

ZW3D

## ZW3D 2021

Extended Functions, Friendlier Interaction



# ZW3D 2021 Highlights



## Better Interaction

1

★ New **Command Search**

★ New **Map Key**

★★ Updated **Translator**

★★★ **CSYS** and **Datum Axis**

## Extended CAD Functions

2

★★★ Enhanced **Sketch Design** with lots of new features

★★★ Optimized **Modeling and Assembly**

★★ Improvements of **Sheet Metal and Drafting**

★ New **ECAD**

## Optimized CAM Capability

3

★★ New **Customizable Turning Stock**

★★★ Upgraded **Full Machine Simulation**

★★★ New **Excel Format for Operation List**

★ New **Arc Fitting**



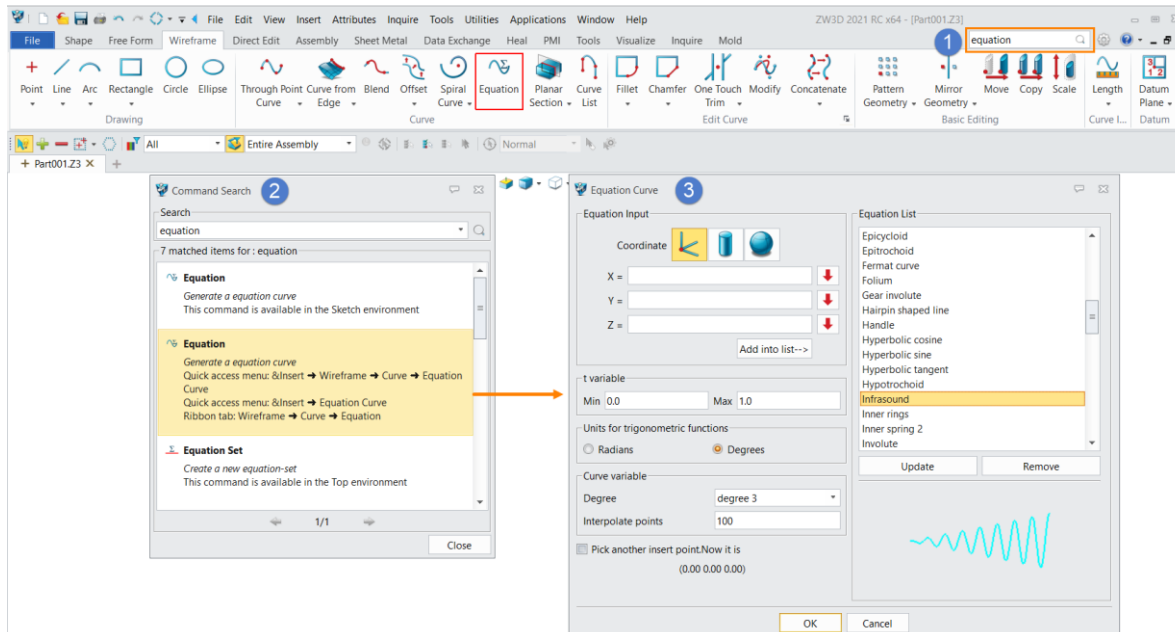
Better Interaction

# Workflow Interaction



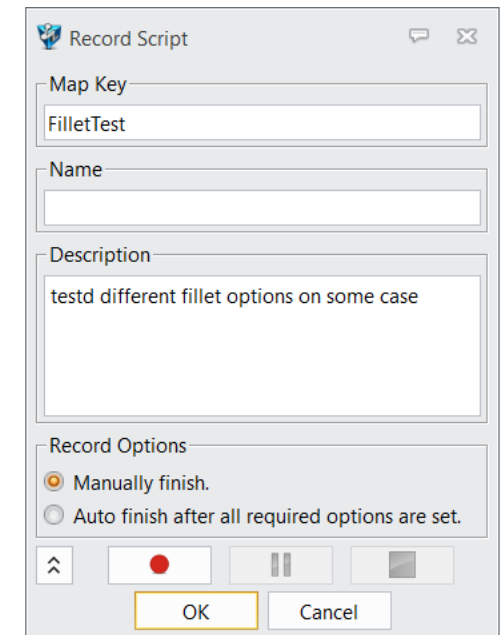
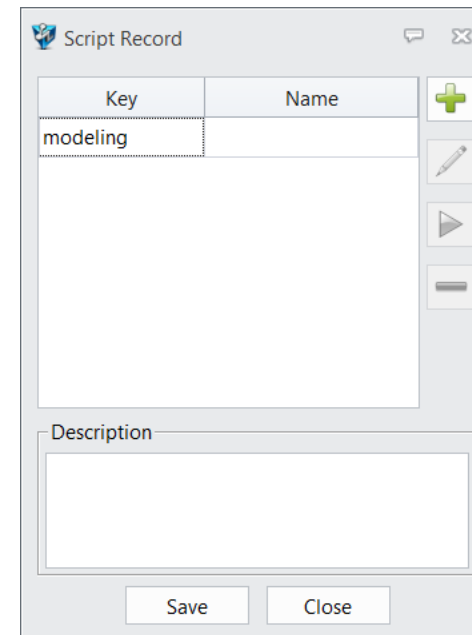
## New Command Search

- Quickly access to the needed commands, especially useful for unfamiliar functions



## New Map Key

- Record a group of commands as a script
- Save the script as a Map Key and apply it to simple or repetitive tasks



# Updated Translator-1



## Update Supported Version

| Import Format  | Suffix   | Supported Version                         |
|----------------|--|---|
| Catia® V4      | .model, .exp, .session                           | 4.1.9 – 4.2.4                             |
| Catia® V5/V6   | .CATPart, .CATProduct, .CATDrawing, .CGR, .3DXML | V5R8--- <b>V5/V6R2020</b>                 |
| NX® (UG®)      | .prt   | 11– <b>NX 1899</b>                        |
| Creo® (Pro/E®) | .prt, .prt*, .asm, .asm.*                        | 16 – <b>Creo 6.0</b>                      |
| SolidWorks®    | .sldprt, .sldasm                                 | 98– <b>2020</b> (Only 64 bit supported)   |
| SolidWorks_2D® | .slddrw  | 2013– <b>2020</b> (Only 64 bit supported) |
| SolidEdge®     | .par, .asm, .psm                                 | V18 – <b>SE2020</b>                       |
| Inventor®      | .ipt, .iam                                       | V6 – <b>V2020</b>                         |
| ACIS®          | .sat, .sab, .asat, .asab                         | R1 – <b>2020 1.0</b>                      |
| DWG            | .dwg   | R11 - 2013                                |
| DXF            | .dxf   | R11 - 2013                                |
| IGES           | .ige, .iges                                      |   |
| STEP           | .stp, .step, .stpz                               | 203, 214, <b>242</b>                      |
| Parasolid®     | .x_t, .x_b, .xmt_txt, .xmt_bin                   | Up to 30.0                                |
| 3DXML          | .3dxml   | 4.0 - 4.3                                 |
| XCGM           | .x cgm   | R2012- <b>2020 1.0</b>                    |
| JT             | .jt  | 6.4-10.4                                  |
| OBJ            | .obj   |   |

## Support Attributes Conversion

- Read the part attributes of imported files, such as hidden components and material

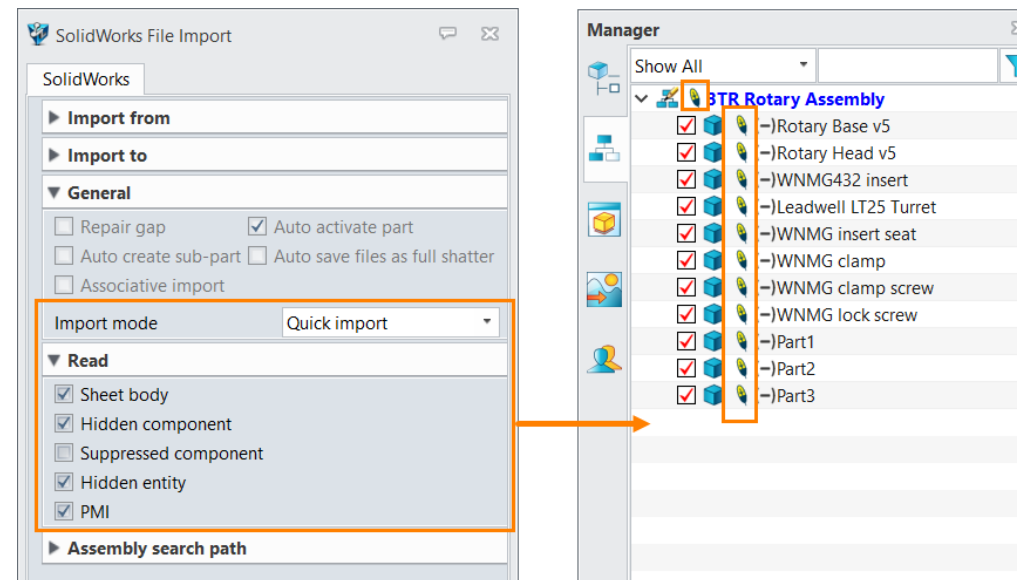
| Format      | Hidden Components | Suppressed Components | Hidden Entities | User Custom Attributes | Material Density |
|-------------|-------------------|-----------------------|-----------------|------------------------|------------------|
| NX®         | X                 | √                     | √               | √                      | √                |
| Creo®       | X                 | √                     | X               | √                      | √                |
| SolidWorks® | √                 | √                     | √               | √                      | √                |
| CatiaV5®    | √                 | √                     | √               | √                      | √                |
| Inventor®   | X                 | X                     | X               | √                      | √                |
| Solid Edge® | X                 | X                     | √               | √                      | √                |

# Updated Translator-2



## Adjustments of Quick Import

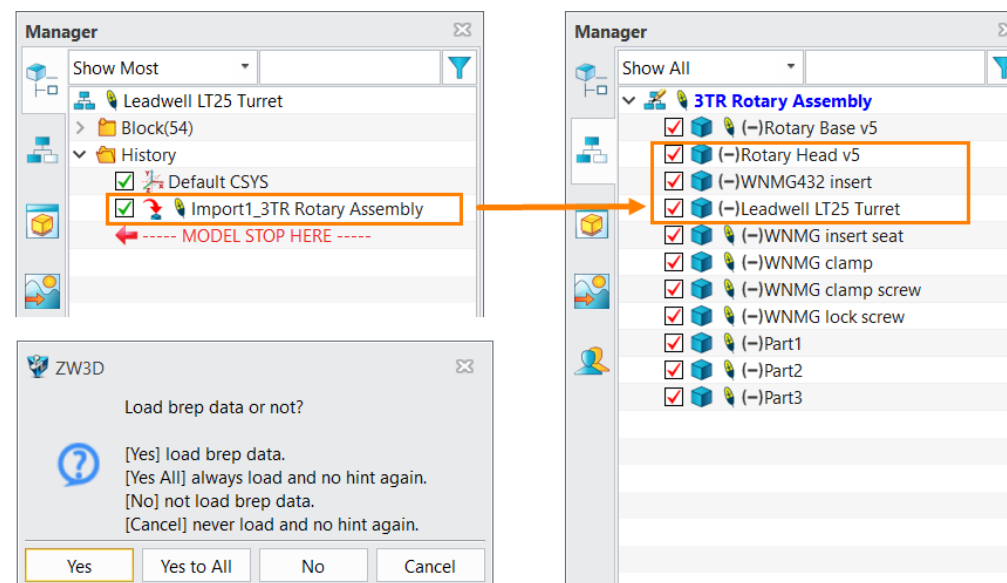
- Cancel the limitation of Quick Import
- Create an import feature node in history manager
- Load and edit the model data after Quick Import



1. Quick Import to get the display data

## Improvements of DWG/DXF

- New "Explode hatch as single line" option for export
- New "Placement" option for import



2. Loaded model data for editing



# CSYS and Datum Axis

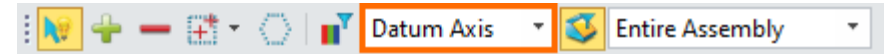


## CSYS

- Enable multiple local coordinate systems (LCS)
- Create a complete Cartesian coordinate system, including three axes and three planes

## Datum Axis

- Facilitate sketch design, modeling, PMI dimensions and assembly constraints
- Enhance design friendliness





# Extended CAD Functions



# Enhanced Sketch Design



## Built-in Offset Constraint

Offset constraint will be automatically created when offsetting curves, to get a well-defined sketch



## New Equal Curvature Constraint

Enable curves and surfaces of higher quality



## New Cosmetic Sketch

Cosmetic Sketch can be used as symbols and shape marks



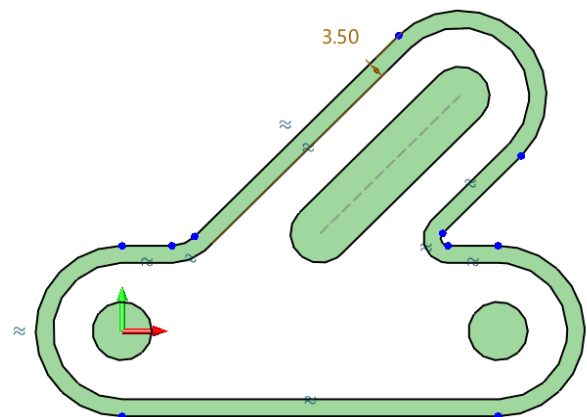
## Tinted Close Sketch

The closed area in the sketch will be tinted for better visual identification

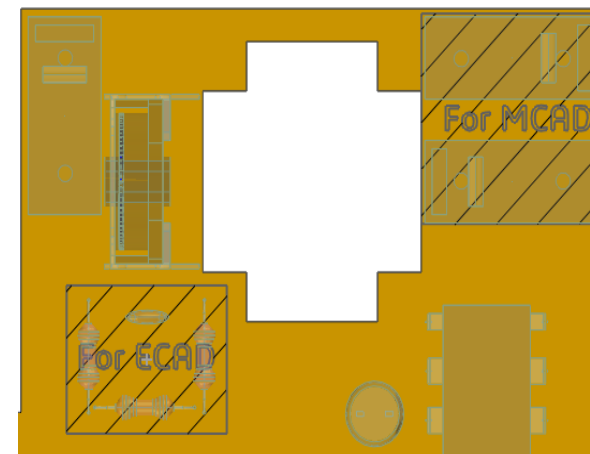


## Relocate Sketch in the Sketch Level

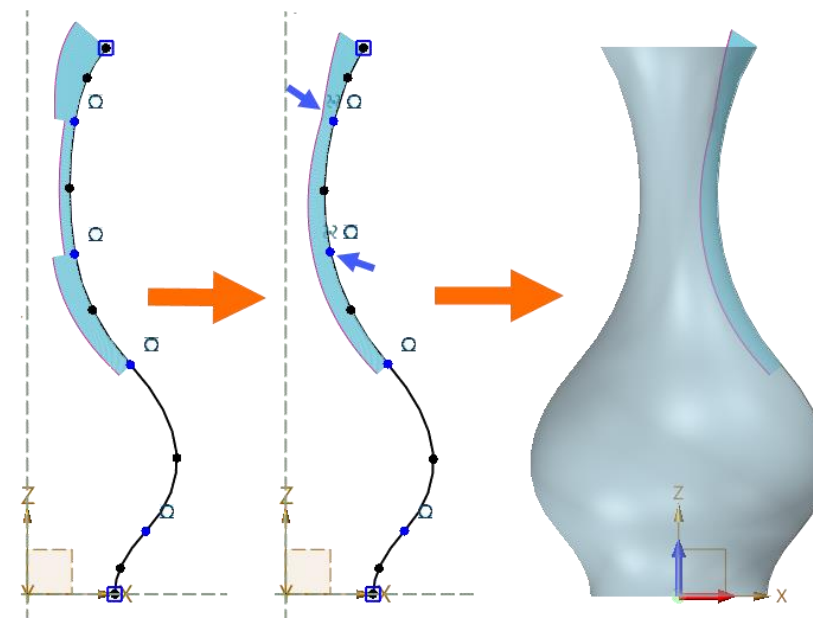
Directly relocate the sketch in the Sketch environment



Tinted closed area with offset constraint



Cosmetic Sketch



Equal Curvature Constraint

# Optimized Modeling



## New Cross Trim

Trim multiple surfaces and sew them at the same time



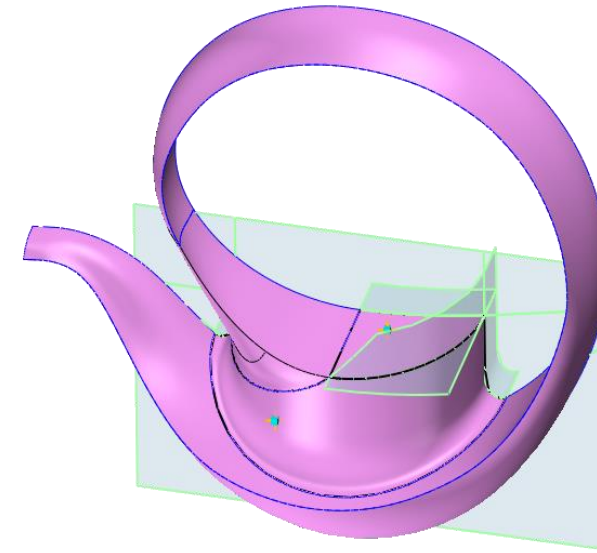
## New G2 Blend Option

Get a higher-quality fillet or blend face in surface modeling

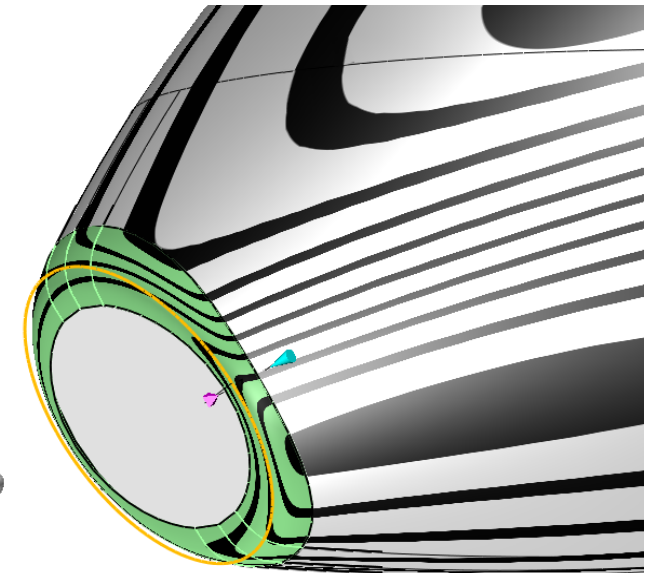
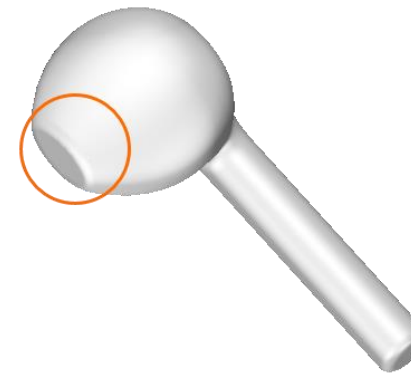


## Higher Modeling Accuracy

Provide a higher tolerance for more precise modeling



Cross Trim

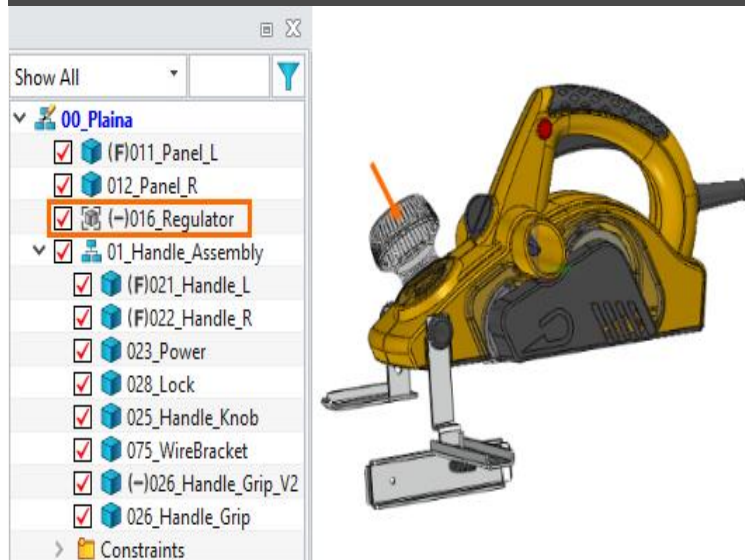


G2 Blend

# Optimized Assembly

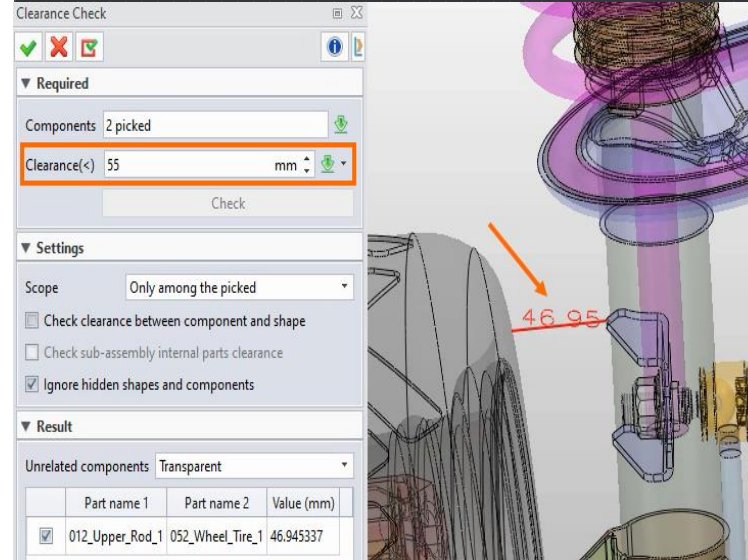


## Include Unplaced Component



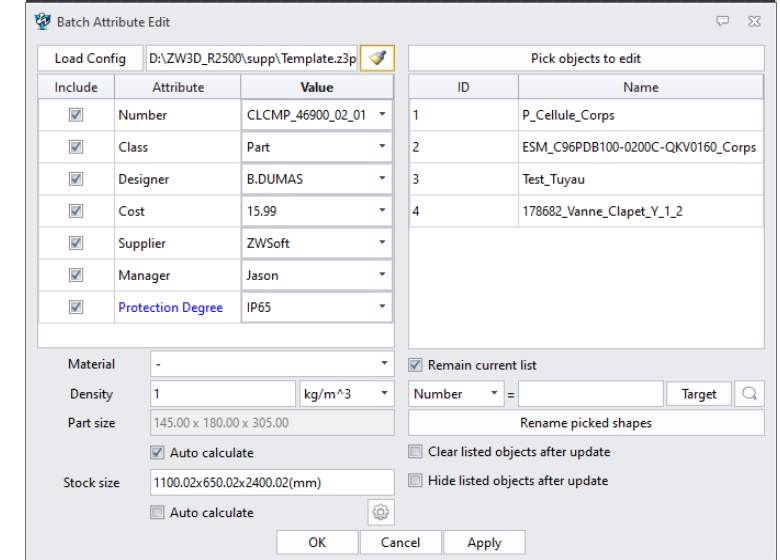
- Insert the virtual components without loading
- Decide whether to list them in BOM or not

## New Clearance Check



- Check the clearance to guarantee the safe distance

## Batch Attribute Edit



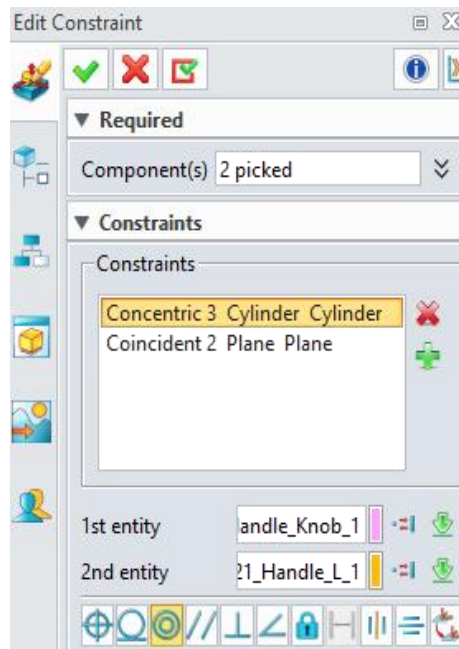
- Add specific attributes to multiple components at the same time

# Optimized Assembly



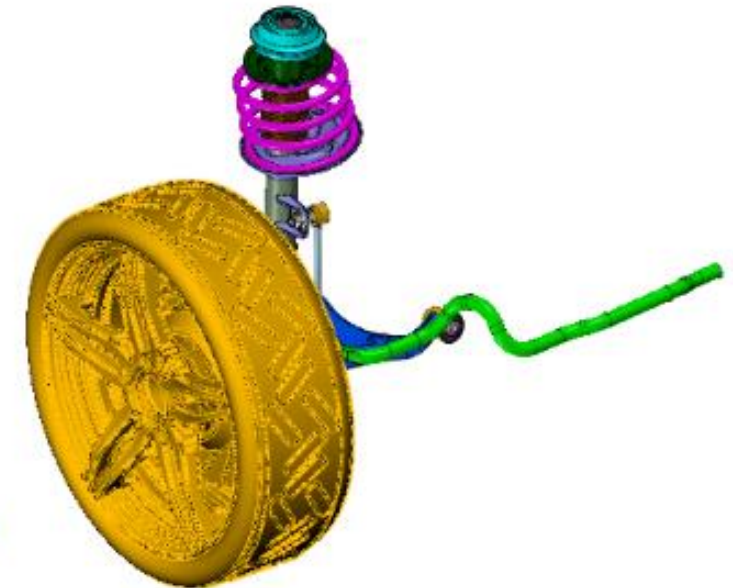
## Enhanced Edit Constraint

- Edit constraints on more than one component



## Group/Dissolve Sub-assembly

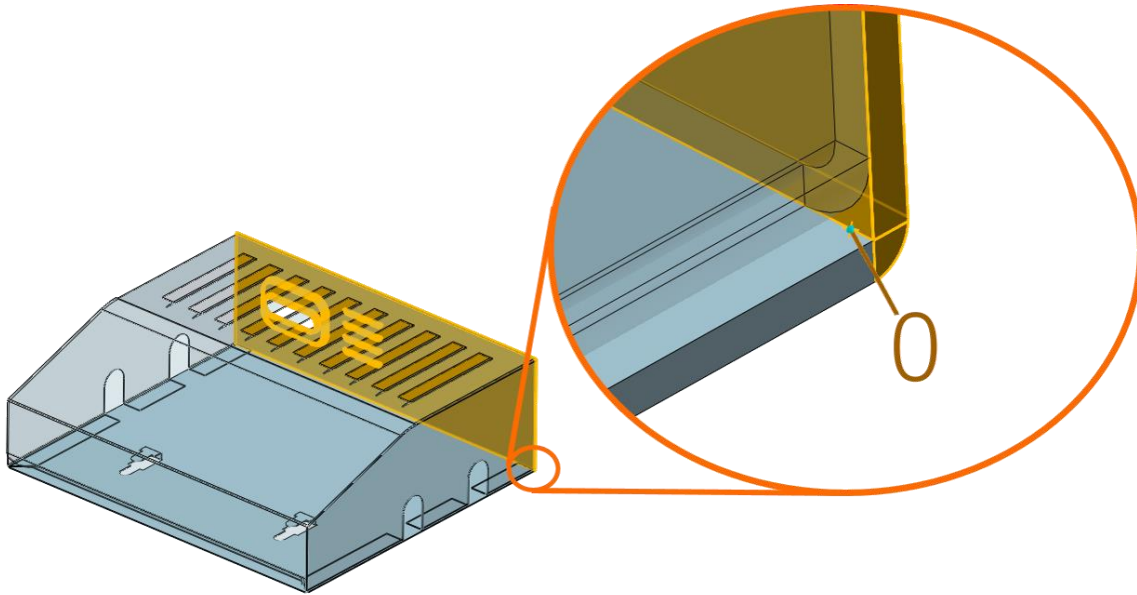
- Group parts as a sub-assembly or dissolve a sub-assembly in parts





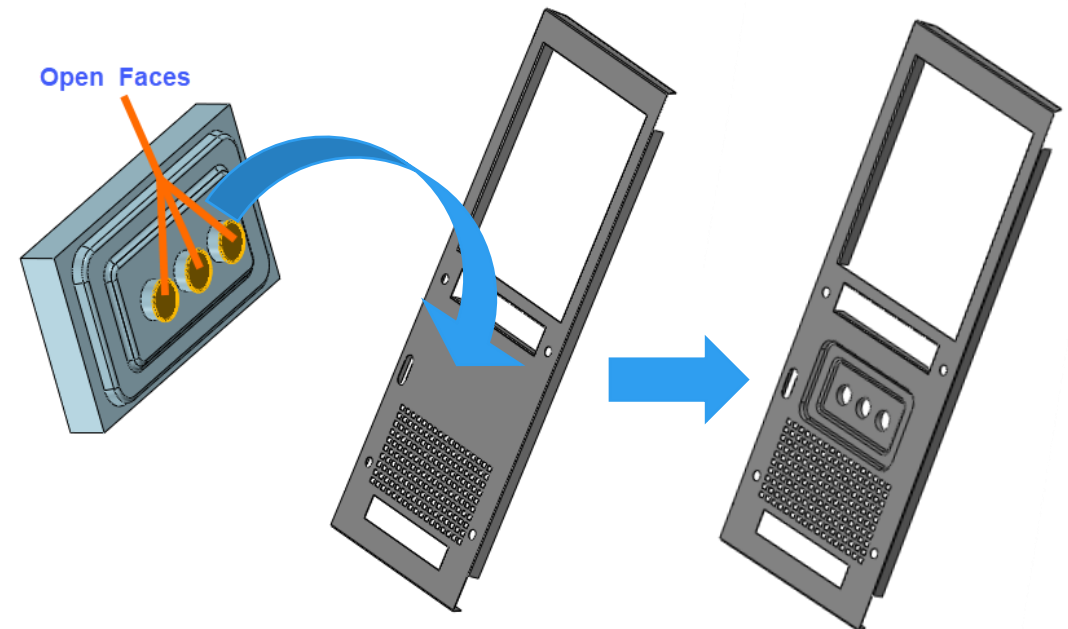
## Support Zero Radius Flange

- The radius of flanges can be zero to satisfy specific needs for some industries.



## Upgraded Punch

- Fillets and open faces are available in punch.
- The punch shape can be imported from an external z3prt file.



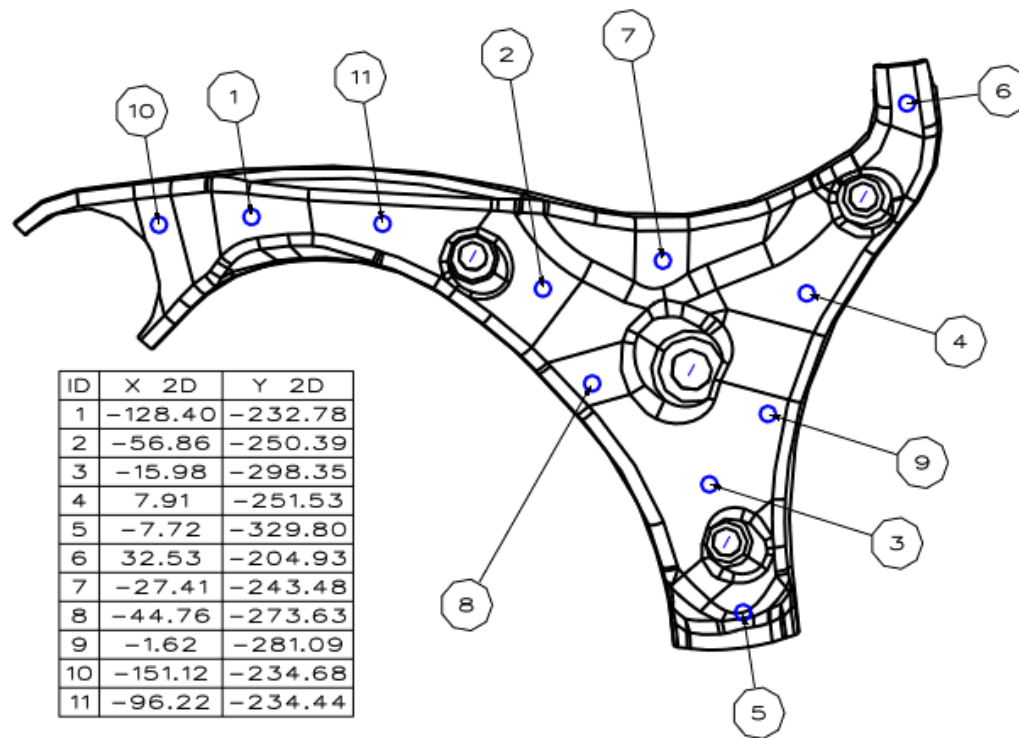


# Improvements of Drafting



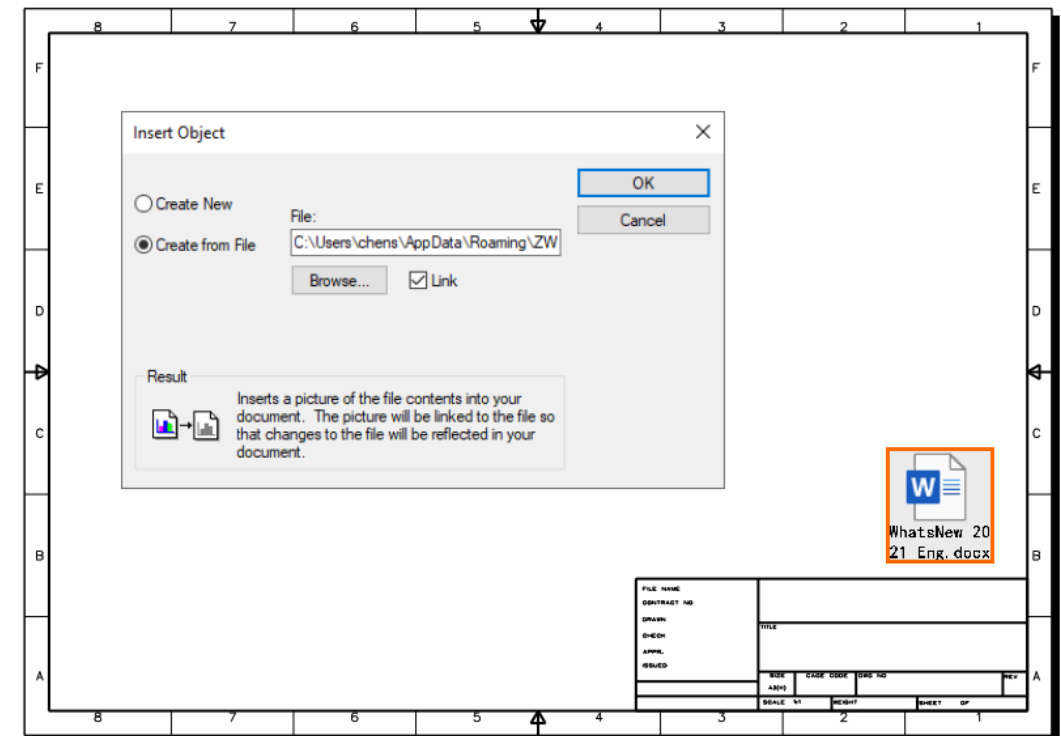
## New Point Table and Dimension Table

- Output point table and dimension table for inspection by measuring instruments.



## New Insert OLE Object

- Insert external file objects of all formats
- Keep the links of the inserted files



# New ECAD Module

## New ECAD for electronic circuit layout



### New ECAD Object

Independent environment for ECAD



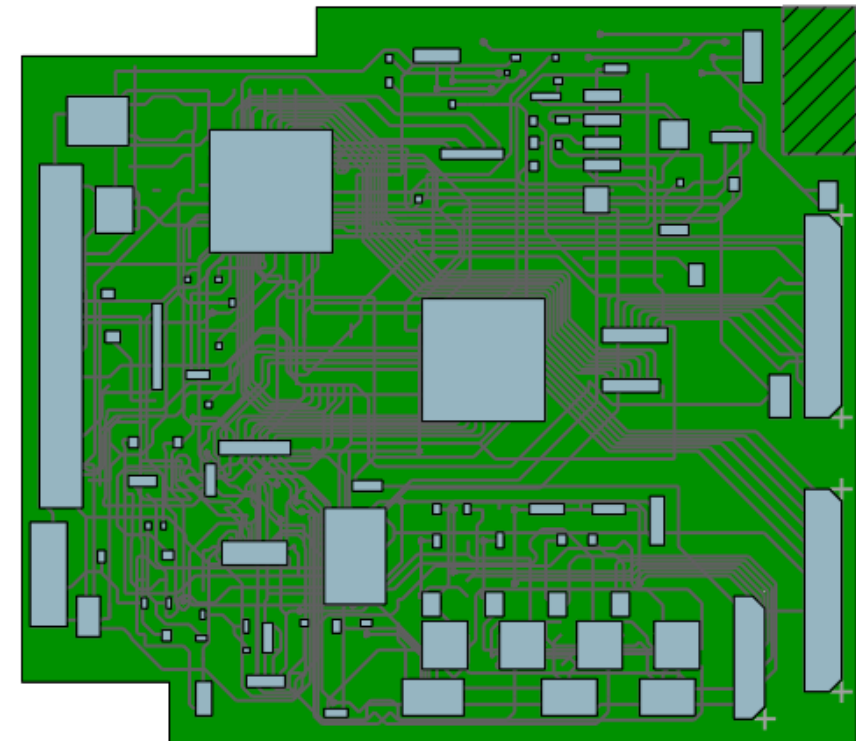
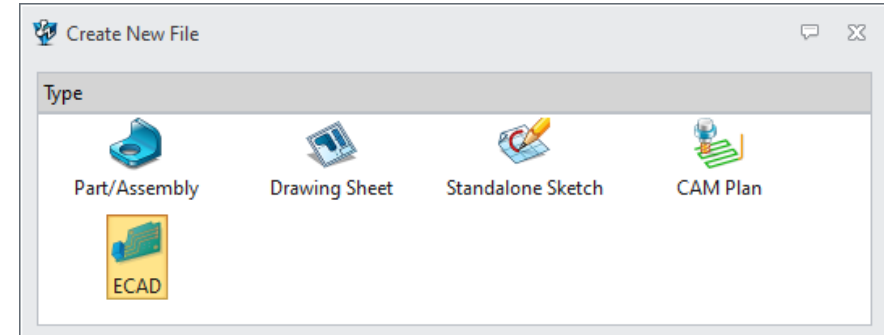
### Set Region

Set different regions for different usage like Routing, Placement, Via, etc.



### Translator for IDF Format

Import and export IDF format with attributes of regions







# Optimized CAM Capability



## Optimized CAM Capability

### Turning

New Customizable Stock  
More Types of Cutter  
Optional Grooving Direction

### Verification

Improved Toolpath Verify  
Improved Solid Verify  
Improved Full Machine Simulation

### Output

Improved Operation List and Post Editor

### Platform

New Arc Fitting and Updated Tool manager



# Turning - New Customizable Stock

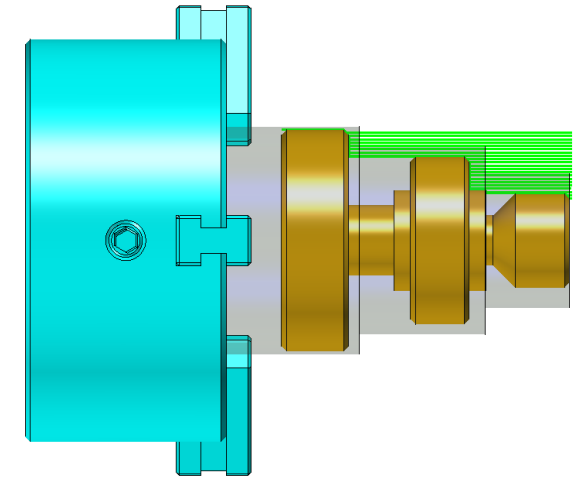


## Remove Redundant Toolpaths

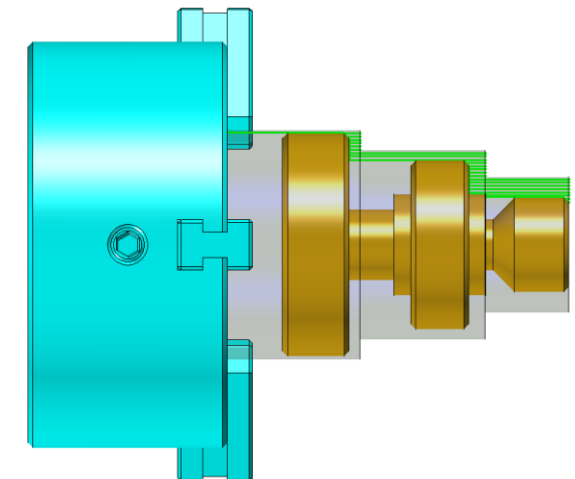
- Save toolpaths to increase machining efficiency

## Stock Customization

- Support setting the profile of stock type as the machining feature
- Support specifying a customized part as a stock



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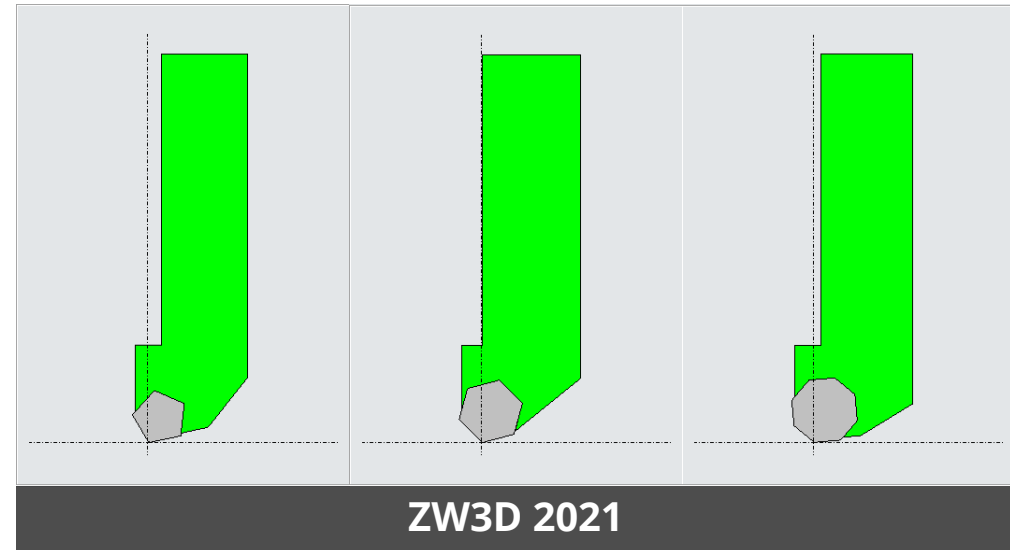
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# Turning - New Polygon Tools



## More Types of Cutting Tools

- Pentagon, hexagon and octagon cutting tools can be used.

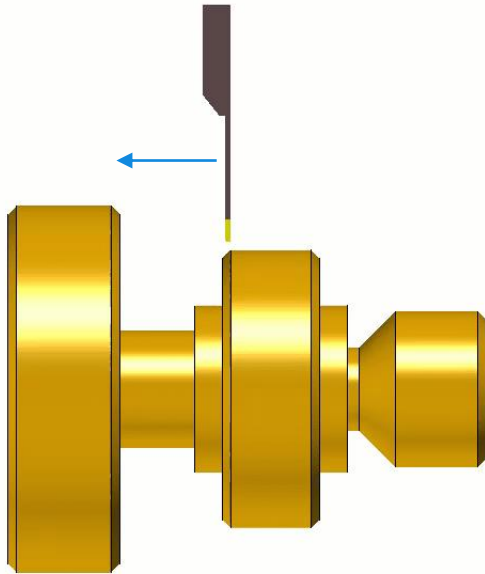


# Turning - Flexible Cutting Direction in Grooving

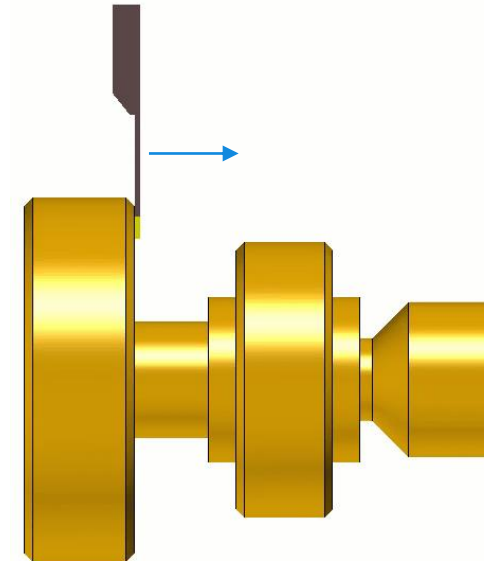


## Groove from Left to Right

- Except from right to left, now grooving from left to right is also supported, satisfying different machining needs.



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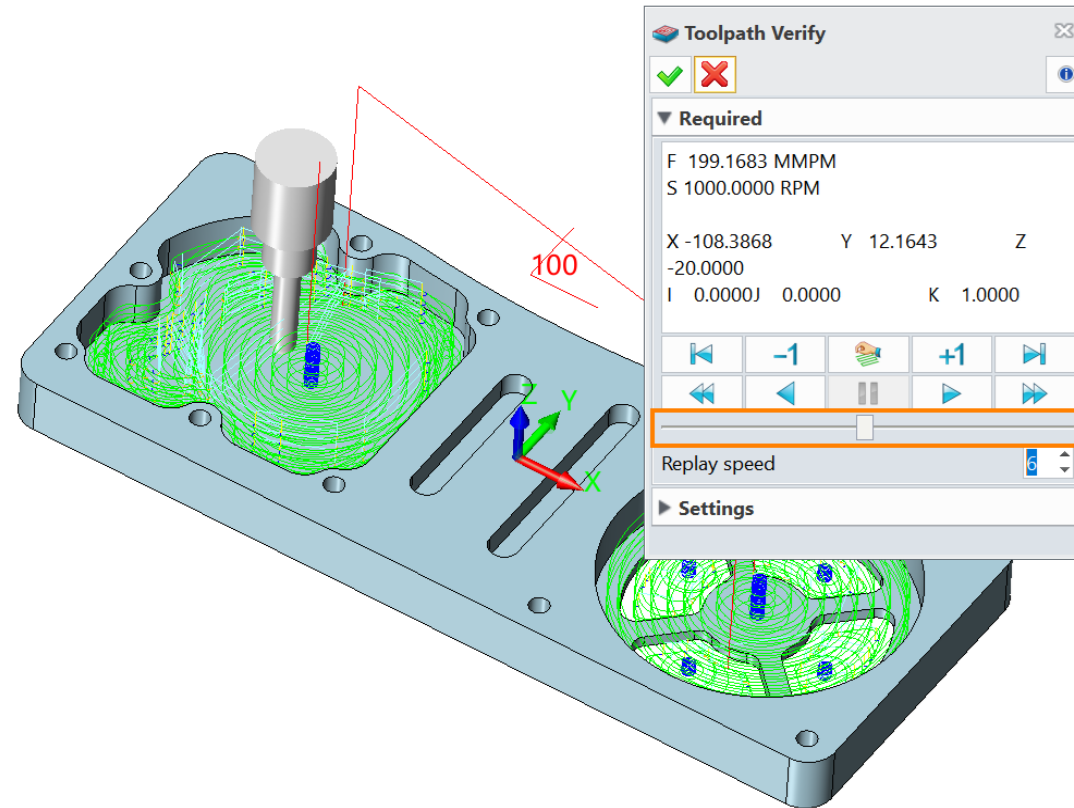
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# Verify - New Progress Bar for Toolpath Verify



## Progress Bar for Toolpath Verify

- Drag the progress bar to verify the toolpaths more flexibly

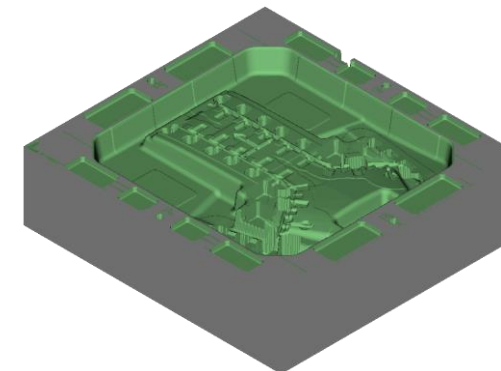
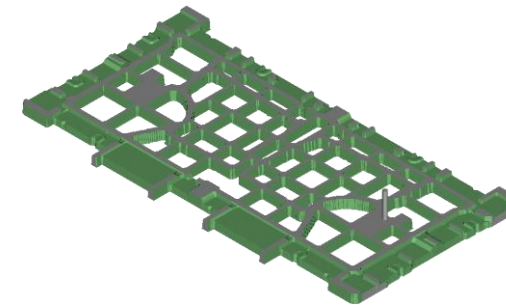
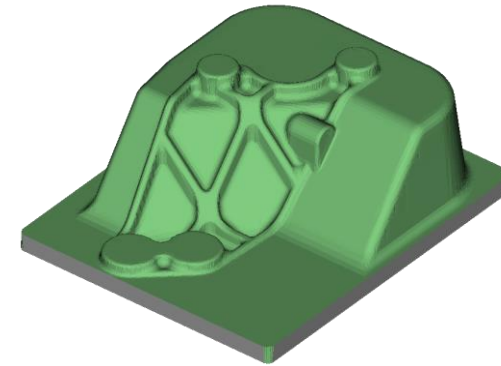


# Verify - More Efficient Solid Verify

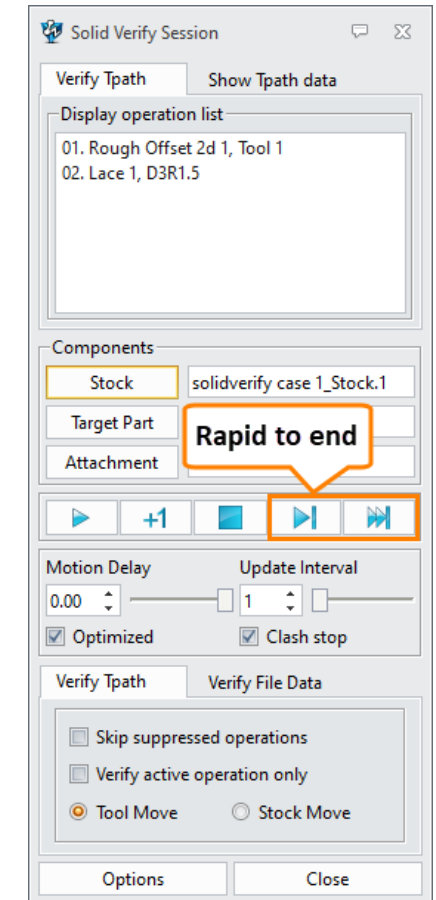


## Quicker Solid Verify

- Accelerate “Rapid to end” for solid verify, to get results in seconds
- Check gouge and allowance



| Time<br>Cases | Software | ZW3D 2020 | ZW3D 2021 | Other<br>Software |
|---------------|----------|-----------|-----------|-------------------|
| Case 1        |          | 00:00:26  | 00:00:02  | 00:01:48          |
| Case 2        |          | 00:14:36  | 00:00:02  | 00:03:01          |
| Case 3        |          | 00:00:19  | 00:00:04  | 00:09:19          |





# Verify - Upgraded Full Machine Simulation



## New Machine Builder

Support importing and customizing external machine



## New CNC Controller

Specify the controller for simulation



## Support RTCP

Simulate the machines with RTCP



## New Machine Register

Set the Work Coordinate System  
Define the Tool Compensation



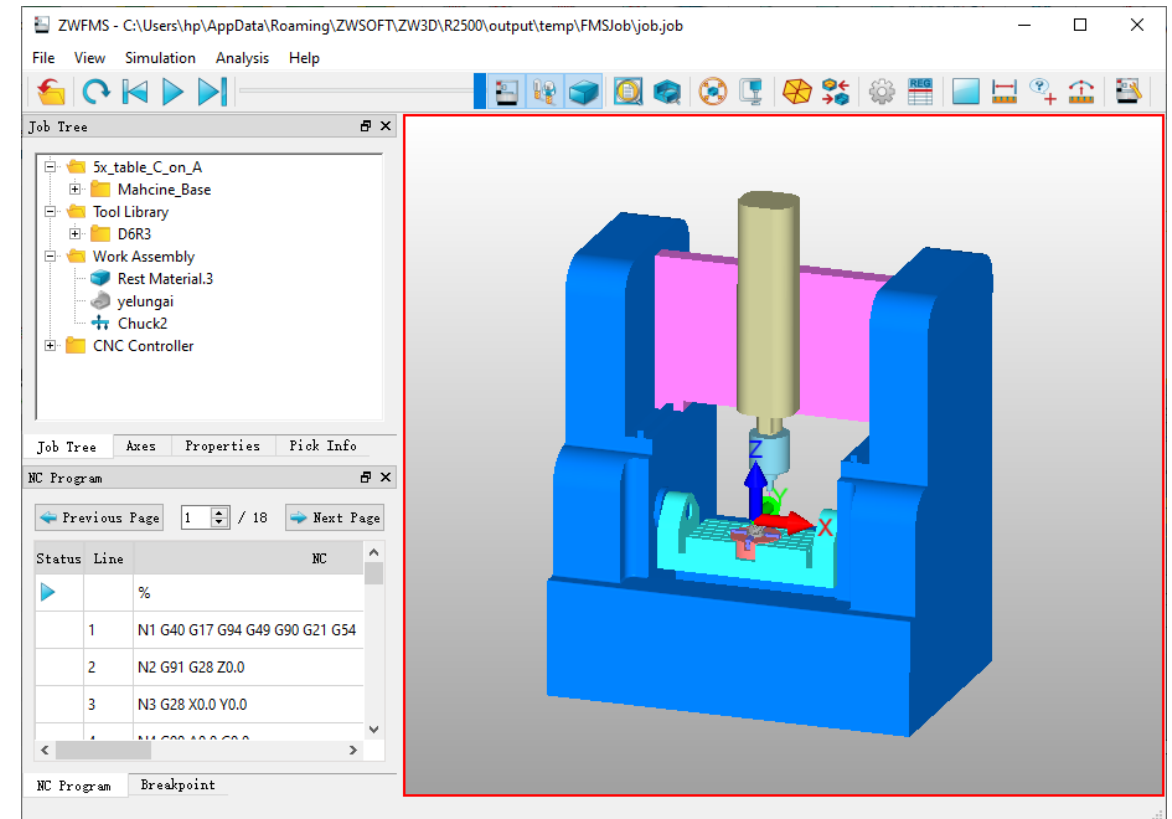
## Enhanced NC Code

Import NC code from external files  
Display NC code during simulation



## Misc.

New measuring tools  
New control bar for simulation speed



# Output - New Excel Format in Operation List



## Coordinate Visibility

- Show/hide coordinates
- Output operation list with specific coordinate

## Output Operation List to Excel

- Customizable excel template
- Improved output efficiency

| ZWSOFT                                    |              |                   |                 |                   |   |      |           |        |            |                         |               |             |                |          | CNC                 |         |                |         |  |
|---|--------------|-------------------|-----------------|-------------------|---|------|-----------|--------|------------|-------------------------|---------------|-------------|----------------|----------|---------------------|---------|----------------|---------|--|
| Ref. #:                                   |              |                   |                 |                   |   |      |           |        |            |                         |               |             |                |          | Operation List      |         |                |         |  |
| Sender: Machined Part: Judo               |              |                   |                 |                   | Ref. #:                                   |      |           |        |            | Programmer: Judo        |               |             |                |          | Date: 2020/05/29    |         |                |         |  |
| Material: Aluminum cast                   |              |                   |                 |                   | Checked by:                               |      |           |        |            | TIME: 4:06:27           |               |             |                |          |                     |         |                |         |  |
| Quantity:                                 |              |                   |                 |                   | Estimated Machining Time: 164 46MIN 52SEC |      |           |        |            | Required Finished Date: |               |             |                |          |                     |         |                |         |  |
| Archived Path: C:\Users\jg\Documents\ZW3D |              |                   |                 |                   |   |      |           |        |            |                         |               |             |                |          |                     |         |                |         |  |
| Serial #                                  | Program Name | Operation Name    | Tool Parameters |                   |   | Feed | Thickness |        | Step Value |                         | Tool Diameter | Tool Length |                |          | Tool Path Attribute |         |                | Comment |  |
|   |              |                   | Tool #          | Name              | Speed(RPM)                                |      | Side      | Bottom | XY         | Z                       |               | Flute       | Min            | Overhang | Z max               | Z min   | Time           |         |  |
| 1   | NC           | Top Facing 1      | T 1 H1          | D25R0.8           | 2000                                      | 1600 | 0         | 0      | 15         | 6                       | 25            | 100         | unavailable    | 187.5    | 88.9                | 88.9    | 19MIN 15SEC    |         |  |
| 2   | NC           | Rough Offset 2d 1 | T 1 H1          | D25R0.8           | 2000                                      | 1600 | 0.3       | 0.2    | 11.25      | 0.5                     | 25            | 100         | Not calculated | 187.5    | 88.9294             | 88.9473 | 3H 36MIN 40SEC |         |  |
| 3   | NC           | Rough Offset 2d 2 | T 1 H6          | 6 mm Flat Endmill | 2200                                      | 1200 | 0.3       | 0.2    | 2.7        | 0.5                     | 6             | 24          | Not calculated | 45       | 79.4313             | 41.5844 | 43MIN 24SEC    |         |  |
| 4   | NC           | Flat Finish 1     | T 1 H1          | D25R0.8           | 2000                                      | 1600 | 0.1       | 0.1    | 11.25      | 0                       | 25            | 100         | Not calculated | 187.5    | 89                  | 86.9111 | 19MIN 18SEC    |         |  |
| 5   | NC           | Angle Limiting 1  | T 5 H5          | 6 mm Ball Endmill | 1500                                      | 2000 | 0.1       | 0.1    | 0.48999    | 0.01                    | 6             | 24          | Not calculated | 45       | 89                  | 41.425  | 1H 14MIN 24SEC |         |  |
| 6   | NC           | Flat Finish 2     | T 1 H1          | D25R0.8           | 2000                                      | 1600 | 0         | 0      | 11.25      | 0                       | 25            | 100         | Not calculated | 187.5    | 88.9                | 86.2911 | 3H45 28EC      |         |  |
| 7   | NC           | Angle Limiting 2  | T 5 H5          | 6 mm Ball Endmill | 1500                                      | 2000 | 0         | 0      | 0.48999    | 0.01                    | 6             | 24          | Not calculated | 45       | 88.9                | 41.325  | 1H 14MIN 34SEC |         |  |
| 8   | NC           | Corner Finish 1   | T 1 H1          | 1 mm Ball Endmill | 1500                                      | 2200 | 0         | 0      | 0.3995     | 0.01                    | 4             | 18          | Not calculated | 30       | 76.1396             | 41.325  | 19MIN 25SEC    |         |  |

Block Size: Length 386.087 Width 177.805 Height 88.9

Z Min 41.325 Z Max 89

327.837 mm

327.837 mm

327.837 mm

475.973 mm

|                              |  |                     |  |                       |  |                     |  |                        |  |                |  |                       |  |
|------------------------------|--|---------------------|--|-----------------------|--|---------------------|--|------------------------|--|----------------|--|-----------------------|--|
| Completed Size               |  | Verified Result     |  | Signed by Programmer: |  | Signed by Operator: |  | Signed by Team Leader: |  | Delivered to:  |  | Date:                 |  |
| Operation List Received/Date |  | Stock Received/Date |  | Machine #             |  | Machine #           |  | Started Date           |  | Completed Date |  | Actual Machining Time |  |

# Output - Enhanced Post Editor



## Post Editor in ZW3D without Switching Interface

- Post Editor can be activated as an independent editor in ZW3D
- No need of web browsers with IE kernel
- Not occupy any ports

The screenshot shows the ZW3D Post Editor interface. On the left is a sidebar with a list of configuration options: Default Property, Start of Program, Part Number, Block Sequence Number, Comment Block, Define Machine Functions (highlighted), Automatic Tool Change, Define Words Properties, Define 5x Machine, Output Format, Tool length Compensation, Canned Cycles, Other Properties, Reverse Post functions, Output Spindle, Motion Parameters, End of Program, and Edit Macros. The main area is titled 'Define Machine Functions' and contains a table with columns: Funtion, NC-code, Parameter Format, and Modal. The table is divided into sections: Motion Interpolation (Rapid, Liner, Circular CLW, Circular CCLW), Motion Plane (XY plane, ZX plane, YZ plane), and Output unit (Inch, Millimeter). Each row has input fields for the parameter format and a checkbox for the modal setting. At the bottom, there is a 'Submit' button and a 'Close ZW3D Post Editor' button. The version number 'ver2.210.00' is displayed at the bottom left.

| Funtion                     | NC-code | Parameter Format | Modal                               |
|-----------------------------|---------|------------------|-------------------------------------|
| <b>Motion Interpolation</b> |         |                  |                                     |
| Rapid                       | G00     | X,Y,Z,A,B,C      | <input checked="" type="checkbox"/> |
| Liner                       | G01     | X,Y,Z,A,B,C,F    | <input checked="" type="checkbox"/> |
| Circular CLW                | G02     | X,Y,Z,I,J,K,F    | <input checked="" type="checkbox"/> |
| Circular CCLW               | G03     | X,Y,Z,I,J,K,F    | <input checked="" type="checkbox"/> |
| <b>Motion Plane</b>         |         |                  |                                     |
| XY plane                    | G17     |                  | <input checked="" type="checkbox"/> |
| ZX plane                    | G18     |                  | <input checked="" type="checkbox"/> |
| YZ plane                    | G19     |                  | <input checked="" type="checkbox"/> |
| <b>Output unit</b>          |         |                  |                                     |
| Inch                        | G20     |                  | <input checked="" type="checkbox"/> |
| Millimeter                  | G21     |                  | <input checked="" type="checkbox"/> |

ZW3D 2020

The screenshot shows the ZW3D Post Editor interface. On the left is a sidebar with a list of configuration options: Default Property, Start of Program, Part Number, Block Sequence Number, Comment Block, Define Machine Functions (highlighted), Automatic Tool Change, Define Words Properties, Define 5x Machine, Output Format, Tool length Compensation, Canned Cycles, Other Properties, Reverse Post functions, Output Spindle, Motion Parameters, End of Program, and Edit Macros. The main area is titled 'Define Machine Functions' and contains a table with columns: Funtion, NC-code, Parameter Format, and Modal. The table is divided into sections: Motion Interpolation (Rapid, Liner, Circular CLW, Circular CCLW), Motion Plane (XY plane, ZX plane, YZ plane), and Output unit (Inch, Millimeter). Each row has input fields for the parameter format and a checkbox for the modal setting. At the bottom, there is a 'Submit' button and a 'Close ZW3D Post Editor' button. The version number 'ver2.210.00' is displayed at the bottom left.

| Funtion                     | NC-code | Parameter Format | Modal                               |
|-----------------------------|---------|------------------|-------------------------------------|
| <b>Motion Interpolation</b> |         |                  |                                     |
| Rapid                       | G00     | X,Y,Z,A,B,C      | <input checked="" type="checkbox"/> |
| Liner                       | G01     | X,Y,Z,A,B,C,F    | <input checked="" type="checkbox"/> |
| Circular CLW                | G02     | X,Y,Z,I,J,K,F    | <input checked="" type="checkbox"/> |
| Circular CCLW               | G03     | X,Y,Z,I,J,K,F    | <input checked="" type="checkbox"/> |
| <b>Motion Plane</b>         |         |                  |                                     |
| XY plane                    | G17     |                  | <input checked="" type="checkbox"/> |
| ZX plane                    | G18     |                  | <input checked="" type="checkbox"/> |
| YZ plane                    | G19     |                  | <input checked="" type="checkbox"/> |
| <b>Output unit</b>          |         |                  |                                     |
| Inch                        | G20     |                  | <input checked="" type="checkbox"/> |
| Millimeter                  | G21     |                  | <input checked="" type="checkbox"/> |

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# Platform - New Arc Fitting



## Products of Higher Precision

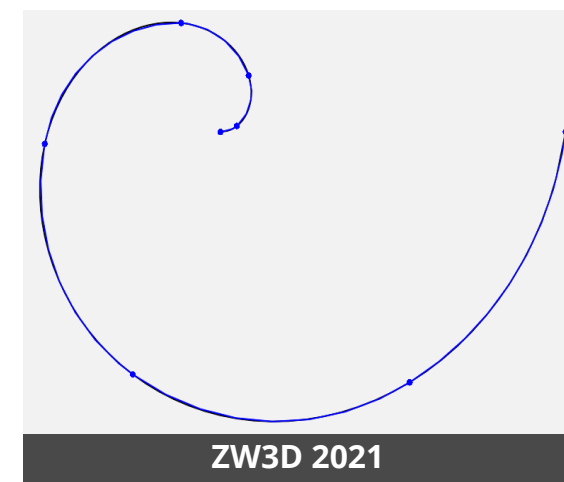
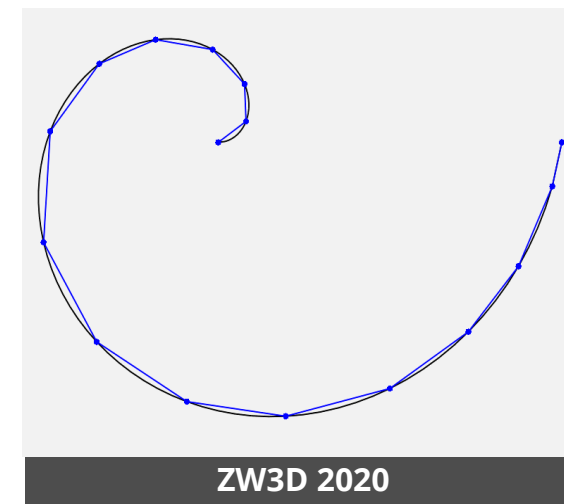
- Arc Fitting helps generate toolpaths of higher precision

## Available in Multiple Operations

- Available in 2X Milling, 5X Milling and Surface Engraving

```
no arc fit.nc - Notepad
File Edit Format View Help
%
Oarc fit
N1 G90 G17 G49 G00
N2 T0 M06
N3 S1000 M03
N4 G05.1 Q1.
N5 G90 G00 X22
N6 G43 Z100. H
N7 Z2.5
N8 G01 Z0 F50.
N9 X234.265 Y6
N10 X234.866 Y
N11 X235.315 Y
N12 X235.76 Y6
N13 X236.12 Y

arc fit.nc - Notepad
File Edit Format View Help
%
Oarc fit
N1 G90 G17 G49 G00
N2 T0 M06
N3 S1000 M03
N4 G05.1 Q1.
N5 G90 G00 X227.771 Y67.74
N6 G43 Z100. H0 M08
N7 Z2.5
N8 G01 Z0 F50.
N9 X234.265 Y68.013 F150.
N10 G17 G03 X241.735 Y73.814 I-.267 J8.055 F250.
N11 X239.819 Y85.144 I-12.576 J3.7
N12 X225.905 Y93.694 I-16.955 J-11.994
N13 X205.126 Y89.164 I-4.504 J-29.26
N14 X188.833 Y66.569 I21.359 J-32.573
N15 X191.972 Y33.002 I46.933 J-12.542
N16 X220.243 Y5.205 I52.499 J25.121
N17 X265.706 Y1.241 I28.277 J61.619
N18 X310.765 Y33.492 I-19.801 J75.268
N19 X324.265 Y68.013 I-71.341 J47.799
N20 G01 X325.355 Y74.421 F750.
N21 G00 Z100.
N22 G05.1 Q0
N23 G91 G28 Z0 M05
N24 G91 G28 X0 Y0 M09
N25 M30
%
```



# Platform - Upgraded Spreadsheet and Tool manager



## Newly-added Items in Spreadsheet

- Stepdown Type and Stepdown value can be set in Spreadsheet.

Spreadsheet Interface - Operation View

| Tolerance | Step Type  | Step Size | Stepdown Type | Stepdown | Surface Thick | Z Surface ... | Speed | Feed | Speeds a |
|-----------|------------|-----------|---------------|----------|---------------|---------------|-------|------|----------|
| 0.01      | % Tool Dia | 60        | Base Only     | 6        |               | 0             | 2000  | 1600 | FEED FOR |
| 0.1       | % Tool Dia | 45.0      | Absolute      | 0.5      | 0.3           | 0.2           | 2000  | 1600 | FEED FOR |
| 0.1       | % Tool Dia | 45.0      | Absolute      | 0.5      | 0.3           | 0.2           | 2200  | 1200 | FEED FOR |
| 0.01      | % Tool Dia | 45        |               |          | 0.1           | 0             | 2000  | 1600 | FEED FOR |
| 0.01      | Scallop    | 0.01      | Scallop       | 0.01     | 0.1           | 0             | 4500  | 2000 | FEED FOR |
| 0.01      | % Tool Dia | 45        |               |          | 0             | 0             | 2000  | 1600 | FEED FOR |
| 0.01      | Scallop    | 0.01      | Scallop       | 0.01     | 0             | 0             | 4500  | 2000 | FEED FOR |
| 0         | Scallop    | 0.01      |               | 0.01     | 0             | 0             | 4500  | 2200 | FEED FOR |

Feature View Reset Values Calculate All Item Config Export Spreadsheet Import Spreadsheet Tactic Interface Cancel Save All

## New Options in Speed & Feed

- Numeric and Rapid options have been added.

Tool

Name  Load SpdFd

Speeds

Units RPM

Speeds 3000.0

Rapid Percent 100.0

Step-over Percent 100.0

Plunge Percent 100.0

Engage Percent 100.0

Retract Percent 100.0

Traversal Percent 100.0

Slotcut Percent 100.0

Slowdown Percent 100.0

Feed rates

Units MM/PM

Feeds 1500.0

Rapid Rapid

Step-over Percent 100.0

Plunge Percent 20.0

Engage Percent 60.0

Retract Percent 300.0

Traversal Percent 100.0

Slotcut Percent 40.0

Slowdown Percent 60.0

OK Apply Reset Save All Cancel



- Better workflow interaction like Command Search and Map Key
- Upgraded translator
- CSYS and Datum Axis



- Enhanced sketch functions like offset and Equal Curvature Constraint
- New Cross Trim command and G2 option in surface modeling
- Optimized assembly



- Zero radius flange and enhanced Punch in sheet metal
- Point table and dimension table in 2D sheet
- New ECAD for electronic design



- New customizable stock, more types of cutter, and more grooving directions in Turning
- Optimized Toolpath Verify, Solid Verify, and Full Machine Simulation



- Improved Operation List and Post Editor
- Upgraded platform



## ZW3D 2021

- Better interaction
- New CAD features to extend design capability
  - Optimized CAM functions to deliver more efficient programming and reliable machining.