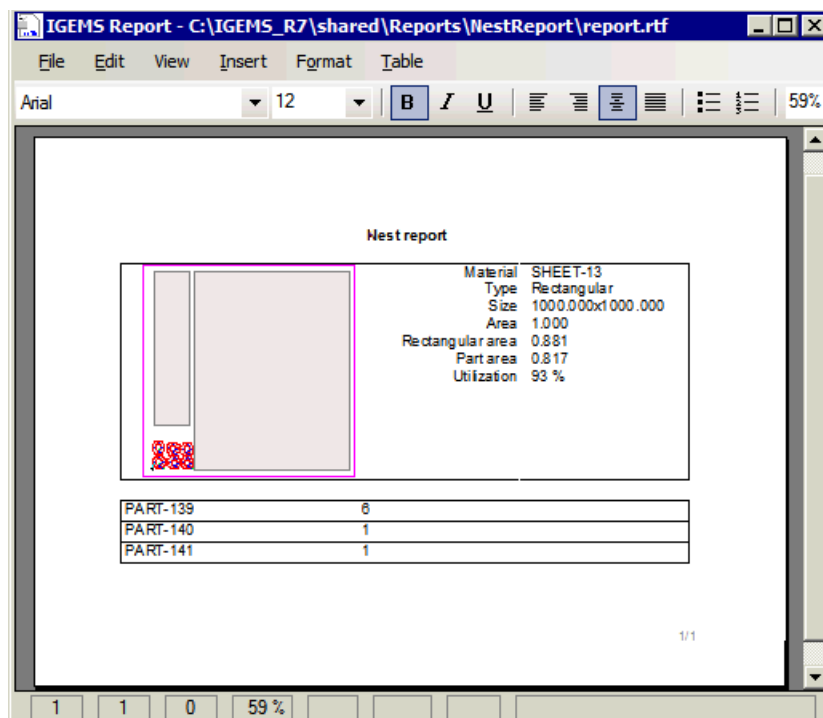
The distance defined as "Part distance" in the material settings or the diameter specified as the "Tool diameter" in the machine settings. This makes it more easy to use the command for making a nest prepared for common cutline.

## Nest reports



Picture 54

The nest report is now using our new report system. Start the command and select the sheet. Then you will have a report of the sheet.



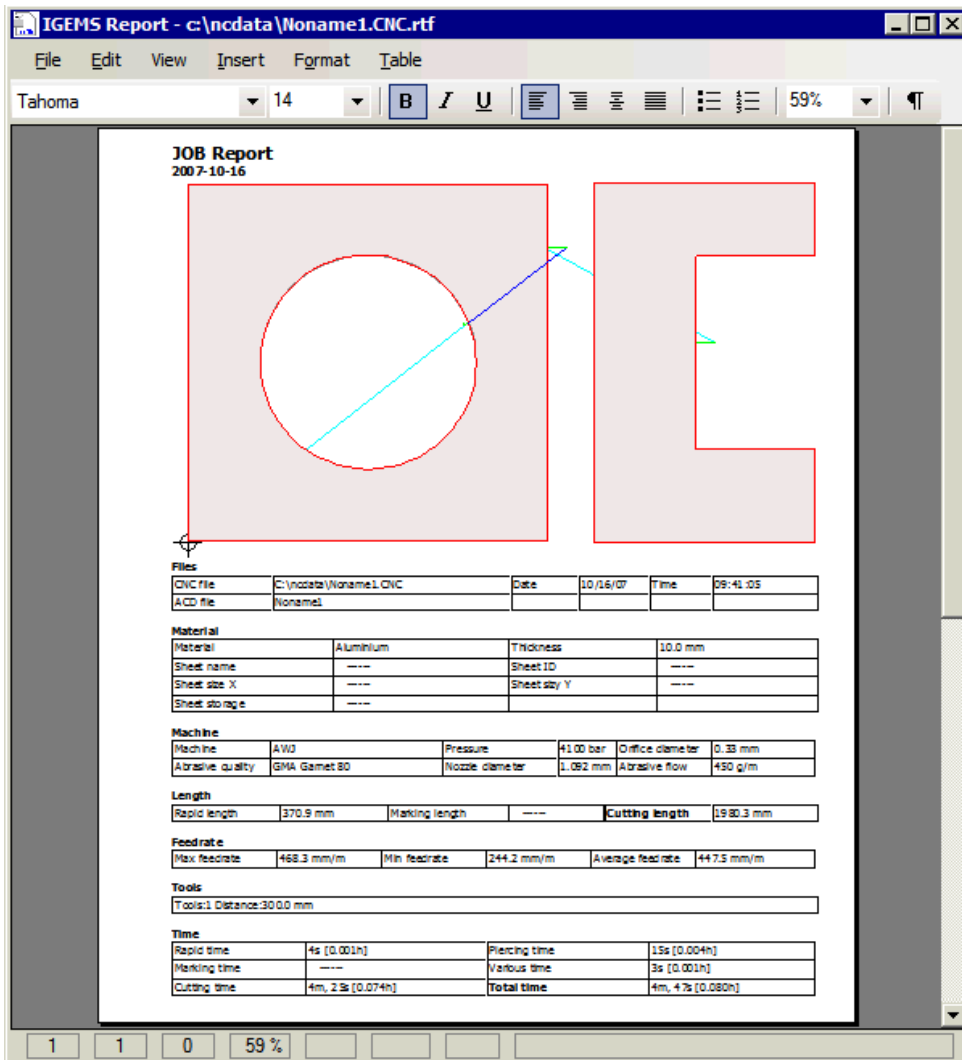
Picture 55

## Chapter 10. New Report system

In previous version of IGEMS we have used three different kind of reports.

- The Postprocessing was using HTML and MHT files that could be viewed in a standard web-browser.
- The Organizer and the Estimate cost command was using the CX-reports.
- The Nest reports was creating a text file.

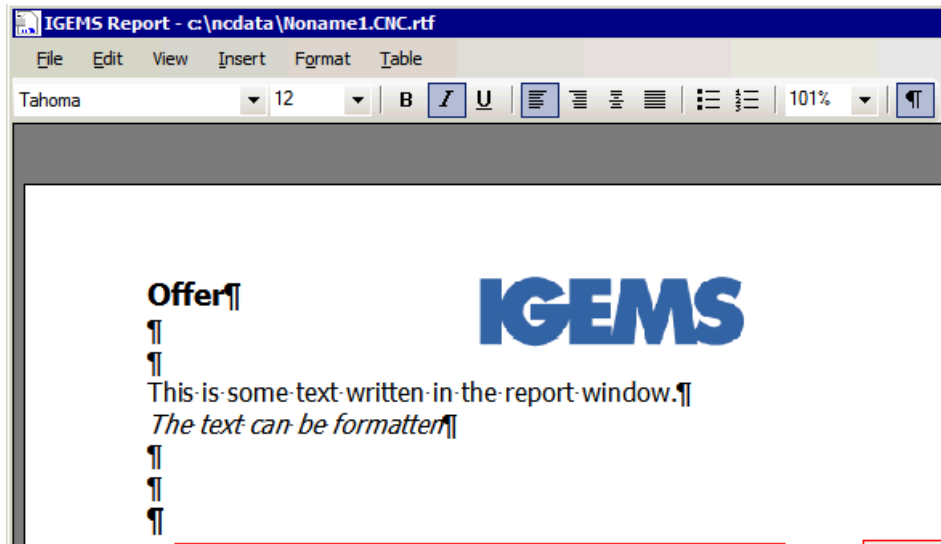
In IGEMS\_R7 we are using the same system in all kind of reports.



Picture 56

### Dynamic document

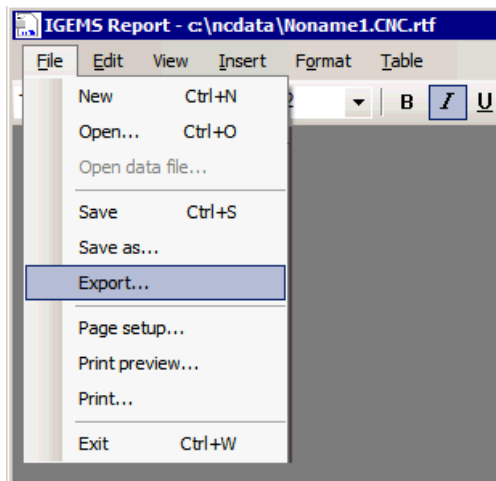
The report system is at the same time a simple word processor where you can add your own text, pictures and tables.



Picture 57

## Save and export

If you save the document it will be saved as a RTF file. The RTF file is supported by the windows operating system and can also be imported to other program. Of this reason you do not need a special application for read and viewing reports made in IGEMS.



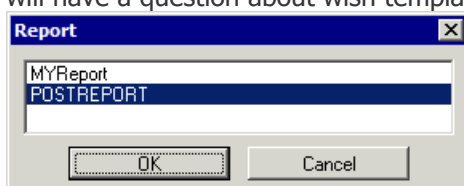
Picture 58

By the Export function you can save the reports in optional format like DOC, PDF and other.

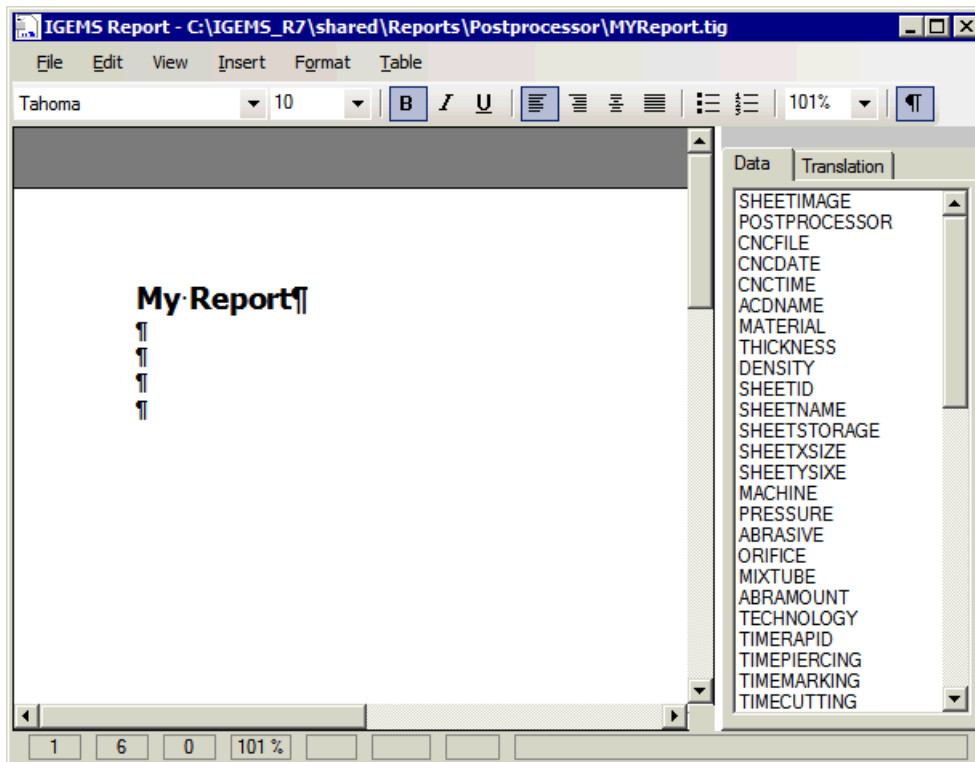
## Design mode

By pressing the F5-key you can switch between Normal mode and Design mode. When using design mode you will design template files that are used in the normal mode when viewing the information.

The standard templates are read only. If you want to make your own templates then you must save the files in a different name. If you have several templates you will have a question about wish template to use when starting the report window.



Picture 59



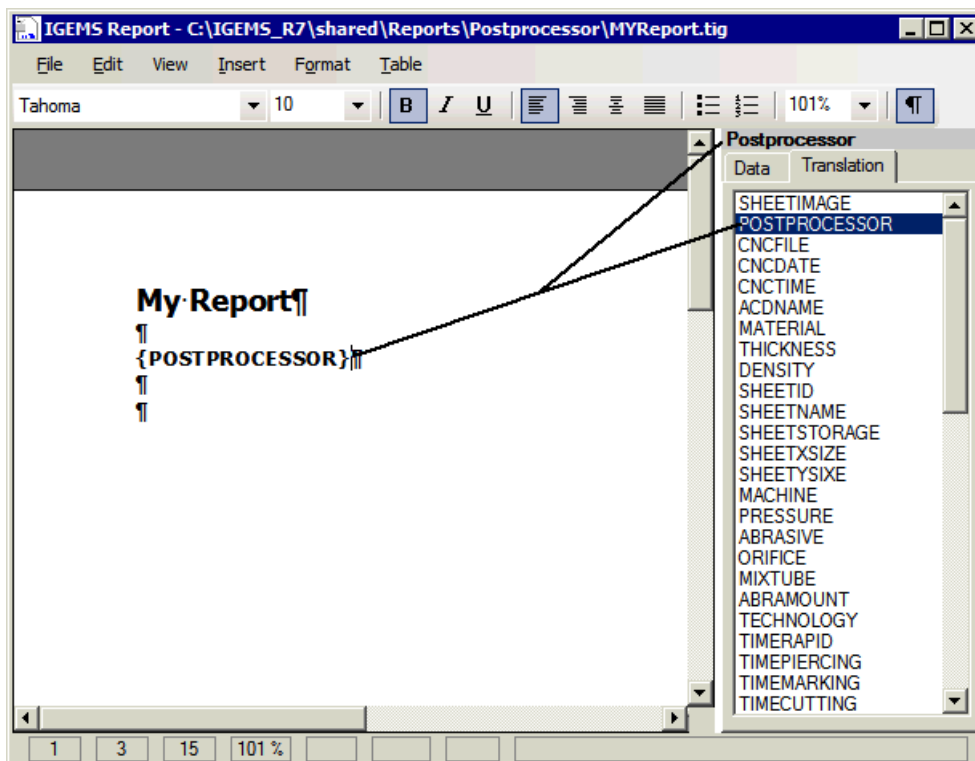
Picture 60

### Plain text (Static text)

You can write any text in the document. This text will not be changed when you switch to normal mode. An example is the text "My Report" on the picture above.

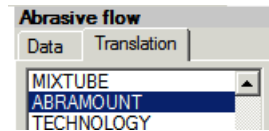
### Translations (Dynamic text)

Only variables defined in the Translation field can be used as dynamic text. Dynamic text is only required when making reports that should be used in multiple languages. Put the cursor on an optional position and double click on an variable in the Translation field.



Picture 61

The variable inside the {curly braces} will be replaced with the translation of the word in that language currently used by IGEMS.

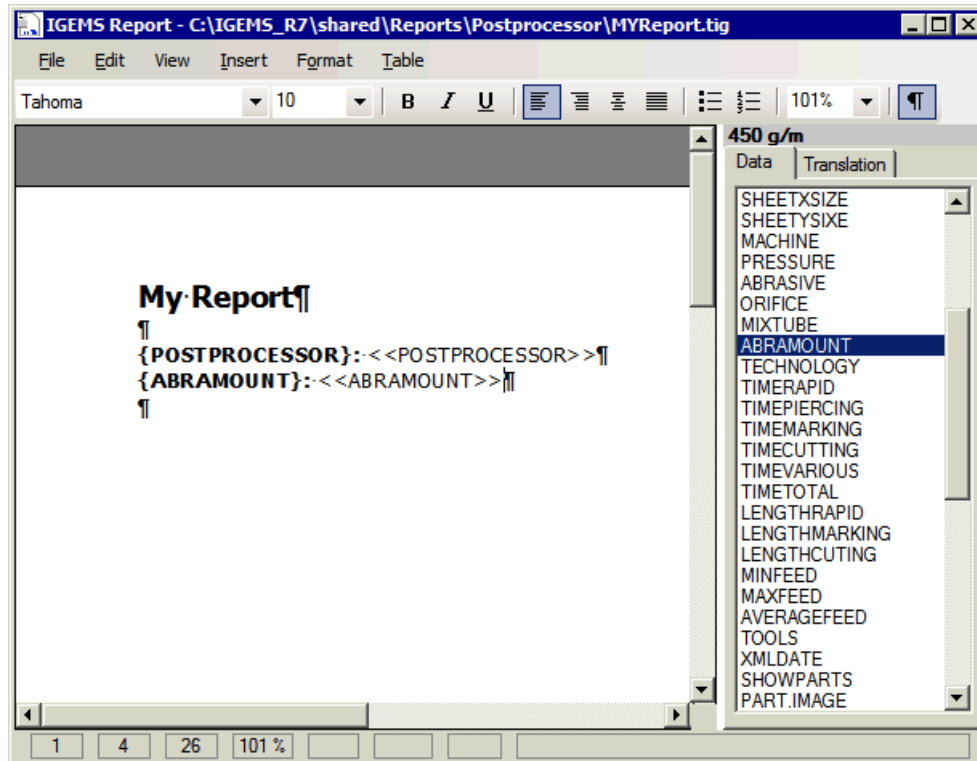


Picture 62

Above the Data and Translation field you can see the value of the selected variable.

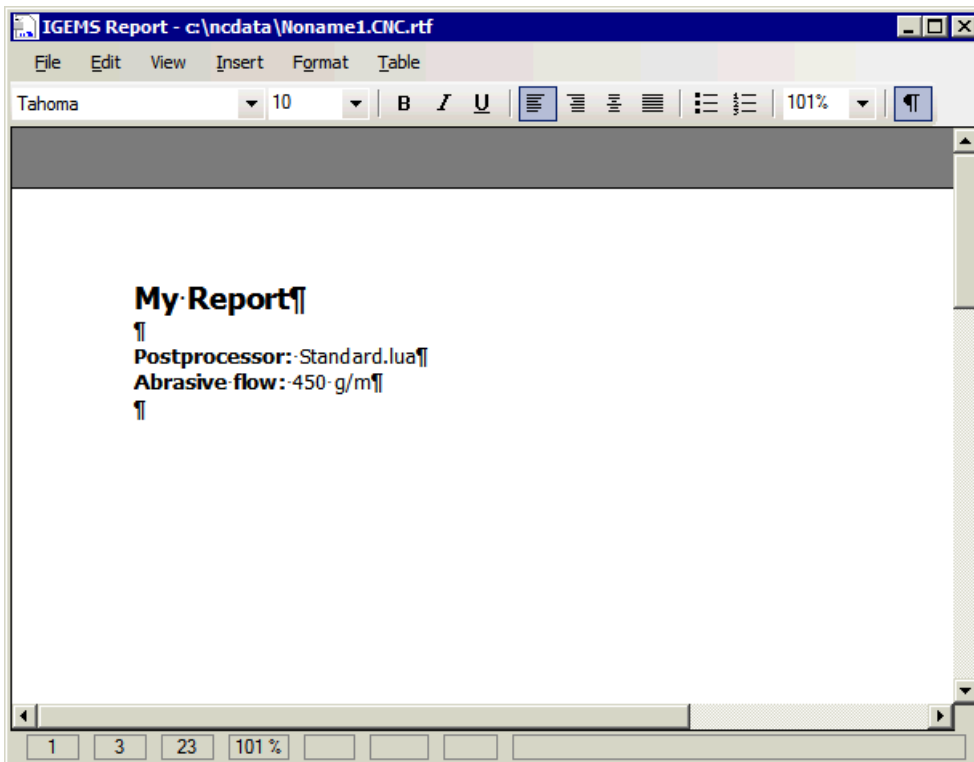
### Data variables

The variable inside the double << and >> will be replaced with the values of the variable. You can insert the variable at the same way as the Translation. The tags can (if you like) be formatted with different text styles.



Picture 63

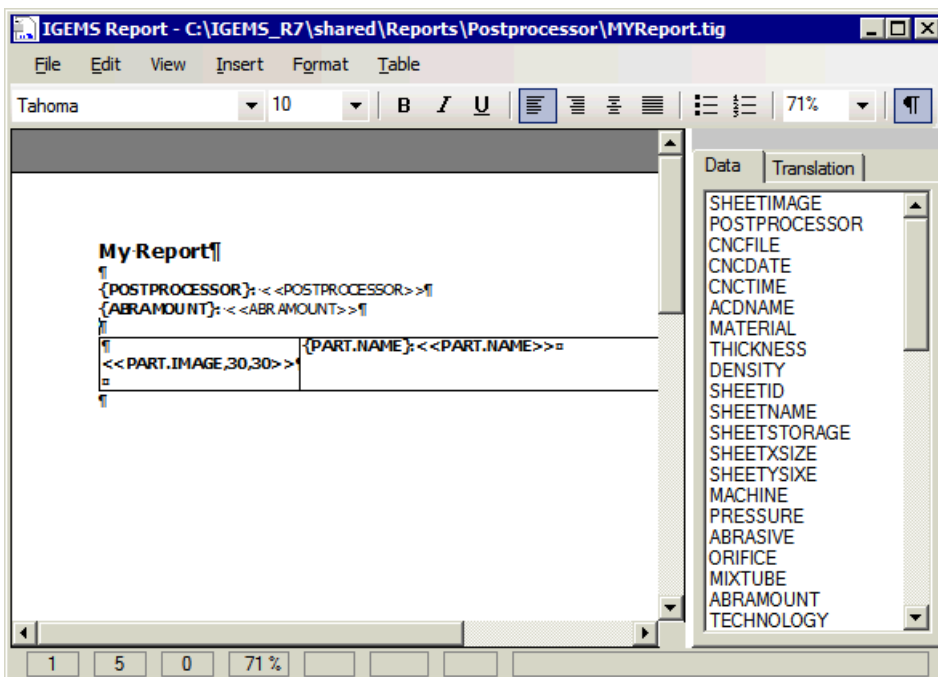
By pressing the F5 key you can switch back to normal mode and see the result.



Picture 64

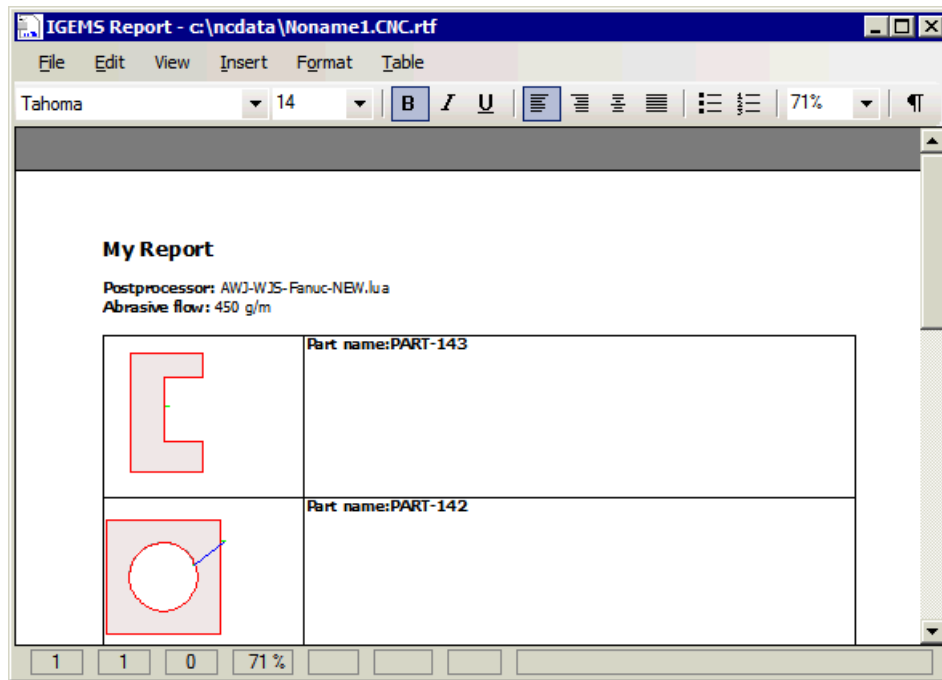
## Lists

The variable name that include a dot is used for multiple parts. By using a list you can view separate information on multiple parts.



Picture 65

The number of lines in the list should always be one. It will be expand to the number of parts handled by the report. When using an image the size of the image must be included as extra argument. This is the result of the template above.



Picture 66

## Creating reports outside IGEMS

Every time you create a new CNC-file, the postprocessor also create a data file. The file is saved in the directory specified by the Report path in the machine settings (or in the drawing directory if you are using the Project mode). The Data file has the same name as the CNC-file, but with an extra extension ".RIG". It stands for (Report IGems). By double click on the RIG file you can start the Report program. To be able to do this you must install IGEMS in the actual computer. You do not need a license for using the reports.

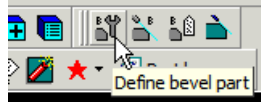
## Chapter 11. Bevel cut

---

The Bevel cut command can be used for defining and cutting 3-dimensional flat parts. The edges on part can be in optional angles.

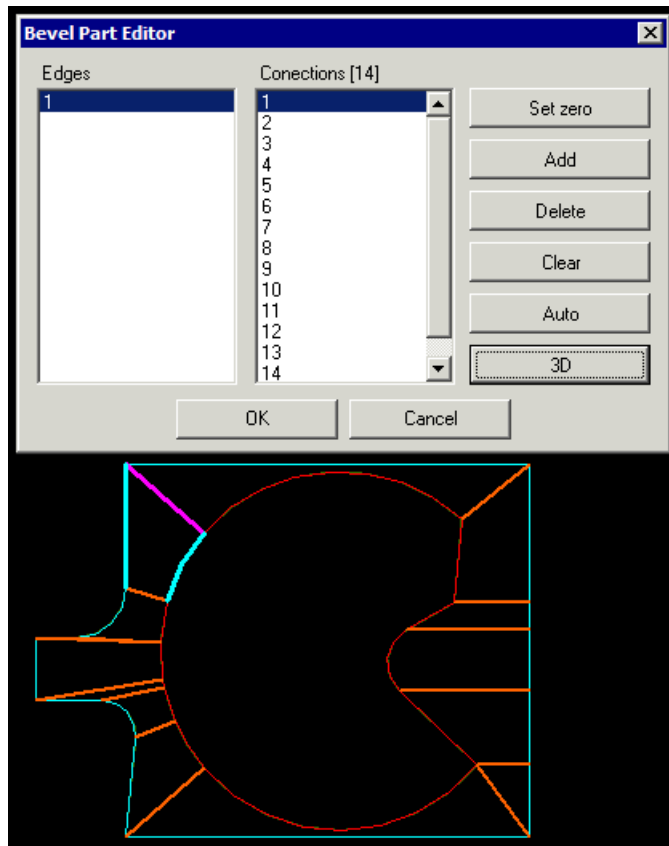
### Define Bevel part

---



Picture 67

In this version you can add the connection lines between the top and the bottom geometry more free.

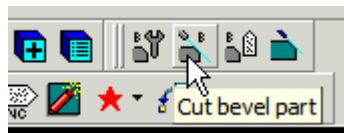


Picture 68

You can now snap from top to bottom or opposite. This make it more easy to define complex geometrys.

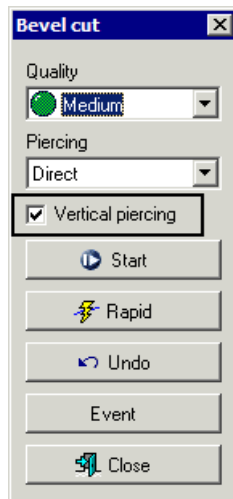
### Cut bevel part

---



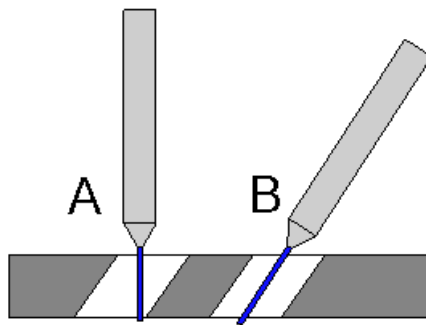
Picture 69

Its now possible to make vertical or non vertical piercing.



Picture 70

If you use do not select the "Vertical piercing" then the piercing will be done in the same angle as the angle of the first cutting edge.



Picture 71

The example A shows a vertical piercing. In example B the piercing is done in the same angle as the cutting edge.

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