Click on the ICON to view the directory

Introduction

IGEMS is a CAD/CAM software, designed for Abrasive Water Jet Cutting. It will allow you to do everything from designing geometry, to generating toolpaths.

It has been developed in close cooperation with more than 30 waterjet machine manufacturers worldwide.

IGEMS is available in many languages and in metric and imperial measurements. Postprocessors and applications consists of open text files which you easily can change yourself. Its modular (you only need to buy the modules you have use for).

This document is written as a demonstration of the software. If you are not interested in the actual features, go to next slide. Please be aware of that not all machines may support every feature described in this document.

Designed for Abrasive Water Jet

There are three ways to handle the cutting speed in Abrasive Water Jet Cutting:

Cut with high speed
You will have a fast production but the cutting results will not be perfect.

Cut with low speed
The result will be excellent but the cutting time will be very long.

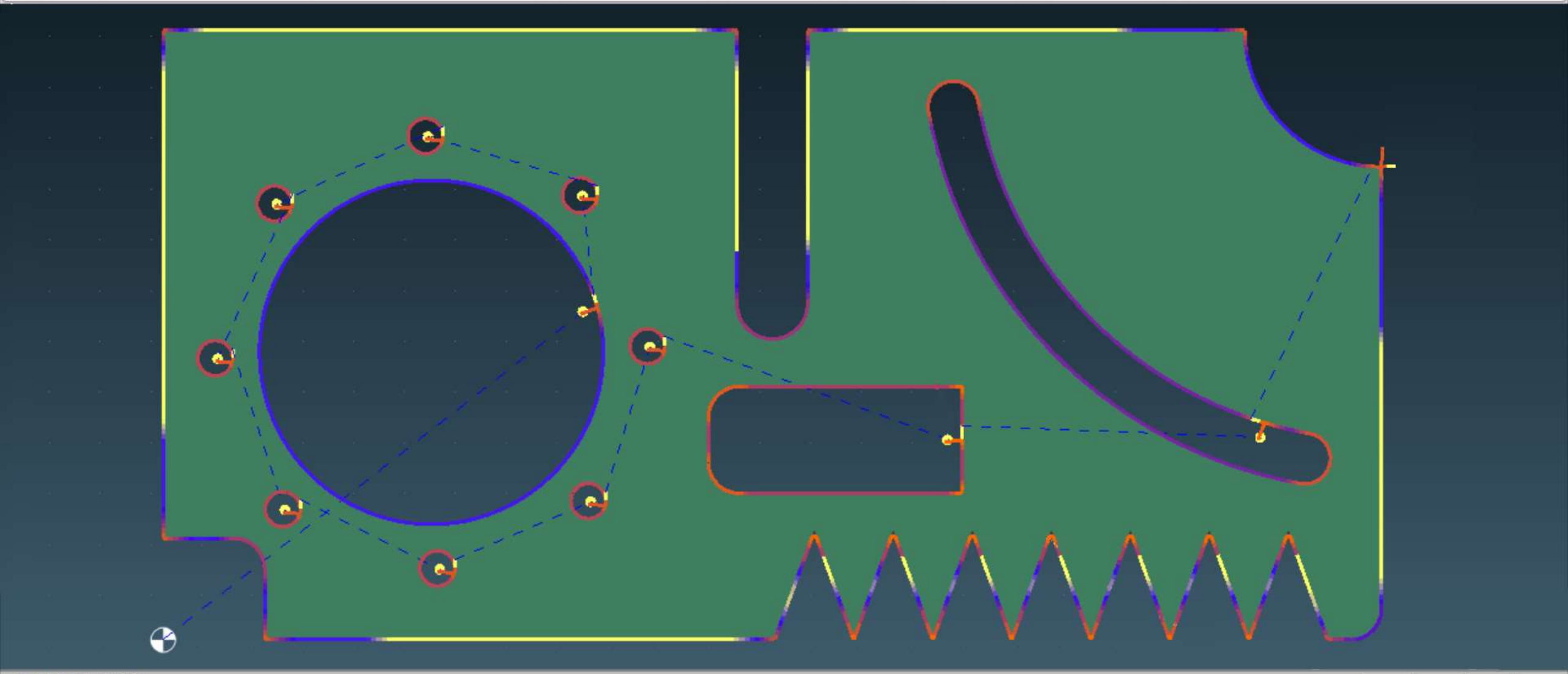
Use a software with speed optimizing
IGEMS has probably the most advance speed optimizing of all softwares. The formulas will optimize the speed and combine a fast production with and an excellent cutting result.

IGEMS speed optimizing is based on the experience from almost 30 years of development. The experience and cooperation with our partners is one of the reasons IGEMS is the world leading software for waterjet cutting.

IGEMS R2015 Noname1 - <Aluminium / Standard [20.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Create (Sheet) | Create | Quality | Taper control | Tool setup (Part) | Contour | Quick | Marking | Holes (Toolpath) | Edit | Delete (Modify) | Define | Cut (Bevel) | Define (TubeCut) | Order | Process (Process) | Register | Organizer (Organizer)



-7.416,77.7351

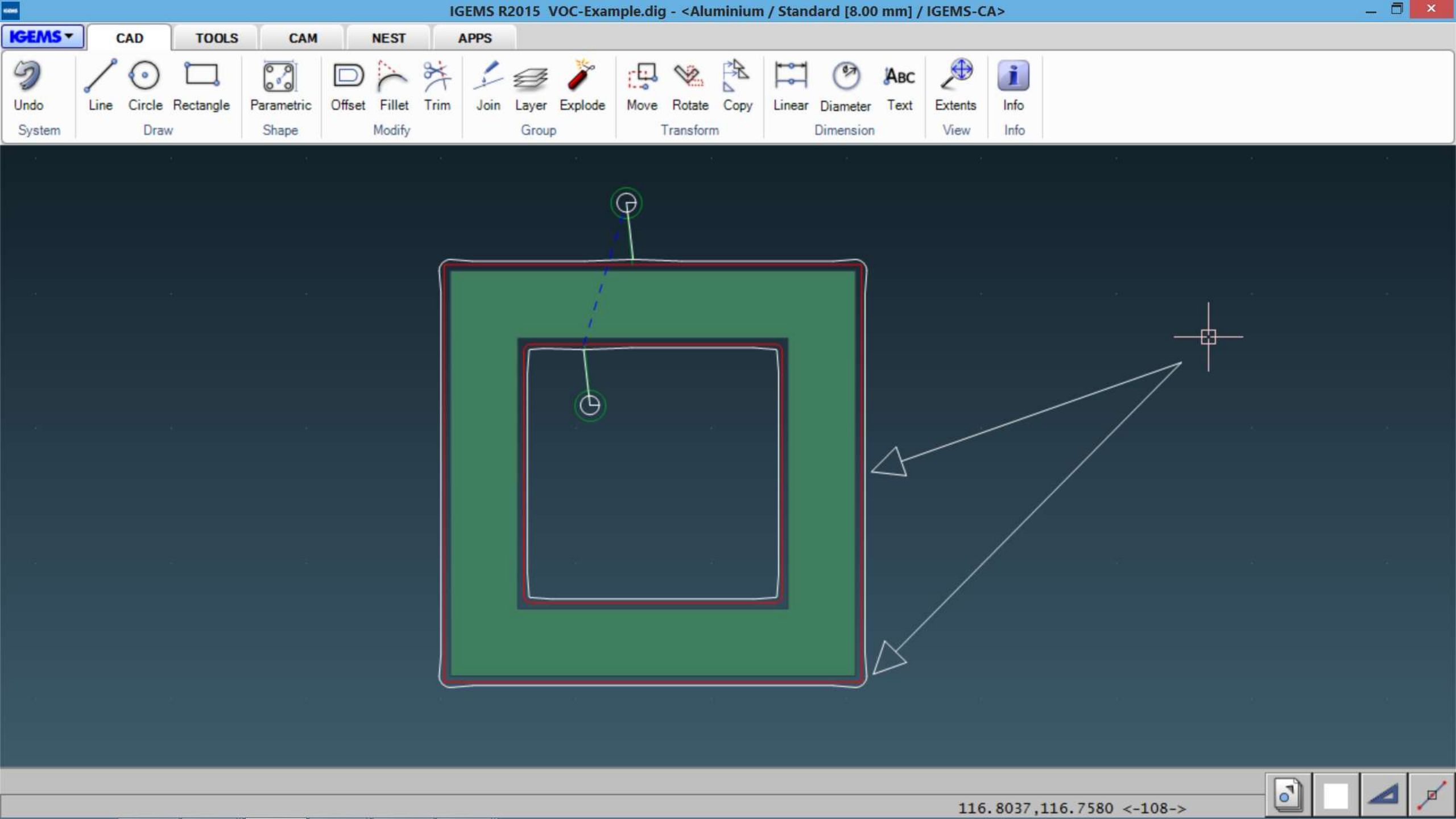
PROCESS

161.0450,140.9683 <-309->

Variable offset control

When you cut with a slow speed, the jet is cutting away more material compared to cutting with a high speed.

In IGEMS the kerf is dynamically changed depending on the actual speed.


IGEMS R2015 VOC-Example.dig - <Aluminium / Standard [8.00 mm] / IGEMS-CA>
IGEMS
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Explode
Group
Move
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Copy
Transform
Linear
Diameter
Text
Dimension
Extents
View
Info
Info
116.8037,116.7580 <-108->

Workflow

Since we are describing many features in this presentation, the workflow may look more complicated than it is.

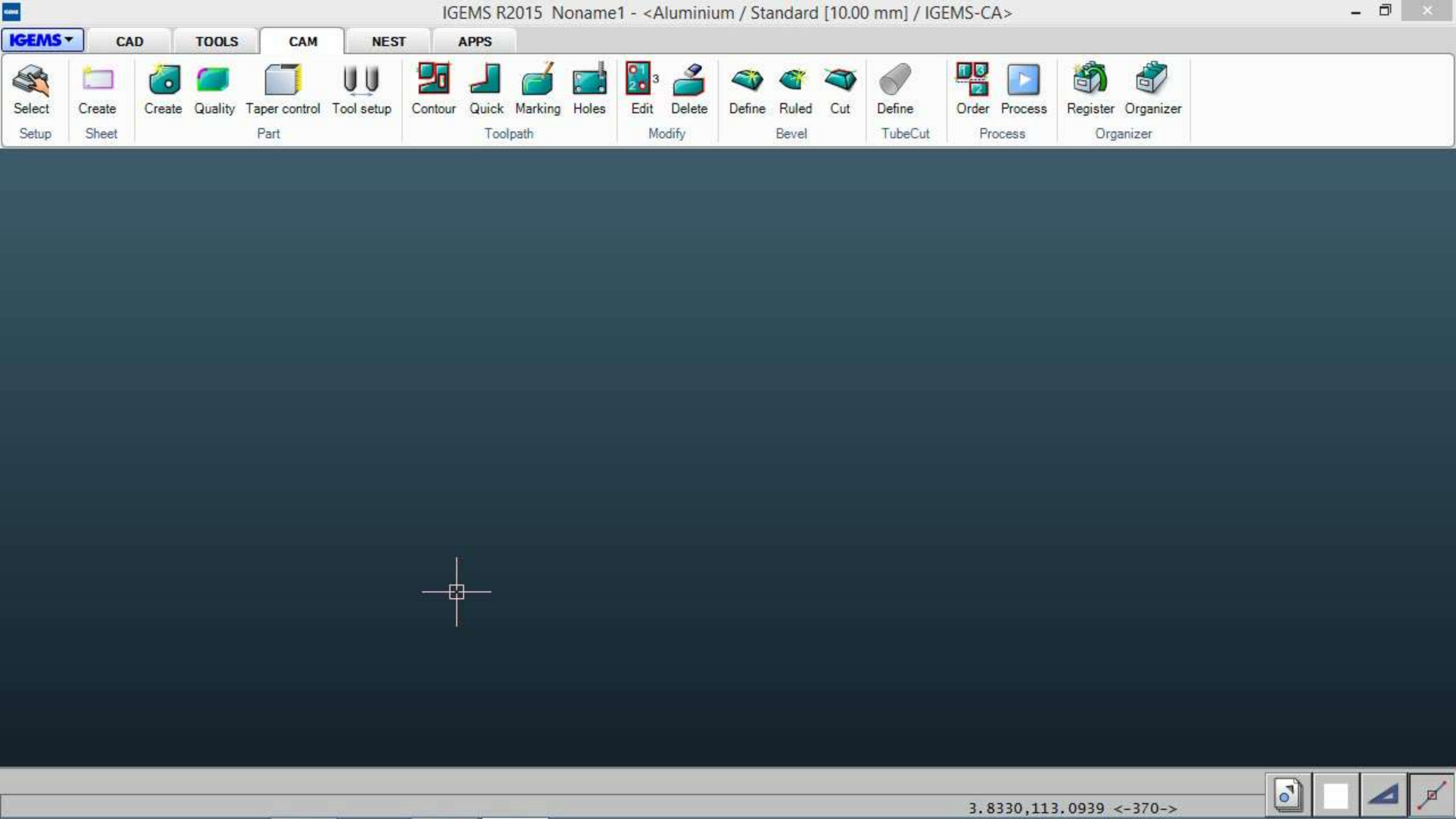
The first video will show how easy it can be to prepare a job:

1: Create a drawing with a rectangle 100 by 100 mm with a hole with radius 20 mm in the center.

2: Add the toolpath.

3: Make a 5-axis CNC-file with Taper control.

The whole process will take about20 seconds .


IGEMS R2015 Noname1 - <Aluminium / Standard [10.00 mm] / IGEMS-CA>
IGEMS
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TubeCut
Order
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Organizer
Organizer
3.8330,113.0939 <-370->

Create geometry

To be able to generate a code for the machine to cut something, you must have a geometry that describes the final product and the movements in the machine. The geometry must be drawn in the exact size and tolerance. In IGEMS, this geometry can be generated in many ways.

Create geometry – 1: In the CAD system

You can generate the geometry in the CAD-system. If you have any experience with AutoCAD, you don’t need much practice. It’s similar but faster and more easy to use. It contains all important CAD commands for making 2D drawings.

IGEMS R2015 Noname1 - <Stainless Steel / Standard [10.00 mm] / IGEMS-CA>

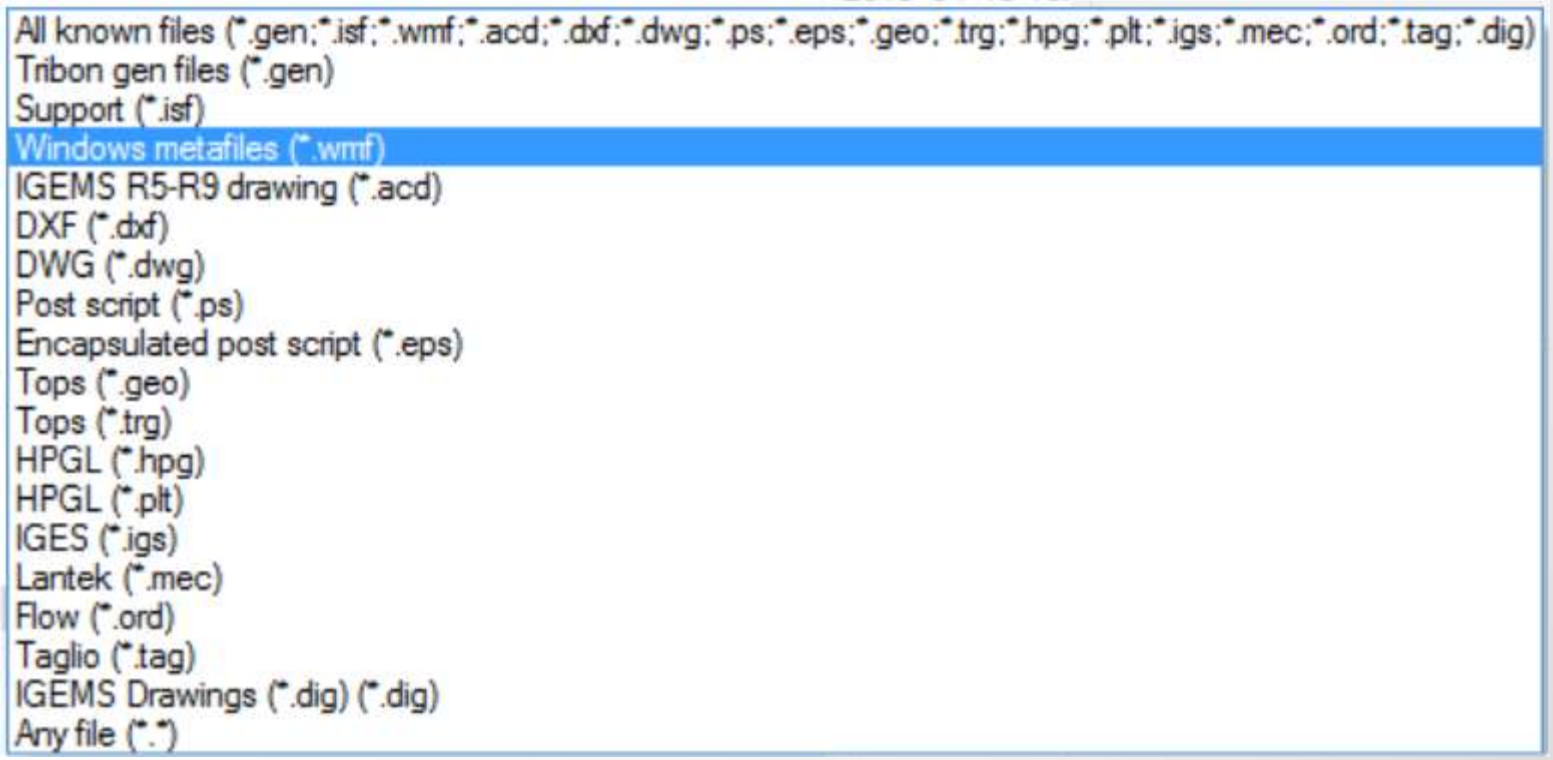
IGEMS | CAD | TOOLS | CAM | NEST | APPS

Undo — System
Line, Circle, Rectangle — Draw
Parametric — Shape
Offset, Fillet, Trim — Modify
Join, Layer, Explode — Group
Move, Rotate, Copy — Transform
Linear, Diameter, Text — Dimension
Extents — View
Info — Info

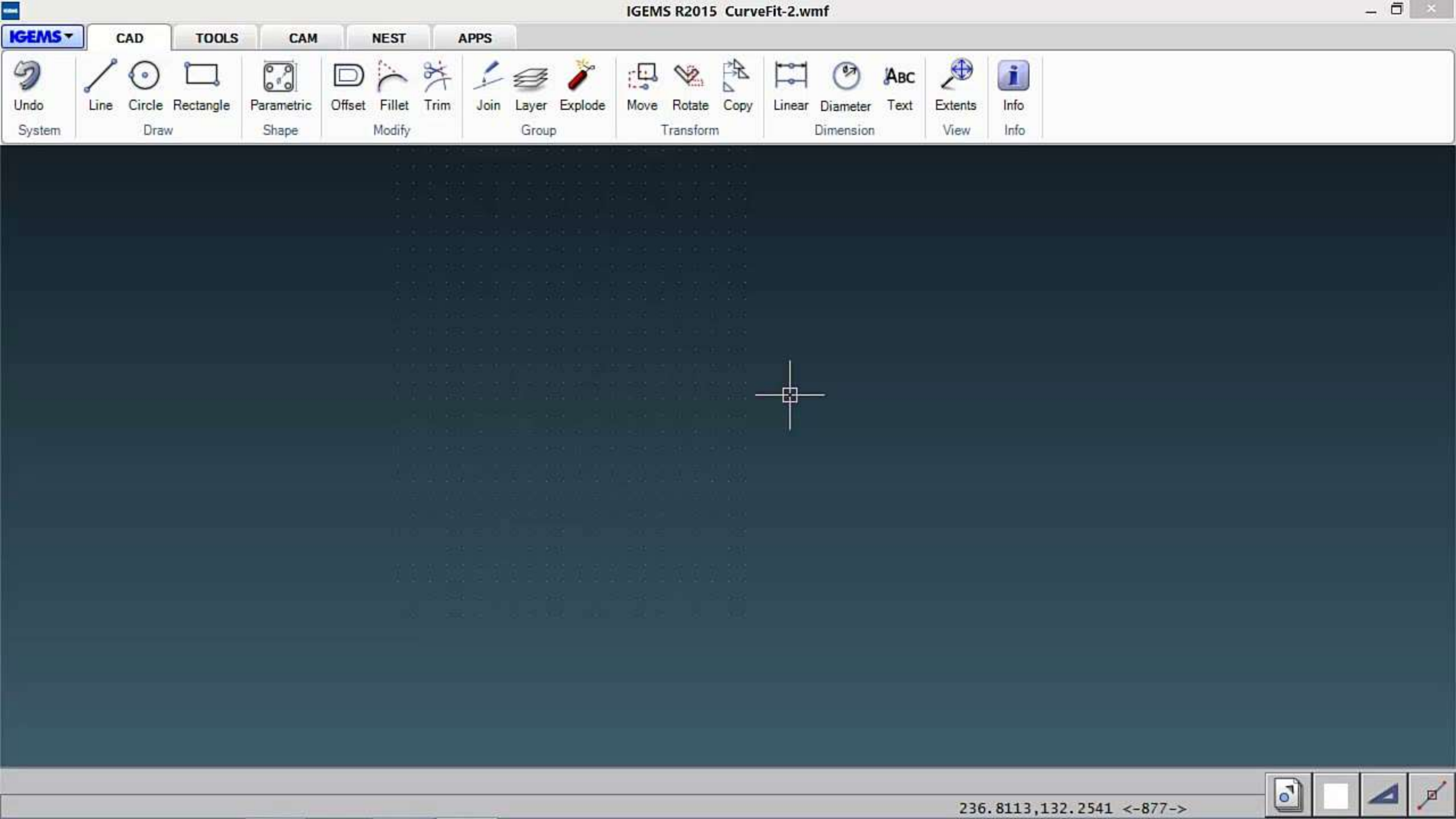
225.5710,207.9022 <-309->

Create geometry – 2: Import

You can import data from other 2D-CAD systems. You can select 17 different file formats from the open dialog .



It’s also possible to import 3D-files in STEP, IGES and STL files.


IGEMS R2015 CurveFit-2.wmf
IGEMS
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Explode
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Rotate
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Transform
Linear
Diameter
Text
Dimension
Extents
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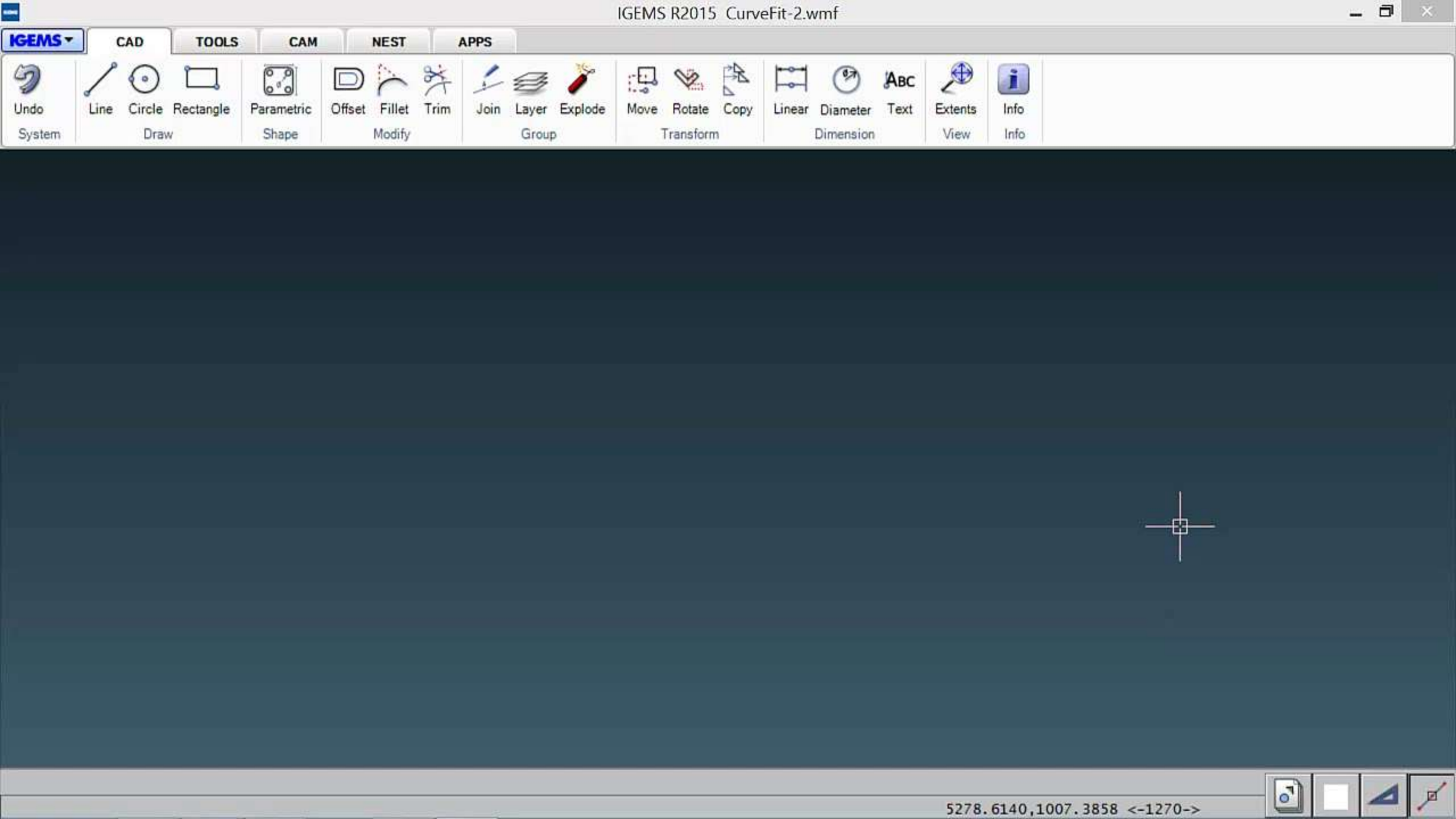
Info
236.8113,132.2541 <-877->

Create geometry – 3: Parametric Shapes

Select one of 53 different parametric shapes in our parametric library. You can create exact geometry within a few clicks.


IGEMS R2015 CurveFit-2.wmf
IGEMS
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Diameter
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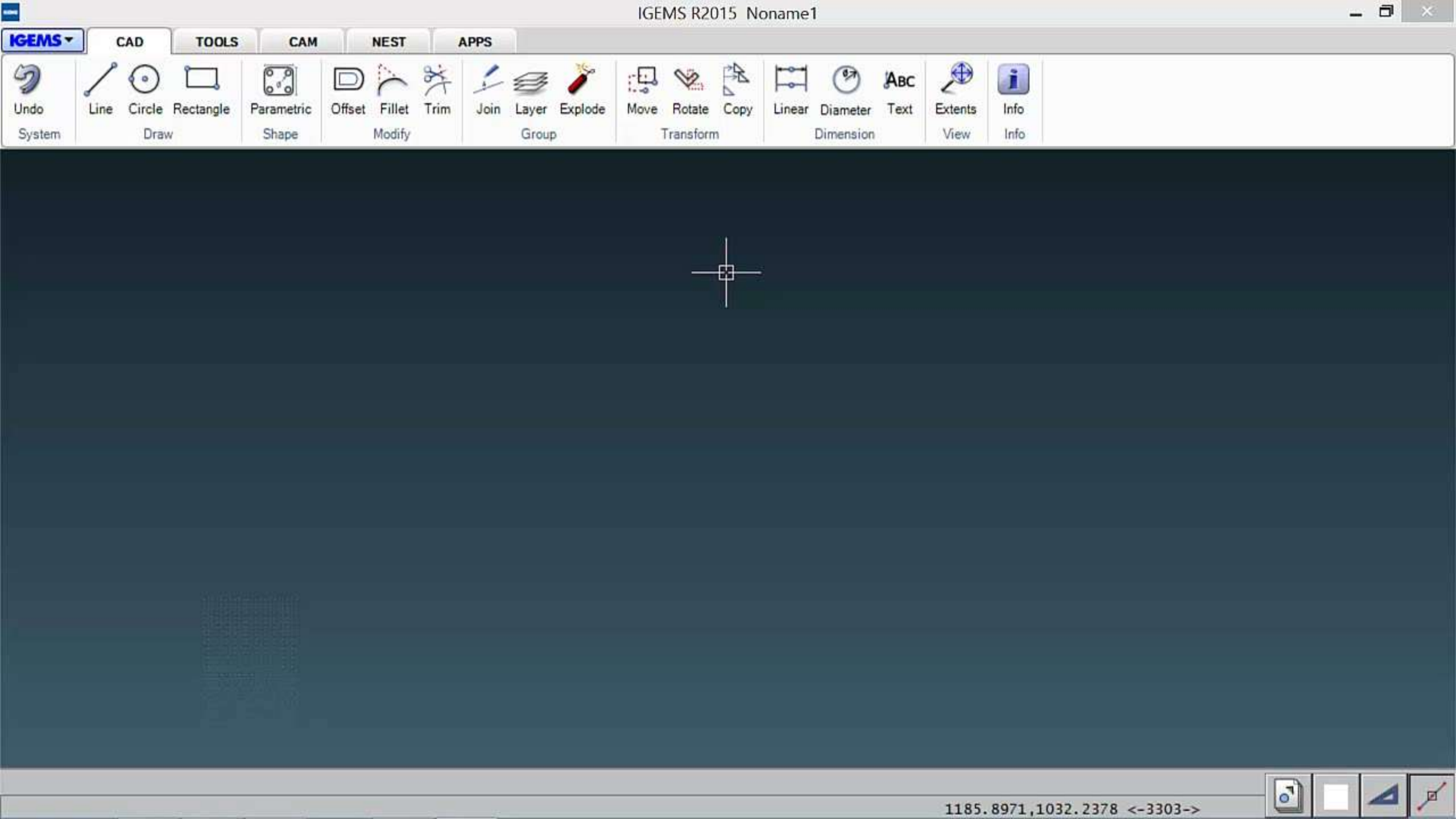
Info
5278.6140,1007.3858 <-1270->

Create geometry – 4: Unfolding of tubes

Unfolding of tubes, IGEMS have many parts for duct manufacturing.


IGEMS R2015 Noname1
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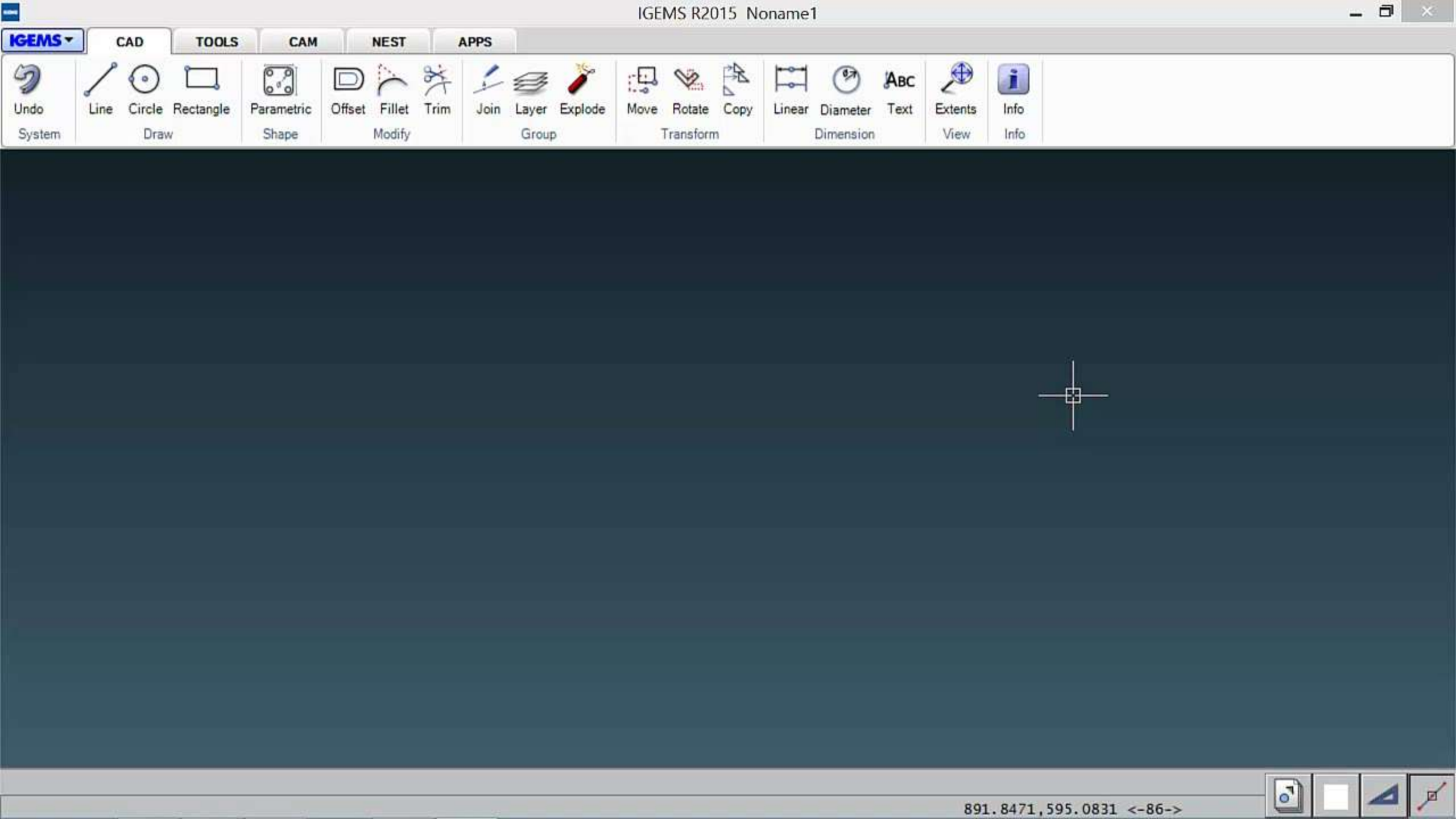
1185.8971,1032.2378 <-3303->

Create geometry – 5: Spur gear generator

You can make spur gears by using the spur gear generator.


IGEMS R2015 Noname1
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Rotate
Copy
Transform
Linear
Diameter
Text
Dimension
Extents
View
Info
Info
891.8471,595.0831 <-86->

Create geometry – 6: From TrueType fonts

If you are making signs, you can convert all TrueType fonts to usable geometrical information by the ImageTracer command.

IGEMS R2015 Noname1

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Clean up | EdgeFix | Replace | Analyze | Boundary scan | Boundary trim | Curvefit — CAM tools

Font tracer | Image | Image tracer — Sign maker

Tile | Tile cut | Inlay — Tile maker

Import | NC reader — Data exchange

1046.5909,645.9598 <-445->

Create geometry – 7: From a camera

If you have a camera or a scanner. Take a picture and generate the geometry automatically. This function works well if the picture have good contrast between bright and dark areas.

IGEMS R2015 Noname1

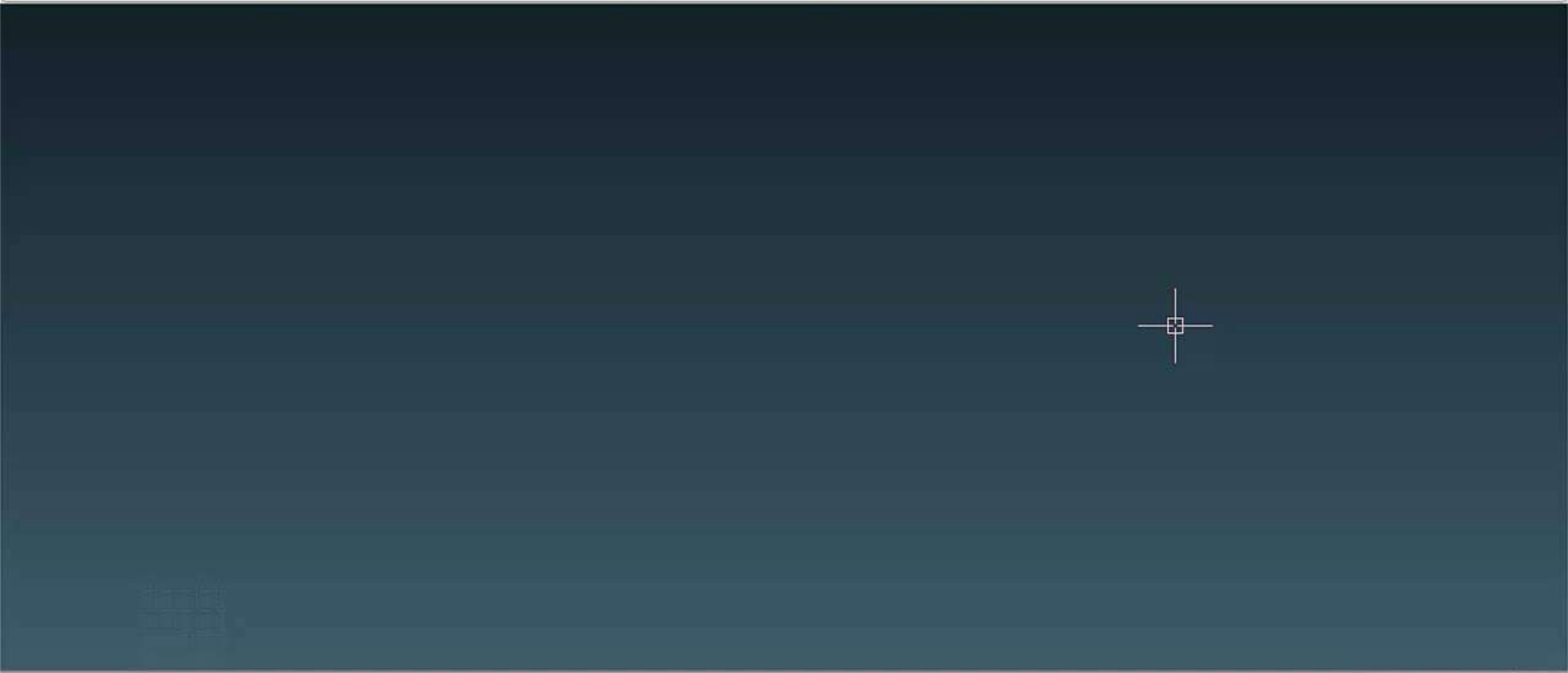
IGEMS | CAD | TOOLS | CAM | NEST | APPS

Clean up | EdgeFix | Replace | Analyze | Boundary scan | Boundary trim | Curvefit — CAM tools

Font tracer | Image | Image tracer — Sign maker

Tile | Tile cut | Inlay — Tile maker

Import | NC reader — Data exchange



2617.1970,950.2022 <-3963->

Create geometry – 8: Draw on a picture

If you have a camera or a scanner. Take a picture and use it as background in the CAD system. Then generate geometry by drawing objects on the picture.

IGEMS R2015 Noname1

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Undo — System

Line, Circle, Rectangle — Draw

Parametric — Shape

Offset, Fillet, Trim — Modify

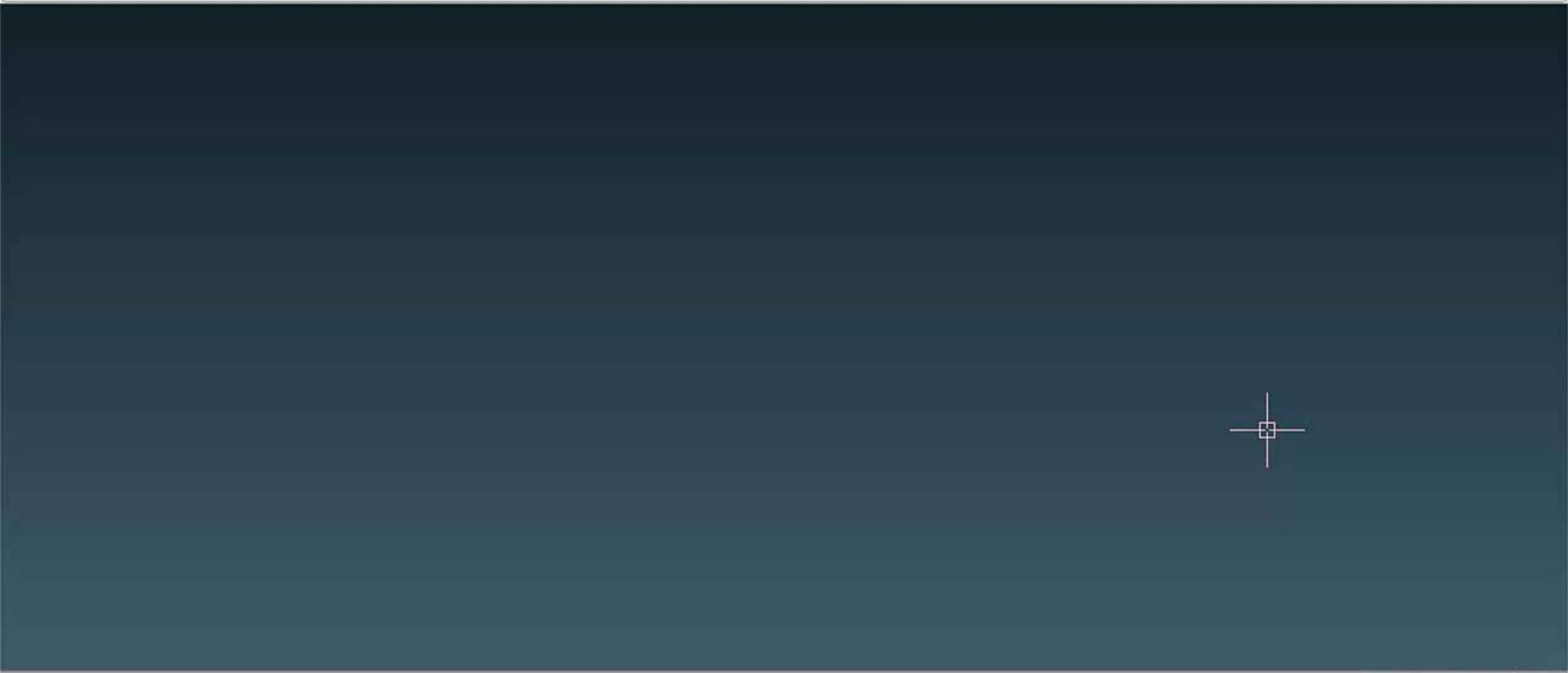
Join, Layer, Explode — Group

Move, Rotate, Copy — Transform

Linear, Diameter, Text — Dimension

Extents — View

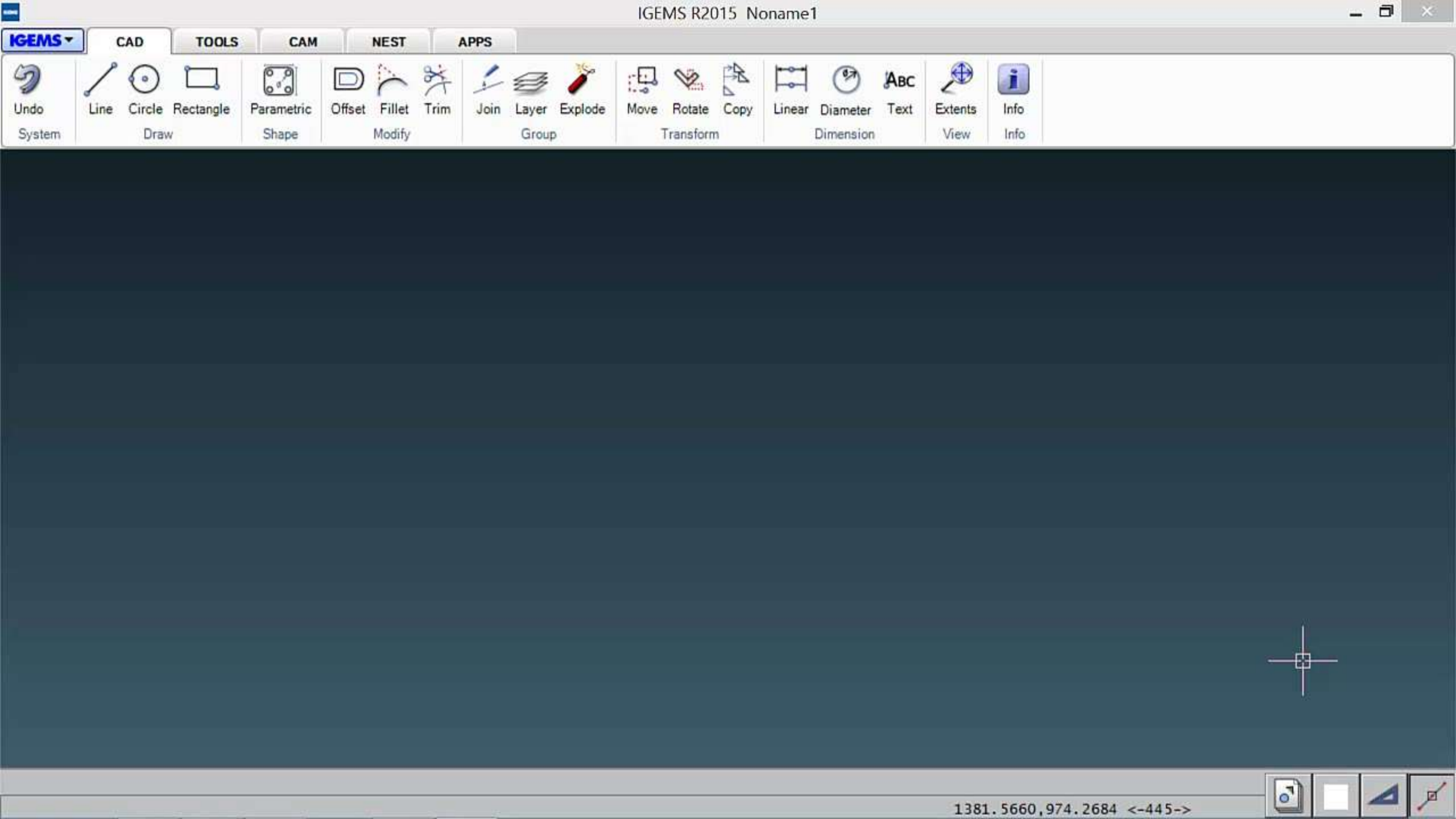
Info — Info



1966.0316,910.8338 <-2294->

Create geometry – 9: Puzzle generator

A funny thing is the puzzle generator. A Waterjet is a perfect machine to make a jig saw puzzle. This may not generate a lot of money, but you can design your own puzzles.


IGEMS R2015 Noname1
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Modify
Join
Layer
Explode
Group
Move
Rotate
Copy
Transform
Linear
Diameter
Text
Dimension
Extents
View
Info
Info
1381.5660,974.2684 <-445->

Create geometry – 10: From 3D-files

If you have a 5-axis cutting machine, you'll need 3D information. In IGEMS you can import this information from a professional 3D systems by using STEP, IGES or STL files formats.

IGEMS R2015 Noname1 - <Stainless Steel / Standard [10.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer

227.2122,176.7259 <-768->

Create geometry – 11: From CNC-code

Reverse engineering. If you have an old CNC-file and no drawing. The command NC-Reader can create geometry from most CNC-systems. It’s also great for checking CNC-files.

Noname2

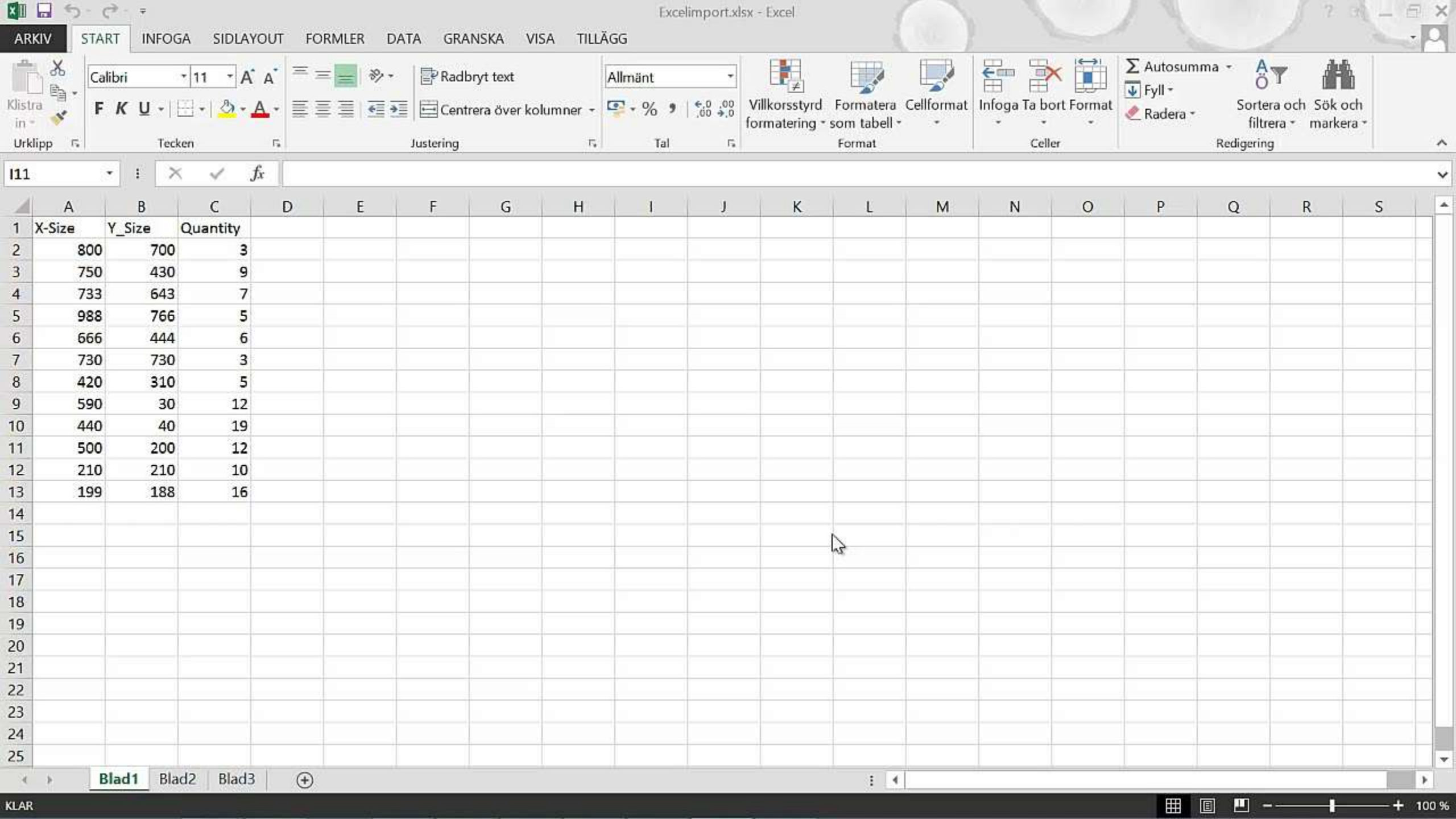
IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer

797.1894,745.4100 <-2294->

Create geometry – 12: From applications

IGEMS have an built in application language that can be used for generating geometries from various data. For example, make a table with width and height values in Excel and let the application generate the geometry automatically.



	A	B	C
1	X-Size	Y_Size	Quantity
2	800	700	3
3	750	430	9
4	733	643	7
5	988	766	5
6	666	444	6
7	730	730	3
8	420	310	5
9	590	30	12
10	440	40	19
11	500	200	12
12	210	210	10
13	199	188	16

Improve the geometry: Clean up

Other CAD systems that are designed for CAM applications may sometimes create geometries that contains double lines, overlapped objects or gap between objects. IGEMS have a fantastic command that can clean up geometries automatically.

The next example will remove 14 objects and repair gaps.

IGEMS R2015 Noname1

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Undo (System) | Line, Circle, Rectangle (Draw) | Parametric (Shape) | Offset, Fillet, Trim (Modify) | Join, Layer, Explode (Group) | Move, Rotate, Copy (Transform) | Linear, Diameter, Text (Dimension) | Extents (View) | Info (Info)

563.0592,-29.8593 <-732->

Improve the geometry: CurveFit

Other CAD systems that are designed for CAM applications may sometimes create geometries that contains thousands of short lines describing a spline or a circle. You can use this information as it is, but the CNC-file will be massive and the machine memory will skyrocket.

By using the command Curvefit, short lines will be converted to longer lines or to arcs..

IGEMS R2015 CurveFit-1.dwg

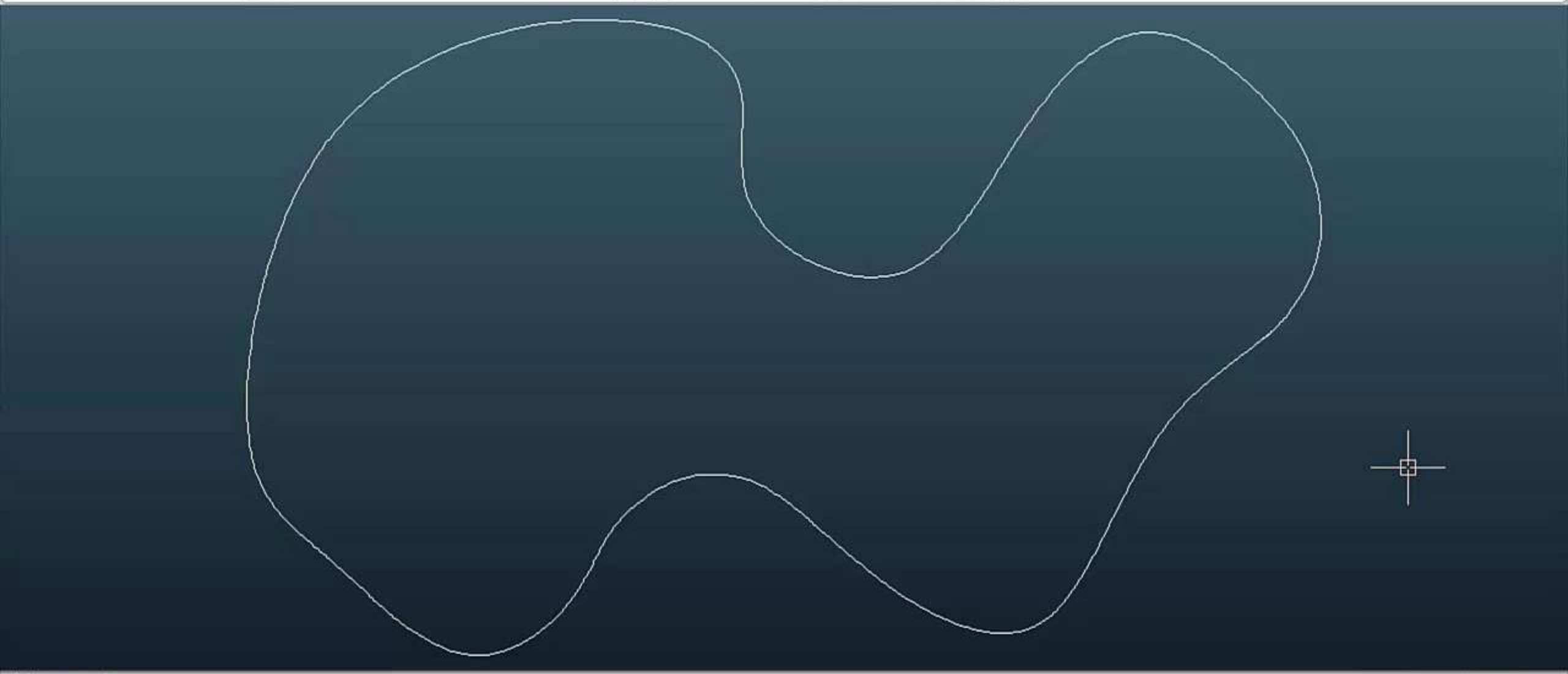
IGEMS | CAD | TOOLS | CAM | NEST | APPS

Clean up | EdgeFix | Replace | Analyze | Boundary scan | Boundary trim | Curvefit — CAM tools

Font tracer | Image | Image tracer — Sign maker

Tile | Tile cut | Inlay — Tile maker

Import | NC reader — Data exchange



objects : 1

376.8877,81.8976 <-434->

Create parts

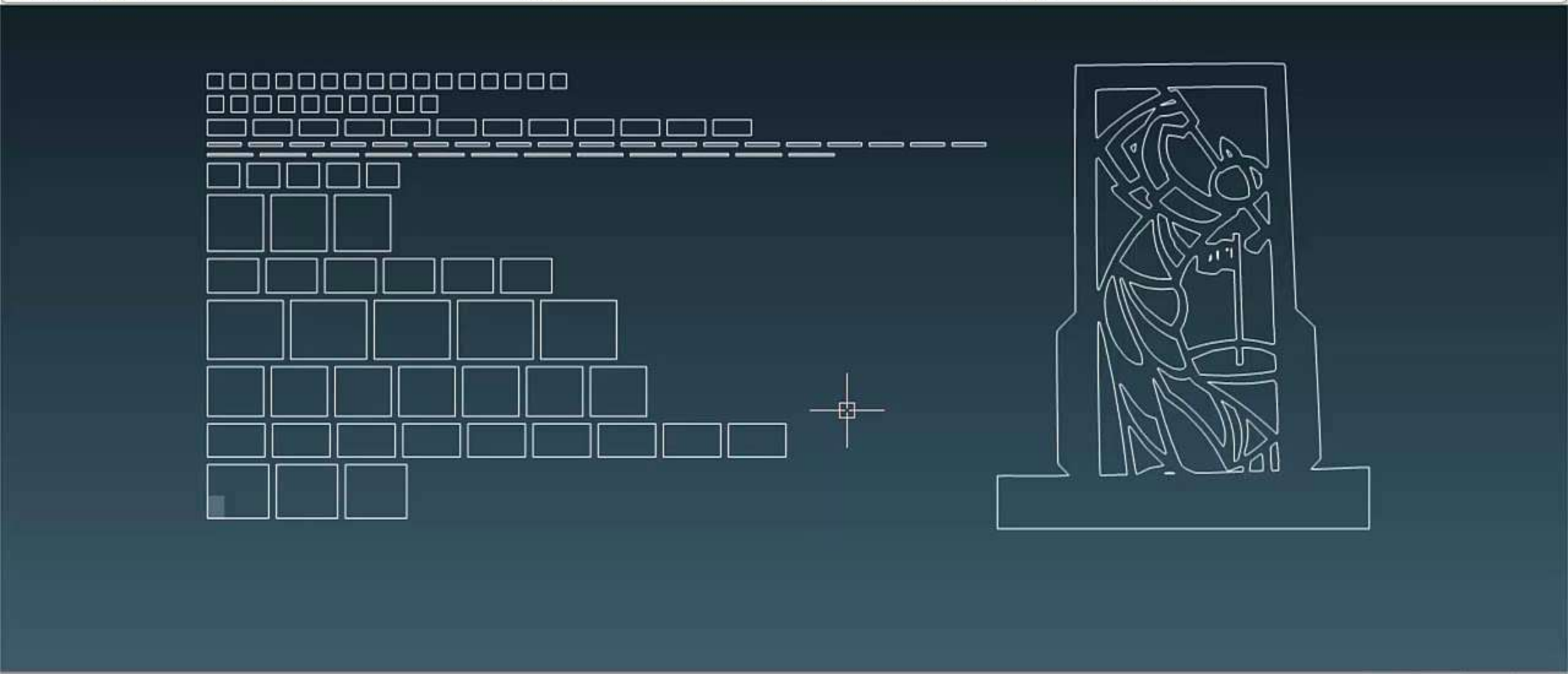
A part is a group of objects (for example: lines, arcs, circles) describing the geometry profile. The part also stores information about the quantity of parts to produce, and some other properties. The next video will show you how to do.

IGEMS R2015 Noname1 - <Stainless Steel / Standard [10.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Create | Create | Quality | Taper control | Tool setup | Contour | Quick | Marking | Holes | Edit | Delete | Define | Cut | Define | Order | Process | Register | Organizer

Setup | Sheet | Part | Toolpath | Modify | Bevel | TubeCut | Process | Organizer



8349.3214,1405.1566 <-20450->

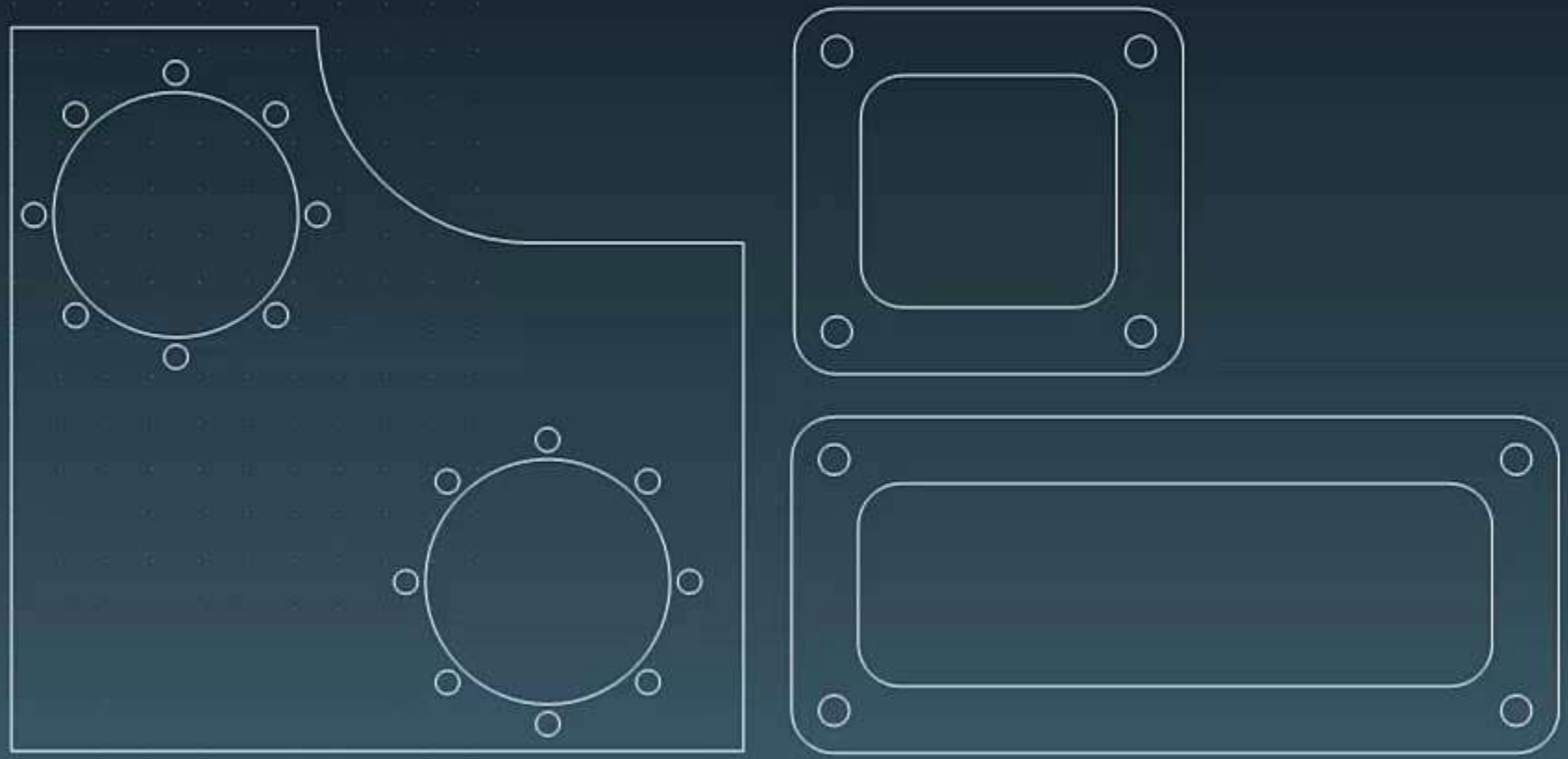
Parts – Cutting quality

The most important property in the part is the cutting quality. It can be up to 400 percent difference in speed between the most rough and fine quality. Do never use a better quality than the requirements. The initial cutting quality is set when you create the part, but you can easily change the quality by using the command Quality.

IGEMS R2015 Holes.dig - <Stainless Steel / Standard [10.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select (Setup) | Create (Sheet) | Create, Quality, Taper control, Tool setup (Part) | Contour, Quick, Marking, Holes (Toolpath) | Edit, Delete (Modify) | Define, Cut (Bevel) | Define (TubeCut) | Order, Process (Process) | Register, Organizer (Organizer)



474.2618,172.5009 <-510->

Nesting – Single nest

The nesting is only needed when you are cutting several parts. It’s placing your parts in a clever way to use minimum amount of material. There are 6 different nesting commands in IGEMS.

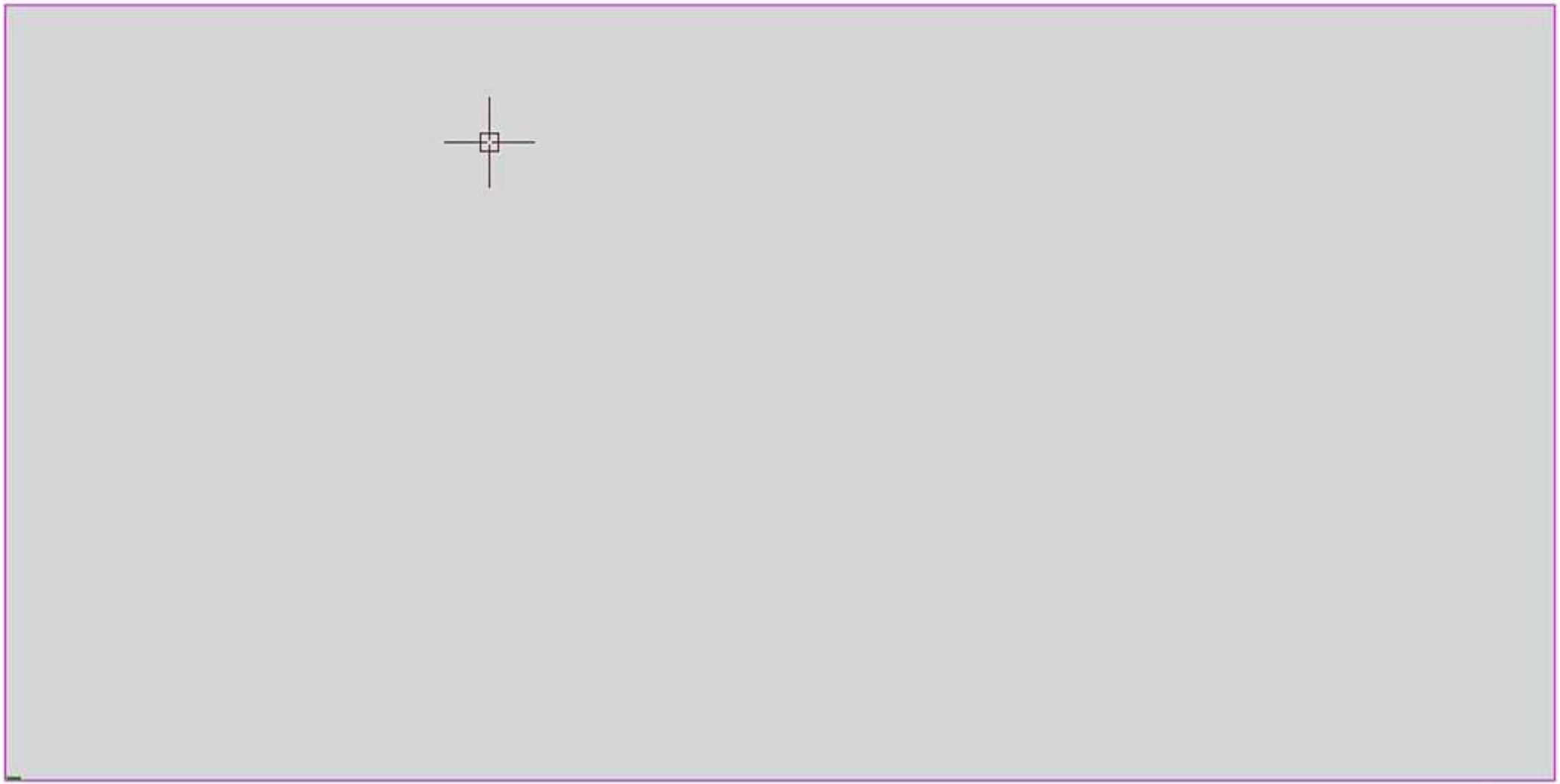
Single nest is a special algorithm for nesting a single parts.

Noname3 - <Aluminium / Standard [1.00 mm] / IGEMS-RD>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Create | Create | Browser | Quick | Glide | Single | Rectangle | Circle | Auto | Report

Setup | Sheet | Part | Nest



1362.6548,1571.1224 <-4919->

Nesting – Rectangle nest

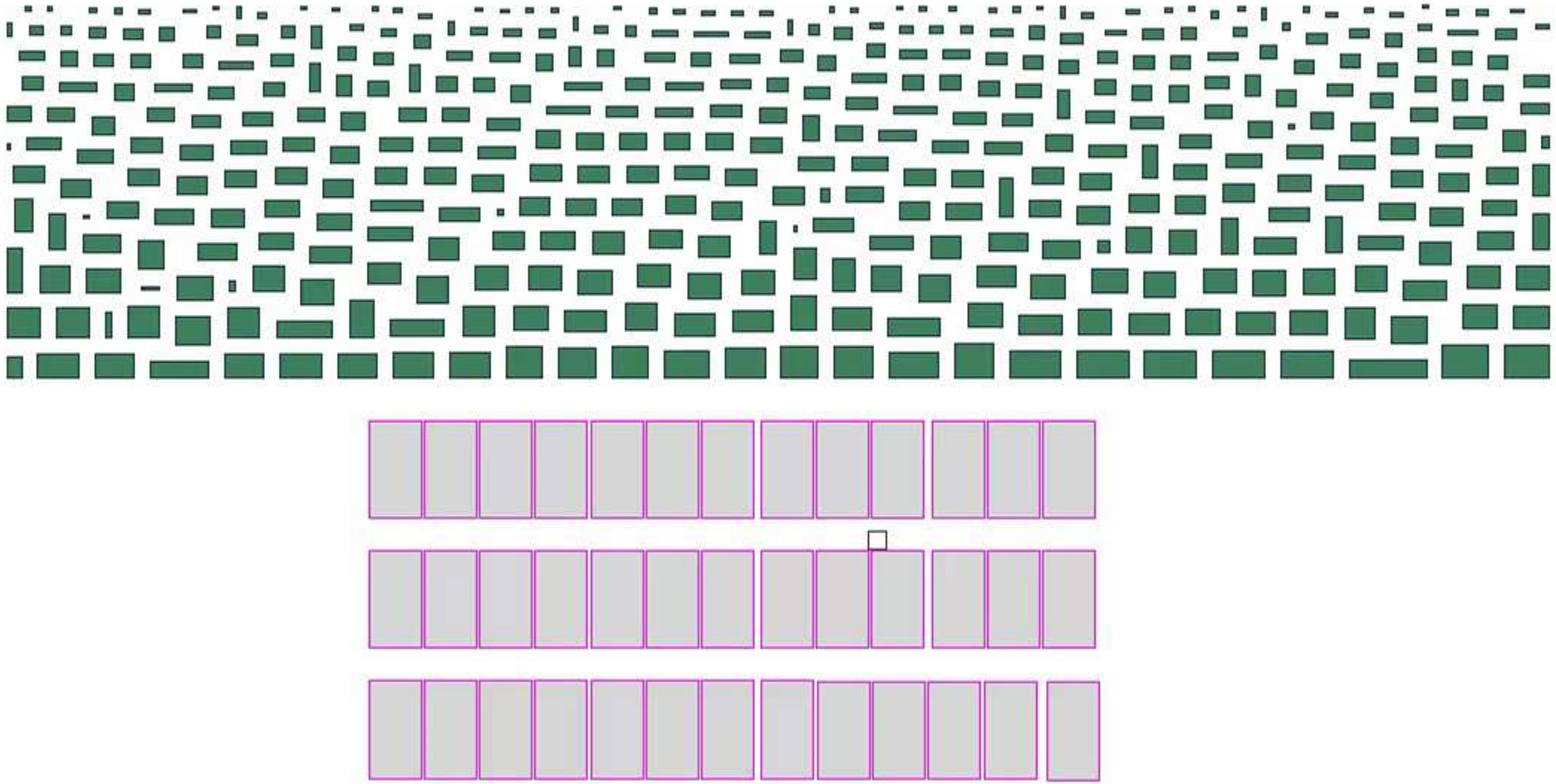
Rectangle nest is a special algorithm developed for nesting of rectangular parts (it don’t have to be rectangles). You can select different size of parts at the same time. The command will mix and rotate the parts to make the most efficient nest.

Rectanglenest.dig - <Aluminium / Standard [4.00 mm] / IGEMS-RD>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Create | Create | Browser | Quick | Glide | Single | Rectangle | Circle | Auto | Report

Setup | Sheet | Part | Nest



Select sheets:

RECTANGLE

45334.9276,-20572.4103 <-117108->

Nesting – Circle nest

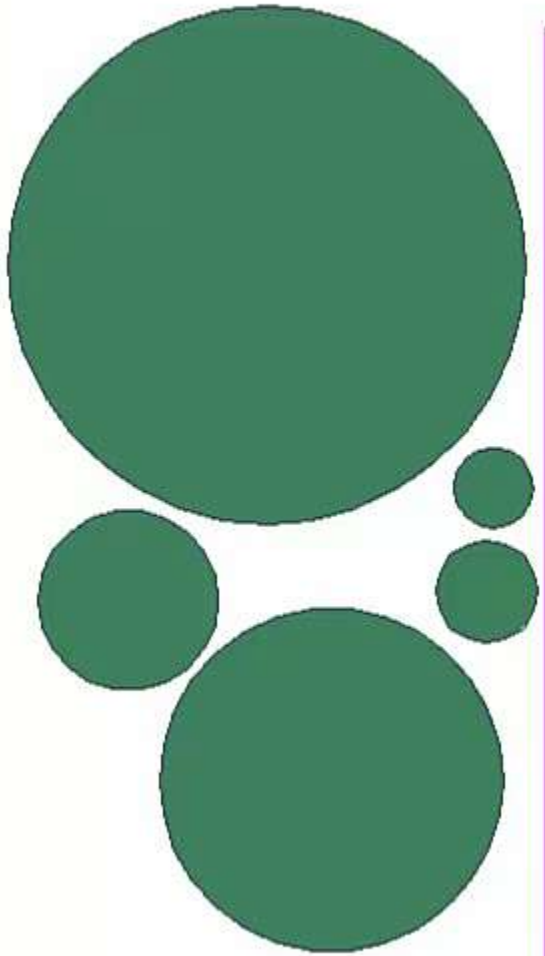
Circle nest is another algorithm developed for nesting of circular parts (it don’t’ have to be circles). The command will mix and rotate the parts to make the most efficient nest.

Noname3 - <Aluminium / Standard [1.00 mm] / IGEMS-RD>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Create | Create | Browser | Quick | Glide | Single | Rectangle | Circle | Auto | Report

Setup | Sheet | Part | Nest



1223.5334,2031.4349 <-5389->

Nesting – Auto nest

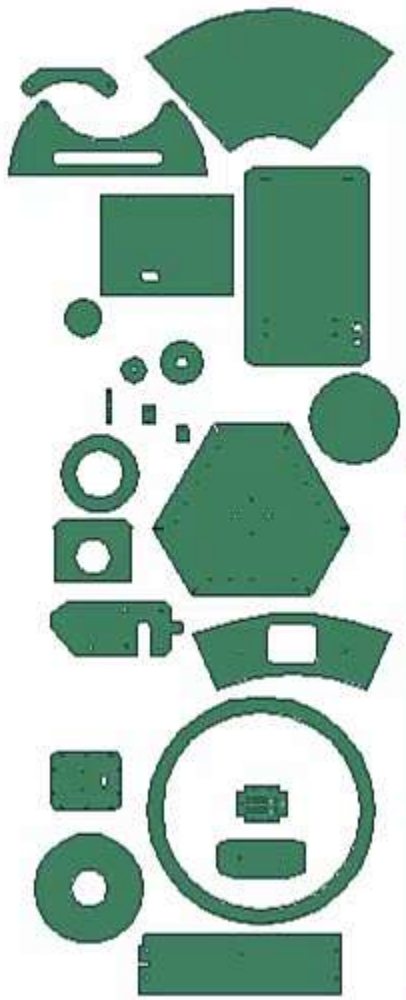
Automatic nesting is our most flexible nesting command. It can nest different parts to multiple sheets. It can automatically place parts in holes of larger parts. It also makes an optimal layout if you want to cut with several cutting heads.

ANest-1.acd - <Aluminium / Standard [6.00 mm] / IGEMS-RD>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Create | Create | Browser | Quick | Glide | Single | Rectangle | Circle | Auto | Report

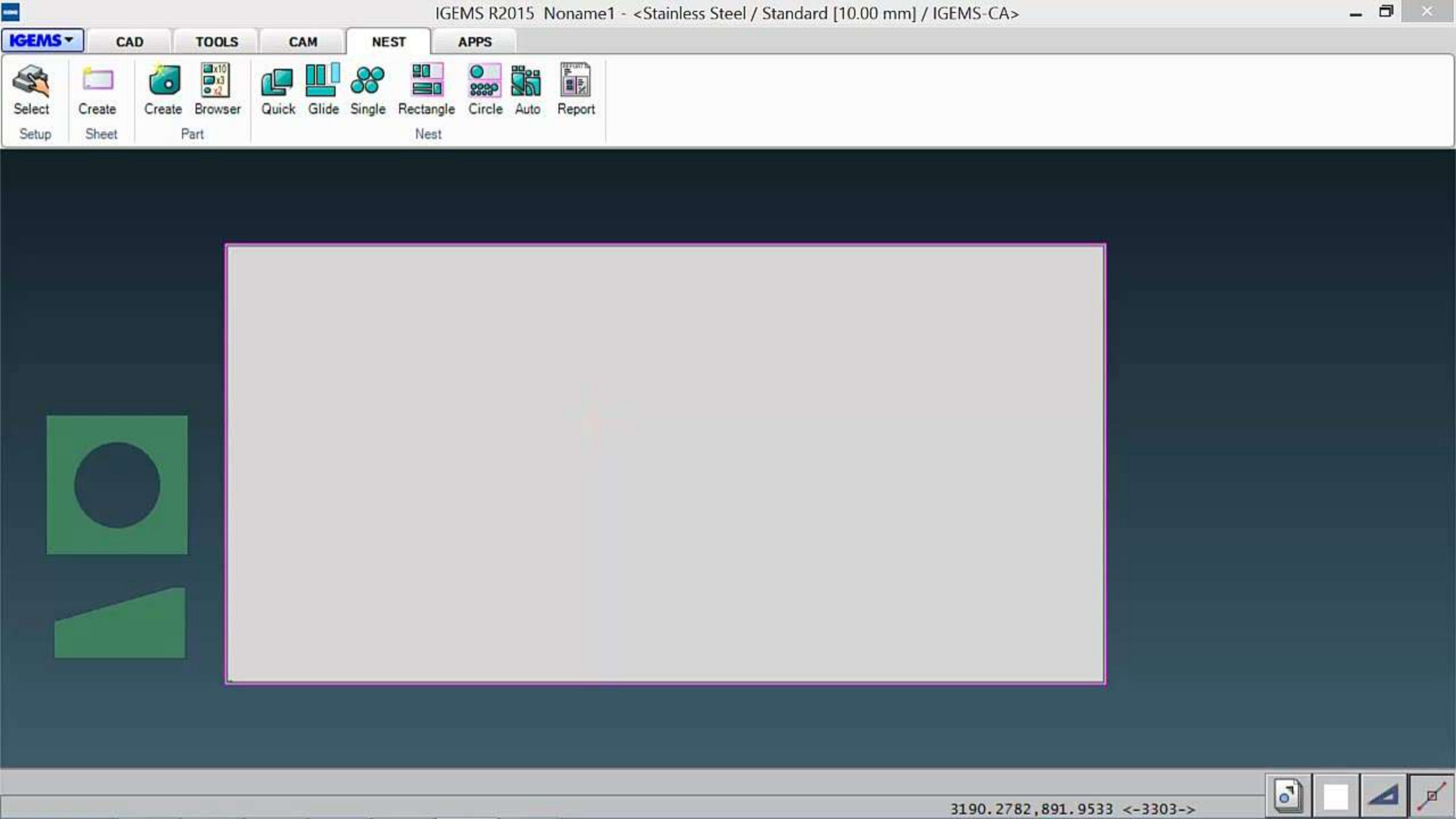
Setup | Sheet | Part | Nest



1010.7604,2059.0832 <-5165->

Nesting – Quick nest

Quick nest can be used if you prefer to do the nesting in a more manual way. It’s a combination of many CAD commands like move, copy and rotate joined together in a great user interface.


IGEMS R2015 Noname1 - <Stainless Steel / Standard [10.00 mm] / IGEMS-CA>
IGEMS
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Setup
Create
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Create
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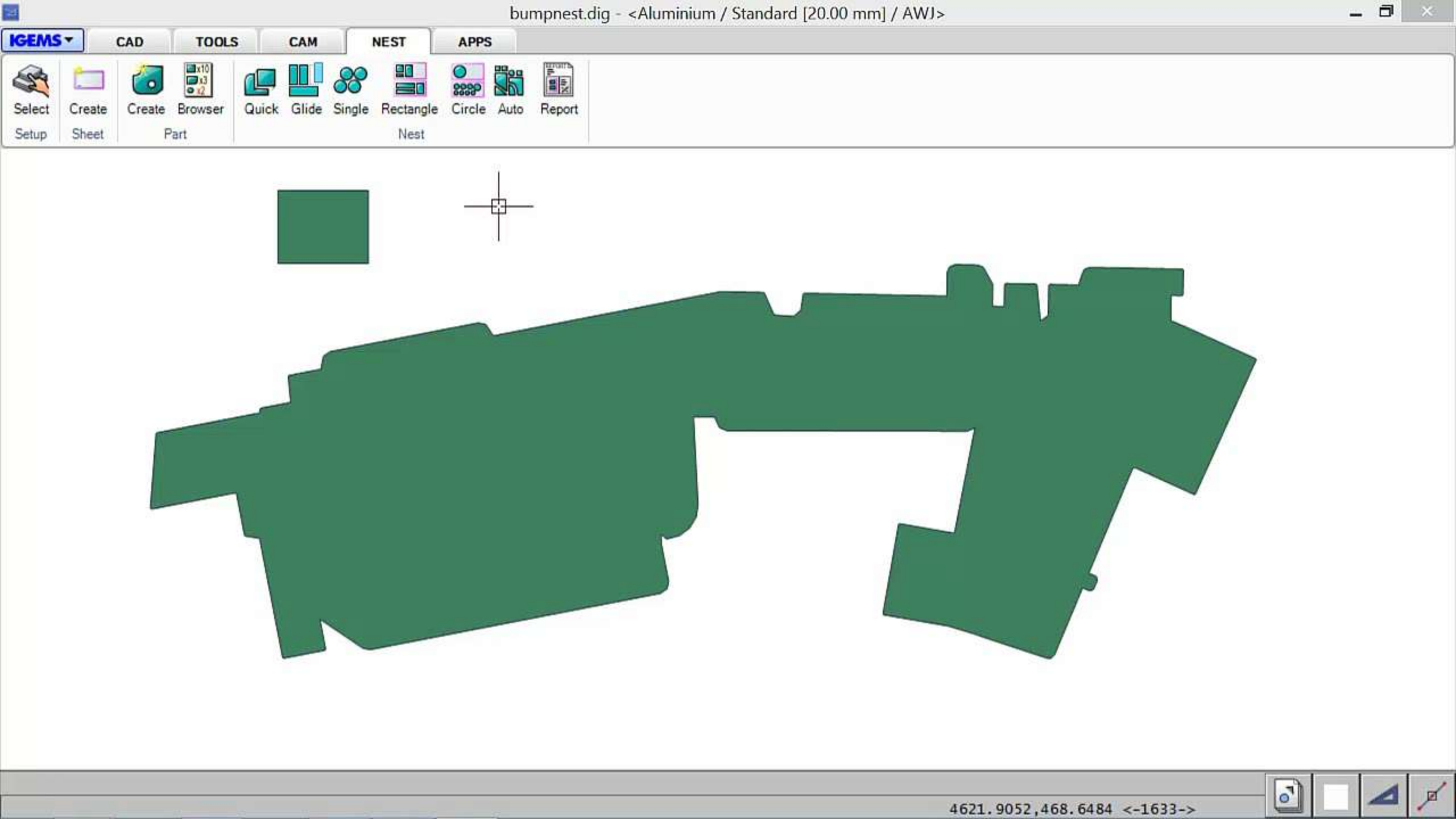
Part
Quick
Glide
Single
Rectangle
Circle
Auto
Report
Nest
3190.2782,891.9533 <-3303->

Nesting – Glide nest

Glide nest is similar to Quick nest but have another user interface.


bumpnest.dig - <Aluminium / Standard [20.00 mm] / AWJ>
IGEMS
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CAM
NEST
APPS
Select
Setup
Create
Sheet
Create
Browser
Part
Quick
Glide
Single
Rectangle
Circle
Auto
Report
Nest
4621.9052,468.6484 <-1633->

Toolpath - Single

There are several ways to add toolpaths to the parts.
When using the option Single, you need one click with the mouse for each geometry to cut. Use this option when you need to control the exact start position.

IGEMS R2015 SINGLE.dig - <Aluminium / Standard [6.00 mm] / IGEMS>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer

295.5022,51.2711 <-370->

Toolpath - Multiple

The most automatic way is to use the option Multiple. This command will add toolpaths to all selected parts automatically. The command knows what is inside and outside of the parts. It adds the lead-ins on places where there is no collision to other parts. This command is the most used command for adding toolpaths in IGEMS.

SINGLE.dig - <Aluminium / Standard [6.00 mm] / IGEMS>

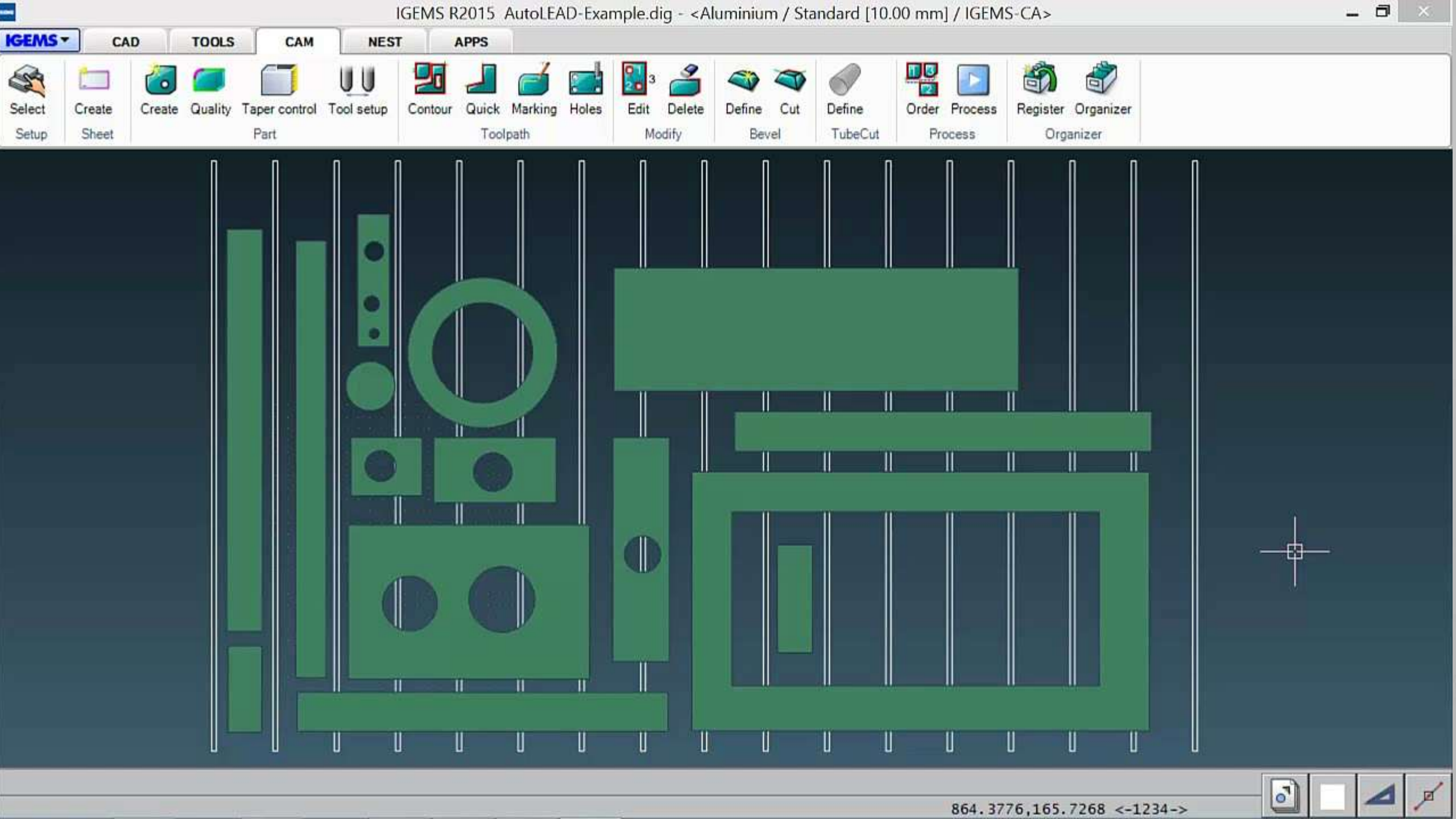
IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer

299.8450,49.5340 <-370->

Toolpath– Automatic lead selection

IGEMS can analyze the lead-position and automatically adjust the parameters of the lead. The function will use the material, thickness and size of the part. In this example the function will automatically add a small bridge on small parts that else could fall down in the tank.


IGEMS R2015 AutoLEAD-Example.dig - <Aluminium / Standard [10.00 mm] / IGEMS-CA>
IGEMS
CAD
TOOLS
CAM
NEST
APPS
Select
Setup
Create
Sheet
Create
Quality
Taper control
Tool setup
Part
Contour
Quick
Marking
Holes
Toolpath
Edit
Delete
Modify
Define
Cut
Bevel
Define
TubeCut
Order
Process
Process
Register
Organizer
Organizer
864.3776,165.7268 <-1234->

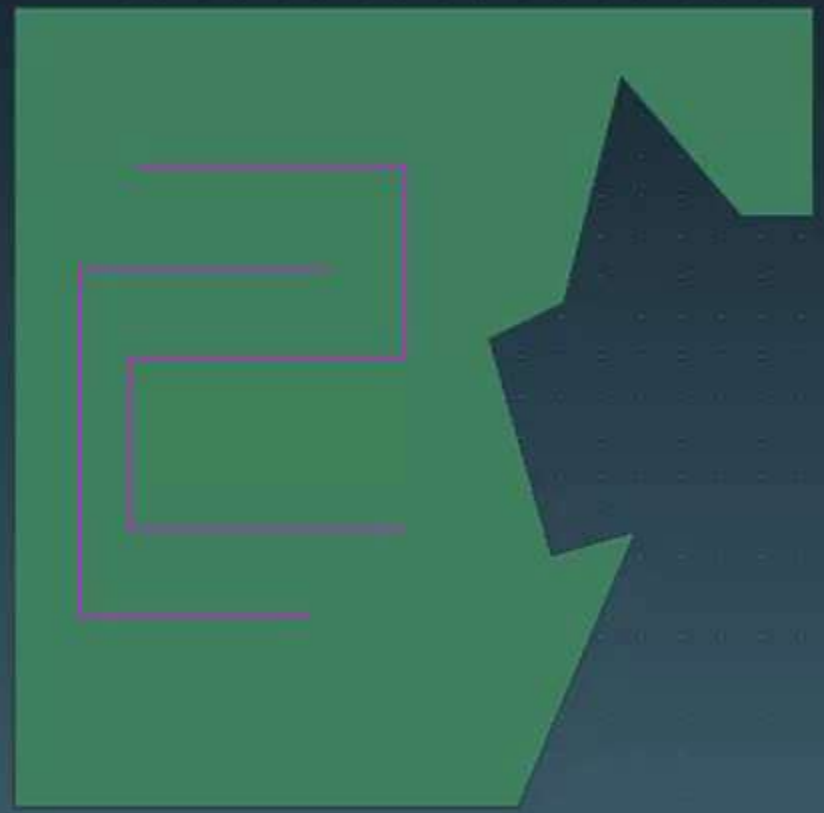
Add toolpath – Quick cut

If you only want to cut some sides of a part or a slit inside the part, you can use the command Quick.

IGEMS R2015 Noname2 - <Stainless Steel / Standard [10.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer



384.7817,129.2868 <-640->

Toolpath - Marking

By using the command marking you can easily add information to various kinds of marking devices.

IGEMS R2015 CurveFit-2.wmf - <Stainless Steel / Standard [10.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer

380.5133,156.8070 <-613->

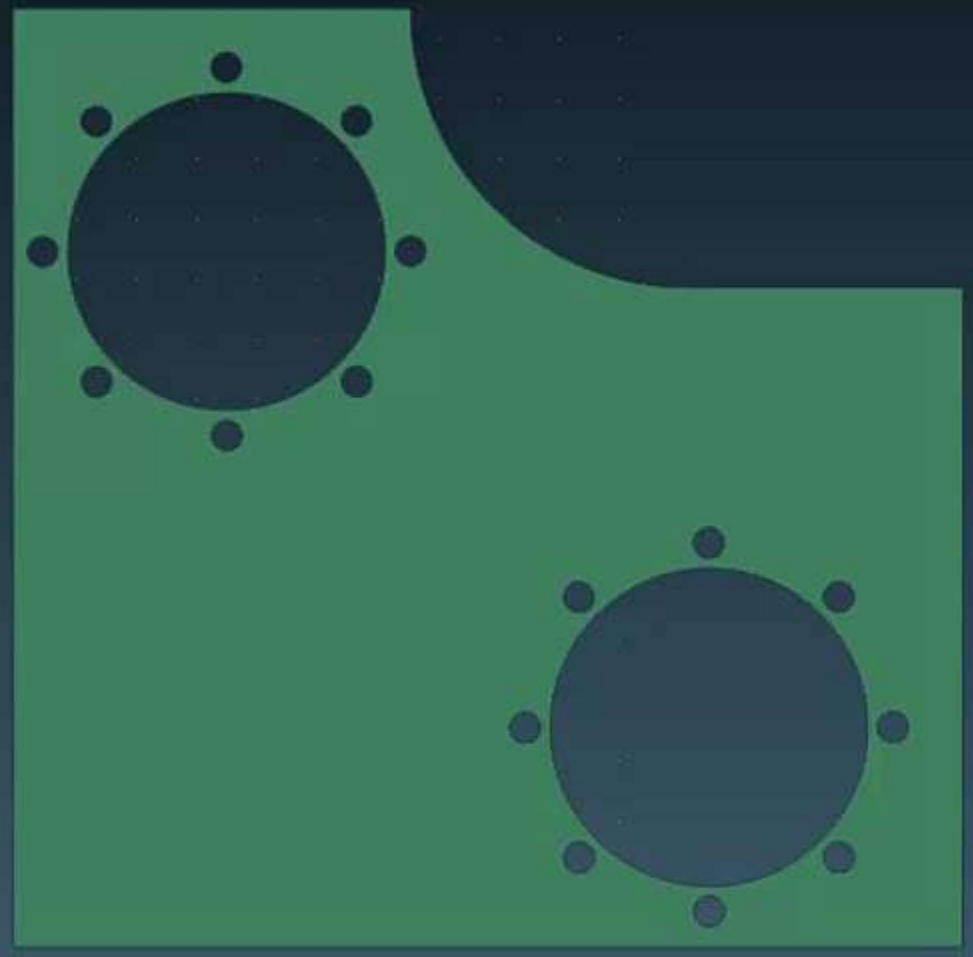
Add toolpath - Drilling

If your machine is equipped with a drilling unit, this can be used for making starting holes in your material. It can also be used to drill holes.

IGEMS R2015 CurveFit-2.wmf - <Stainless Steel / Standard [10.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

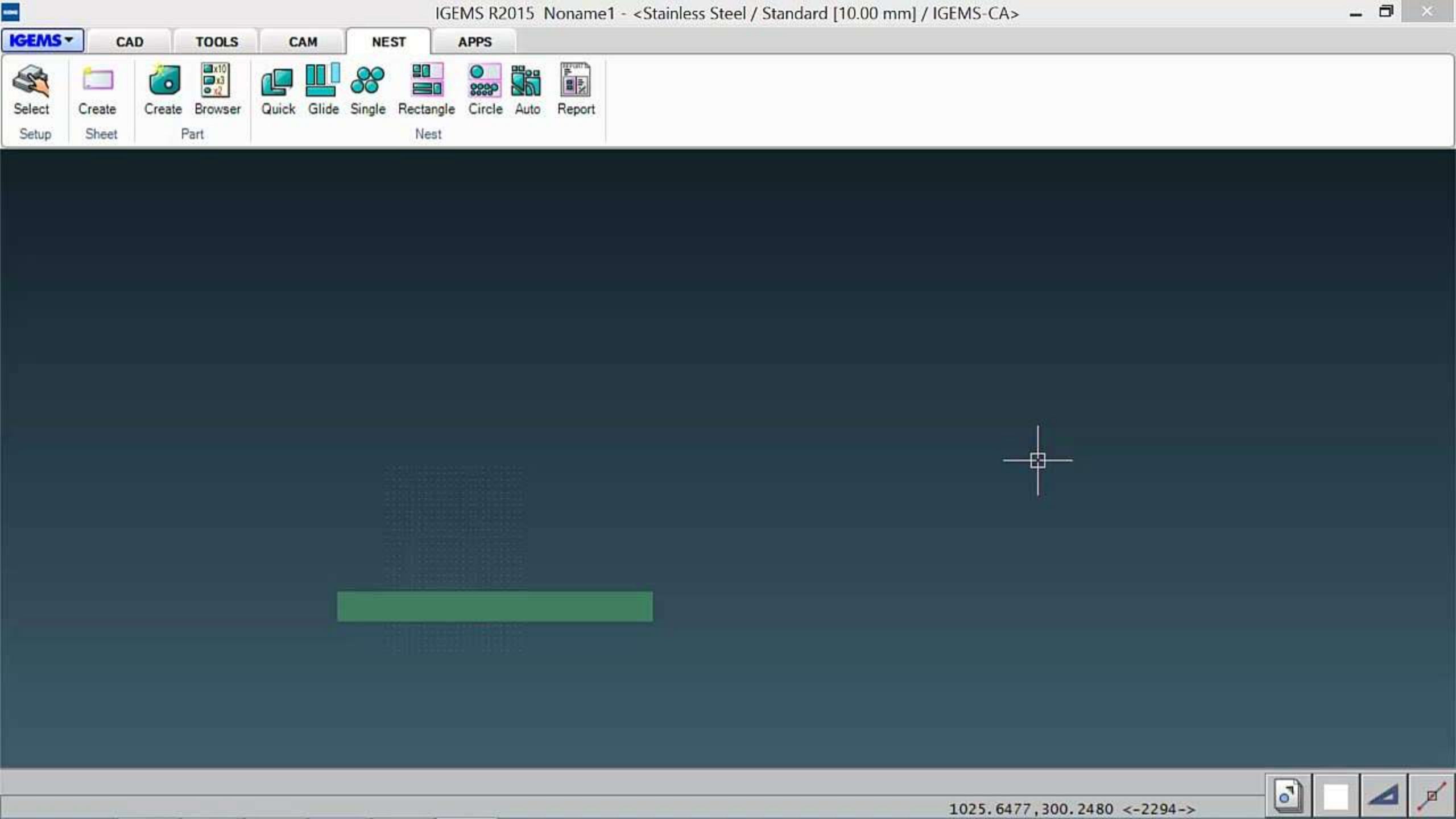
Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer



365.0488,116.0631 <-425->

Toolpath– Common cut lines

If the parts have long straight sides, you can save a lot of time by using Common Cut lines. IGEMS supports two methods of common cutlines. In this example, you can cut the same parts on half the time compared with traditional cutting.


IGEMS R2015 Noname1 - <Stainless Steel / Standard [10.00 mm] / IGEMS-CA>
IGEMS
CAD
TOOLS
CAM
NEST
APPS
Select
Setup
Create
Sheet
Create
Browser
Part
Quick
Glide
Single
Rectangle
Circle
Auto
Report
Nest
1025.6477,300.2480 <-2294->

Postprocessing – Create CNC-file

When you have added the toolpaths to your parts, press the process button and select the parts. All the information are collected and processed, with this you can do several things:

Create a CNC-file. It contains the movement instructions for the machine. IGEMS can make those files to every machine on the market.

IGEMS R2015 Multiple.dig - <Stainless Steel / Standard [8.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Create — Setup / Sheet

Create | Quality | Taper control | Tool setup — Part

Contour | Quick | Marking | Holes — Toolpath

Edit | Delete — Modify

Define | Cut — Bevel

Define — TubeCut

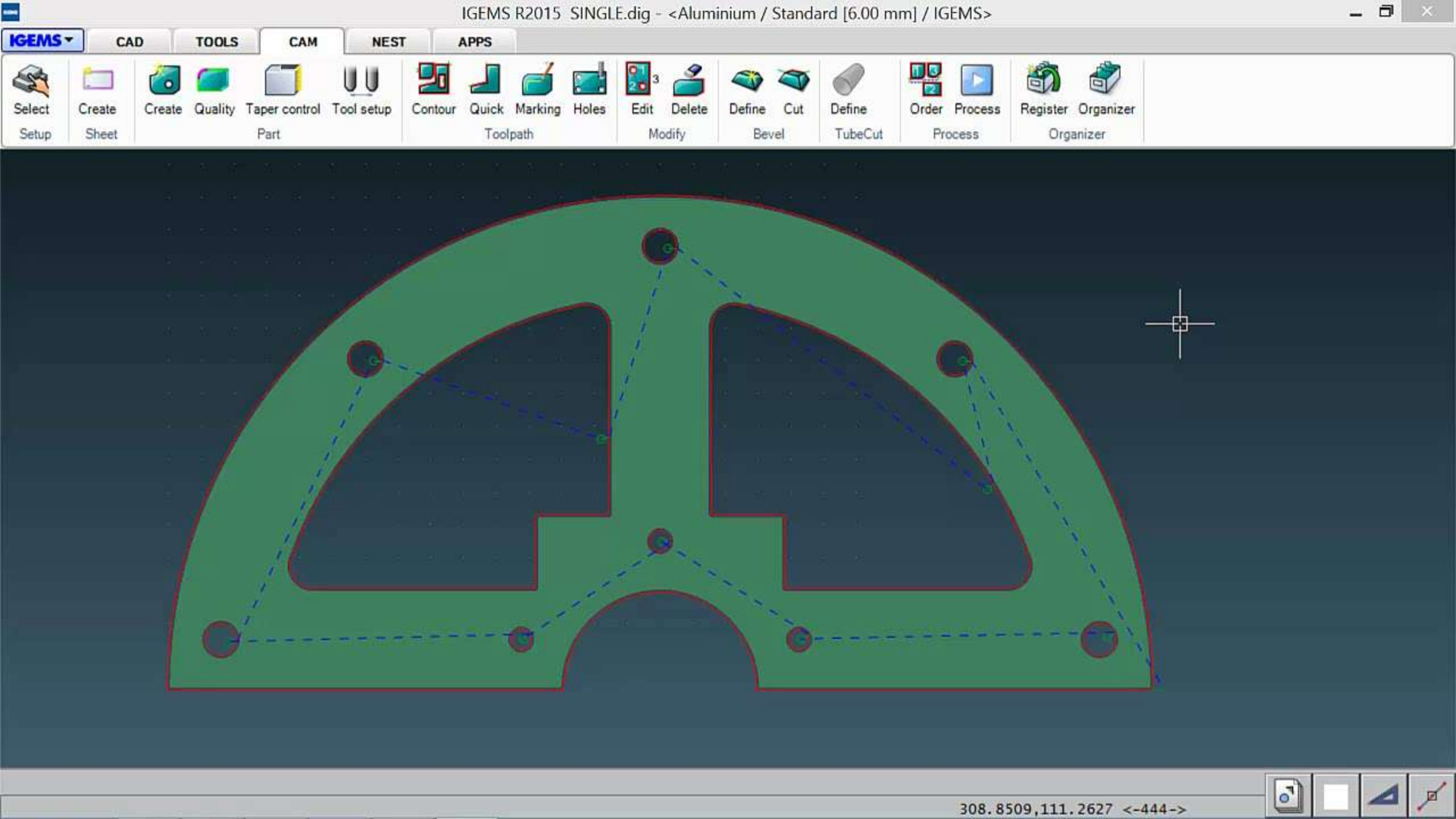
Order | Process — Process

Register | Organizer — Organizer

3617.9035,703.0497 <-2500->

Postprocessing – Create cost estimations

The same information can also be used to make estimations for cutting cost and material cost.


IGEMS R2015 SINGLE.dig - <Aluminium / Standard [6.00 mm] / IGEMS>
IGEMS
CAD
TOOLS
CAM
NEST
APPS
Select
Setup
Create
Sheet
Create
Quality
Taper control
Tool setup
Part
Contour
Quick
Marking
Holes
Toolpath
Edit
Delete
Modify
Define
Cut
Bevel
Define
TubeCut
Order
Process
Process
Register
Organizer
Organizer
308.8509,111.2627 <-444->

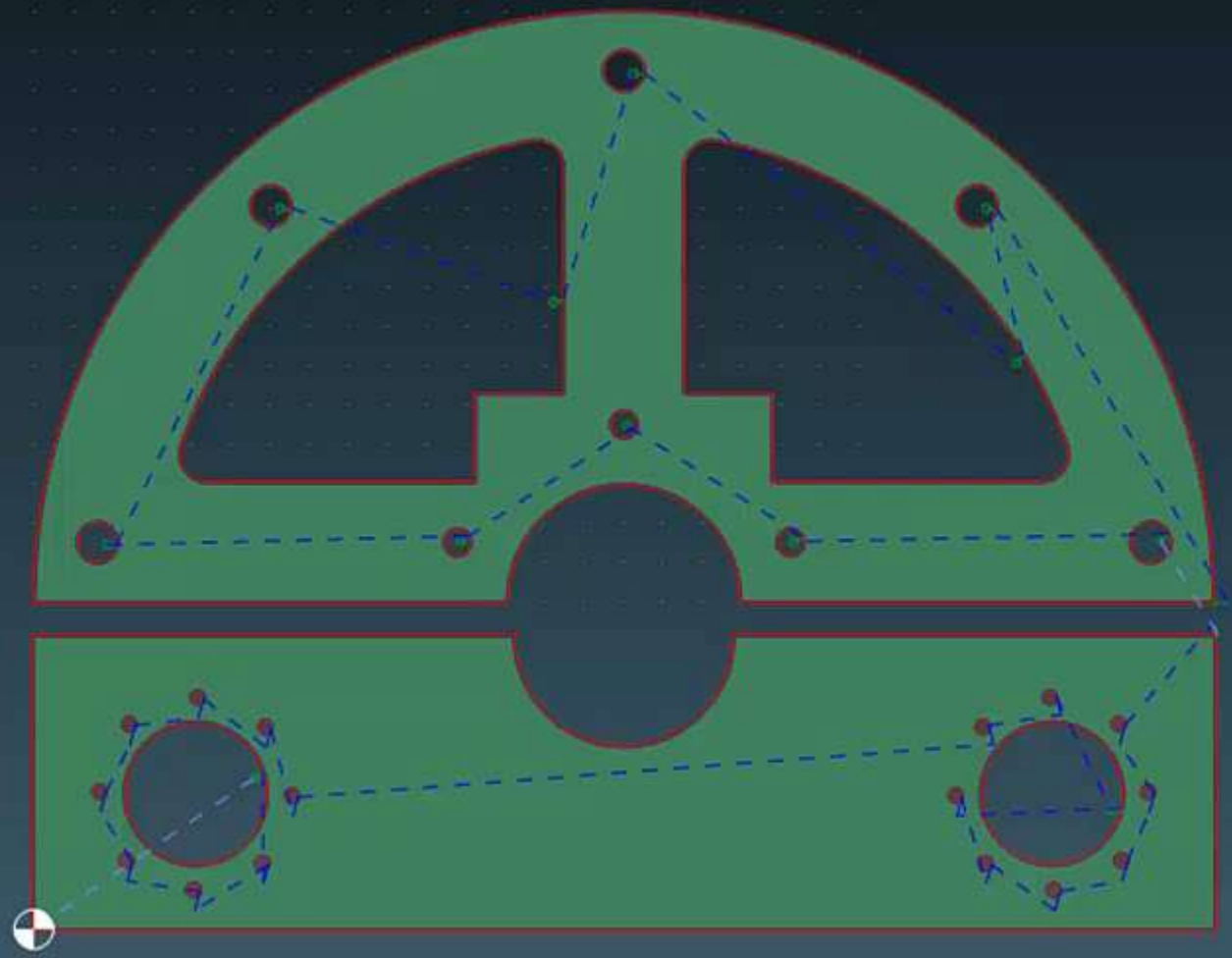
Postprocessing – Make job reports

You can make Job reports in Word or PDF. If you always want reports, you can tell IGEMS to generate those reports automatically when you create the CNC-file.

IGEMS R2015 SINGLE.dig - <Aluminium / Standard [6.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer



497.5897,-0.0834 <-640->

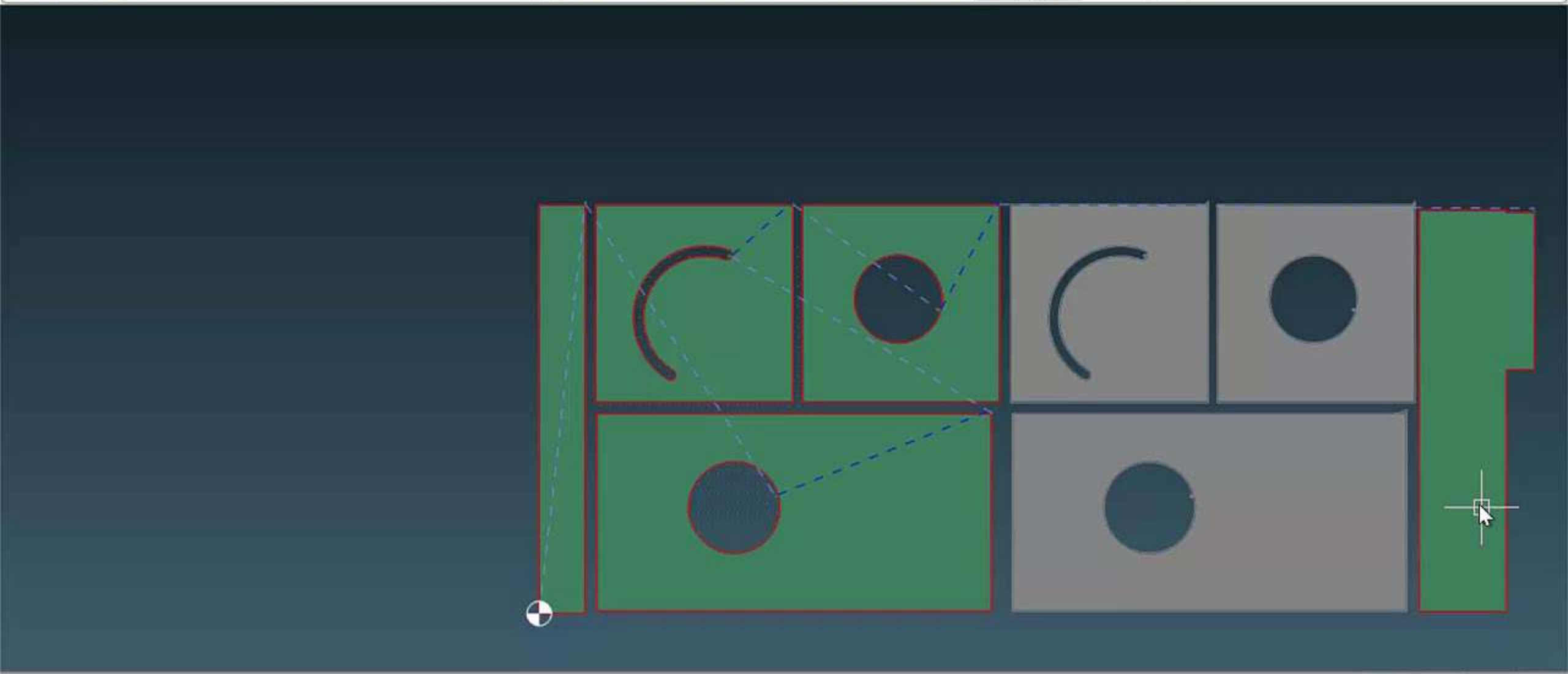
Postprocessing – Simulations

You can also use the information for simulations. Two different types of simulations is possible, 2D and 3D. Next sample shows 2D-simulation with two cutting heads.

IGEMS R2015 SINGLE.dig - <Aluminium / Standard [4.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer



895.2168,26.4524 <-1592->

5-axis cutting

The 5-axis cutting machine can be used for two major purposes. To obtain a straight cut on normal 2D parts or to make a cut in a special angle on 2D or 3D parts.

5-axis cutting – Taper control

When you are cutting with a fast speed, the edge of the part become more conical compared with cutting with a slower speed. The angle will be larger in thin hard materials than in soft thick material. IGEMS can automatically adjust the nozzle tilt for actual speeds so the final result will be a straight angle.

```
/3 N40 G01 X82.813 Y-1.205 Z0 A4.14 B134.25 F545.6
N41 G03 X80.817 Y-1.288 R=14.6 Z0 A6.02 B128.19 F10
N42 G03 X74.21 Y-3.723 R=14.6 Z0 A6.02 B114.69 F106
N43 G03 X69.511 Y-8.967 R=14.6 Z0 A6.02 B101.19 F10
N44 G03 X67.813 Y-15.8 R=14.6 Z0 A6.02 B87.69 F1062
N45 G03 X69.511 Y-22.633 R=14.6 Z0 A6.02 B74.19 F10
N46 G03 X74.21 Y-27.877 R=14.6 Z0 A6.02 B60.69 F106
N47 G03 X80.817 Y-30.312 R=14.6 Z0 A6.02 B47.19 F10
N48 G03 X82.813 Y-30.394 R=14.6 Z0 A4.15 B42.68 F54
/3 N49 G01 X82.813 Y-32.394 Z0 A4.38 B70.4 F1062.8
/3 N50 G01 X82.813 Y-33.297 Z0 A4.11 B88.09 F1062.8
/3 N51 G01 X82.813 Y-34.2 Z0 A4.35 B105.41 F1062.8
/3 N52 G01 X82.813 Y-36.2 Z0 A4.07 B133.5 F545.6
/3 N53 G01 X80.813 Y-36.2 Z0 A6.07 B134.08 F1062.8
/3 N54 G01 X42.418 Y-36.2 Z0 A4.12 B176.58 F1062.8
/3 N55 G01 X4.023 Y-36.2 Z0 A5.65 B217.55 F1062.8
/3 N56 G01 X2.023 Y-36.2 Z0 A3.77 B219.83 F545.6
/3 N57 G01 X1.977 Y-35.858 Z0 A2.85 B261.41 F634.8
/3 N58 G01 X1.932 Y-35.516 Z0 A3.77 B302.23 F545.6
/3 N59 G01 X3.862 Y-34.992 Z0 A5.65 B302.95 F1062.8
/3 N60 G01 X23.276 Y-29.721 Z0 A4.47 B322.54 F1062.
/3 N61 G01 X44.62 Y-23.927 Z0 A4.12 B343.29 F1062.8
N62 G03 X48.38 Y-21.742 R=8.421 Z0 A4.12 B313.36 F1
N63 G03 X50.549 Y-17.974 R=8.421 Z0 A4.12 B283.44 F
N64 G03 X50.549 Y-13.626 R=8.421 Z0 A4.12 B253.52 F
N65 G03 X48.38 Y-9.857 R=8.421 Z0 A4.12 B223.59 F10
N66 G03 X44.62 Y-7.673 R=8.421 Z0 A4.12 B193.67 F10
/3 N67 G01 X5.8 Y2.866 Z0 A4.12 B193.67 F1062.8
/3 N68 G01 X2.326 Y3.809 Z0 A2.59 B194.3 F545.6
/3 N69 G01 X1.358 Y3.983 Z0 A2.59 B194.3 F1062.8
N70 G04 0.5
/1 N71 M47
/1 N72 M45
N73 G04 0.6
N74 G194 (SPEED IPO OFF)
/6 N75
/2 N76 G00 Z20 (UP BETWEEN PARTS)
N77 G00 A-1 B0.6
N78 /1 M191 (PUMP OFF)
N79 (SECONDS 60)
N80 (USED TIME 00:00:60)
N81 (IGEMS:2014.4.502 POST:IGEMS-RD Date:2014.05.30
/9 N82 M30
```

Speed

Tilt: 0.00° Dir: 0.00° X=1.36 Y=3.98 Z=20.00 A=0.00° B=0.00° C=0.00°

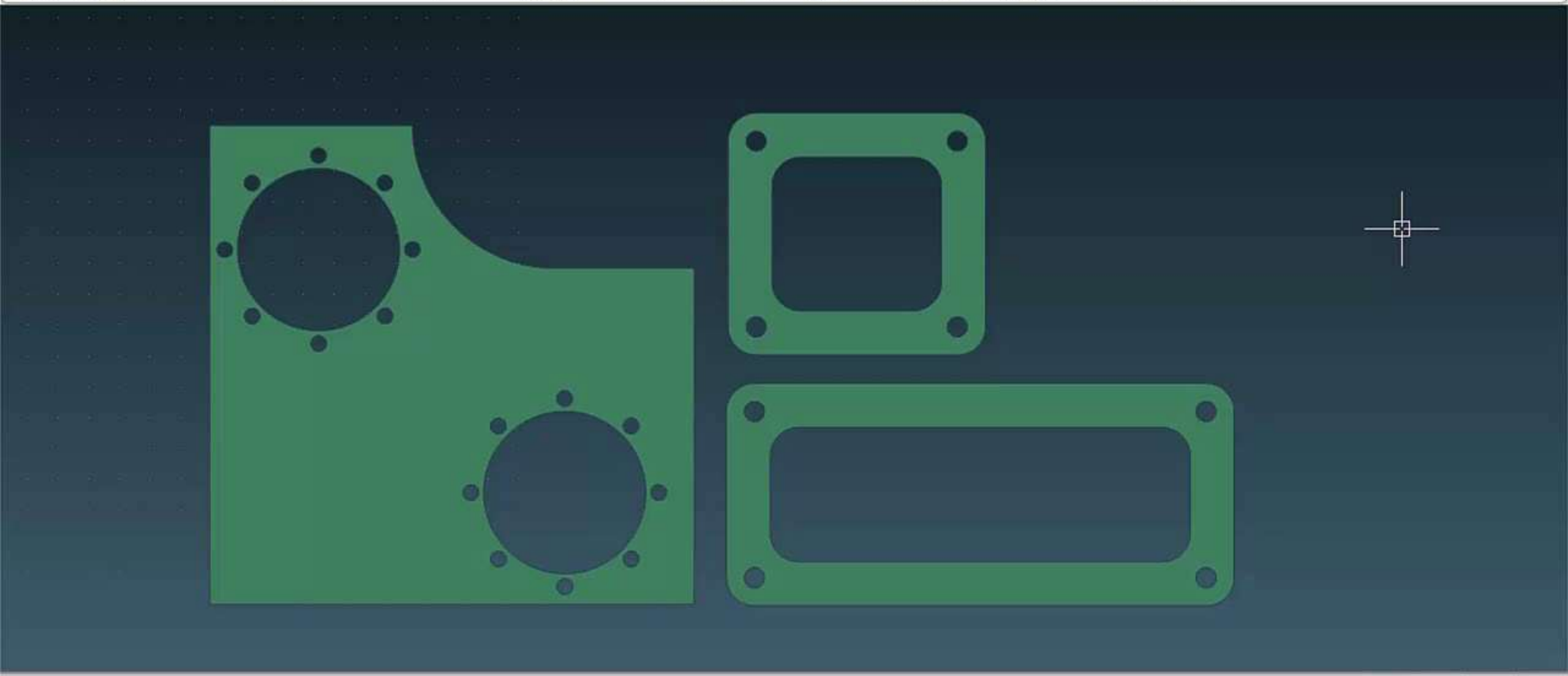
5-axis cutting –Taper control

Some machines need longer time to cut with taper control than without. We have a command to turn the TAC On/Off for each geometry on the part. In this case use only TAC on that geometries that are needed.

IGEMS R2015 Holes.dig - <Stainless Steel / Standard [10.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select (Setup) | Create (Sheet) | Create, Quality, Taper control, Tool setup (Part) | Contour, Quick, Marking, Holes (Toolpath) | Edit, Delete (Modify) | Define, Cut (Bevel) | Define (TubeCut) | Order, Process (Process) | Register, Organizer (Organizer)



497.8077,161.3266 <-510->

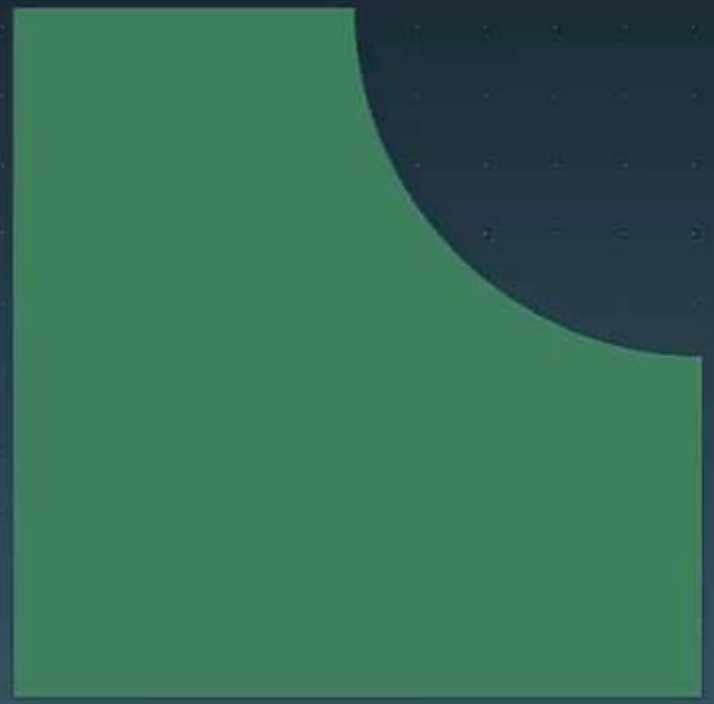
5-axis cutting – Quick bevel

A lot of parts are produced that later should be welded together. IGEMS have developed an easy way to make this kind of chamfers. We call this command Quick Bevel.

IGEMS R2015 SINGLE.dig - <Aluminium / Standard [15.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer



209.1614,82.8303 <-370->

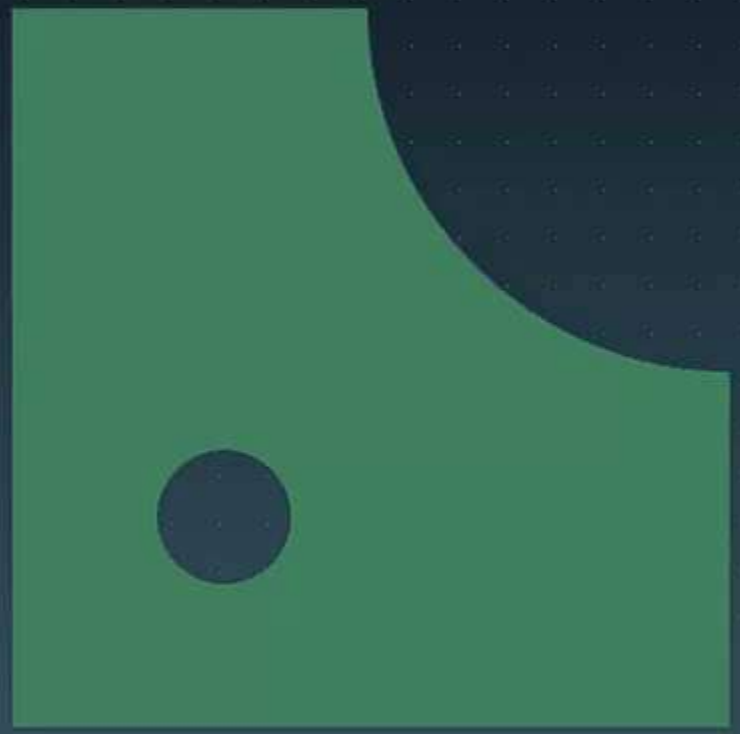
5-axis cutting – Standard bevel

You can make more complicated 5-axis part by using the Standard bevel command. In this case we first define the bevel angles and then cut the bevel.

IGEMS R2015 SINGLE.dig - <Aluminium / Standard [15.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer



295.5085,70.2188 <-533->

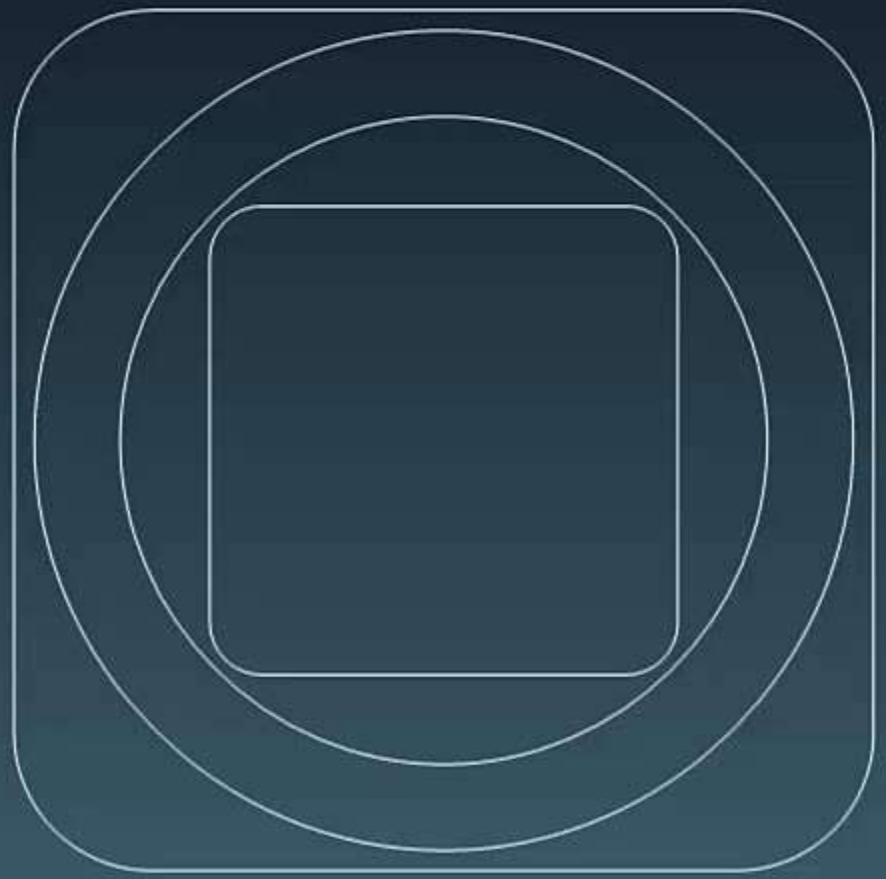
5-axis cutting – Ruled bevel

With this option you can define a complicated part from two geometries. One geometry specifies the upper profile and the other specifies the lower profile.

IGEMS R2015 SINGLE.dig - <Aluminium / Standard [20.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer



353.3824,21.0059 <-149->

5-axis cutting – 3D-5X

It’s also possible to load a STEP, IGS or STL file made in a 3D-system and add the toolpath in 3D.

IGEMS R2015 SINGLE.dig - <Aluminium / Standard [4.00 mm] / IGEMS-CA>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer

322.3163,27.9871 <-149->

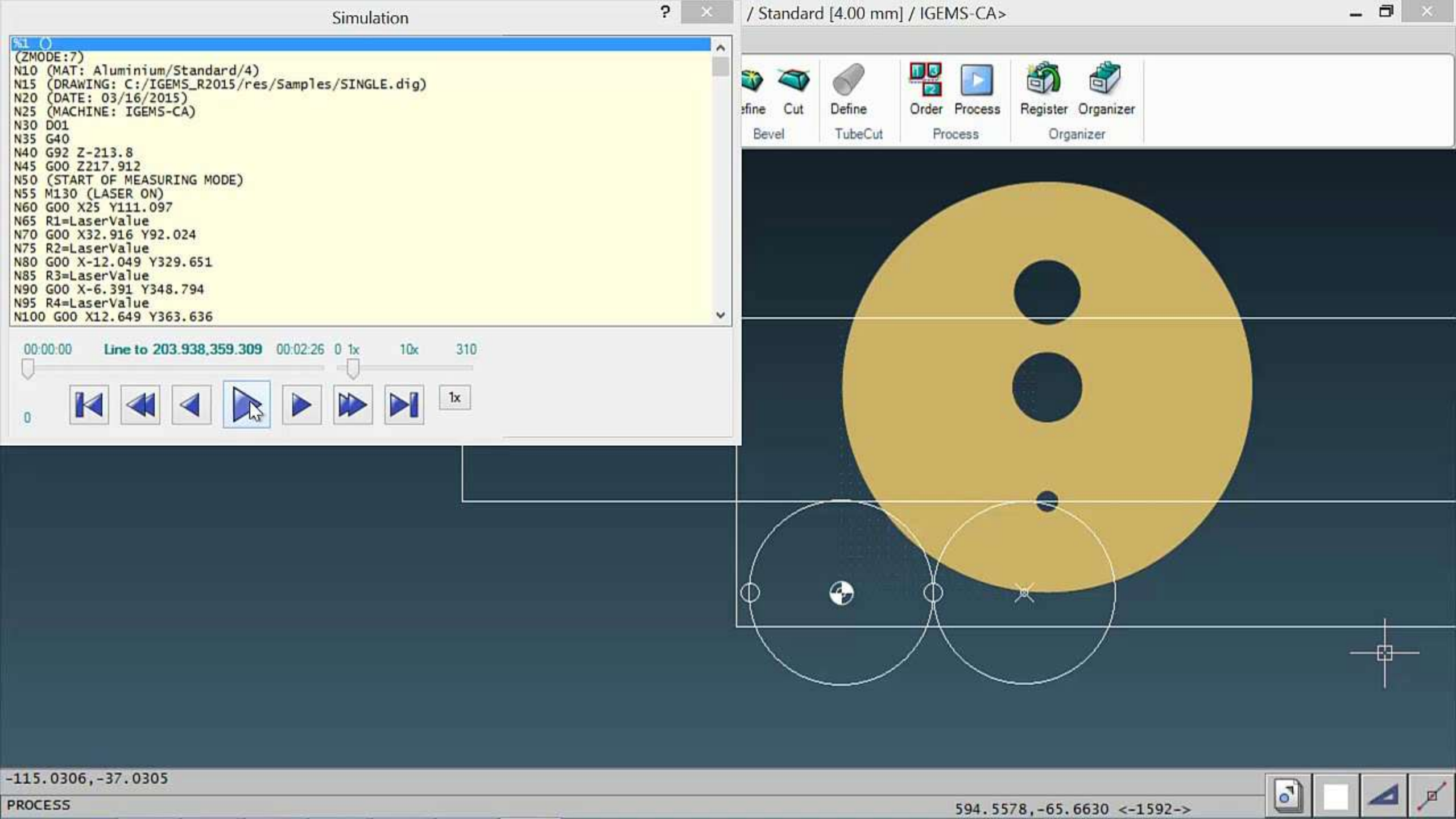
Z-axis control by measuring in advance

When cutting with a straight vertical jet, the exact Z-position of the nozzle is not that important as it is when cutting with a tilted nozzle. IGEMS have a method called measuring in advance. This method can be used if your machine have a laser or another measurement tool that can be used on non-flat surfaces. The method only measures a few points on the surface and creates an interpolation between this points in the CNC-controller during the cutting. The Z-coordinates are interpolated from the measurements, all other information is generated in the postprocessor.


We will show how to use a laser equipment to get
the correct height for cutting

5-axis cutting – Measuring in advance

This example shows how to use the measuring in advance together with 5-axis cutting.


Simulation
%1 ()
(ZMODE:7)
N10 (MAT: Aluminium/Standard/4)
N15 (DRAWING: C:/IGEMS_R2015/res/Samples/SINGLE.dig)
N20 (DATE: 03/16/2015)
N25 (MACHINE: IGEMS-CA)
N30 D01
N35 G40
N40 G92 Z-213.8
N45 G00 Z217.912
N50 (START OF MEASURING MODE)
N55 M130 (LASER ON)
N60 G00 X25 Y111.097
N65 R1=LaserValue
N70 G00 X32.916 Y92.024
N75 R2=LaserValue
N80 G00 X-12.049 Y329.651
N85 R3=LaserValue
N90 G00 X-6.391 Y348.794
N95 R4=LaserValue
N100 G00 X12.649 Y363.636
00:00:00
Line to 203.938,359.309
00:02:26
0
1x
10x
310
1x
0
/ Standard [4.00 mm] / IGEMS-CA>
Cut
Define
Order
Process
Register
Organizer
Bevel
TubeCut
Process
Organizer
-115.0306,-37.0305
PROCESS
594.5578,-65.6630 <-1592->

Cutting in stone and ceramics – Tile cutting

We will now take a look at some special areas of waterjet cutting. The first we will cover is the stone cutting.
IGEMS have a special command for cutting tiles.

IGEMS R2015 Noname1

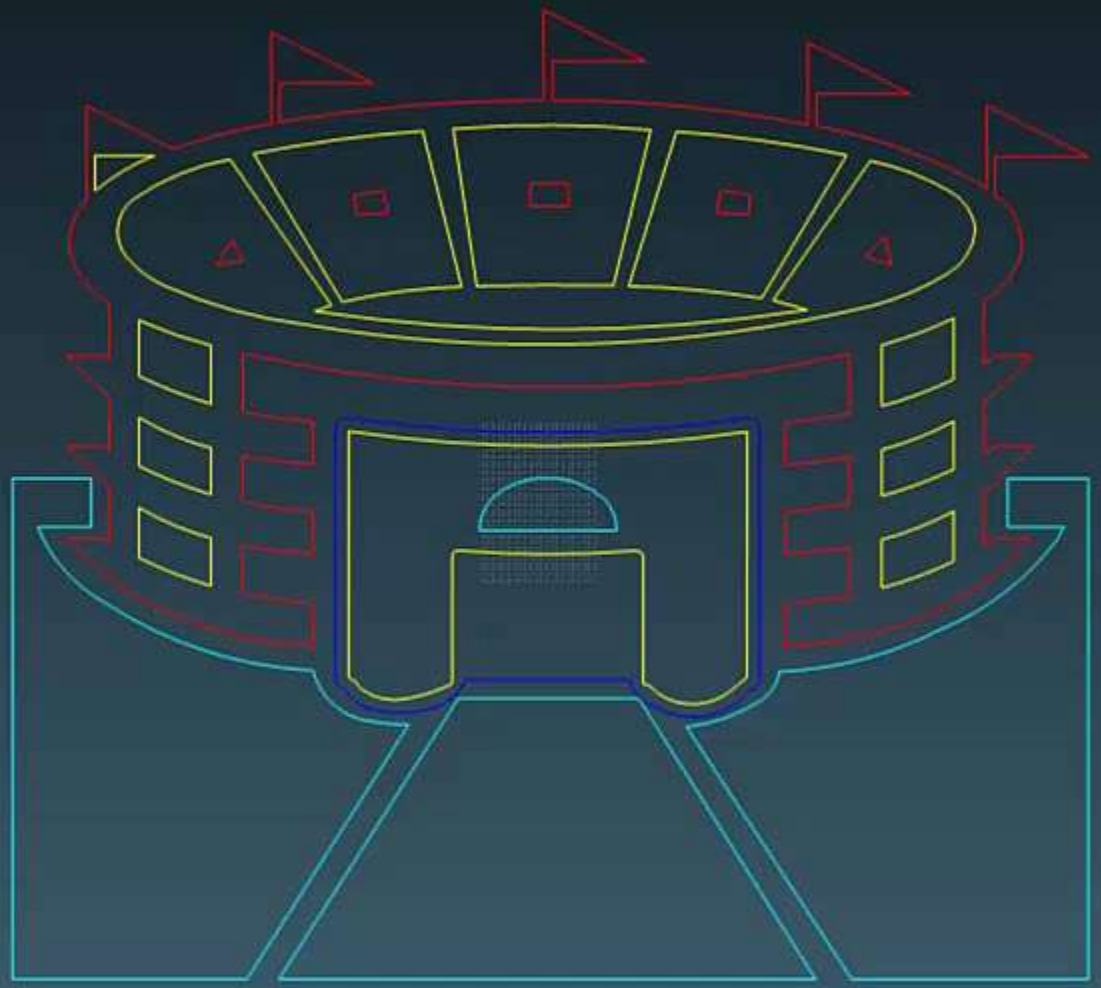
IGEMS | CAD | TOOLS | CAM | NEST | APPS

Clean up | EdgeFix | Replace | Analyze | Boundary scan | Boundary trim | Curvefit — CAM tools

Font tracer | Image | Image tracer — Sign maker

Tile | Tile cut | Inlay — Tile maker

Import | NC reader — Data exchange



2254.7885,58.3746 <-4756->

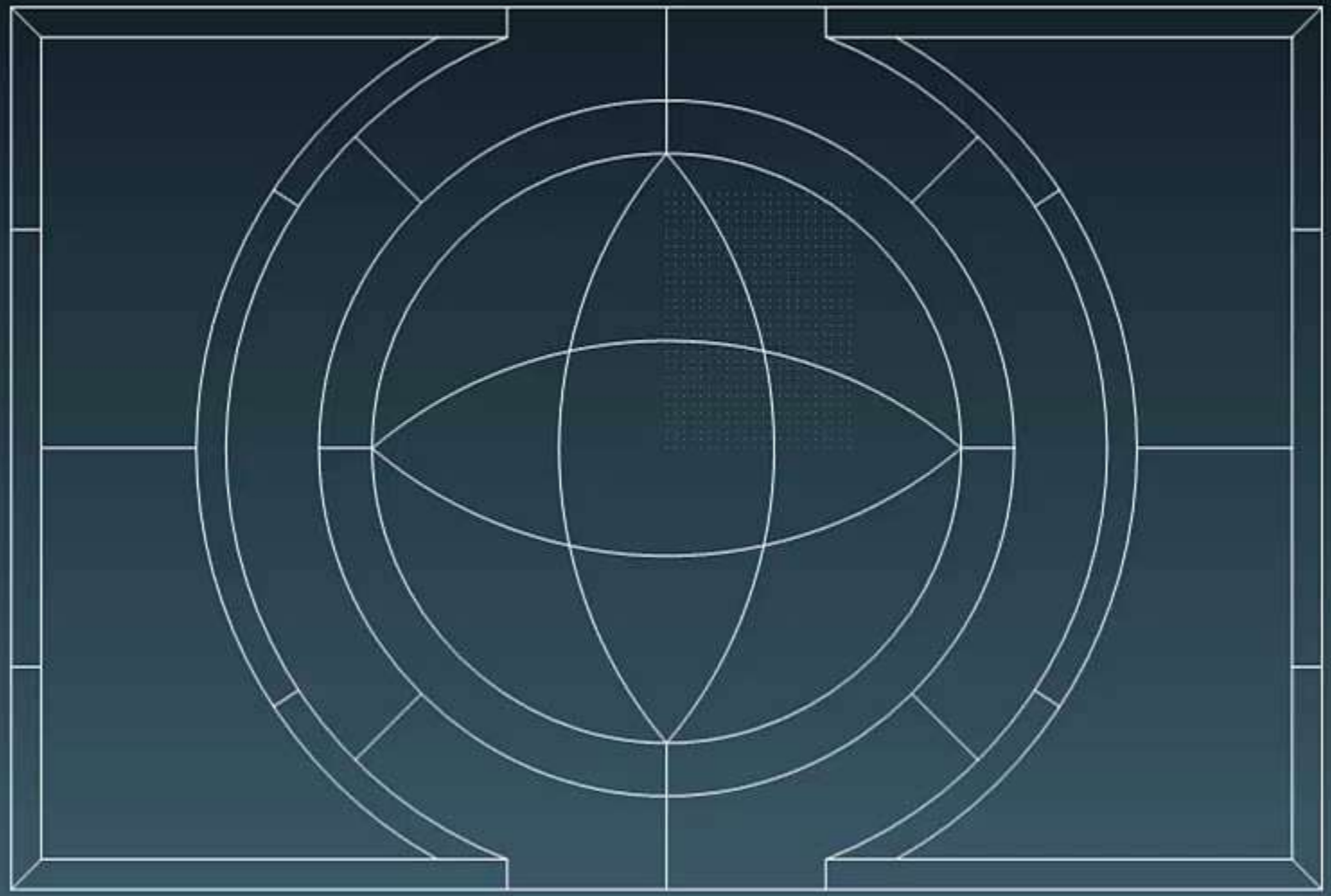
Cutting in stone and ceramics - Inlay

If you have a pattern of the inlay, you can create the production information in a couple of minutes.

IGEMS R2015 Inlay.dig - <Aluminium / Standard [5.00 mm] / IGEMS-RD>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer



1611.5212,117.6448 <-2629->

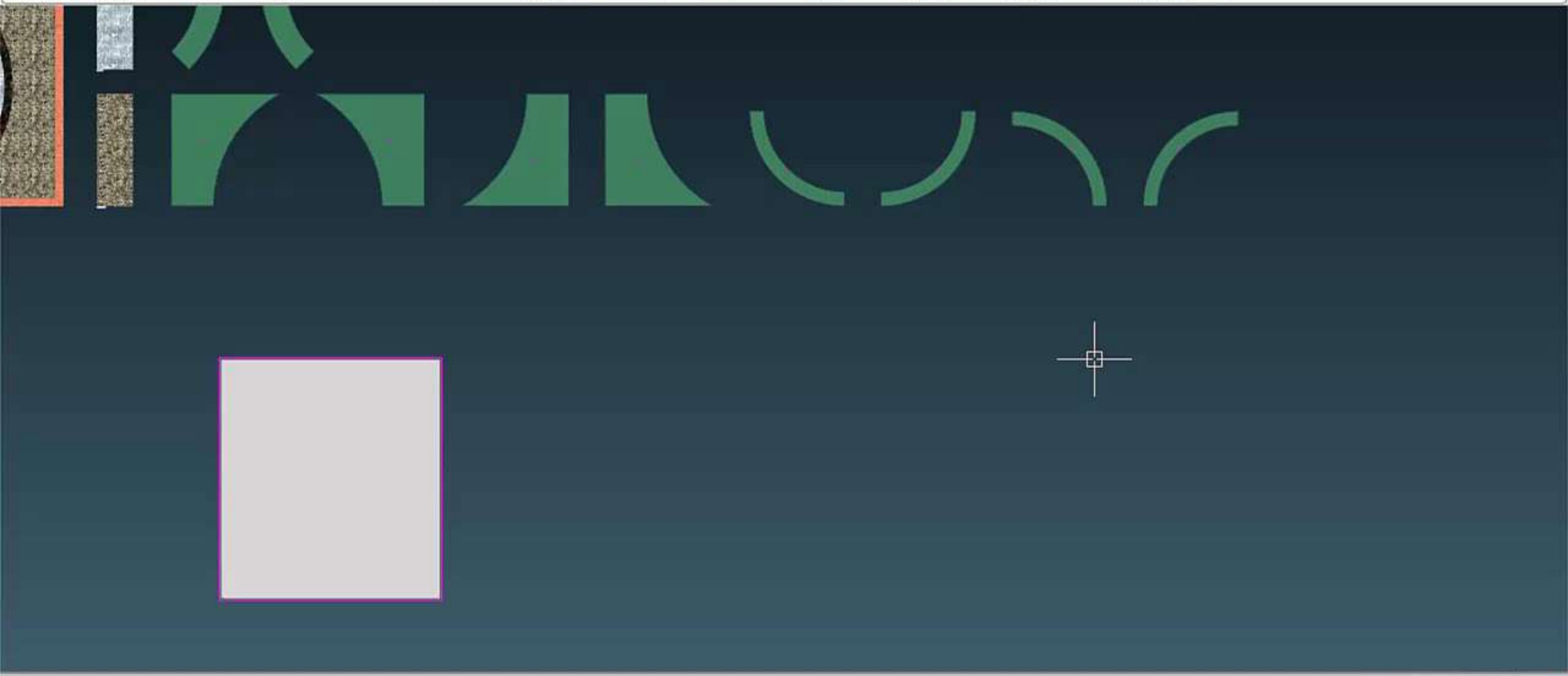
Cutting in stone and ceramics - PrePiercing

The most kind of stone material needs a special handling of the piercing (the starting hole). There is a risk that the material will get damaged, specially on the bottom side. In this case, IGEMS can cut all the starting holes with lower pressure. To speed up the process, all starting holes can be made before the real cutting start.

IGEMS R2015 Inlay.dig - <Marble / Standard [10.00 mm] / IGEMS-RD>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Taper control | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer



5055.7081,-1142.4258 <-6542->

Tube cutting

IGEMS support tube cutting on tubes in optional convex profiles. In this example will show cutting on a rectangular tube.

Noname1 - <Aluminium / Standard [3.00 mm] / IGEMS-RD>

IGEMS | CAD | TOOLS | CAM | NEST | APPS

Select | Setup
Create | Sheet
Create | Quality | Tool setup | Part
Contour | Quick | Marking | Holes | Toolpath
Edit | Delete | Modify
Define | Cut | Bevel
Define | TubeCut
Order | Process | Process
Register | Organizer | Organizer

433.8475,72.6982 <-640->

End of presentation

Directory