



## NC soft for Machine Shop

Home Page <http://www.autonc.jp>

# Manual of Steel block cutting by Diagonal line



### [ Japanese ]

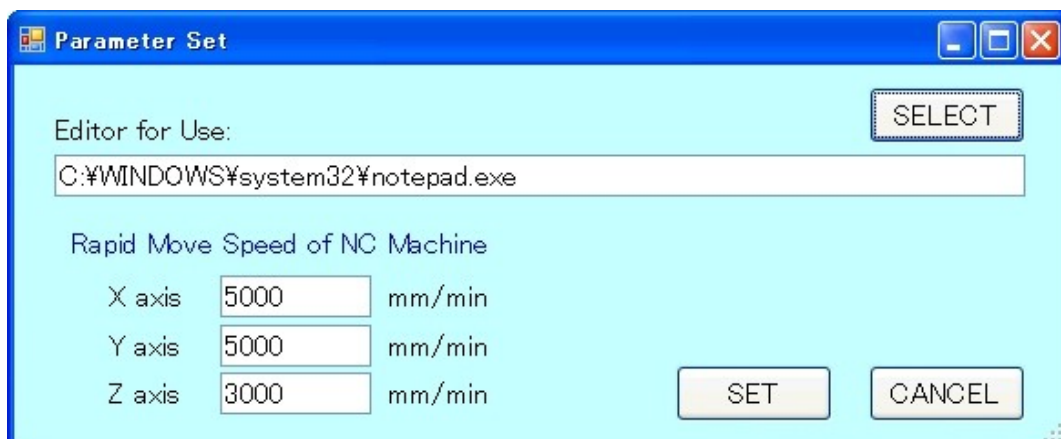
It changes to Japanese language.

### [ Parameter ]

You specify an editor for the editing.

You start up the editor at the "EDIT" button of the program.

At present, you aren't using the rapid move speed of the machine tool.



[START] button shows you a next picture.

Steel Block cutting by Diagonal line

### Cutting by Diagonal line

**ROUGHING TOOL**

Rapid Move Height:  mm

Diameter:  mm

Feed Rate:  mm/min

Spindle Speed:  rev/min

Z Down Value:  mm/time

Standard Cutting Width:  mm

Limit Cutting Width:  mm

Remainder:  mm

**FINISH ENDMILL (OFFSET D01)**

Diameter:  mm

Feed Rate:  mm/min

Spindle Speed:  rev/min

Cutting Times:  Times

Depth:  mm

Depth = Material Height + Extended length

Back Feed Rate:  mm/min

**MATERIAL** Width:  X Length:  X Height:  mm

Start Point: ☒ Left Top ☐ Left Bottom ☐ Right Top ☐ Right Bottom

Distance from Start Point:  mm ☒ Width ☐ Vertical

Angle (Degree):  Degrees ☐ Right Angle ☒ Left Angle

Safety Area:  mm (Tool goes down out of this area.)

**G92** ☐ Yes ☒ No ☒ 1WAY ☐ 2WAY

Write Holder:

Rough Check:   Finish Check:

Roughing File:   Finish File:

----- Graphic Display -----

**MATERIAL**

Width  X Length  X Height  mm

Start Point ☒ Left Top ☐ Left Bottom ☐ Right Top ☐ Right Bottom

Distance from Start Point  mm ☒ Width ☐ Vertical

Angle (Degree)  Degrees ☐ Right Angle ☒ Left Angle

Safety Area  mm (Tool goes down out of this area.)

G92 ☐ Yes ☒ No ☒ 1WAY ☐ 2WAY

The height is the lowest position where Z goes down in roughing cut.  
When using a radius tool, you need to add chip radius.

First, input material size.  
From material size, it calculates cutting volume and safety area.

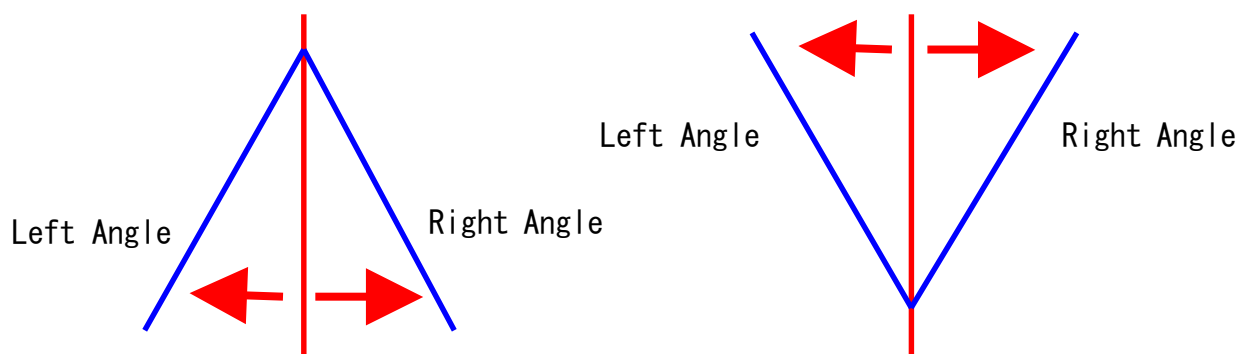
You choose 1way or 2way(up and down) in roughing cut.

You select Left Top, Left Bottom, Right Top, and Right Bottom for Start point.  
Material top of Start point is X0Y0Z0.  
Cutting area is opposite side of Start point.

Input Distance from Start point.  
And select direction, Width or Vertical.  
Input plus Angle from upper point. Select Right Angle or Left Angle.

Input size of Safety-Area around material.  
Tool goes down out of this area.

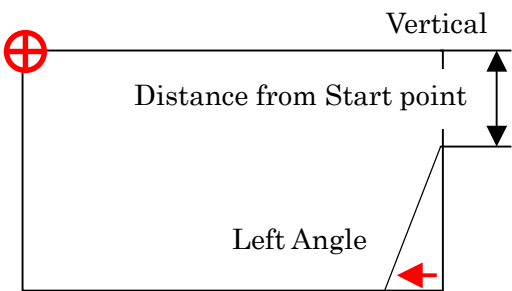
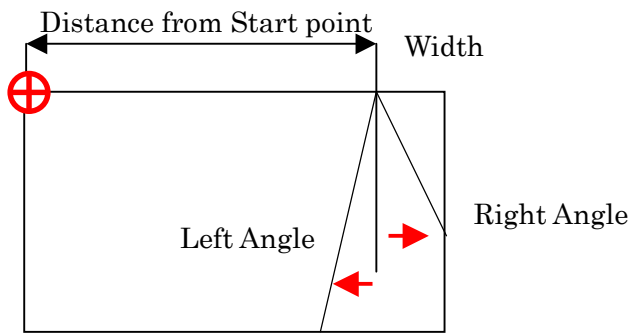
Push [MATERIAL] button and Confirm cutting Diagonal line.



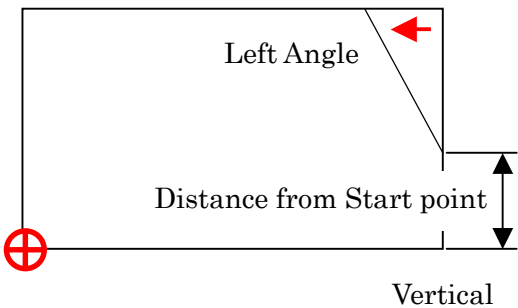
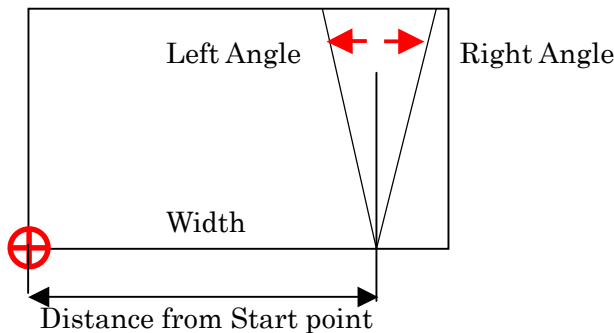
Right or Left Angle datum is vertical line.

# How to input of Material size.

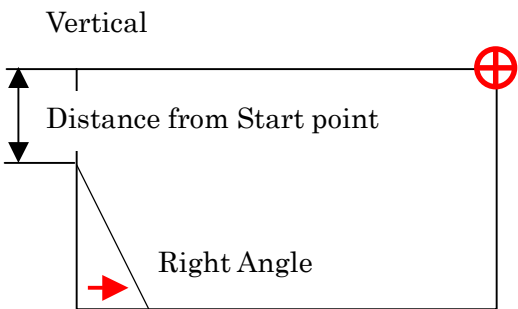
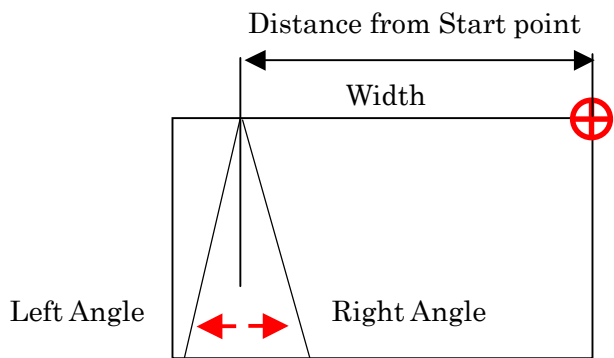
Start point: Left Top



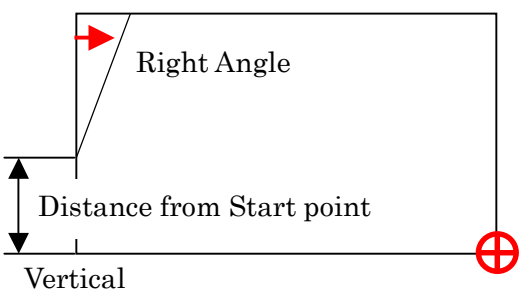
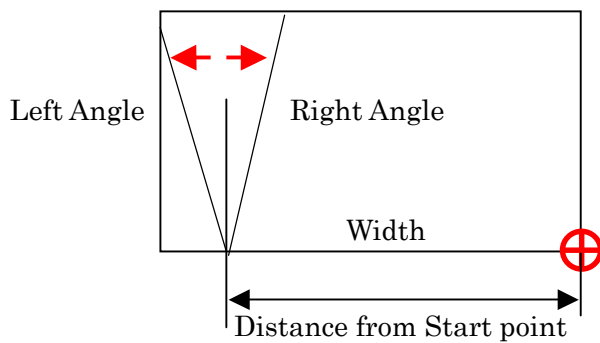
Start point: Left Bottom



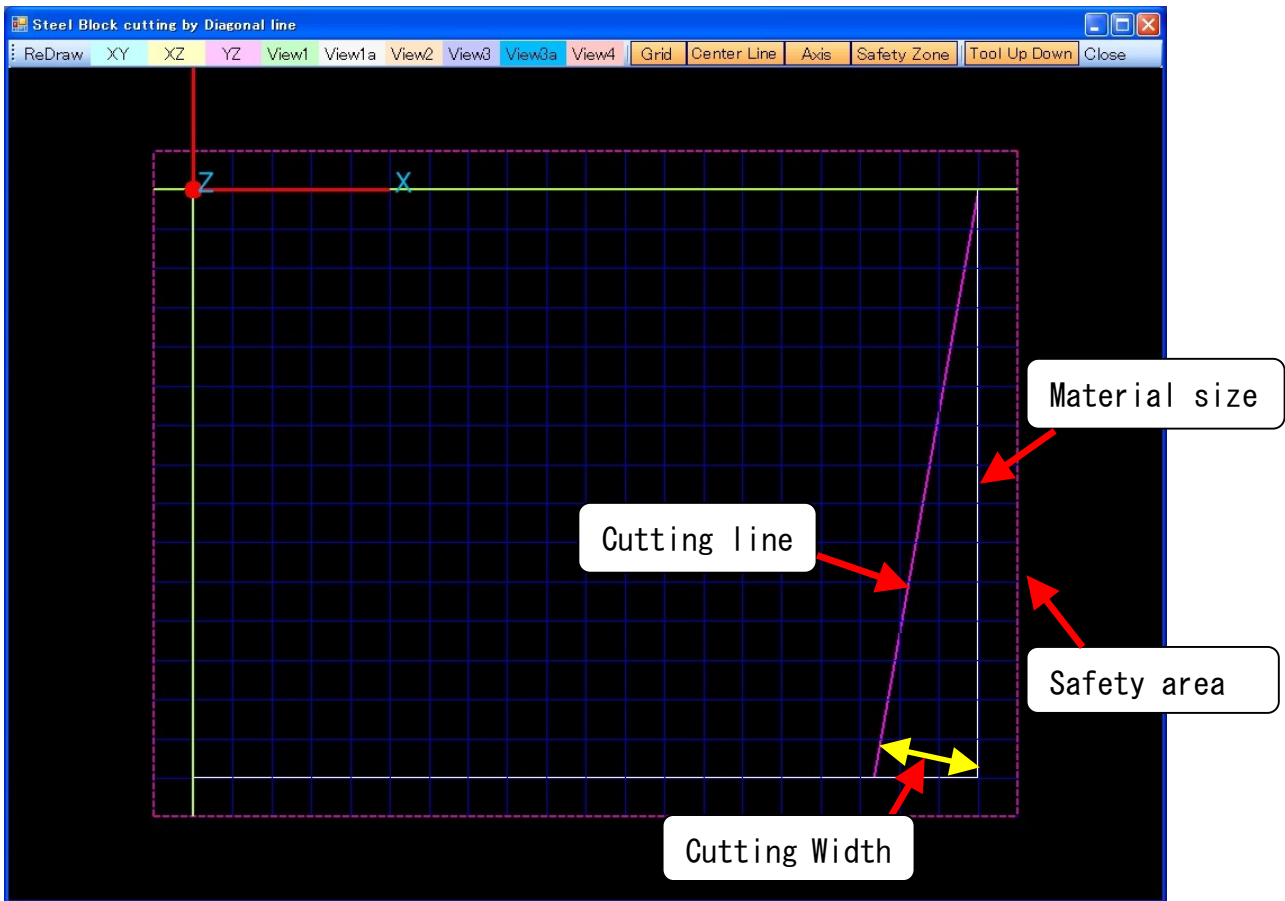
Start point: Right Top



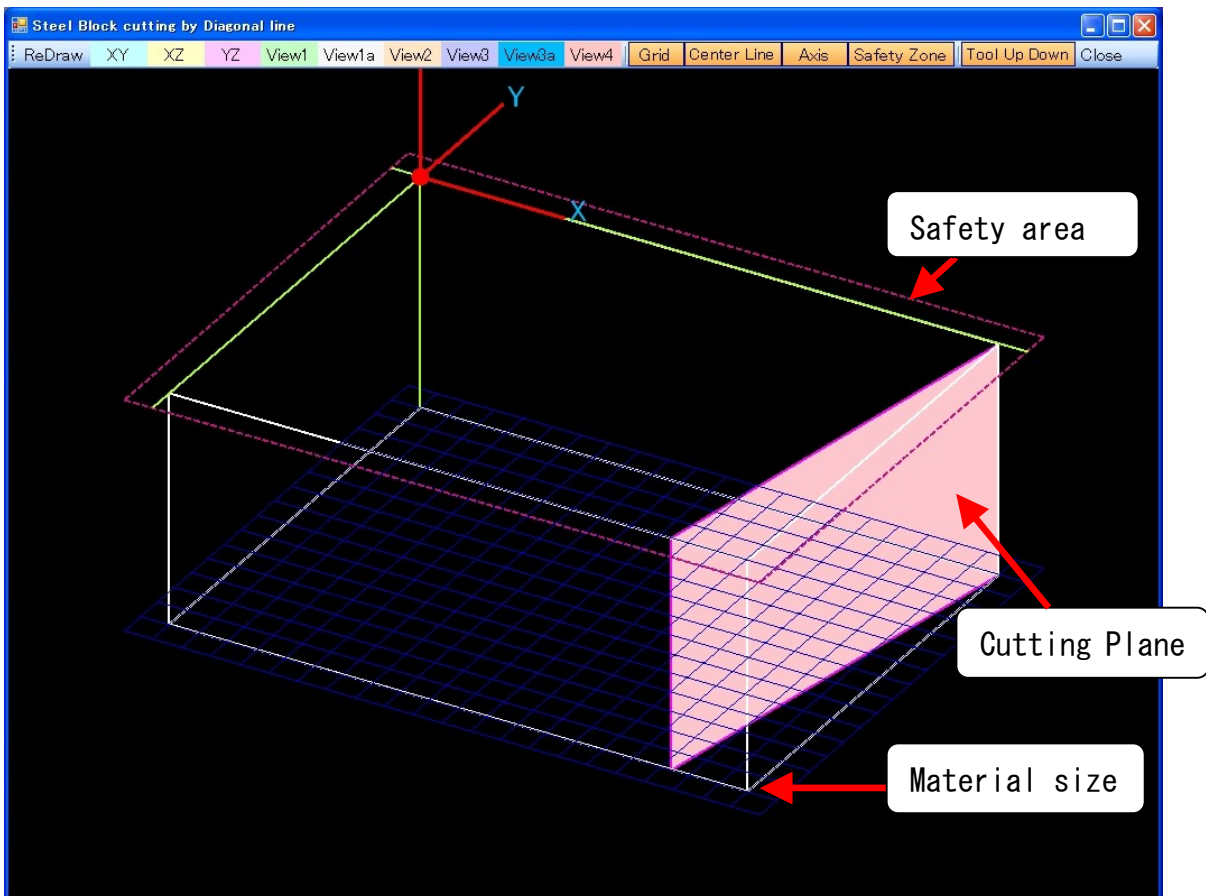
Start point: Right Bottom



Push [MATERIAL] button and Confirm Material size in X-Y Plane.



Next picture shows in View2 direction.



# Cutting Condition

Cutting by Diagonal line

Rapid Move Height	<input type="text" value="30"/>	mm
ROUGHING TOOL		
Diameter:	<input type="text" value="50"/>	mm
Feed Rate:	<input type="text" value="1200"/>	mm/min
Spindle Speed:	<input type="text" value="1000"/>	rev/min
Z Down Value:	<input type="text" value="1"/>	mm/time
Standard Cutting Width:	<input type="text" value="20"/>	mm
Limit Cutting Width:	<input type="text" value="30"/>	mm
Remainder:	<input type="text" value="0.2"/>	mm
FINISH ENDMILL (OFFSET D01)		
Diameter:	<input type="text" value="50"/>	mm
Feed Rate:	<input type="text" value="100"/>	mm/min
Spindle Speed	<input type="text" value="100"/>	rev/min
Cutting Times	<input type="text" value="3"/>	Times
Depth	<input type="text" value="110"/>	mm
Depth = Material Height + Extended length		
Back Feed Rate:	<input type="text" value="2000"/>	mm/min

The Roughing NC data is made of the tool center.

The Finishing NC data is made of the offset NC data.

The offset code is D01.

## <The thinking way of cutting width>

It goes down Z-Down-Value at a time, and does machining.

The width of cuts is the length of the perpendicular line from the corner of the material to the line of the cut.

It cuts off a quotient with ( the width / E. Std.cutting width) and it decides the cut number of times.

If it doesn't exceed F.Limit cutting width, it moves a tool at the pace.

When exceeding a F width, it divides by the cut number of times +1 once more and it decides a pace.

Remainder is the leaving quantity of the adjusting surface ( The side surface ).

The diameter of the Finish-endmill seems not to be necessary for the offset data but is necessary for to compute the approach distance of the tool and the drawing a figure.

The cut depth is positive and enters.

It goes down to the depth from the Z0 position, and cuts.

(The roughing cut depth is the height of the material.)

When putting equal to or more than 2 in the Cutting-Times,

It returns to the position in front of G41 from the position that was left in G40 as same Z height at the Back-Feed-Rate speed.



# NC Output

You choose Yes or No at the <G92>.

When you choose Yes, G90G92X0Y0Z (the rapid move z height) is stored.

When it is No, G90X0Y0; G01Z (the rapid move z height) is stored.

(For the details, you refer to the NC data).

"Select" At the button, it selects a write folder.

It is possible to display the NC data.

The screenshot shows a software interface for NC output. At the top, there is a green box labeled 'G92' with radio buttons for 'Yes' and 'No' (the 'No' button is selected). Below this is a 'Write Holder:' section with a text input field containing 'C:\¥' and a 'SELECT' button. To the right of the 'SELECT' button is a red-bordered box labeled 'Graphic Display' containing four buttons: 'R CHECK', 'F CHECK', 'ROUGHING', and 'FINISH'. Below the 'Write Holder:' section is a table with four rows and two columns. The first row is 'Rough Check:' with the value 'KozaiAraCheck' and an 'EDIT' button. The second row is 'Finish Check:' with the value 'KozaiSiageCheck' and an 'EDIT' button. The third row is 'Roughing File:' with the value 'KozaiAra' and an 'EDIT' button. The fourth row is 'Finish File:' with the value 'KozaiSiage' and an 'EDIT' button. At the bottom right of the interface are two buttons: 'START' and 'CANCEL'. Red arrows point from the text boxes to specific elements: from the first text box to the 'G92' section, from the second text box to the 'SELECT' button, from the third text box to the 'Graphic Display' box, from the fourth text box to the 'EDIT' buttons, from the fifth text box to the 'START' button, and from the sixth text box to the 'CANCEL' button.

G92		<input type="radio"/> Yes	<input checked="" type="radio"/> No		
Write Holder:	C:\¥				
	SELECT				
Rough Check:	KozaiAraCheck	EDIT	Finish Check:	KozaiSiageCheck	EDIT
Roughing File:	KozaiAra	EDIT	Finish File:	KozaiSiage	EDIT
		START		CANCEL	

You enter all file names.

The Roughing check file and the Finish check file are NC data for the confirmation of the input data.

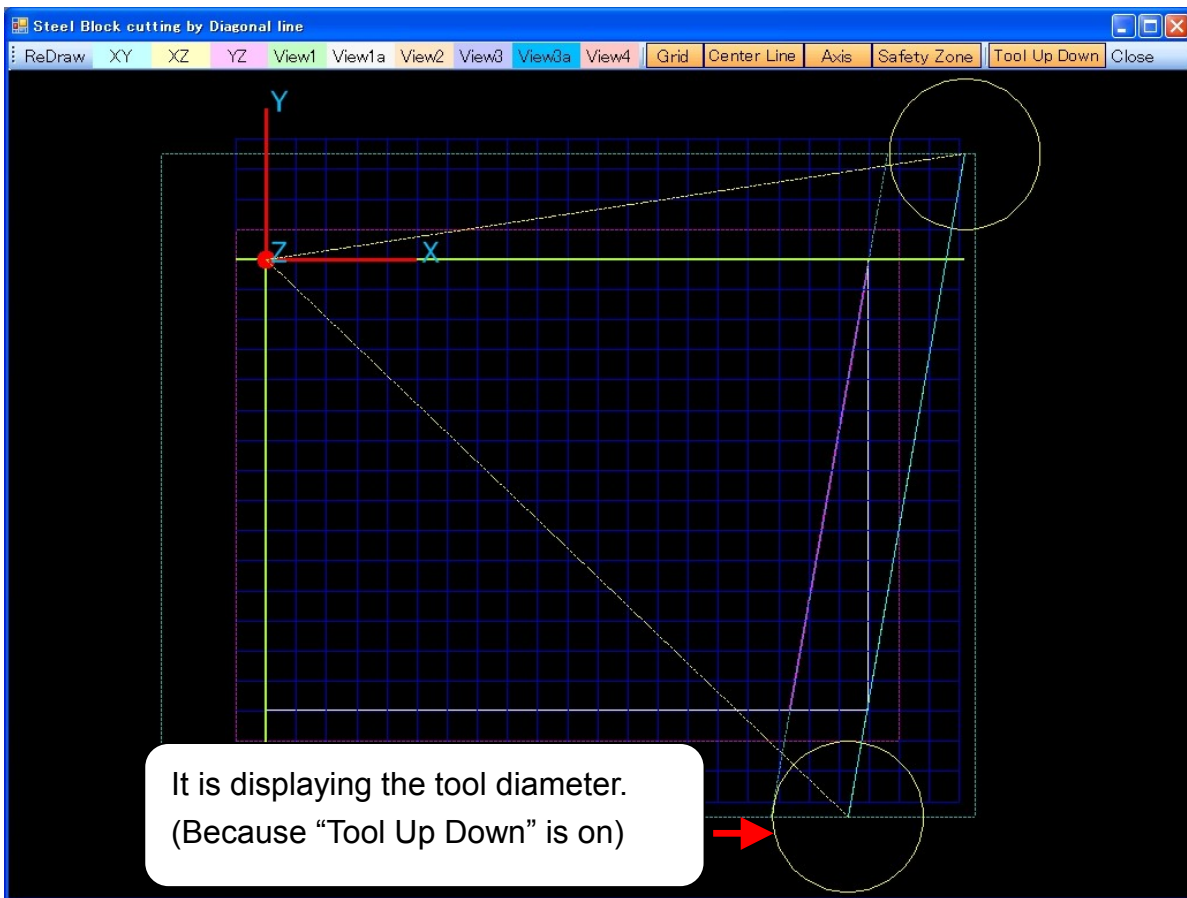
" Edit " When pushing the button, the editor starts up and opens a file.

When pushing the "Start" button after fill in all data, the NC data of the file name is created in folder.

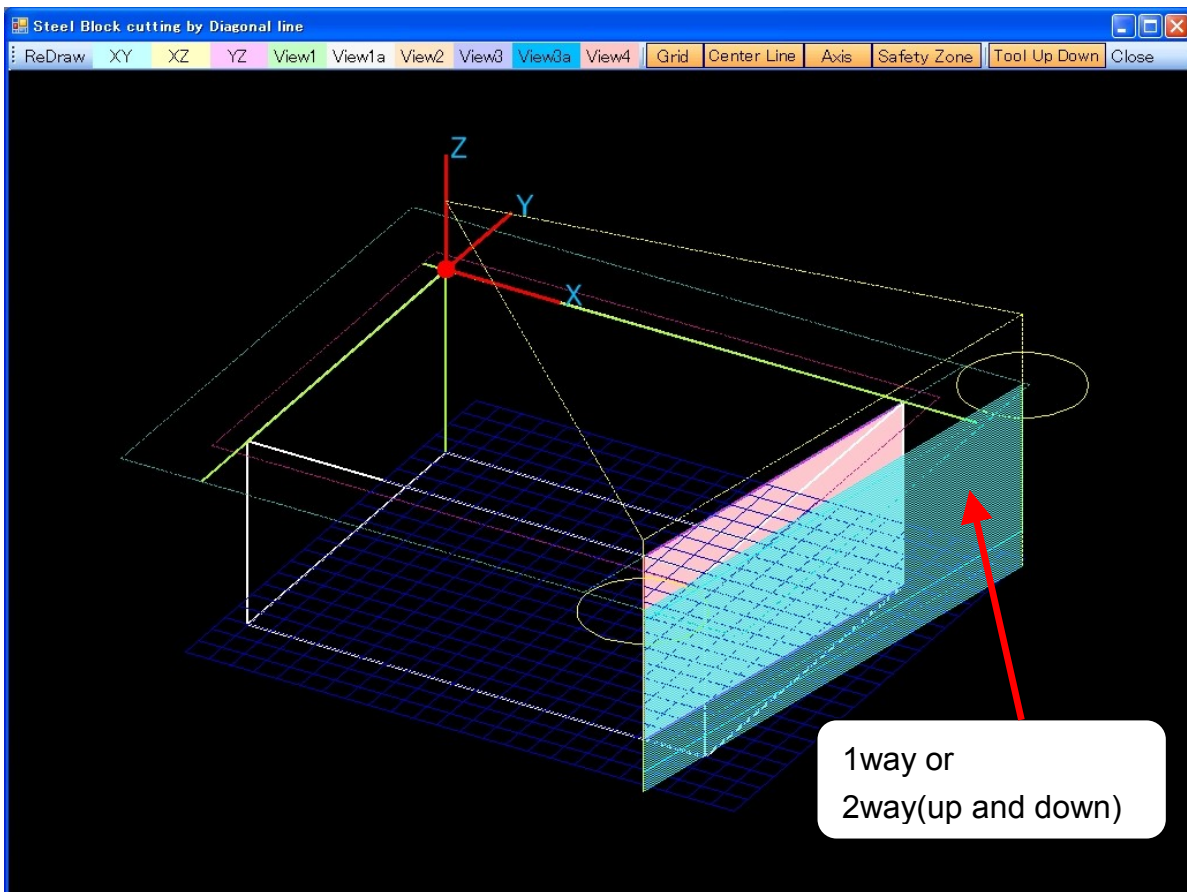
When pushing the "Cancel" button, it ends.  
Input data is saved and is restored in the next time.

# The Display of the NC data

The following shows by "ROUGHING" button. This figure is shown in "the XY plane".

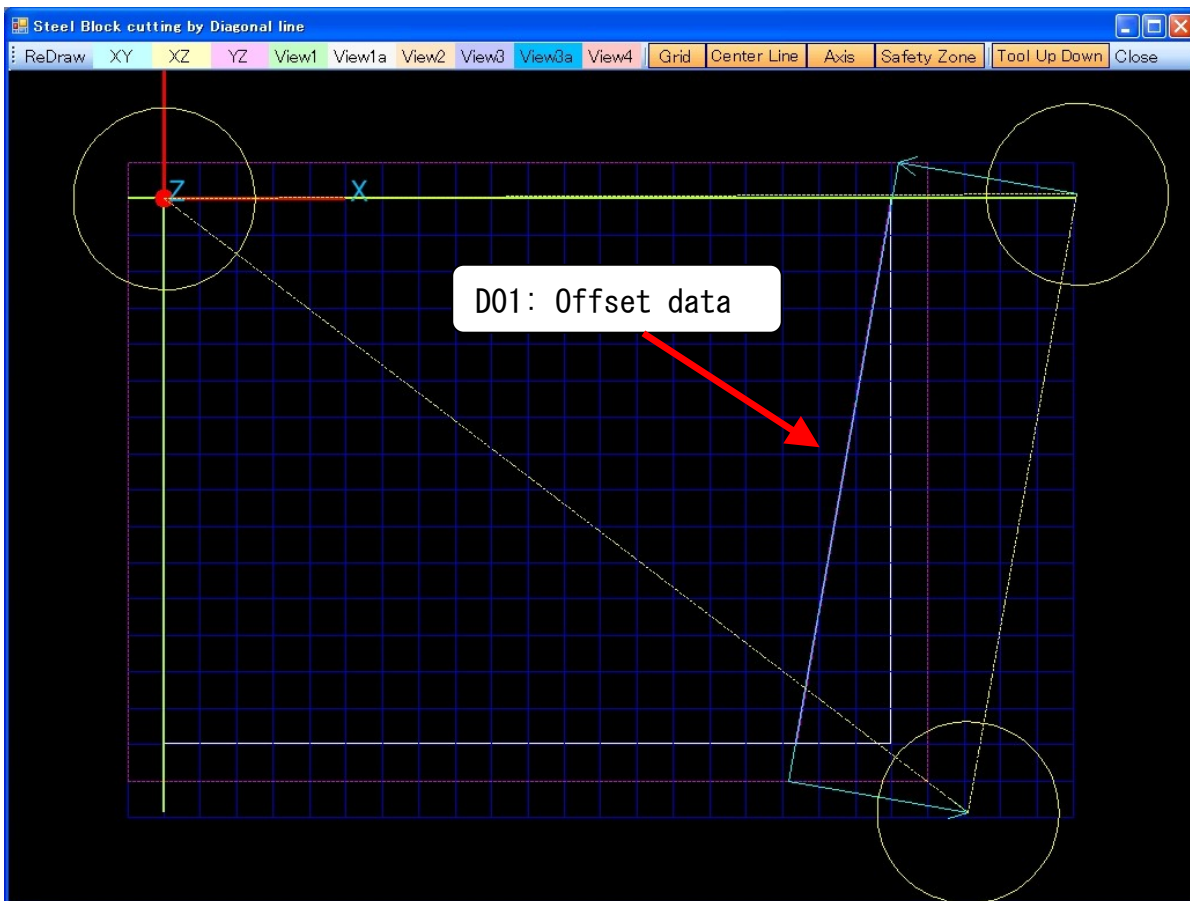


It is displaying the following figure in VIEW2.

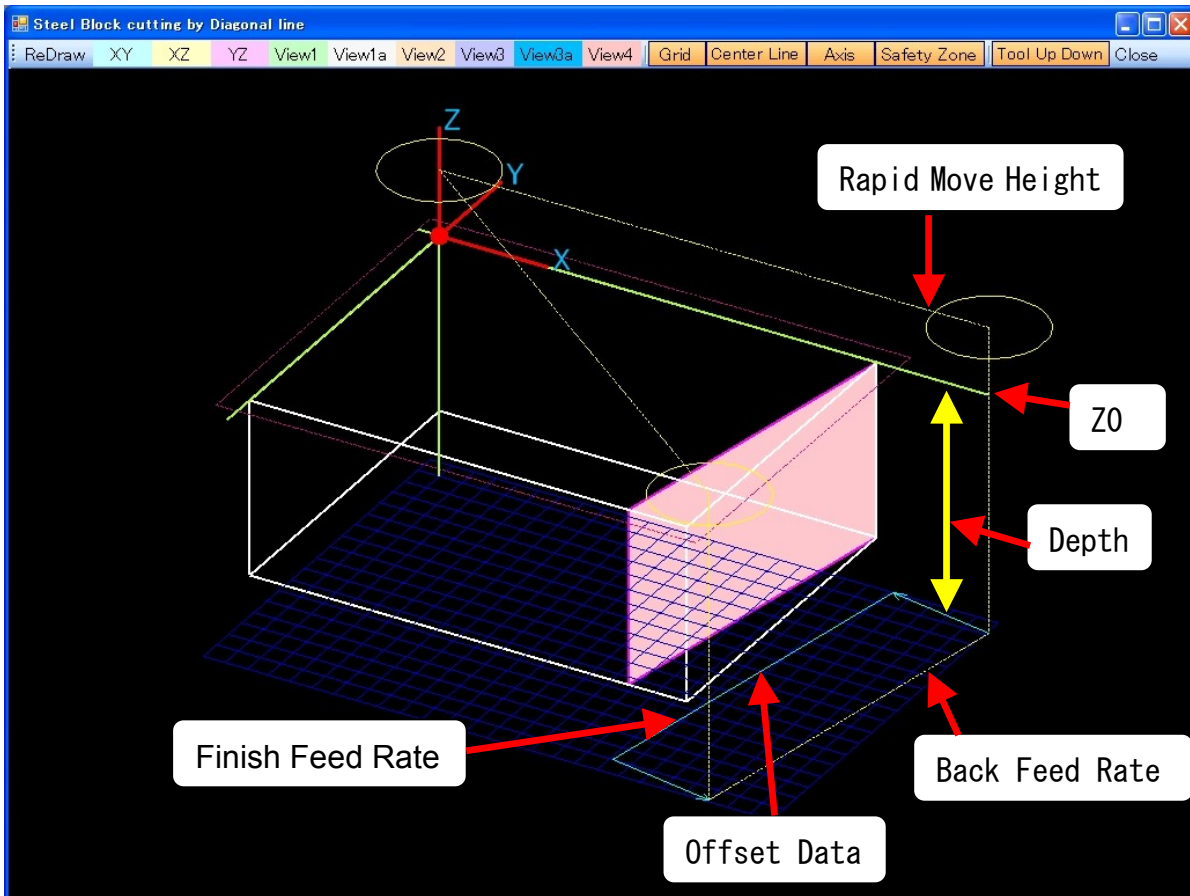




The following shows by "FINISH" button. This figure is shown in "the XY plane".

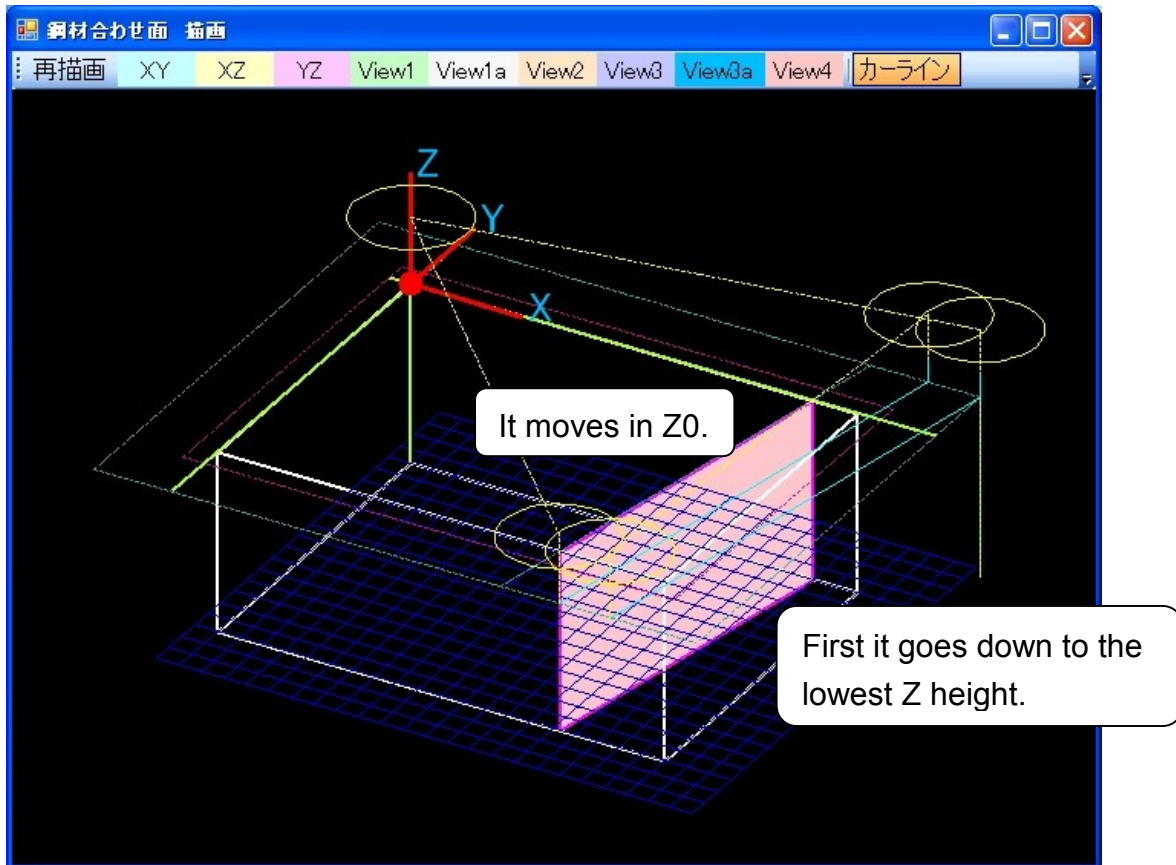


It is displaying the following figure in VIEW2.



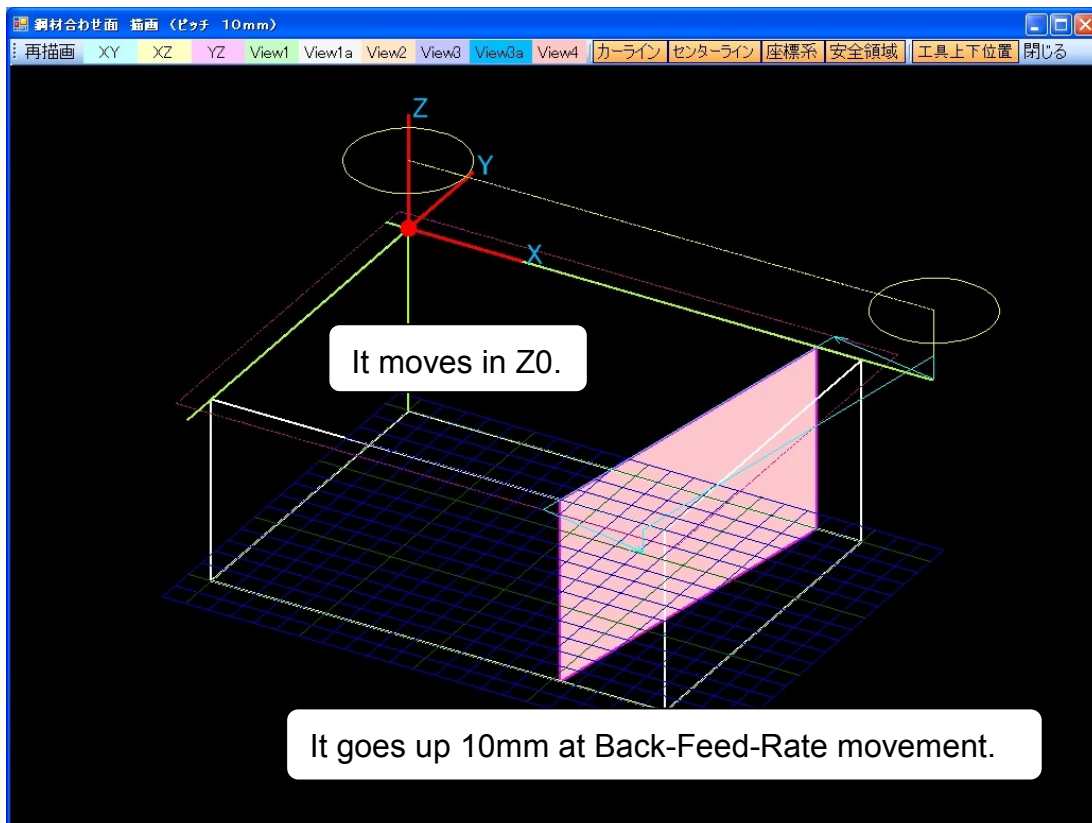
The following shows by "R CHECK" button. This figure is shown in "View2".

First it goes down to the lowest Z height and returns to Z0. And it checks the movement.



The following shows by "F CHECK" button. This figure is shown in "View2".

It checks the movement of data at Z0. When moving this data first, you can know a finish line.



# The Display menu



You can select the display direction.

XY plane , XZ plane ,YZ plane, View1, View1a, View2, View3, View3a, View4.

View is the show that was seen from the diagonal top.

View1, View2, View3, View4 are the show which was seen from 30 degrees above from just beside.

View1a, View3a are the show that was seen from 60 degrees above from just beside.

The show button of Grid, the centerline, the Axis, Circle becomes on.

When making "Grid" off, the grid of blue 50 mm disappears.

When making "Centerline" off, the olive-green X-axis, the Y-axis, the Z-axis disappear.

When making "Axis" off, the coordinate system of the X, the Y, Z disappears.

When making "Safety Zone" off, the safety area display by the purple dotted line disappears.

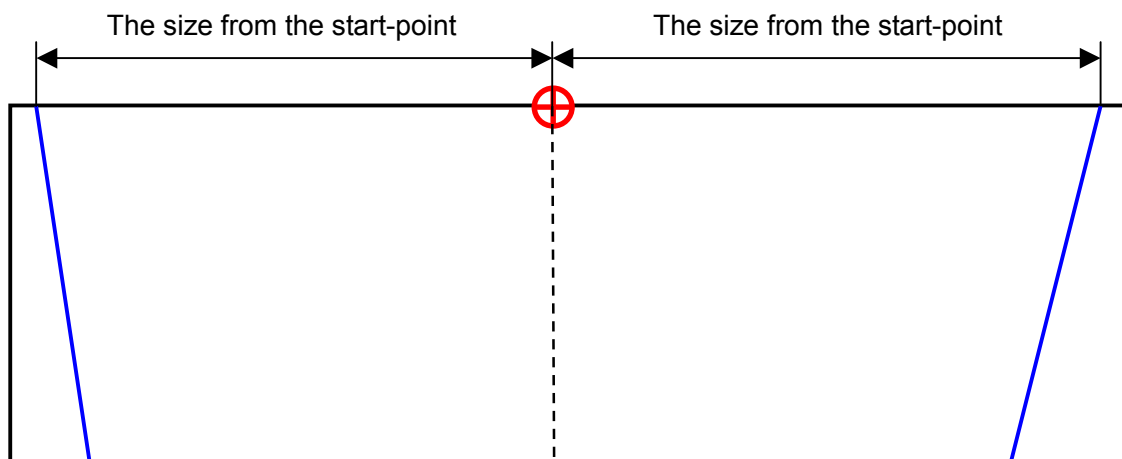
When making "Tool Up Down" off, the tool diameter display disappears.

The part can be displayed in the expansion when clicking with the mouse and dragging.

It returns to the ex-screen by "Close".

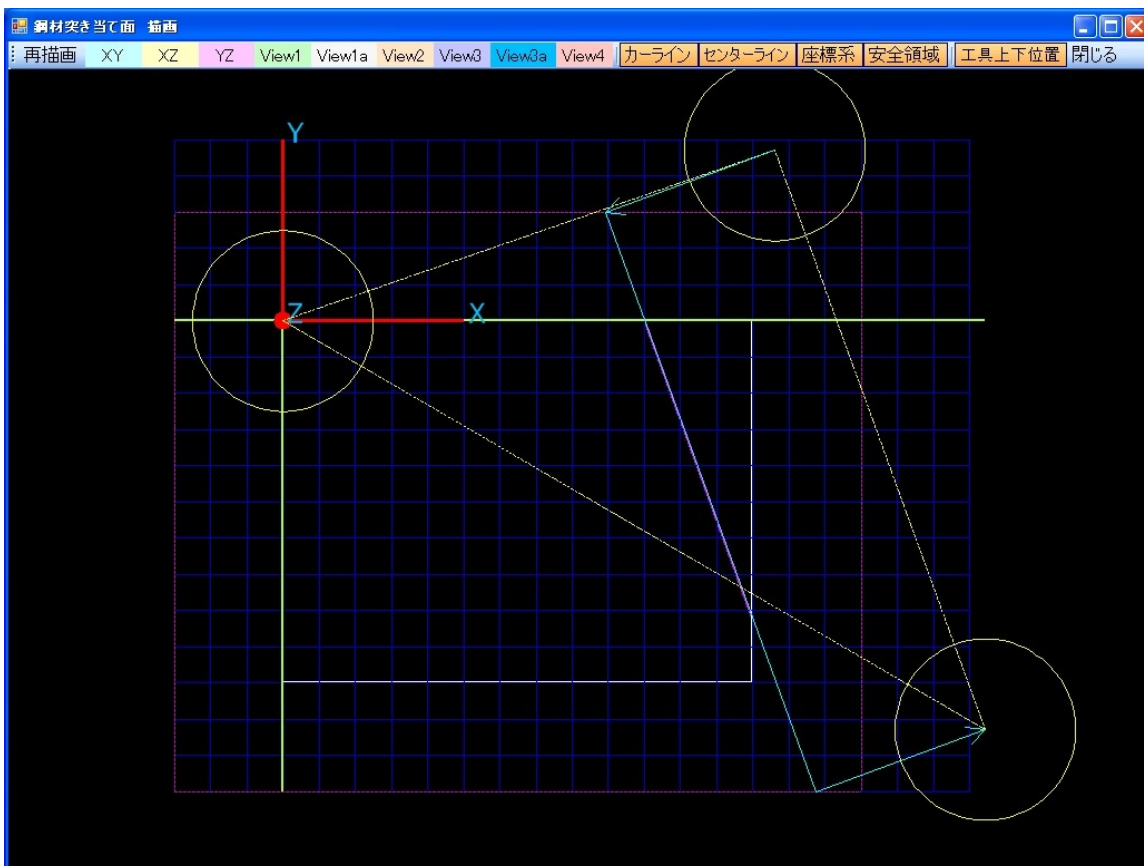
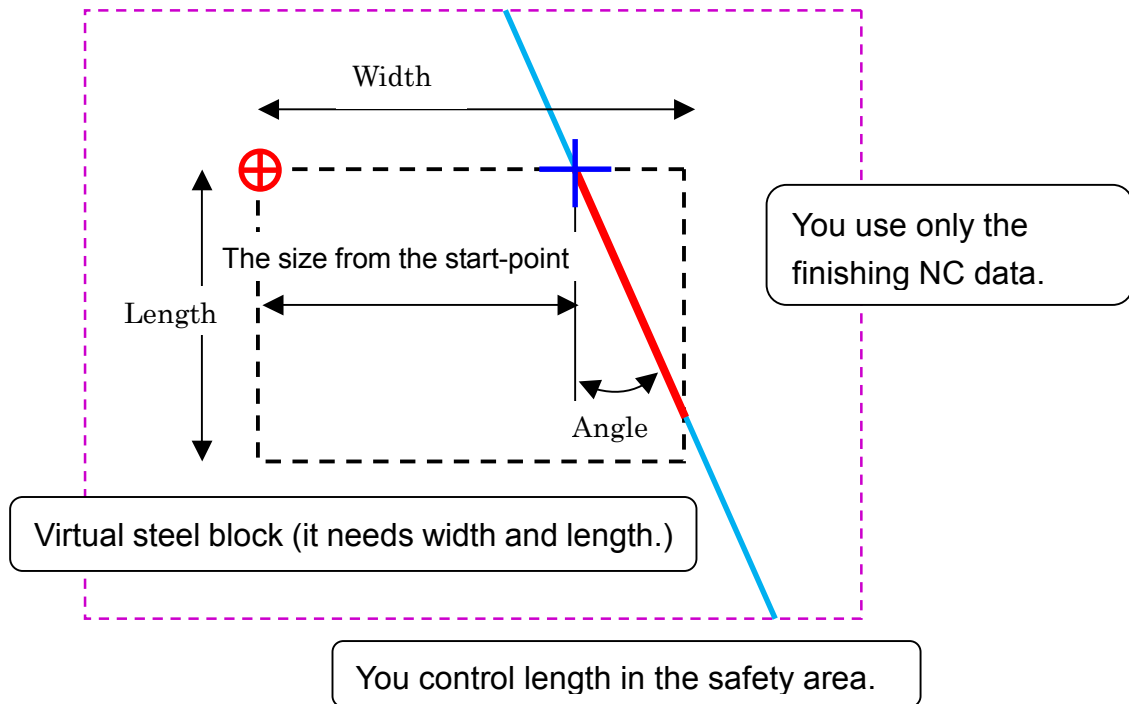
# The application operation

When cutting both sides of steel block, you define a Start-point in the material.



# The Application for the Sectional-Die

When you know some coordinate-value and need to cut the diagonal line, you define virtual steel block.



The above