



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

## The R chamfering Manual



### [ RADIUS ]

You can cut Radial Chamfered surface by the equal height processing by the radius end mill. One-way, or the Zigzag machining can be chosen.

In the range of same Z height, the zigzag machining can be chosen.

When the path at the same Z height is one, it becomes one-way machining.

This is for roughing cut. It is best for steel block.

### [ BALL ]

It cuts Radial Chamfered surface with the ball end mill.

By the zigzag surface going-along processing, you complete a surface.

This is for finish cut.

It machines a circumference at the equal pace.

## [ INSIDE R ]

It machines Radial inside by the equal high processing by the radius tool.  
It estimates rectangular material. It machines and puts corner R.

## [ BOTH IN R ]

It machines Radial inside by the equal high processing by the radius tool.  
It machines and puts both corner R.

## [ R Calculate ]

If radius is bigger than depth at the Inside-R or Both- in- R,there are 2 way for the drawing size in instruction.

This converts the drawing size.

## [ Japanese ]

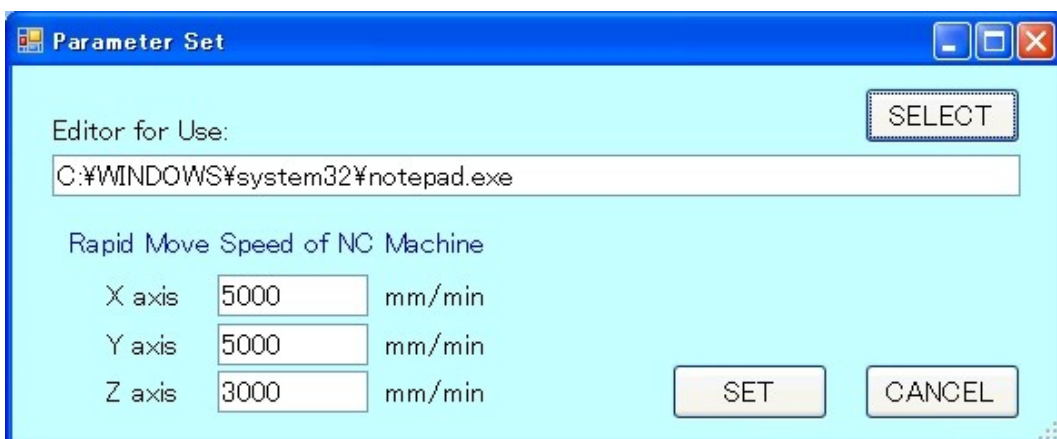
When pushing this button, it becomes Japanese display.

## [ 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.



# [ RADIUS ]

R CHAMFER RADIUS TOOL

**R CHAMFER RADIUS TOOL**

ラジアス工具

A Diameter: 30 mm  
 B. Corner R: 8 mm  
 Feed Rate: 1000 mm/min  
 Spindle Speed: 1000 rev/min  
 D. Z Down Value: 1.0 mm  
 E. Std. Cutting Width: 20 mm  
 F. Limit Cutting Width: 30 mm  
 G. Remainder: 0.2 mm  
 H. Distance X: 10 mm

START POINT  
 原点X O Z O  
 Y Axis Start Point is Free.

R revision  Yes  No

I. Rapid Move Height: 30 mm  
 J. R Chamfer Length: 50 mm  
 K. Y Start Point: 100 mm  
 L. Y End Point: 0 mm

1way  2way    G92  Yes  No

Write Holder:  
 C:¥

Check File: RmentoriCheck    EDIT    Graphic Display    START

File Name: Rmentori    EDIT    NC CHECK    NC DISP    CANCEL

R CHAMFER RADIUS TOOL

**R CHAMFER RADIUS TOOL**

ラジアス工具

A Diameter: 30 mm  
 B. Corner R: 8 mm  
 Feed Rate: 1000 mm/min  
 Spindle Speed: 1000 rev/min  
 D. Z Down Value: 1.0 mm  
 E. Std. Cutting Width: 20 mm  
 F. Limit Cutting Width: 30 mm  
 G. Remainder: 0.2 mm  
 H. Distance X: 10 mm

START POINT  
 原点X O Z O  
 Y Axis Start Point is Free.

R revision  Yes  No

I. Rapid Move Height: 30 mm  
 J. R Chamfer Length: 50 mm  
 K. Y Start Point: 100 mm  
 L. Y End Point: 0 mm

1way  2way    G92  Yes  No

Write Holder:  
 C:¥

Check File: RmentoriCheck    EDIT    Graphic Display    START

File Name: Rmentori    EDIT    NC CHECK    NC DISP    CANCEL

**Cutting Condition**

**Data Area**

**NC Output**

# Data Area

START POINT  
原点 X0Z0

Y Axis Start Point is Free.

<b>R revision</b> <input checked="" type="radio"/> Yes <input type="radio"/> No	
I. Rapid Move Height	30 mm
J. R Chamfer Length	50 mm
K. Y Start Point	100 mm
L. Y End Point	0 mm

Rapid move Z height

It makes a corner X0Z0.  
And it enters data.

The Y axis data moves from Y Start Point to Y End Point by one-way cut or two-way cut ( the range with same Z height ).  
The starting point of the Y axis is optional.  
When it is not below the decimal point, the decimal point can be omitted.

H. When moving Z by rapid move, it takes a distance of this width from steel block.

# Cutting Condition

ラジアス工具

A. Diameter:	30 mm
B. Corner R	8 mm
Feed Rate:	1000 mm/min
Spindle Speed:	1000 rev/min
D. Z Down Value:	1.0 mm
E. Std. Cutting Width:	20 mm
F. Limit Cutting Width:	30 mm
G. Remainder:	0.2 mm
H. Distance X:	10 mm

As R revision, refer to next page.

<The thinking way of cutting width>

D.Z Down Value, every time it goes down, the width to cut is computed.

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.

G.Remainder is the remaining finish value.  
it is perpendicular to the surface.

When cutting deeply at the equal pace in Z, as for the upper surface of radius, the surface becomes rough.

Therefore, you use the ball end mill of the finishing. Then, you select R-revision "No". However, when wanting to make an end in roughing process, you select R-revision "Yes". The data which revises radius in the end of the NC data is added.

## 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 ).

You choose one-way or two-way with the radio button. When choosing one-way, it moves from the Y start point only to the direction of the Y end point. When returning to the Y start point , Z rises to the rapid moving height, and moves a pitch after returning to the previous starting-point.

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

Write Holder:  
C:¥

Check File: RmentoriCheck EDIT

File Name: Rmentori EDIT

----- Graphic Display -----  
NC CHECK NC DISP

SELECT START CANCEL

1way 2way G92 Yes No

You enter a file name. The "Check file" simulates NC movement before actual NC data and confirms data inputs. " Edit " When pushing the button, the editor starts up and opens a file.

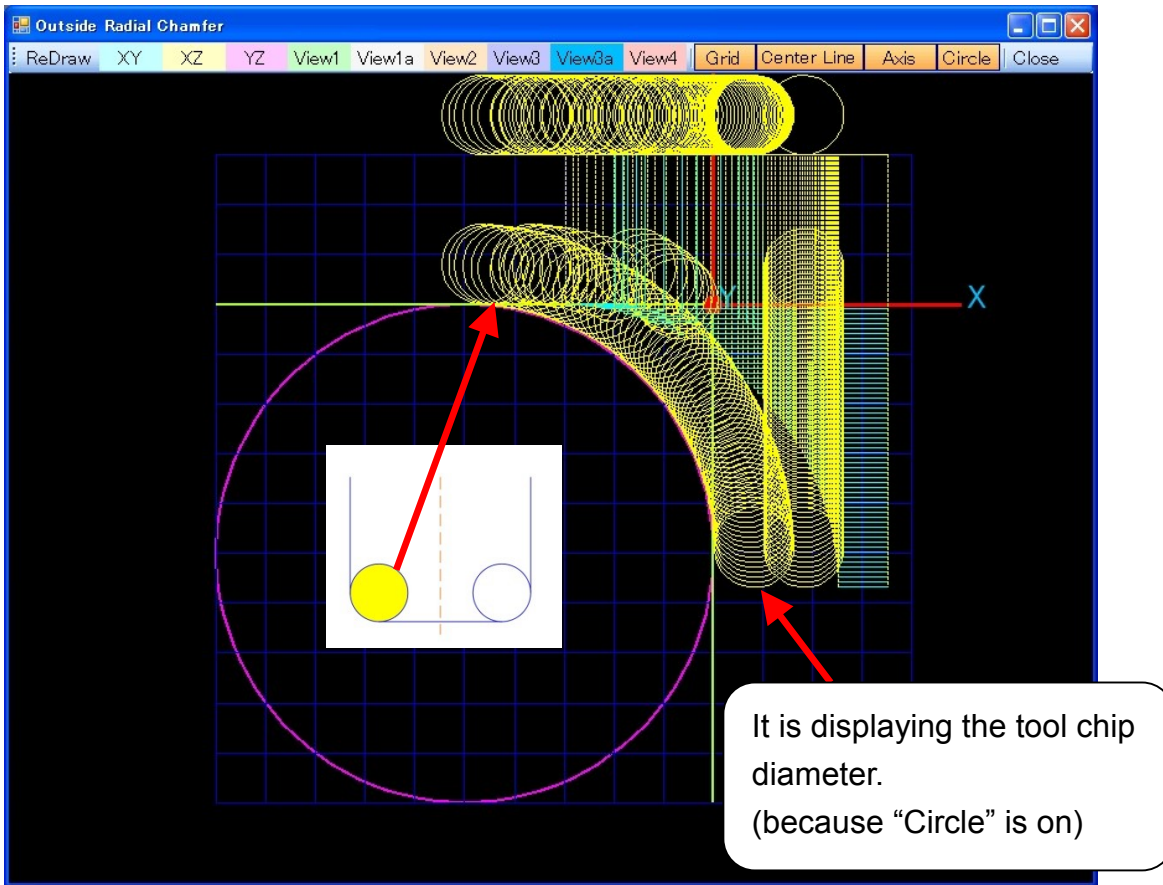
It is possible to display the NC data.

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

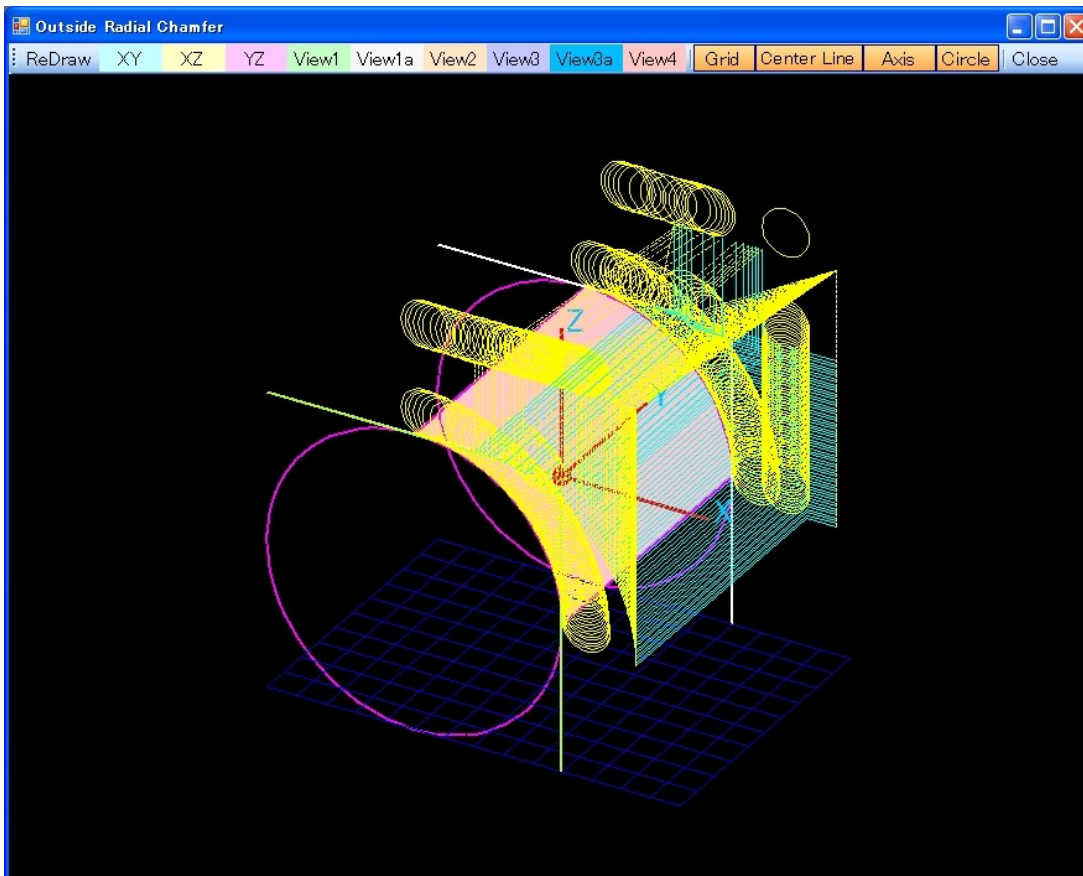
When pushing the "Cancel" button, it ends. Input data is saved and is restored in the next time.

# The Display of the NC data

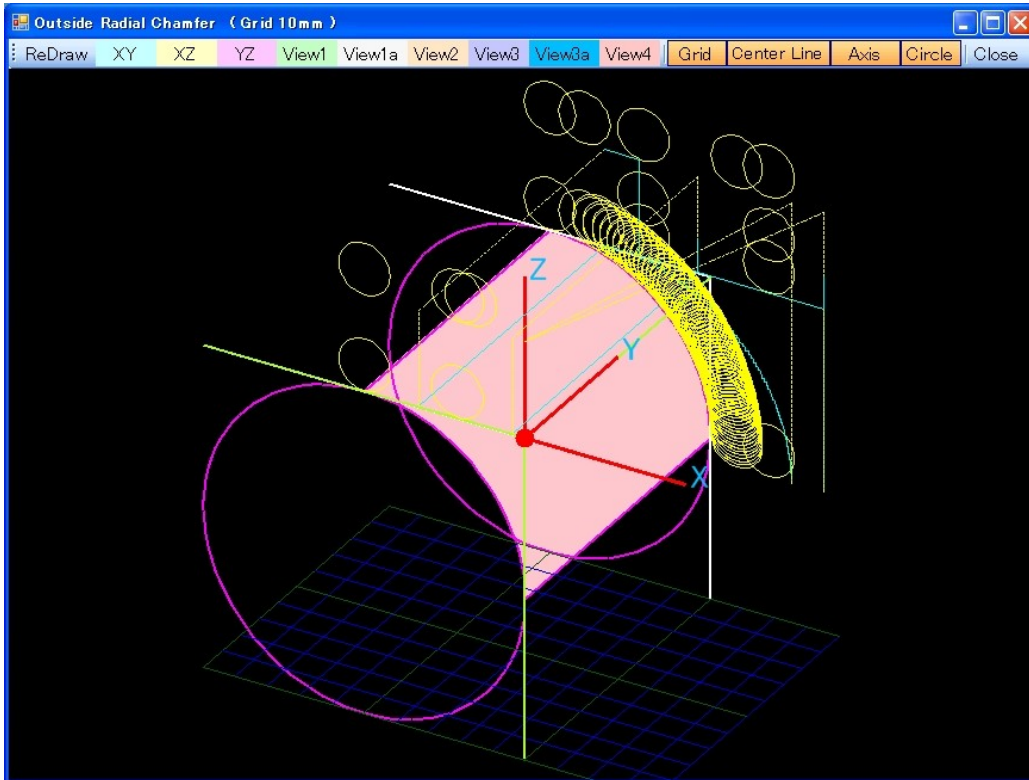
The following shows by "NC DISPLAY" button. This figure is shown in "the XZ plane".



Following figure is shown in "VIEW2".



The following figure is displaying a "Check File". You can understand a width of cuts and a shape. First, it goes to the most low position of Z.



## 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, which 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 10 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 "Circle" 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".

# [ BALL ]

**R CHAMFER BALL TOOL**

**ボールエンド**

A Diameter:  mm  
 Feed Rate:  mm/min  
 Spindle Speed:  rev/min  
**C. Z Down Value:  mm**  
 D. Remainder:  mm

I. Rapid Move Height:  mm  
 J. R Chamfer Length:  mm  
 K. Y Start Point:  mm  
 L. Y End Point:  mm

**原点X O Z O**  
 Y Axis Start Point is Free.

Write Holder:  
 C:¥

Check File:    
 File Name:

**G92**  Yes  No

-- Graphic Display --

Z- Down- Value is a length on the circumference.

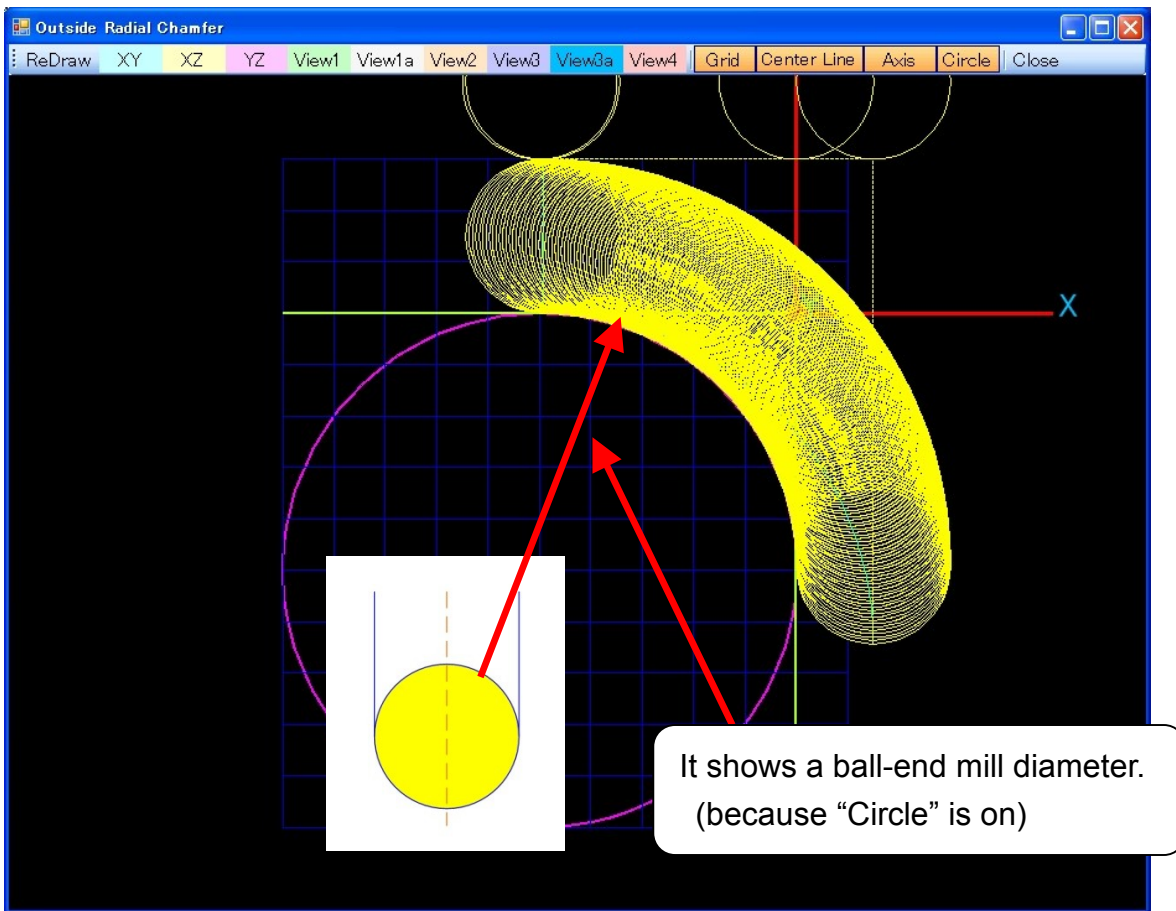
The way of the data definition is the same as the "RADIUS".  
 Only a difference is described.

The Y axis data goes and returns between the Y start point and the Y end point.  
 By the surface going-along processing, it machines a circumference at the equal pace.

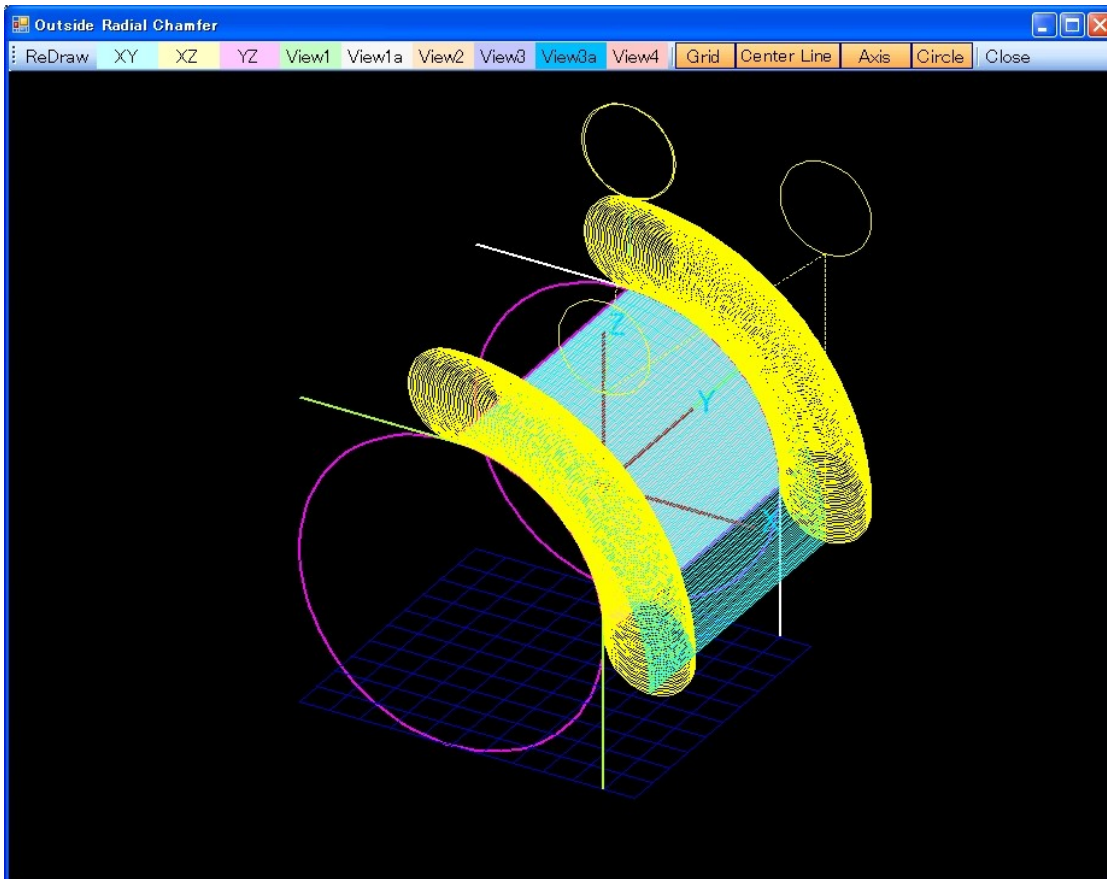


# The Display of the NC data

The following figure shows by "NC DISPLAY" button. This figure is shown in "the XZ plane".

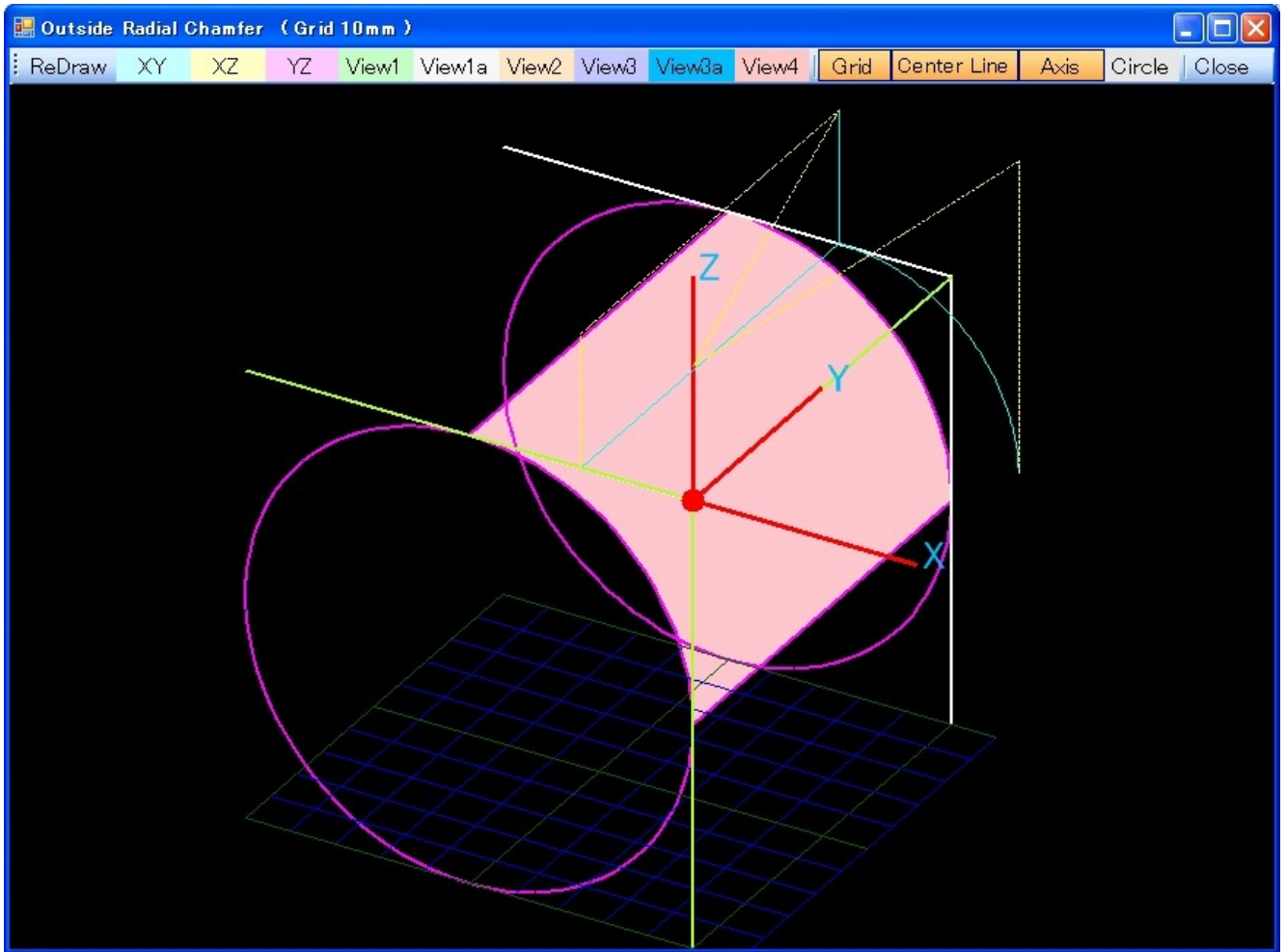


Following figure is shown in "VIEW2".



The following figure is displaying a "Check File".

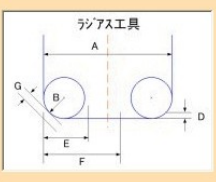
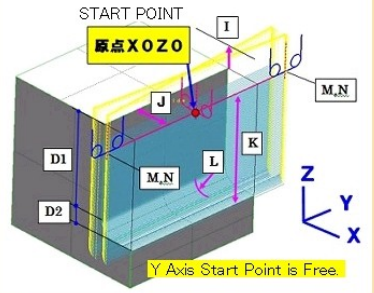
It moves a width of cuts in Z0. And after that, it moves along the finish line.



# [ INSIDE R ]

**INSIDE R CHAMFER RADIUS TOOL**

**INSIDE R RADIUS**

Y Axis Start Point is Free.

A. Diameter: 50 mm  
 B. Corner R: 8 mm  
 Feed Rate: 1000 mm/min  
 Spindle Speed: 1200 rev/min  
 D1. Z Down Value1: 1 mm  
 D2. Z Down Value2: 1 mm  
 E. Std. Cutting Width: 20 mm  
 F. Limit Cutting Width: 30 mm

I. Rapid Move Height: 30 mm  
 J. Width: 50 mm  
 K. Depth(+Value): 100 mm  
 L. Inside R Chamfer: 20 mm  
 M Y Start Point: 100 mm  
 N Y End Point: 0 mm

G92  Yes  No     1way  2way

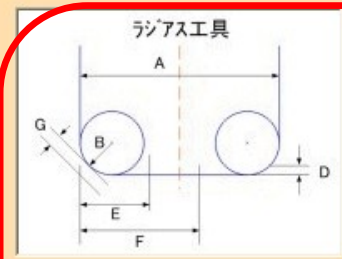
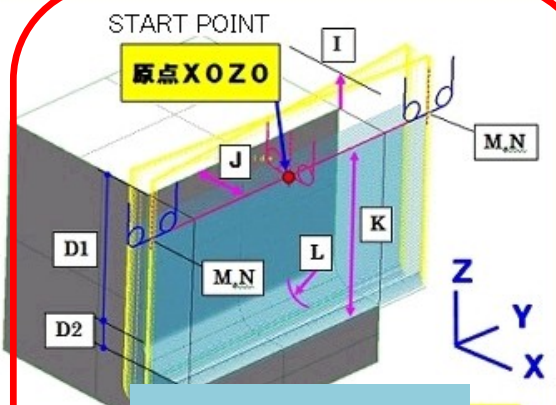
Write Holder: C:¥    NO CHECK    NO DISPLAY

Check File: RmenInsideCheck    EDIT    START    CANCEL

File Name: RmenInside    EDIT

**INSIDE R CHAMFER RADIUS TOOL**

**INSIDE R RADIUS**

**Cutting Condition**

B. Corner R: 8 mm  
 Feed Rate: 1000 mm/min  
 Spindle Speed: 1200 rev/min  
 D1. Z Down Value1: 1 mm  
 D2. Z Down Value2: 1 mm  
 E. Std. Cutting Width: 20 mm  
 F. Limit Cutting Width: 30 mm

**Data Area**

I. Rapid Move Height: 30 mm  
 J. Width: 50 mm  
 K. Depth(+Value): 100 mm  
 L. Inside R Chamfer: 20 mm  
 M Y Start Point: 100 mm  
 N Y End Point: 0 mm

G92  Yes  No     1way  2way

Write Ho: C:¥    CHECK    DISPLAY

Check File: RmenInsideCheck    EDIT    START    CANCEL

File Name: RmenInside    EDIT

**NC Output**    Same as [RADIUS]

# Data Area

START POINT  
原点 X0Z0

I

J

K

L

M,N

D1

D2

Z

Y

X

Y Axis Start Point is Free.

I. Rapid Move Height	30	mm
J. Width	50	mm
K. Depth(+Value)	100	mm
L. Inside R Chamfer	20	mm
M. Y Start Point	100	mm
N. Y End Point	0	mm

Rapid move Z height

It makes a corner X0Z0.  
And it enters data.

Input the Y position which both sides are fully come out from steel block.  
It goes down in G00. The last 10mm becomes G01 mode.

The Y axis data moves from Y Start Point to Y End Point by one-way cut or two-way cut ( the range with same Z height ).  
The starting point of the Y axis is optional.  
When it is not below the decimal point, the decimal point can be omitted.

# Cutting Condition

ラジアス工具

A

B

C

D

E

F

A. Diameter:	30	mm
B. Corner R	8	mm
Feed Rate:	1000	mm/min
Spindle Speed:	1200	rev/min
D1. Z Down Value1:	1	mm
D2. Z Down Value2:	1	mm
E. Std. Cutting Width:	20	mm
F. Limit Cutting Width:	30	mm

(L. Inside R Chamfer) = 0 or (L. Inside R Chamfer) < (B. Corner R)  
Then it computes as (L. Inside R Chamfer) = (B. Corner R)  
For example, if L=5 or L=0, it becomes L=8.

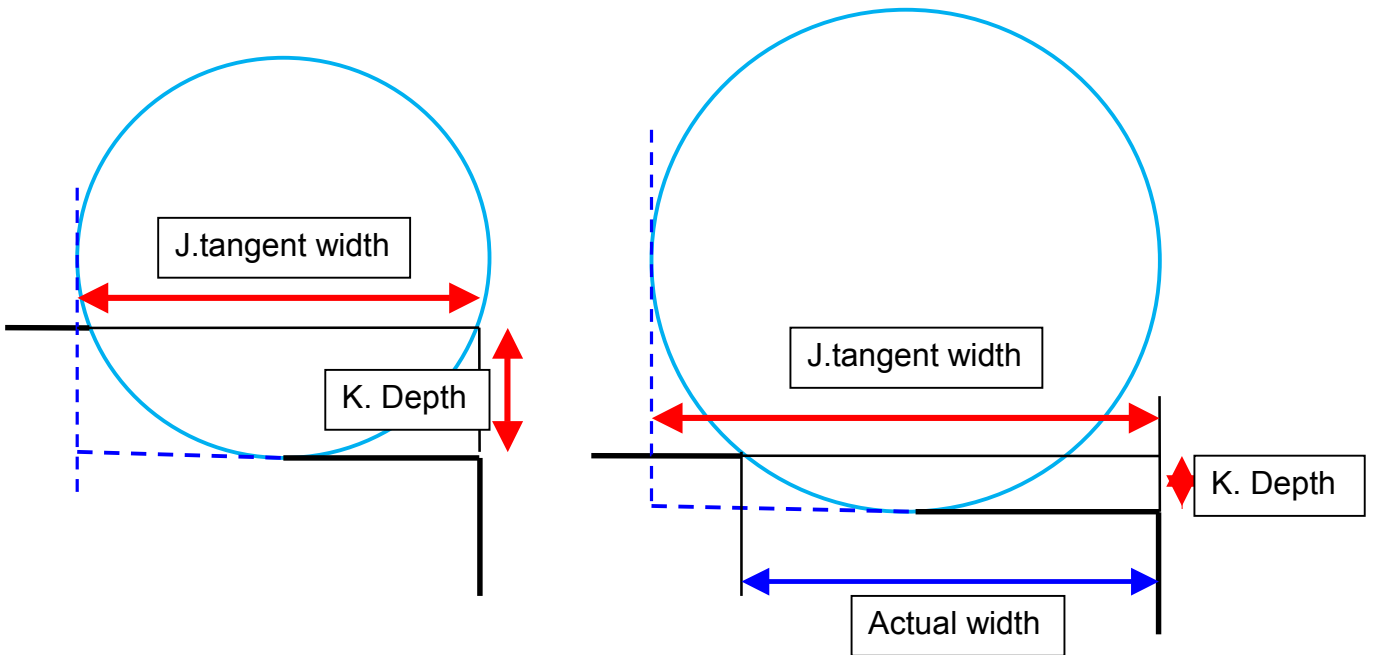
D1.Z-Down-Value1 is the notch quantity of the straight section.  
Straight section = K - L.

D2.Z-Down-Value2 is the notch quantity of the corner R part.

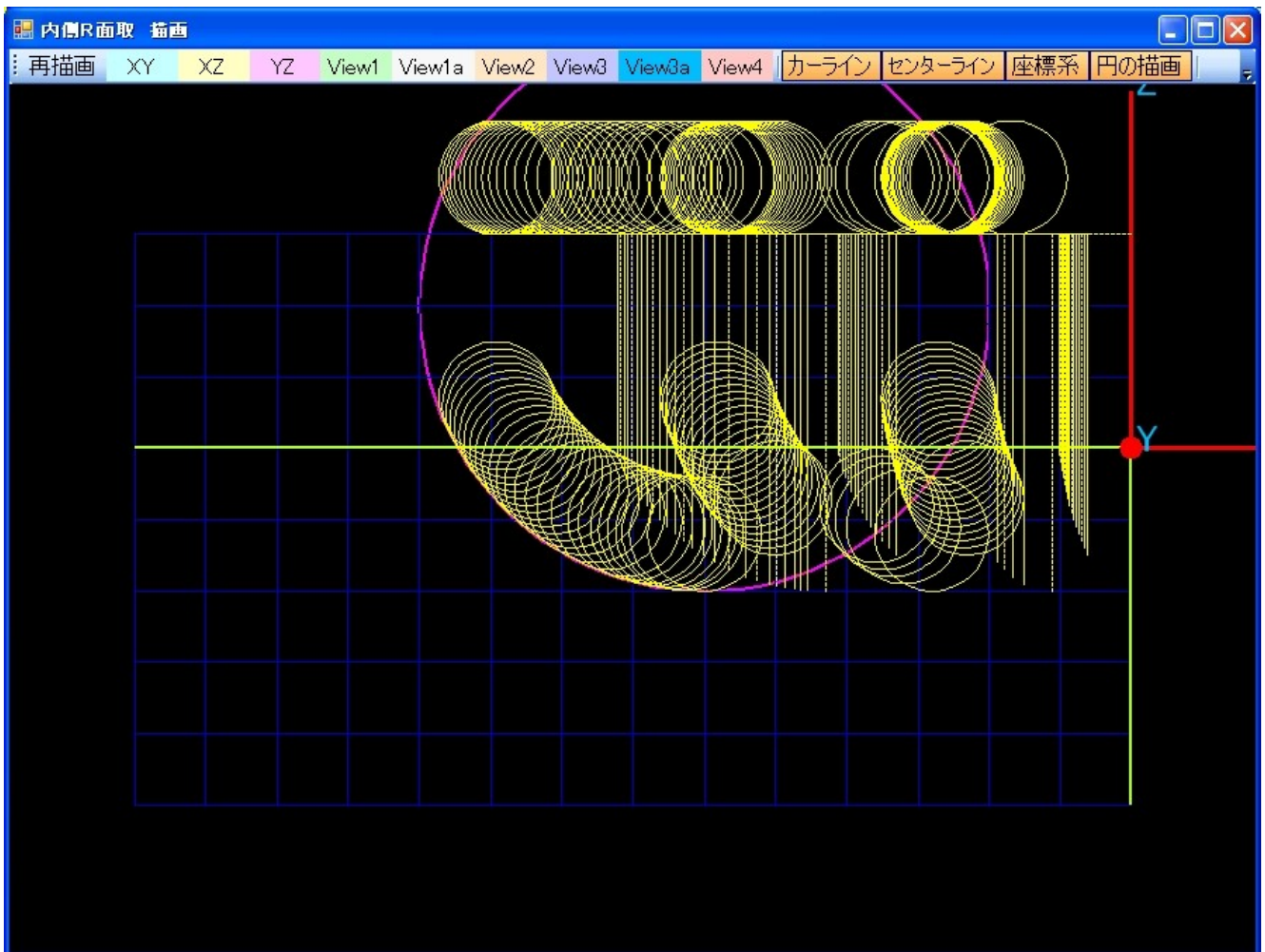
It is possible even if  $(K.Depth < L.Inside\ R\ Chamfer)$ .

Because the width in this case is the width which the corner radius comes in tangent with, it is different from the actual width.

It uses "R Calculate" command to find tangent width from the actual width.

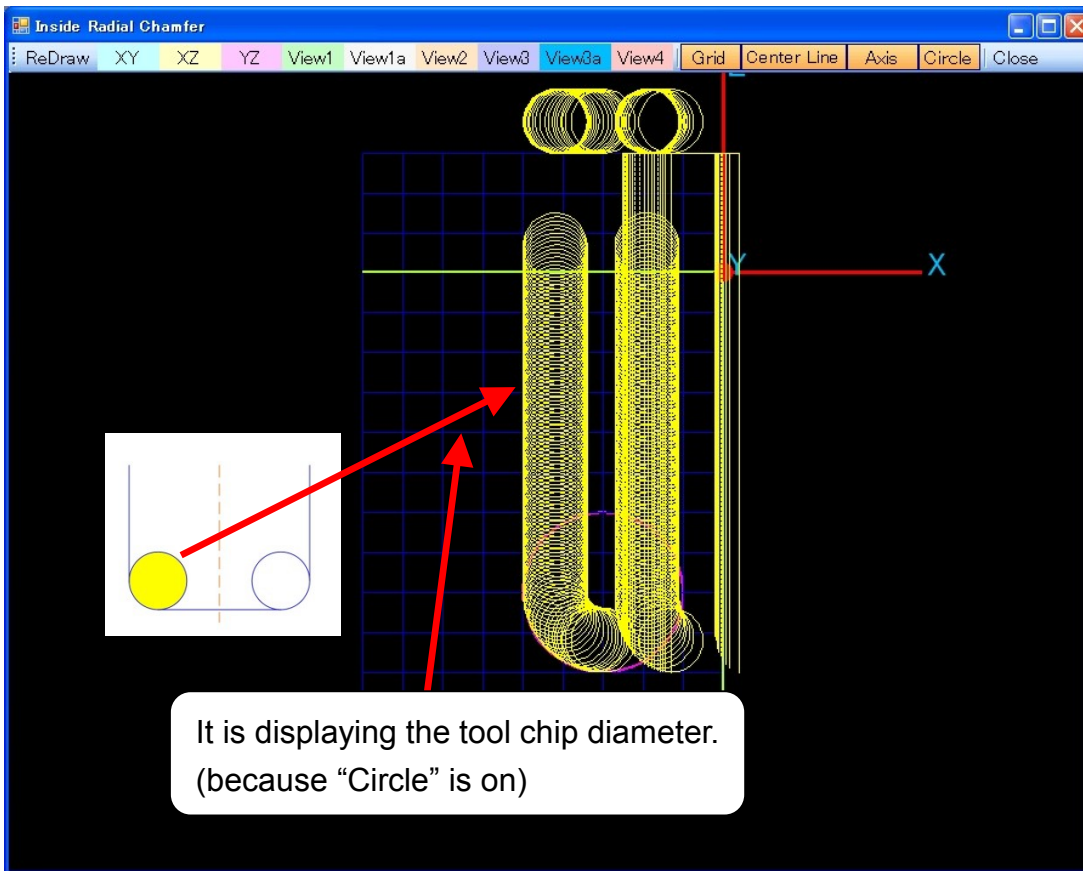


As for the figure below, at the 20-mm depth, the corner radius is 40 mm.

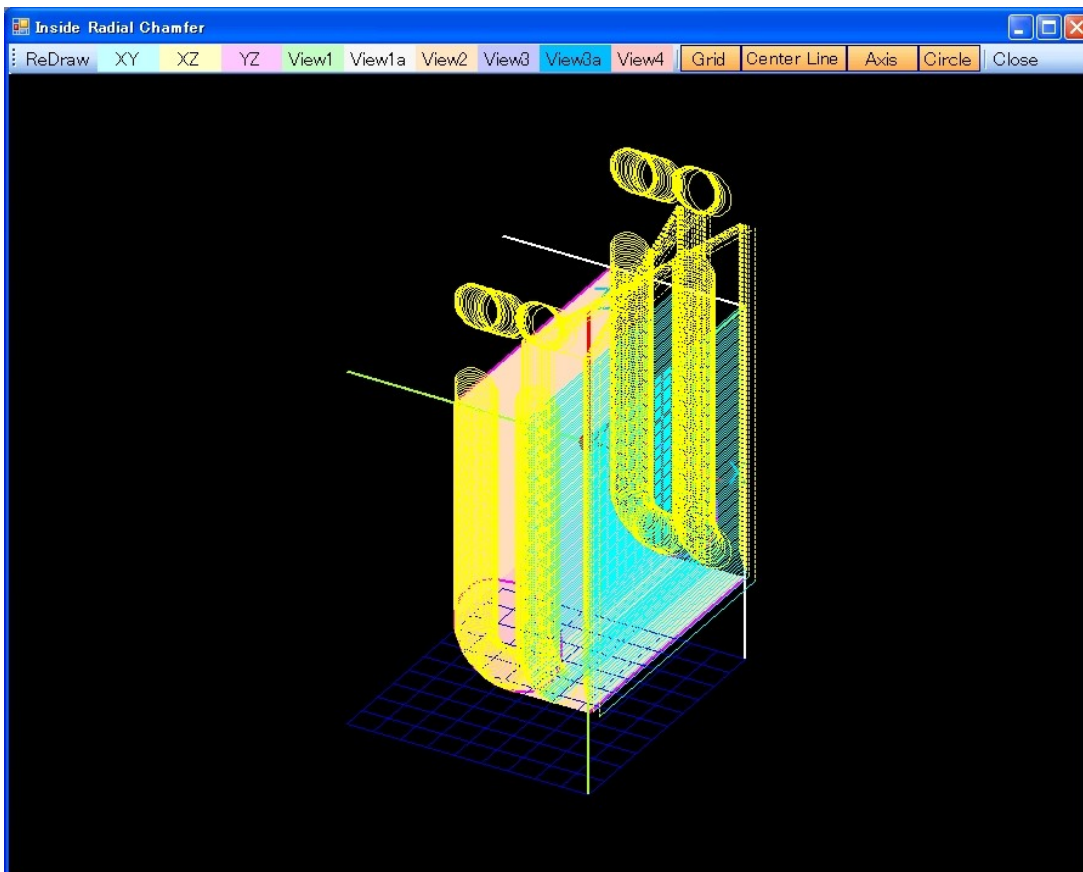


# The Display of the NC data

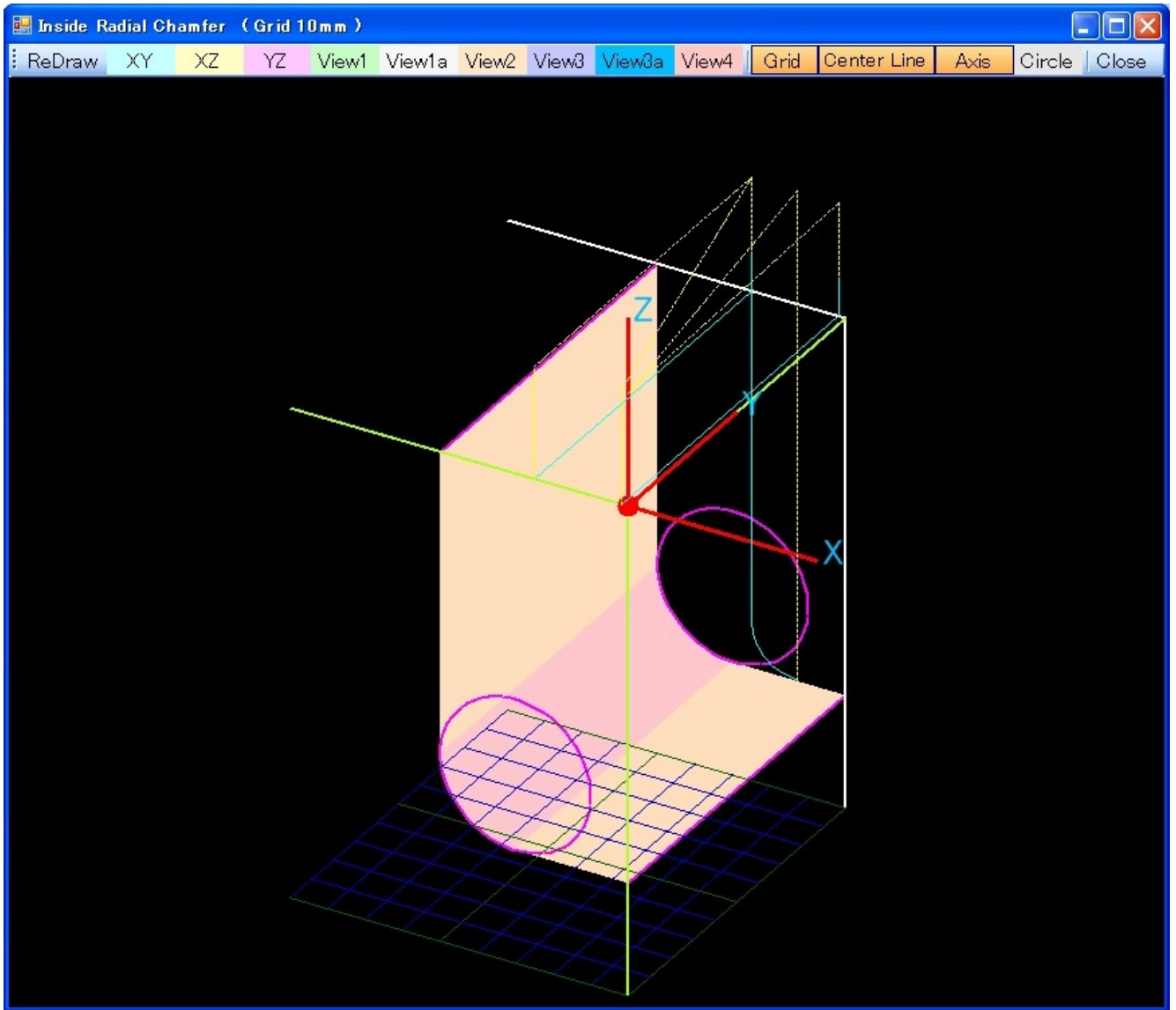
The following shows by "NC DISPLAY" button. This figure is shown in "the XZ plane".



Following figure is shown in "VIEW2".



The following figure is displaying a “Check File”.  
You can understand a width of cuts and a shape.  
It moves the last shape after moving a width of cuts in Z0.



# [ BOTH IN R ]

**BOTH IN R RADIUS TOOL**

ラジウス工具

A Diameter: 50 mm  
 B. Corner R: 8 mm  
 Feed Rate: 1000 mm/min  
 Spindle Speed: 1000 rev/min  
 D1. Z Down Value1: 1 mm  
 D2. Z Down Value2: 1 mm  
 E. Std. Cutting Width: 30 mm  
 F. Limit Cutting Width: 40 mm  
 Cutter D Feed: 500 mm/min

I Rapid Move Height: 30 mm  
 J. Width: 100 mm  
 K. Depth: 30 mm  
 L. Inside R: 20 mm  
 M Y Start Point: 0 mm  
 N Y End Point: 100 mm

Y Axis Start Point is Free.

Write Holder: G92  Yes  No

Check File: BothRmenInsideCheck EDIT  
 File Name: BothRmenInside EDIT

NC CHECK  
 NO DISPLAY  
 START CANCEL

**BOTH IN R RADIUS TOOL**

ラジウス工具

A Diameter: 50 mm

**Cutting Condition**

Spindle Speed: 1000 rev/min  
 D1. Z Down Value1: 1 mm  
 D2. Z Down Value2: 1 mm  
 E. Std. Cutting Width: 30 mm  
 F. Limit Cutting Width: 40 mm  
 Cutter D Feed: 500 mm/min

**Data Area**

I Rapid move height: 30 mm  
 J. Width: 100 mm  
 K. Depth: 30 mm  
 L. Inside R: 20 mm  
 M Y Start Point: 0 mm  
 N. Y End Point: 100 mm

Y Axis Start

Write Holder: G92  Yes  No

NC CHECK  
 NO DISPLAY  
 START CANCEL

**NC Output** Same as [RADIUS]



# Data Area

I. Rapid Move Height	30	mm
J. Width	100	mm
K. Depth	30	mm
L. Inside R	20	mm
M. Y Start Point	0	mm
N. Y End Point	100	mm

Rapid move Z height

It sets a X0Z0 to digging center. And it enters data.

The Y axis data moves from Y Start Point to Y End Point. However, in which direction, it becomes a down cut. The starting point of the Y axis is optional. When it is not below the decimal point, the decimal point can be omitted.

(L. Inside R Chamfer) = 0 or (L. Inside R Chamfer) < (B. Corner R)  
Then it computes as (L. Inside R Chamfer) = (B. Corner R)  
For example, if L=5 or L=0, it becomes L=8.

# Cutting Condition

A. Diameter:	50	mm
B. Corner R	8	mm
Feed Rate:	1000	mm/min
Spindle Speed:	1000	rev/min
D1. Z Down Value1:	1	mm
D2. Z Down Value2:	1	mm
E. Std. Cutting Width:	30	mm
F. Limit Cutting Width:	40	mm
Cutter D Feed	500	mm/min

D1.Z-Down-Value1 is the notch quantity of the straight section. Straight section = K - L.

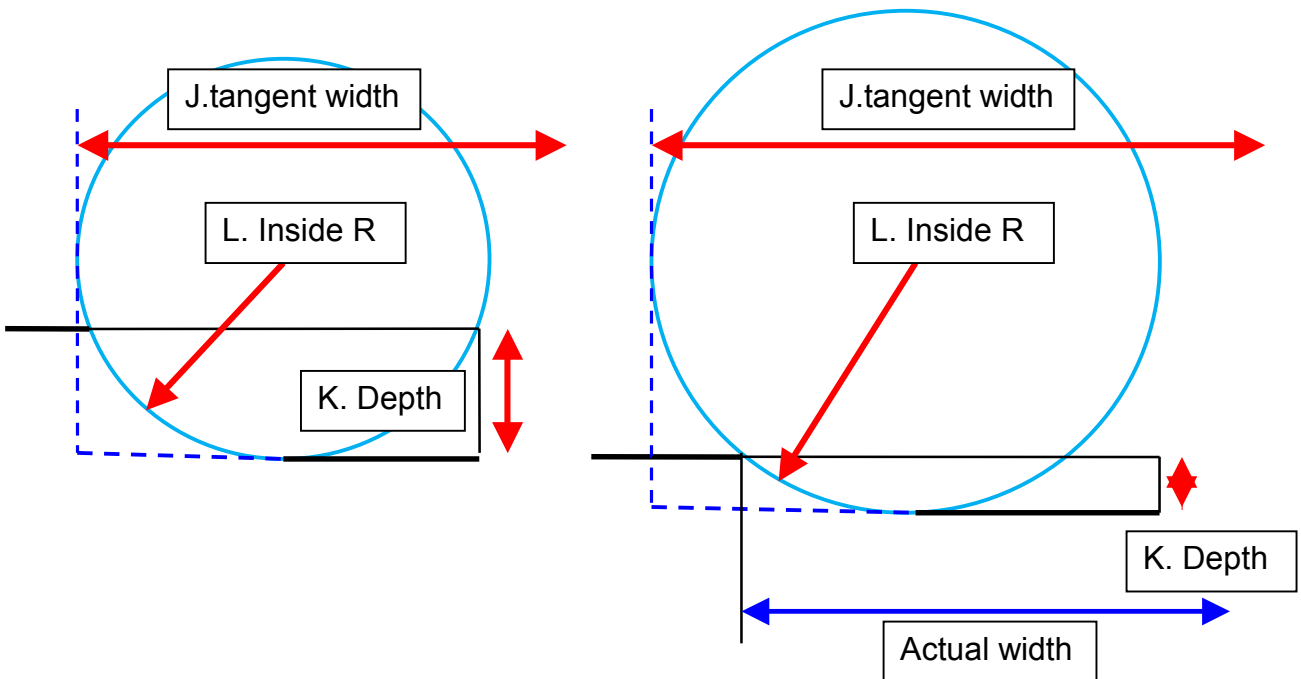
D2.Z-Down-Value2 is the notch quantity of the corner R part.

It cuts first at the span of the tool. This speed is called Cutter-D-Feed. The width of cuts of the remainder is decided at the E and the width of F.

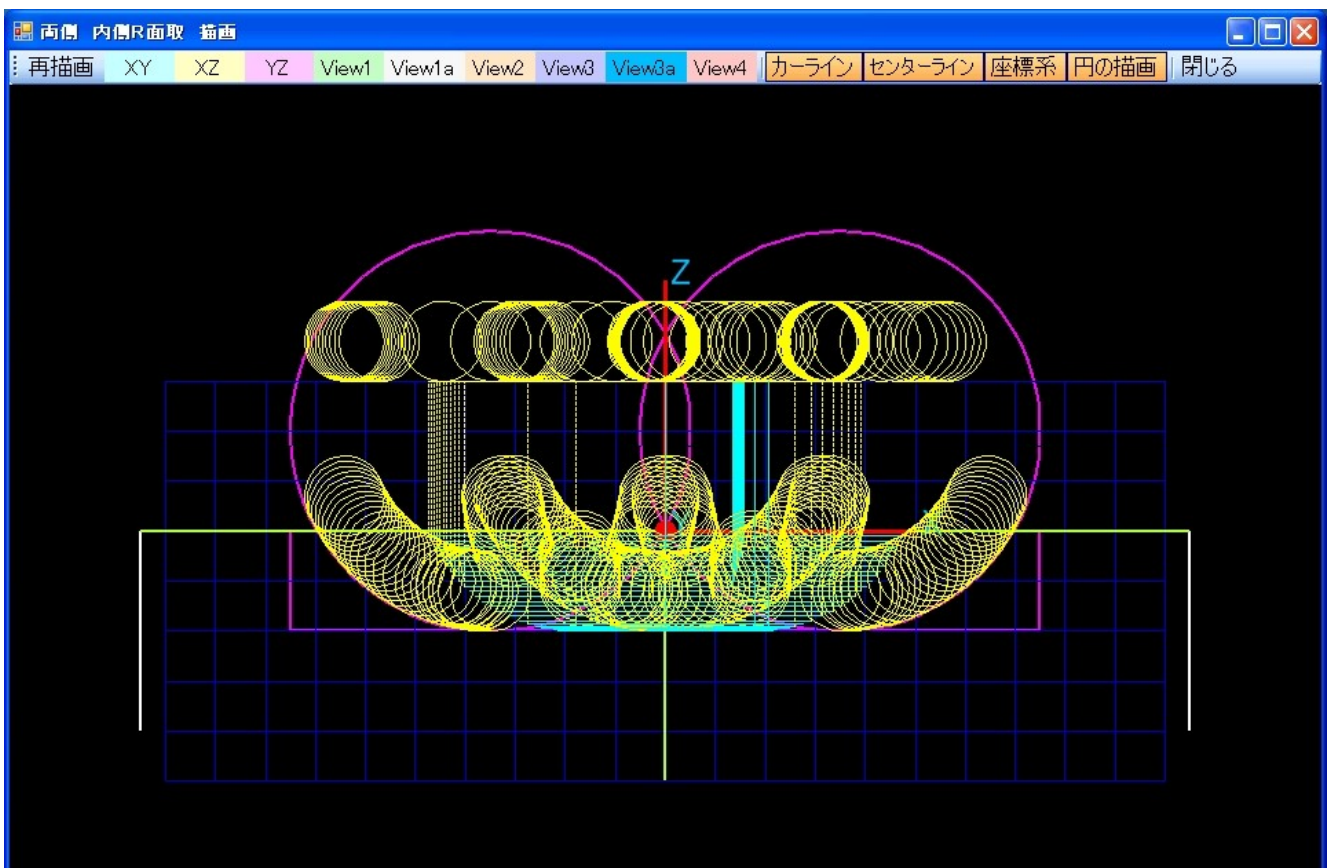
It is possible even if  $(K.Depth < L.Inside\ R\ Chamfer)$ .

Because the width in this case is the width which the corner radius comes in tangent with, it is different from the actual width.

It uses "R Calculate" command to find tangent width from the actual width.

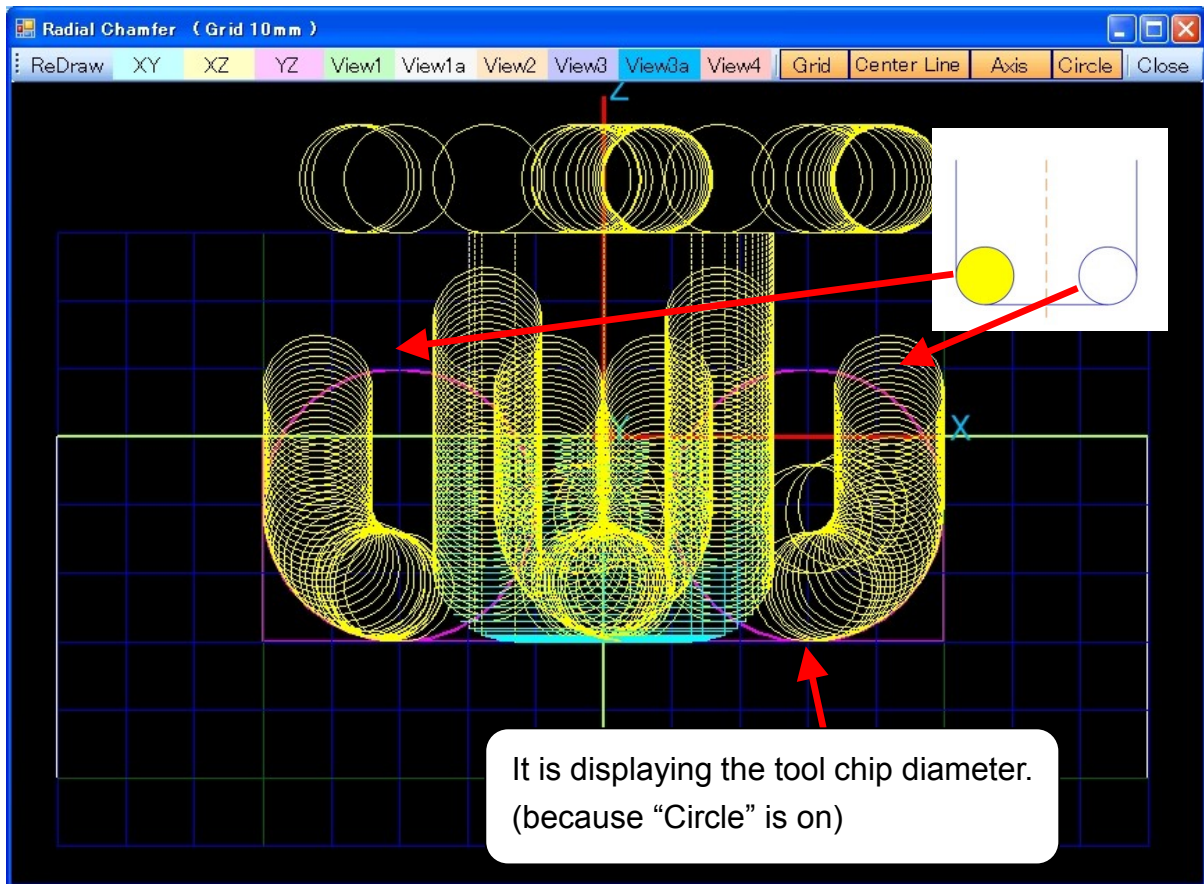


As for the figure below, at the 20 mm depth, the corner radius is 40 mm.

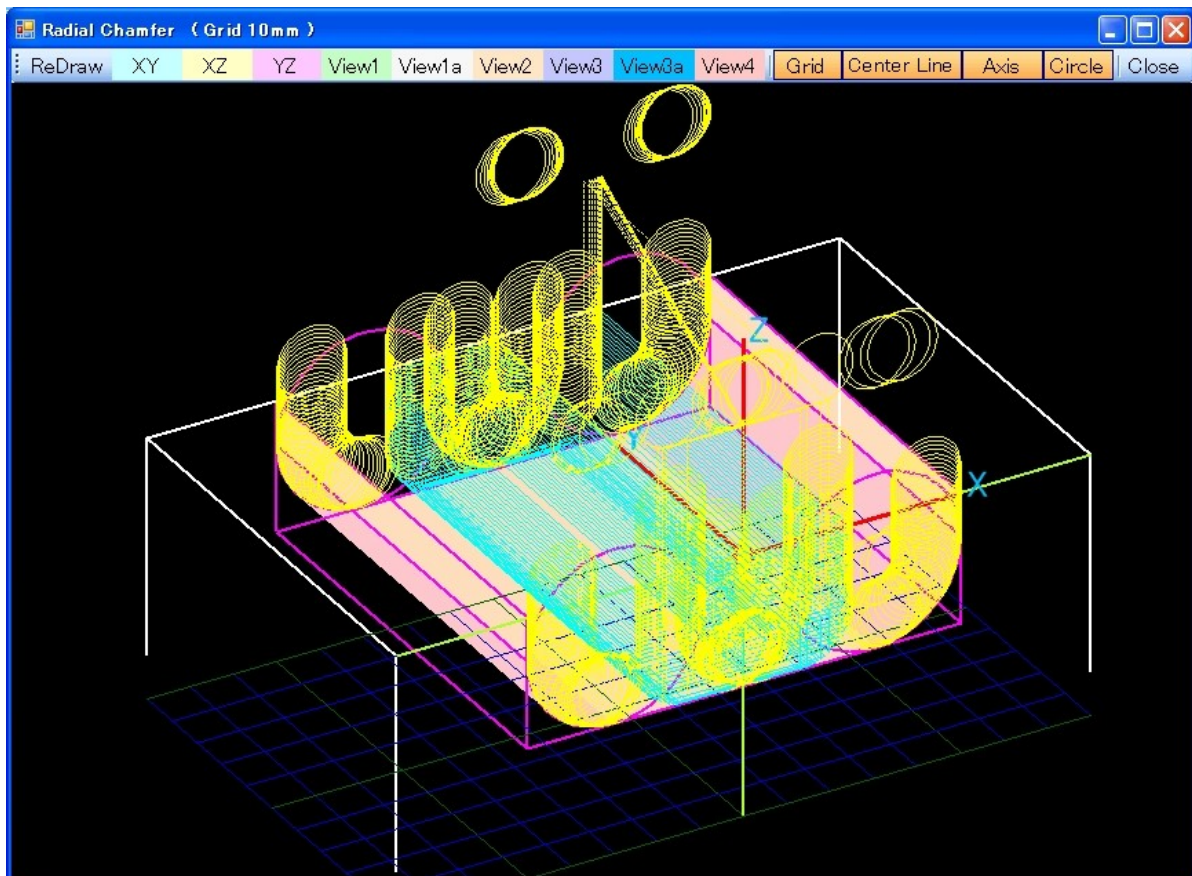


# The Display of the NC data

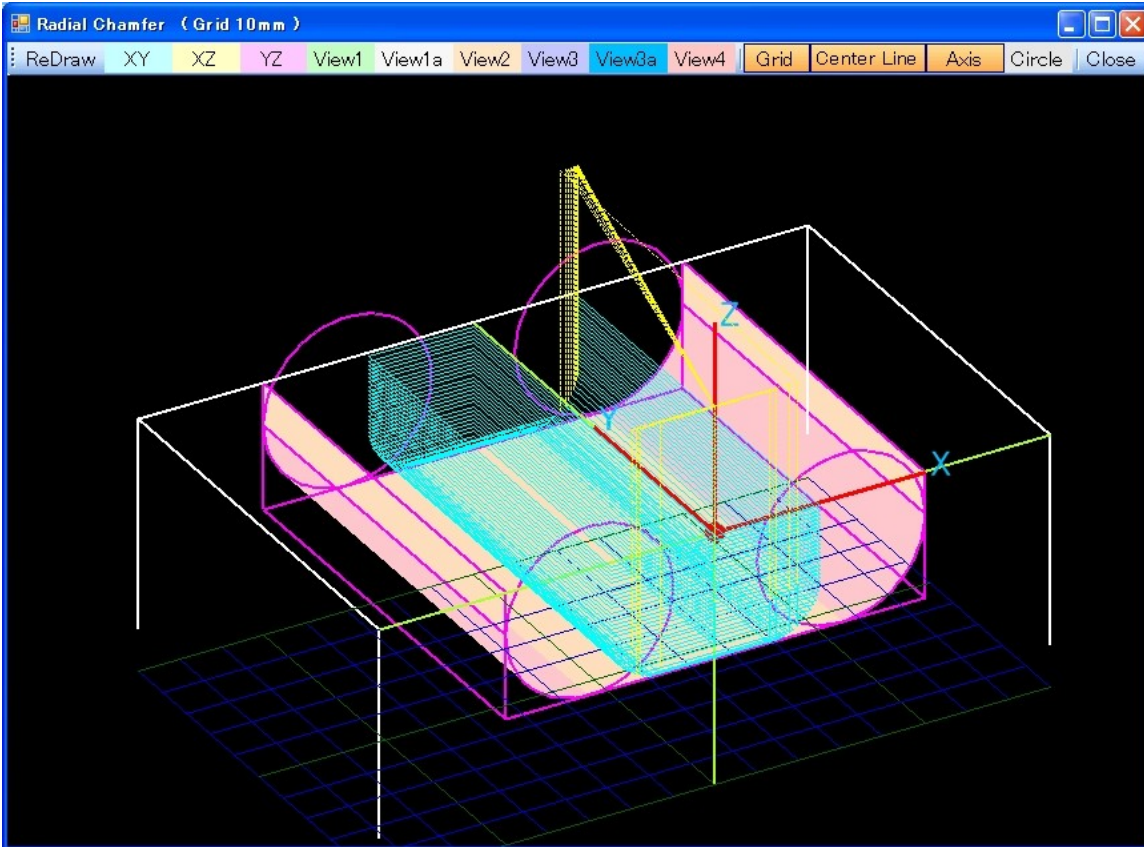
The following shows by "NC DISPLAY" button. This figure is shown in "the XZ plane".



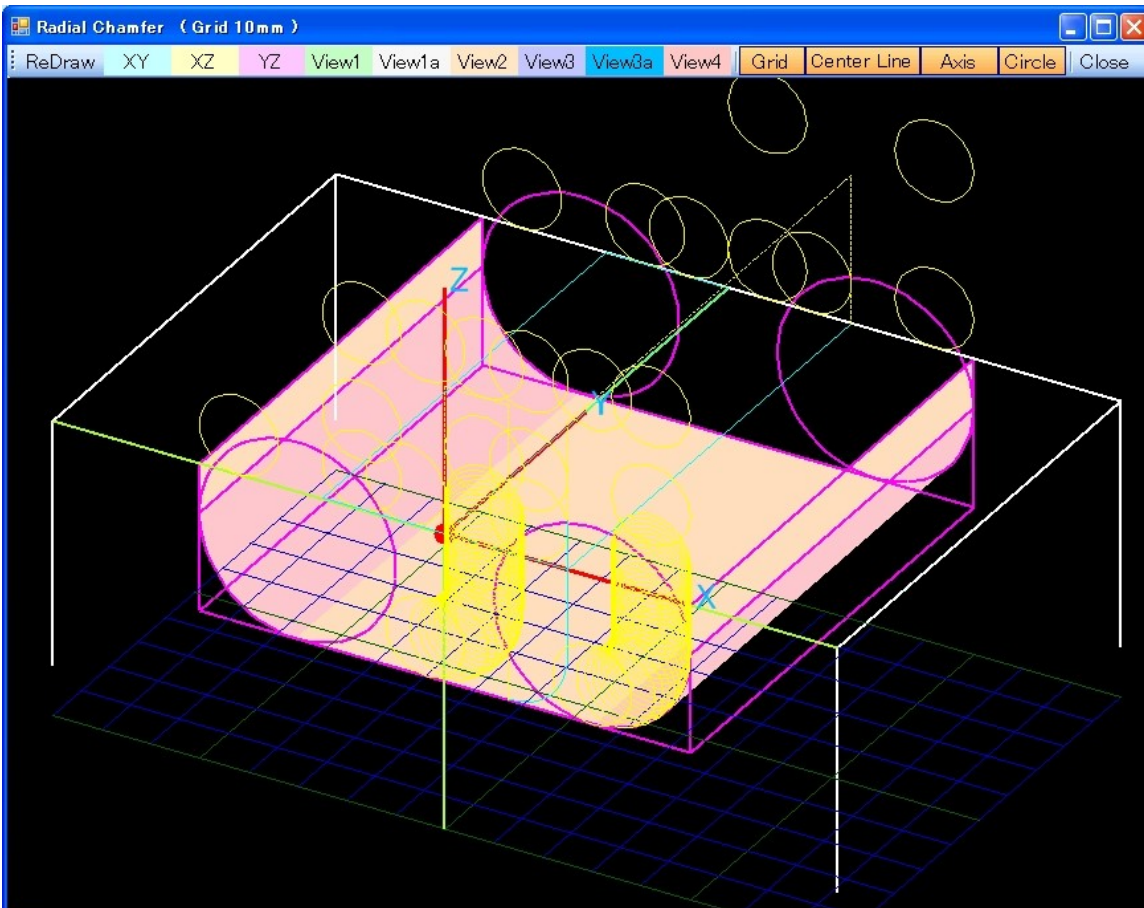
Following figure is shown in "VIEW1".



Following figure is shown in "VIEW1" and "Circle" is off.



The following figure is displaying a "Check File". You can understand a width of cuts and a shape. It moves the last shape after moving a width of cuts in Z0.



# [ R Calculate ]

Inside R, Both Inside R, Length Calculation.

Answer is Copiable.

Answer (Both Inside R)

Answer (Inside R)

R

Inside R

Both Inside R

Input Inside R or Both Inside R.  
If Both is filled, Use Inside R.

CLEAR

CALCULATE

CANCEL

"Inside R", "Both Inside R" of this software needs to put a distance to the tangent Radius. But depending on the drawing, it is written a actual size to cut. This software converts the data.

Inside R, Both Inside R, Length Calculation.

Answer is Copiable.

Answer (Both Inside R) 208.0385

Answer (Inside R) 104.0192

R 30

15

Inside R 100

Both Inside R

Input Inside R or Both Inside R.  
If Both is filled, Use Inside R.

CLEAR

CALCULATE

CANCEL

Input "Inside R" or "Both Inside R" and a depth and a corner R, and pushing the "CALCULATE" button, the distance to the tangential line is converted.

Answer is copiable.

Answer can copy and paste to the [ INSIDE R ] or [ BOTH IN R] software.

The R Calculate can open even if the other software is open.

The above