



3DEXPERIENCE®

PROGRAMUOK IŠMANIAU - GAMINK SPARČIAU

SOLIDWORKS CAM ir CAMWorks naujenos

 **DASSAULT SYSTEMES** | The **3DEXPERIENCE**® Company

HCL | Digital Manufacturing Company



SOLIDWORKS 2022 | TRUMPAI

SOLIDWORKS 2022 | DETALIAI

SOLIDWORKS CAM & CAMWorks 2022 | DETALIAI

SOLIDWORKS CAM & CAMWorks

WireEDM & NESTINGWorks

ShopFloor & VirtualMachine

3DEXPERIENCE Works | DEVESYS





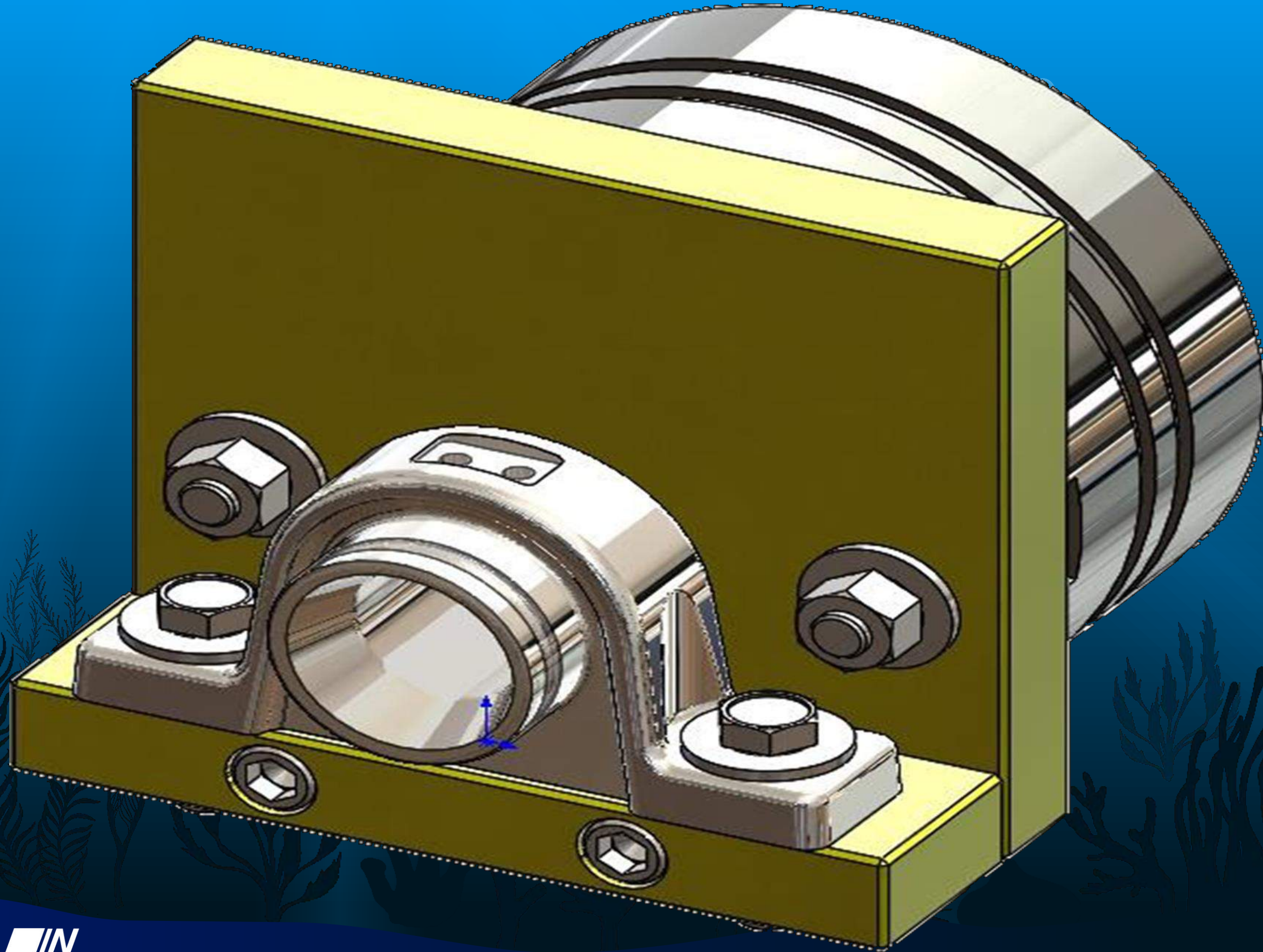
TEKINIMO OPERACIJŲ PROGRAMAVIMAS SURINKIMO KONTEKSTE

ĮRANKIŲ TRAJEKTORIJŲ GRAFINIO ATVAIZDAVIMO NUSTATYMAI

ĮRANKIŲ PAIEŠKA\FILTRAVIMAS TEKSTO PAGALBA



DARBAS SU KELIOMIS TECHNOLOGINĖMIS DUOMENŲ BAZĖMIS



Save Operation Plan | Publish ShopFloor | Tolerance Based Machining | Setup | Step Thru Toolpath | CAMWorks Sync Manager | Post Process | Save CL File | 2.5 Axis Mill Operations | Multi-axis Mill Operations | Multi Surface Feature | 3 Axis Mill Operations | Insert Library Object | Hole Machining Operations | Feature | Turning Operations | Turn Groove Operations | Turn Bore Operations | Wire EDM Operations | Turn Operations

Features | Sketch | Surfaces | Evaluate | MBD Dimensions | SOLIDWORKS Add-Ins | CAMWorks 2021Plus | CAMWorks TBM | CAMWorks Additive Manufacturing

Navigation icons: Home, Back, Forward, Refresh, etc.

Edit Toolpath

✓ ✗

Navigation

Navigation icons: Home, Back, Forward, Refresh, etc.

Display Options

Whole

Start record: 0

Records to display: 7459

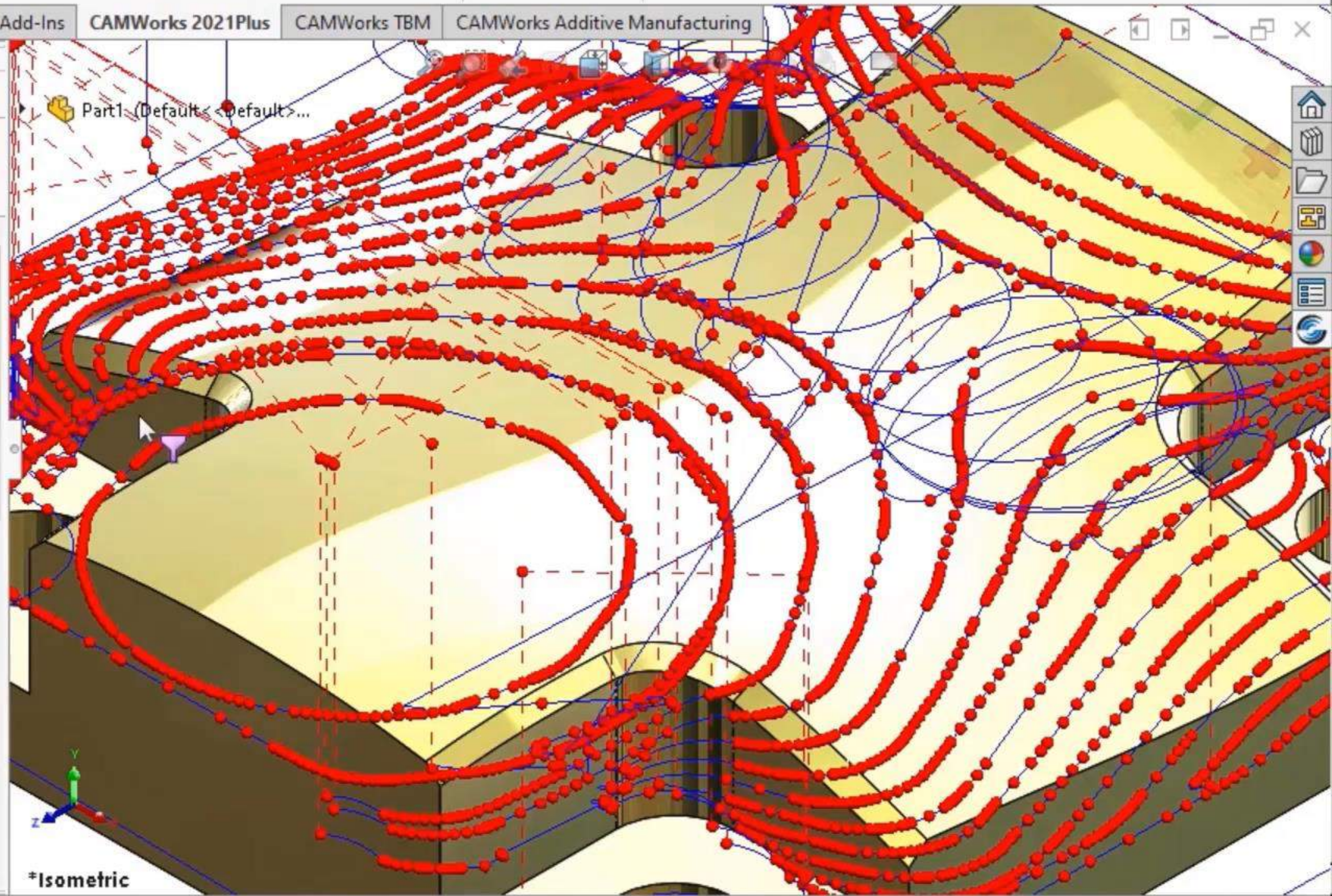
Selection Options

Selection Method: [Icons]

Toolpath

Delete... Edit... Undo

```
GOTO/ -35.768775,-48.671014,25.000000
RAPID/GOTO/ -35.768775,-48.671014,2.500000
FEDRAT/ MMPM,16500.00
GOTO/ -35.768775,-48.671014,-18.669409
FEDRAT/ MMPM,500.00
GOTO/ -35.136501,-47.533258,-19.692774
FEDRAT/ MMPM,200.00
CIRCLE/ -36.043469,-47.029237,-19.692774,0.000000,0.0000
GOTO/ -35.768775,-46.028651,-21.169409
```



Extruded Boss/Base Revolved Boss/Base Swept Boss/Base
 Lofted Boss/Base Boundary Boss/Base

Features Sketch Surfaces Evaluate MBD Dir

CAMWorks NC Manager Machine [Mill - Metric] Tool Crib 2 (Metric)

- T01 - 6 Flat End
- T02 - 10 Flat End
- T03 - 12 Flat End
- T04 - 16 Flat End
- T05 - 20 Flat End
- T06 - 6MM X 60DEG Center Drill
- T07 - 4 Ball Nose
- T08 - 10 Ball Nose
- T09 - 12 Ball Nose
- T10 - 1 Bore
- T11 - 5 X 90 Countersink
- T12 - 50 Face Mill
- T13 - 4 Probe Tool

Tool type: Flat End

Filter by

- Diameter 0mm - 9mm
- End Radius 0mm - 9mm
- Tool material Carbide
- Holder Designation BT-30
- Protrusion Length 0mm - 9mm
- Containing Text 2fl

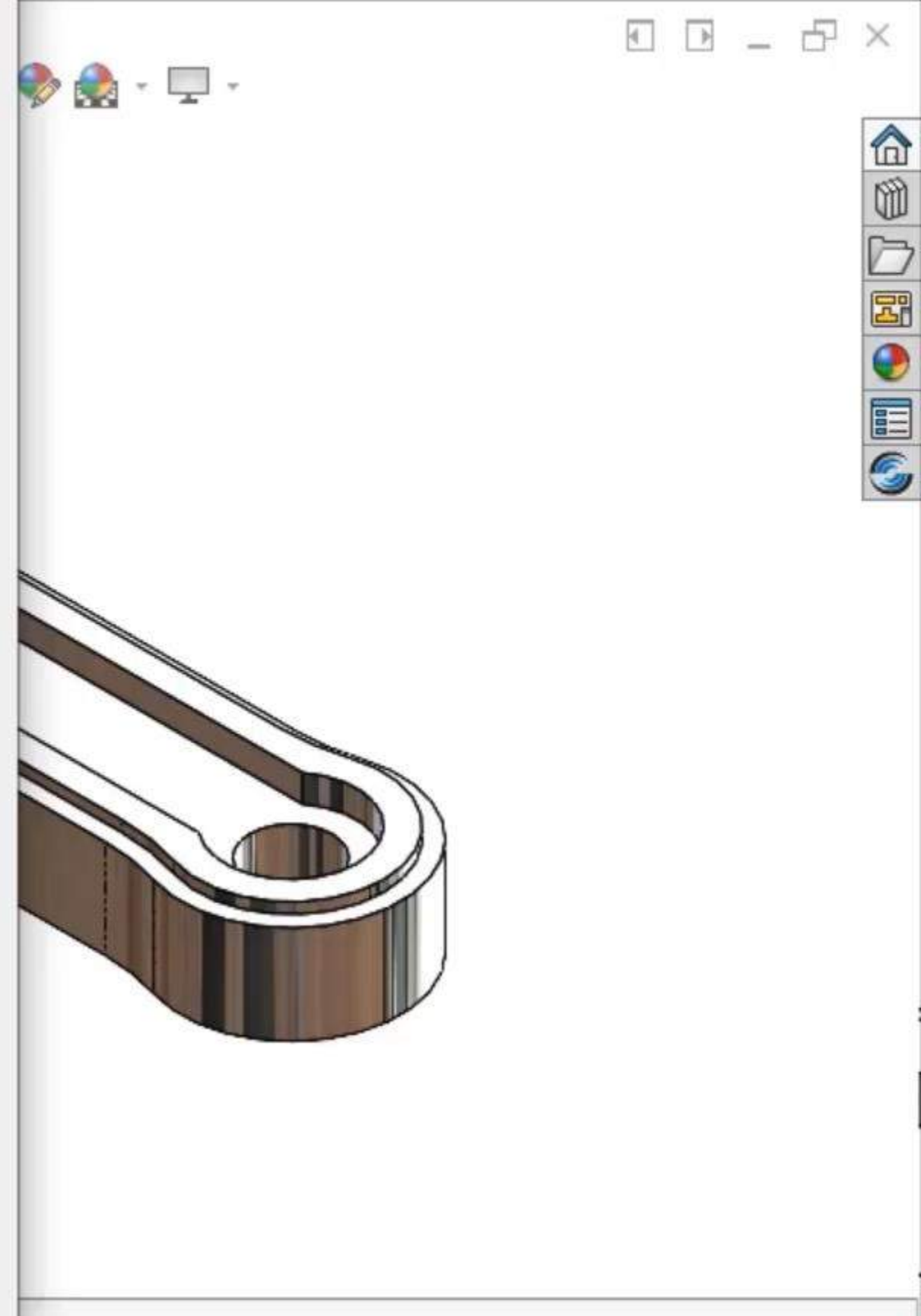
Preview

Mill (Metric)

ID	Tool ID	SubType	End Radius	ShankDia	Descri
1	1MM CRB 2FL 4 LOC	3	0.000000	3.000000	None
2	2MM CRB 2FL 6.3 LOC	3	0.000000	3.000000	None
3	3MM CRB 2FL 12 LOC	3	0.000000	3.000000	None
4	4MM CRB 2FL 14 LOC	3	0.000000	4.000000	None
5	6MM CRB 2FL 19 LOC	3	0.000000	6.000000	None
6	4.5MM CRB 2FL 16 LOC	3	0.000000	6.000000	None
7	8MM CRB 2FL 20 LOC	3	0.000000	8.000000	None
8	7MM CRB 2FL 12 LOC	3	0.000000	8.000000	None
9	10MM CRB 2FL 22 LOC	3	0.000000	10.000000	None
10	12MM CRB 2FL 25 LOC	3	0.000000	12.000000	None
11	11MM CRB 2FL 14 LOC	3	0.000000	12.000000	None
12	14MM CRB 2FL 32 LOC	3	0.000000	14.000000	None
13	16MM CRB 2FL 32 LOC	3	0.000000	16.000000	None
14	18MM CRB 2FL 38 LOC	3	0.000000	18.000000	None
15	20MM CRB 2FL 38 LOC	3	0.000000	20.000000	None
16	25MM CRB 2FL 38 LOC	3	0.000000	25.000000	None

OK Cancel Help

Instant3D



- ☰
- Mill
- Turn
- Mill-Turn
- EDM
- Mill Tooling
- Turn Tooling
- Feed / Speed
- Settings
- About



Settings

Metric Inches ?

General

Application Default : Mill

Post Processor Path : C:\CAMWorks\CAMWorks2021Plusx64\posts

Database added successfully.

Language

Automatic :

Language : English / English

Customization Settings

This functionality allows you to save and restore customization settings for TechDBApp grid column visibility and order location.

Save Settings... Restore Settings...

Manage Databases Import Database



Activ...	Database Details
	C:\CAMWorksData\CAMWorks2021Plusx64\TechDB\TechDB.cwdb
	C:\CAMWorksData\CAMWorks2021Plusx64\TechDB\Techdb_02.cwdb
✓	C:\CAMWorksData\CAMWorks2021Plusx64\TechDB\Techdb_03.cwdb

Description:

Description



NE PLOKŠČIŲ PAVIRŠIŲ MATAVIMAS (PROBING)

KONTŪRO APDIRBIMO OPERACIJOS PARAMETRŲ PATIKSLINIMAS



Operation Parameters

Tool F/S Probe NC Posting

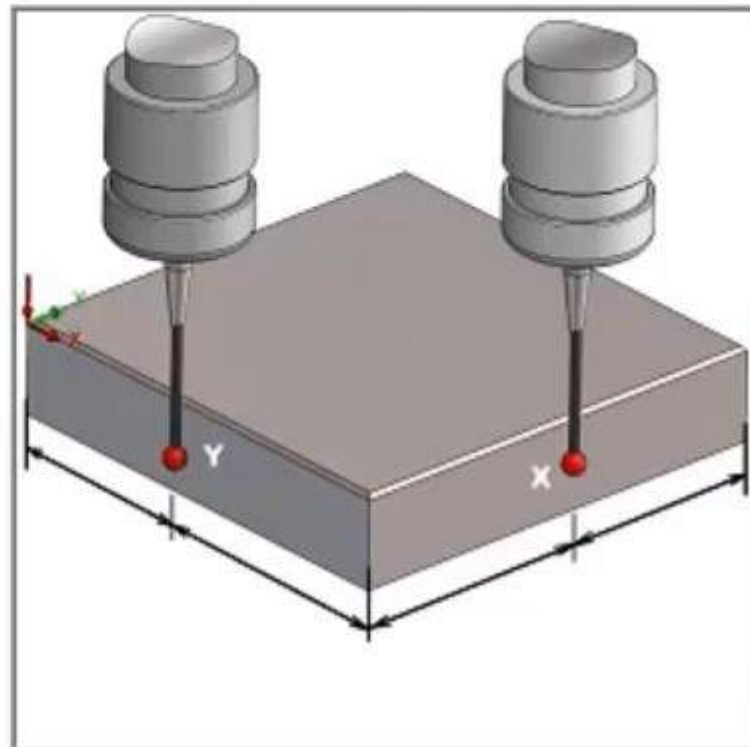
Measure
 XY Z

Probe Cycle
Z: Single Face
CW Face-2

Probe Parameters
Clearance: 10mm
Z Overtravel: 4mm
More Parameters...

Update WCS Offset
 Fixture: 1
 Work Coordinate: 54
 Work and Sub Coordinate: 1
 Use Setup Definition
Current Setup

3 Point Bore/Boss Cycle Angles
A: 0deg B: 120deg C: -120deg



Z depth: Default, 0mm

X location: Default, 0mm

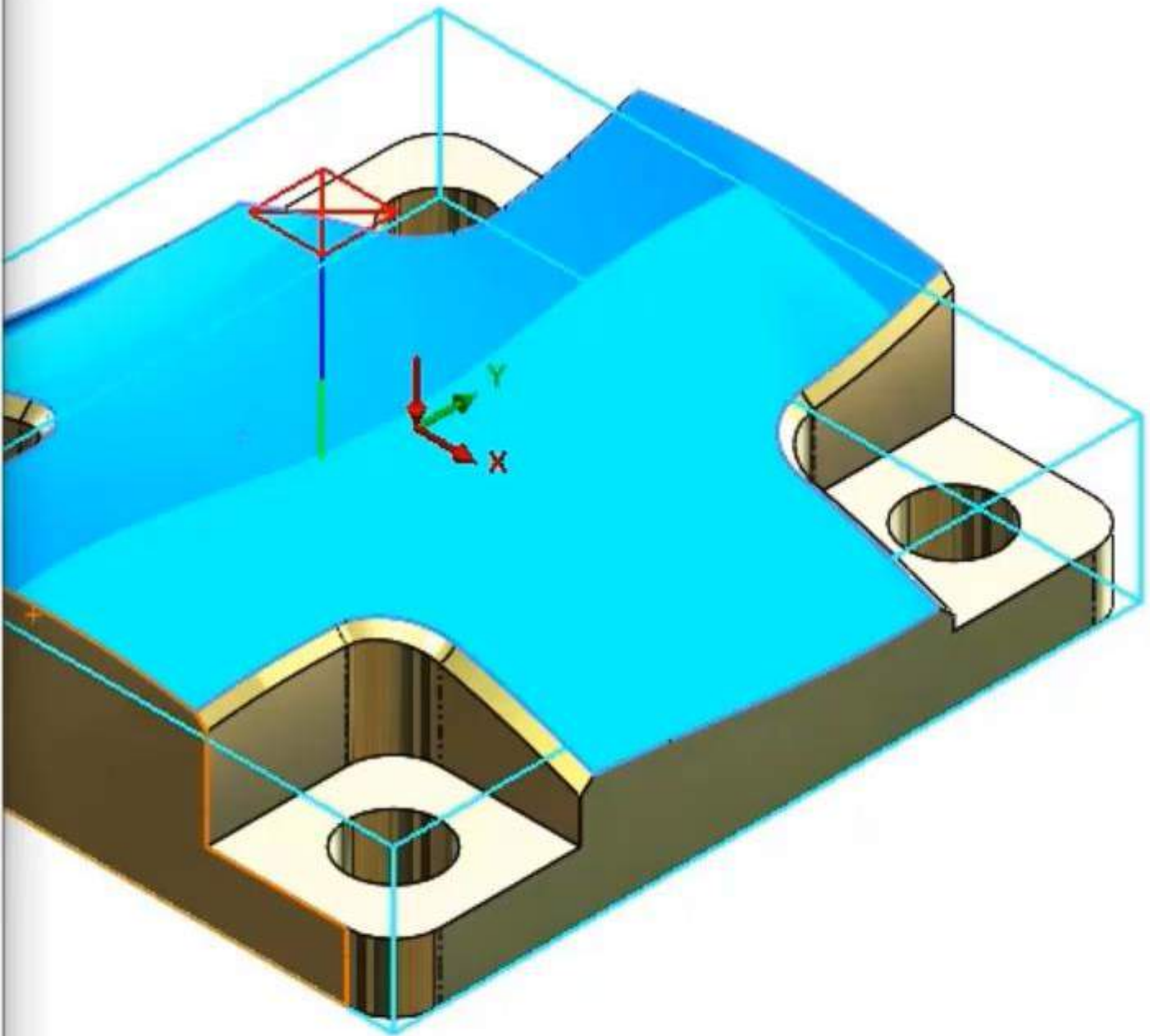
Y location: Default, -50mm

Buttons: OK, Cancel, Preview, Help

CAMWorks Additive Manufacturing

Search Commands

Buttons: Delete Face, Replace Face, Delete Hole, Extend Surface, Trim Surface, Untrim Surface, Thicken, Thickened Cut, Cut With Surface, Knit Surface, Reference Geometry, Curves



Editing Part MMGS

KONTŪRO APDIRBIMO OPERACIJOS PARAMETRŲ PATIKSLINIMAS



CNC finish parameters

CNC compensation

Off

On

Toolpath center

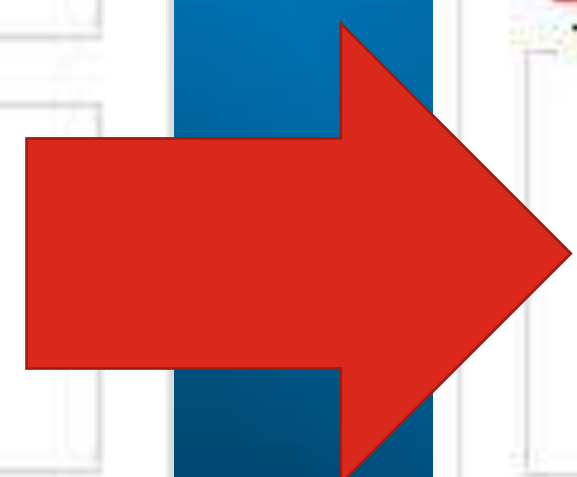
With compensation

Without compensation

Gouge check

Sharp corner
(Corner radius \leq Tool radius)

Add tool radius to leadin/leadout



CNC finish parameters

CNC compensation

None

Yes (For example G41/G42)

Toolpath center

With compensation
(Toolpath is offset by tool radius)

Without compensation
(Tool center is on feature geometry)

Look ahead

Limited look ahead (Gouge check)

Internal sharp corners
(Corner radius \leq Tool radius)

Add tool radius to leadin/leadout



PAGERINTAS DARBAS SU ĮRANKIO SKERSMENS KOMPENSACIJA

PAGREITINTAS 8X G – KODO GENERAVIMAS

3 - JŲ AŠIŲ PAVIRŠIŲ APDIRBIMO OPERACIJŲ GENERAVIMO PAGREITINIMAS

PAGERINTA VARTOTOJO SĄSAJA DARBUI SU 3 – JŲ AŠIŲ PAVIRŠIŲ APDIRBIMU

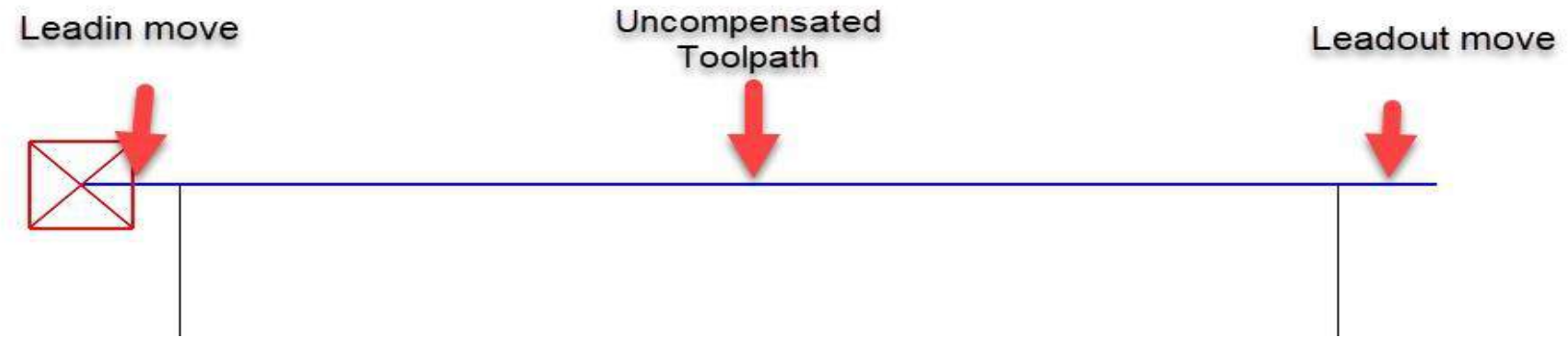
UŽDUOČIŲ JUOSTA SKIRTA GERESNIAM KOMUNIKAVIMUI SU VARTOTOJU



PAGERINTAS DARBAS SU ĮRANKIO SKERSMENS KOMPENSACIJA



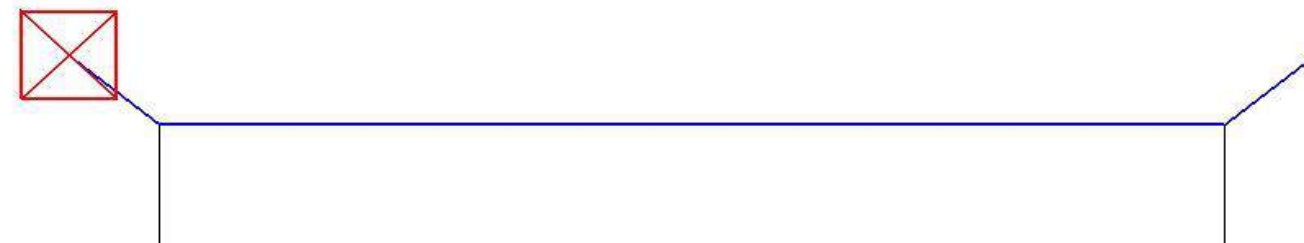
1.



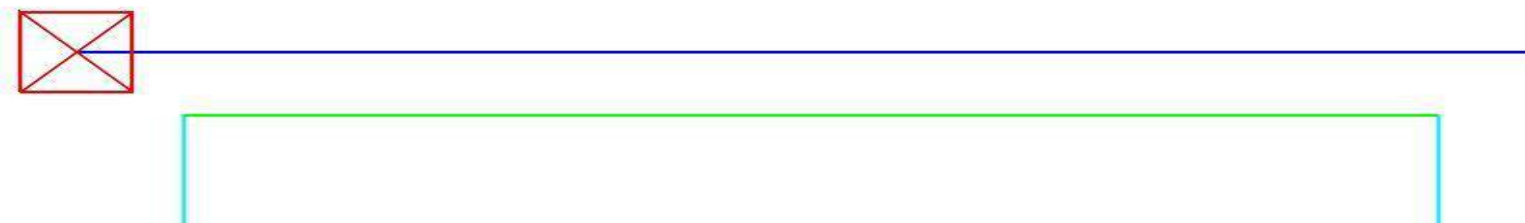
2.



3.



4.





Features Sketch Surfaces Evaluate MBD Dimensions SOLIDWORKS Add-Ins CAMWorks 2021Plus

Post Process

Size :

Operations

- Area Clearance1
- Area Clearance1
- Area Clearance1
- Area Clearance1
- Area Clearance1
- Area Clearance1
- Area Clearance1
- Area Clearance1
- Area Clearance1
- Constant Stepper1
- Constant Stepper1

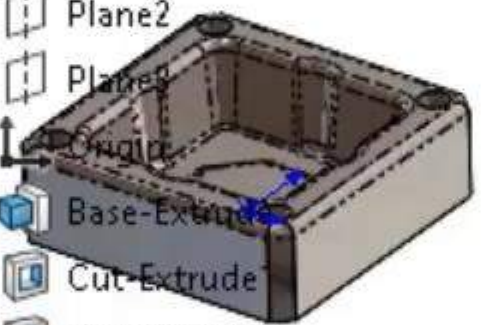
Options

Post Processor Details

Bottom fillet (Default<<...)

- History
- Sensors
- Annotations
- Solid Bodies(1)
- Plain Carbon Steel
- Plane1
- Plane2
- Plane3
- Plane4
- Plane5
- Plane6
- Plane7
- Plane8
- Plane9
- Plane10
- Plane11
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- Plane93
- Plane94
- Plane95
- Plane96
- Plane97
- Plane98
- Plane99
- Plane100

Full



Time Lapse=5X

00:00:53.83
hr min sec

3 - JŲ AŠIŲ PAVIRŠIŲ APDIRBIMO OPERACIJŲ GENERAVIMO PAGREITINIMAS



Operation Parameters

Tool F/S Pattern Area Clearance NC Links Entry/Retract Geometry Advanced Rest Posting Statistics

Features (Faces to cut)

- Multi surface feature 1 [Coarse]

Avoid features (Faces to avoid)

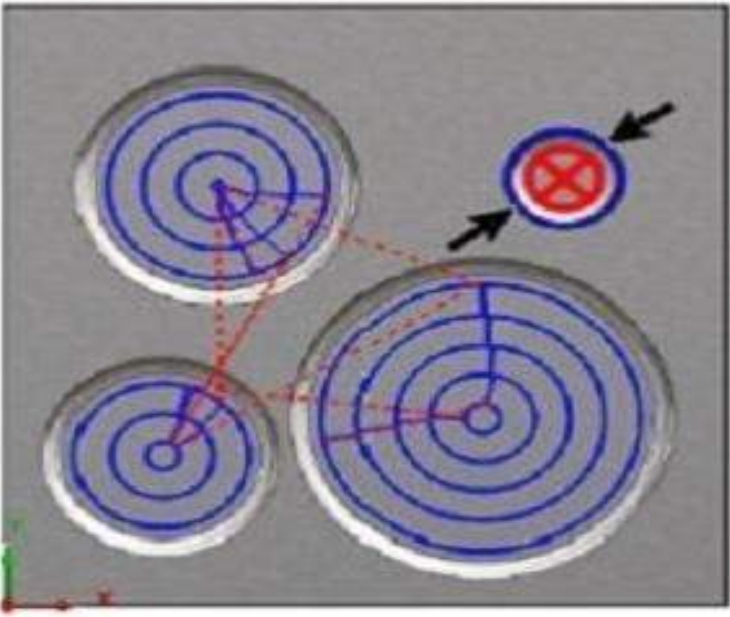
- Multi surface feature 2 [Avoid]

User defined contain area

- Contain area 2

User defined avoid area

- Avoid area 1



Automatic contain area

Method: Stock

Tool condition: On center

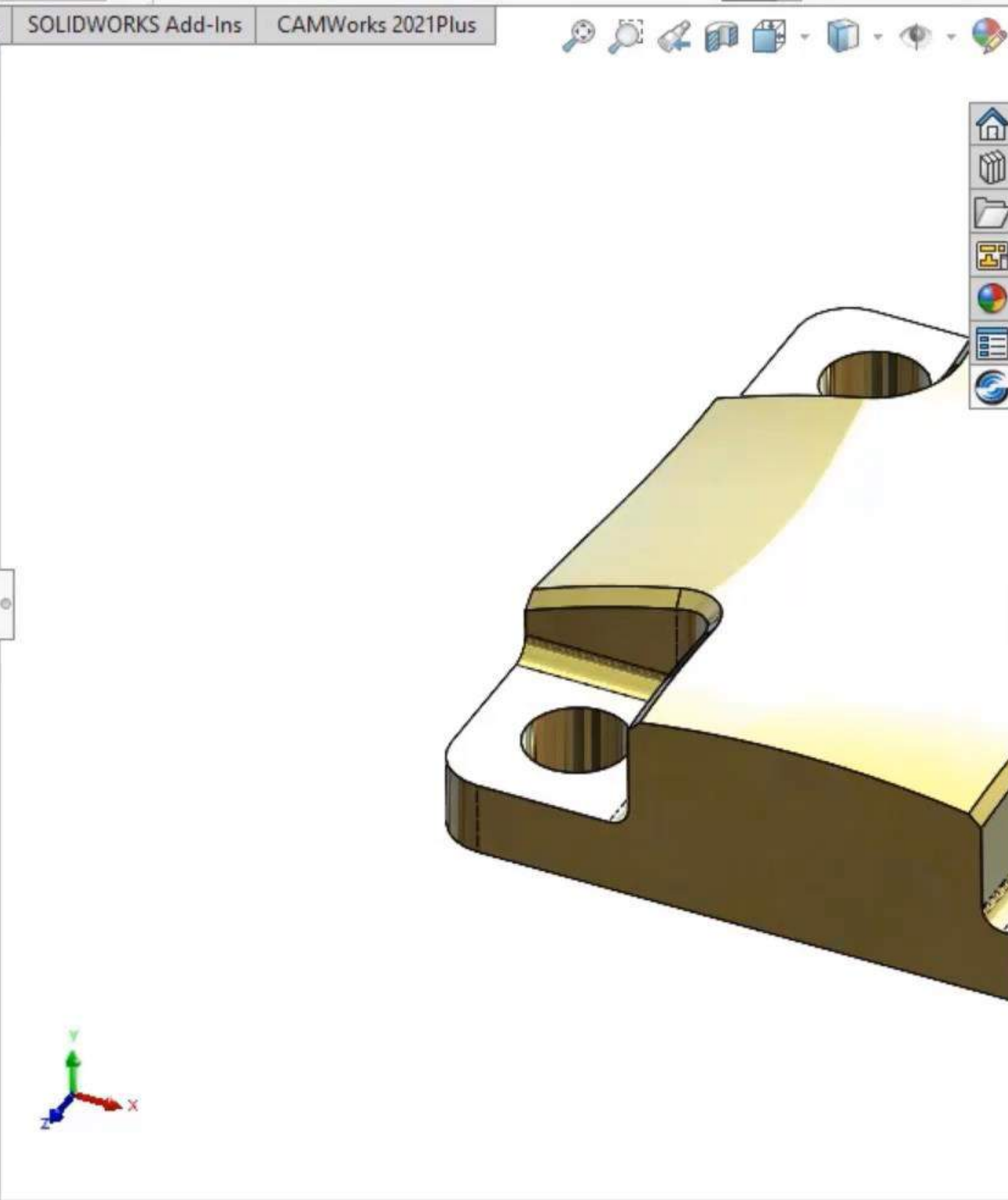
XY offset: 0mm

Avoid small profiles

Max. diameter: 1mm



- CAMWorks NC Manager
 - Configurations
 - Machine [DMU50]
 - Stock Manager[6061-T6]
 - Coordinate System [Not Defined]
 - Recycle Bin



CAMWorks 2021 SP2-EV is available for download

Release Date: 13-May-2021 | USP Date : 15-Apr-2021
[What's New](#) | [Resolved Issues](#)

CAMWorks 2021 SP1 is available for download

Release Date: 27-Apr-2021 | USP Date : 15-Jan-2021
[What's New](#) | [Resolved Issues](#)

CAMWorks 2021 SP0 is available for download

Release Date: 26-Feb-2021 | USP Date : 15-Sep-2020
[What's New](#) | [Resolved Issues](#)

CCAMWorks 2020 SP5.1 is available for download

Release Date: 14-Jan-2021 | USP Date : 15-Oct-2020
[What's New](#) | [Resolved Issues](#)



ĮRANKIŲ 3-JŲ, 5-IŲ AŠIŲ IR VOLUMILL TRAJEKTORIJŲ GRAFINIO ATVAIZDAVIMO NUSTATYMAI



PRIME TURNING TECHNOLOGIJA

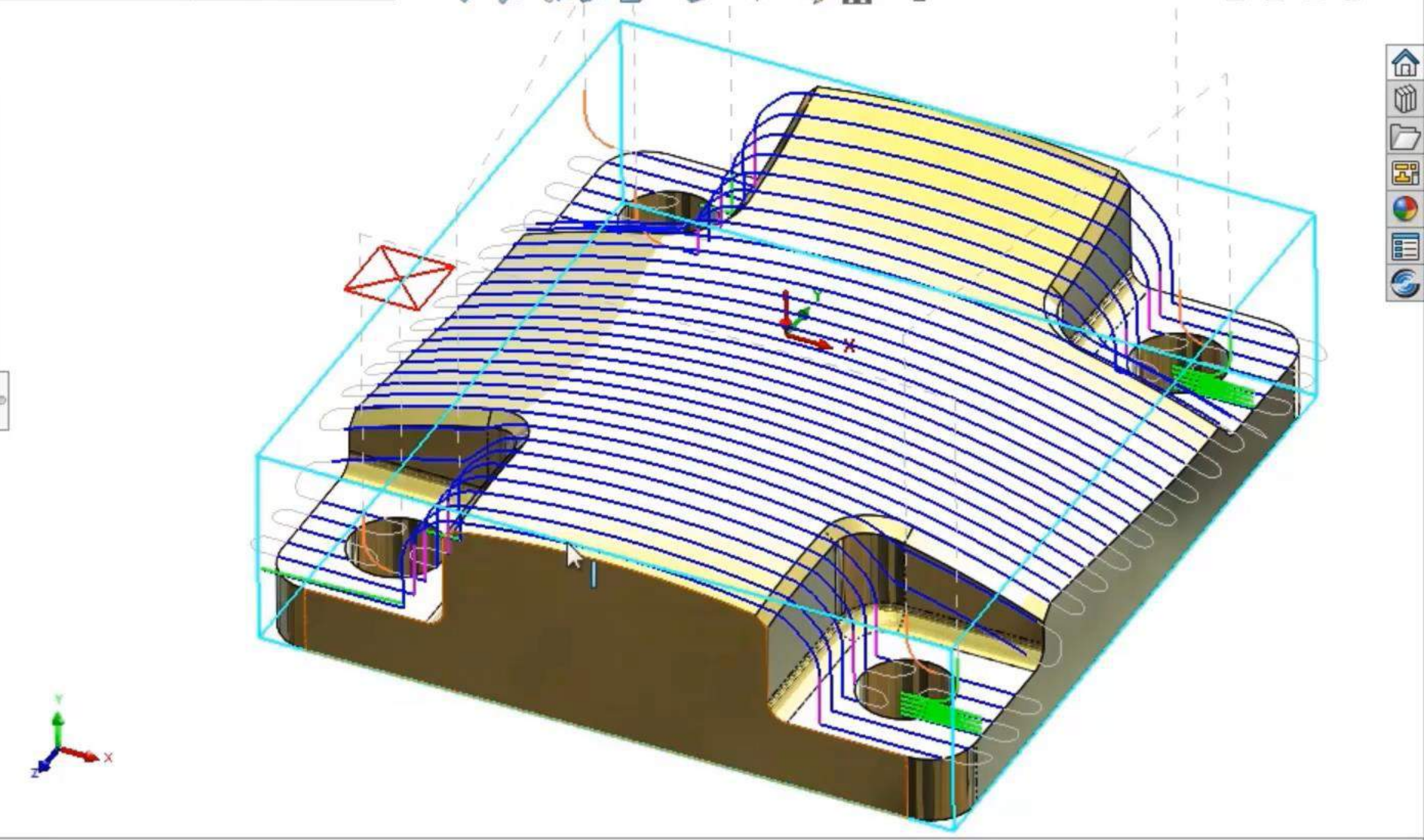
„BARREL“ TIPO ĮRANKIAI SKIRTI DARBUI SU NENUTRŪKSTAMU 3 - JŲ AŠIŲ IR 5 - IŲ AŠIŲ PAVIRŠIAUS APDIRBIMU

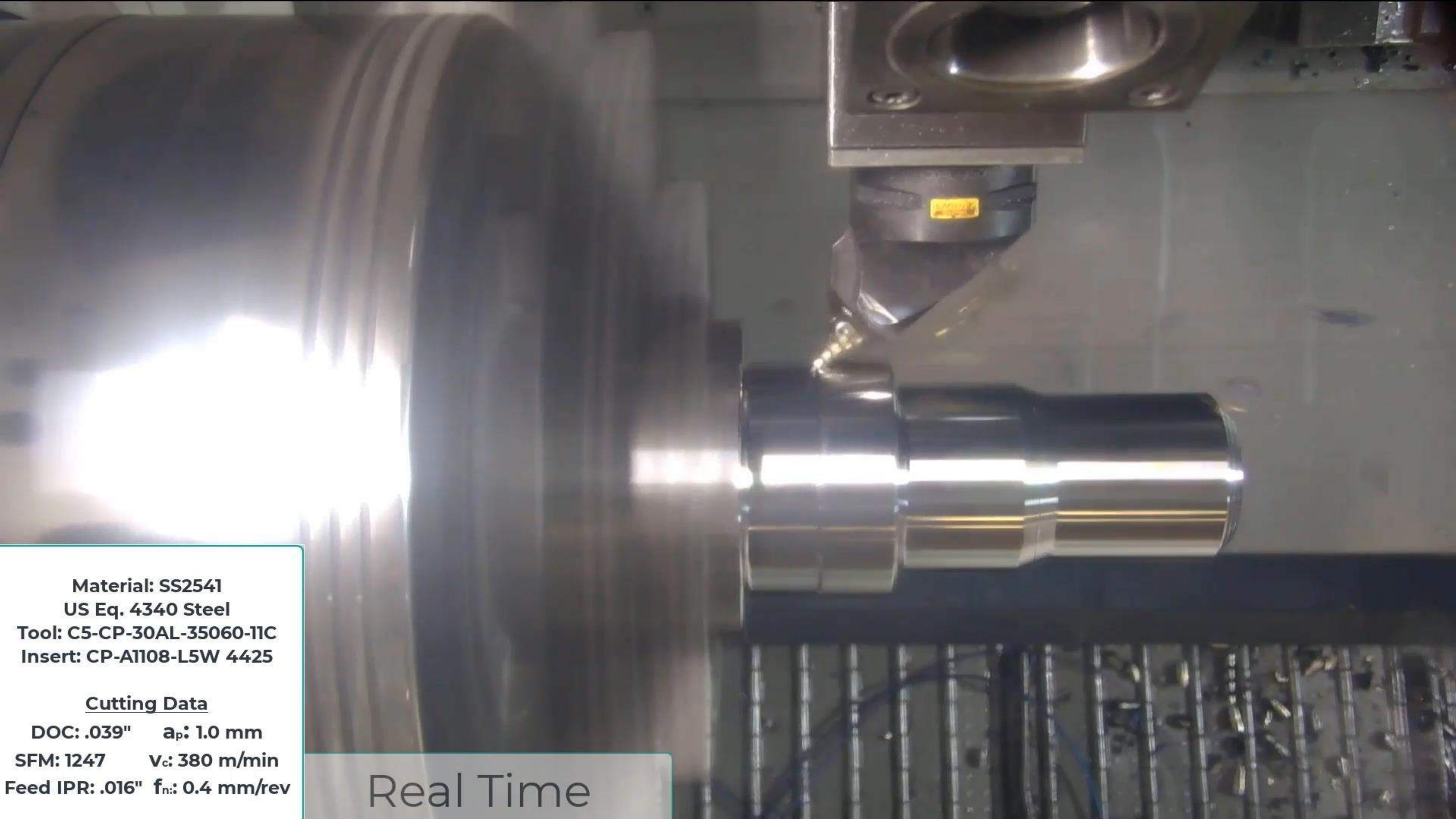
Define Machine, Coordinate System, Stock Manager, Setup, Extract Machinable Features, Generate Operation Plan, Generate Toolpath, Simulate Toolpath, Step Thru Toolpath, Save CL File, Publish ShopFloor, Post Process, Sort Operations, CAMWorks Sync Manager, Feature, 2.5 Axis Mill Operations, Hole Machining Operations, 3 Axis Mill Operations, Multiaxis Mill Operations, Turn Operations, Wire EDM Operations

Features Sketch Surfaces Evaluate MBD Dimensions SOLIDWORKS Add-Ins CAMWorks 2021Plus

CAMWorks NC Manager

- Configurations
- Machine [Mill - Metric]
- Stock Manager[6061-T6]
- Coordinate System [User Defined]
- Mill Part Setup1 [Group1]
 - Contour Mill1[T03 - 12 Flat End]
 - Area Clearance1[T03 - 12 Flat End]
 - Pattern Project1[T08 - 10 Ball Nose]**
 - Rough Mill1[T03 - 12 Flat End]
 - Contour Mill2[T01 - 6 Flat End]
 - Multiaxis Mill2[T01 - 6 Flat End]
 - Multiaxis Mill3[T01 - 6 Flat End]
 - Multiaxis Mill4[T01 - 6 Flat End]
 - Multiaxis Mill5[T01 - 6 Flat End]
- Recycle Bin





Material: SS2541

US Eq. 4340 Steel

Tool: C5-CP-30AL-35060-11C

Insert: CP-A1108-L5W 4425

Cutting Data

DOC: .039" a_p : 1.0 mm

SFM: 1247 v_c : 380 m/min

Feed IPR: .016" f_n : 0.4 mm/rev

Real Time

TYPICAL BALL END TOOL

MANY CUTS

LONG MACHINING TIME

LONGER CYCLE TIMES

APF-B

ADVANCED PRODUCTIVITY FINISHER - BARREL

MULTI Carb

HIGH PERFORMANCE FINISHER - BARREL

FEWER CUTS

SHORT MACHINING TIME

SHORTER CYCLE TIMES

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SOLIDWORKS CAM & CAMWorks

WireEDM & NESTINGWorks

ShopFloor & VirtualMachine

3DEXPERIENCE Works | DEVESYS



3D MODELIS Į G KODĄ VIENO MYGTUKO PASPAUDIMU!

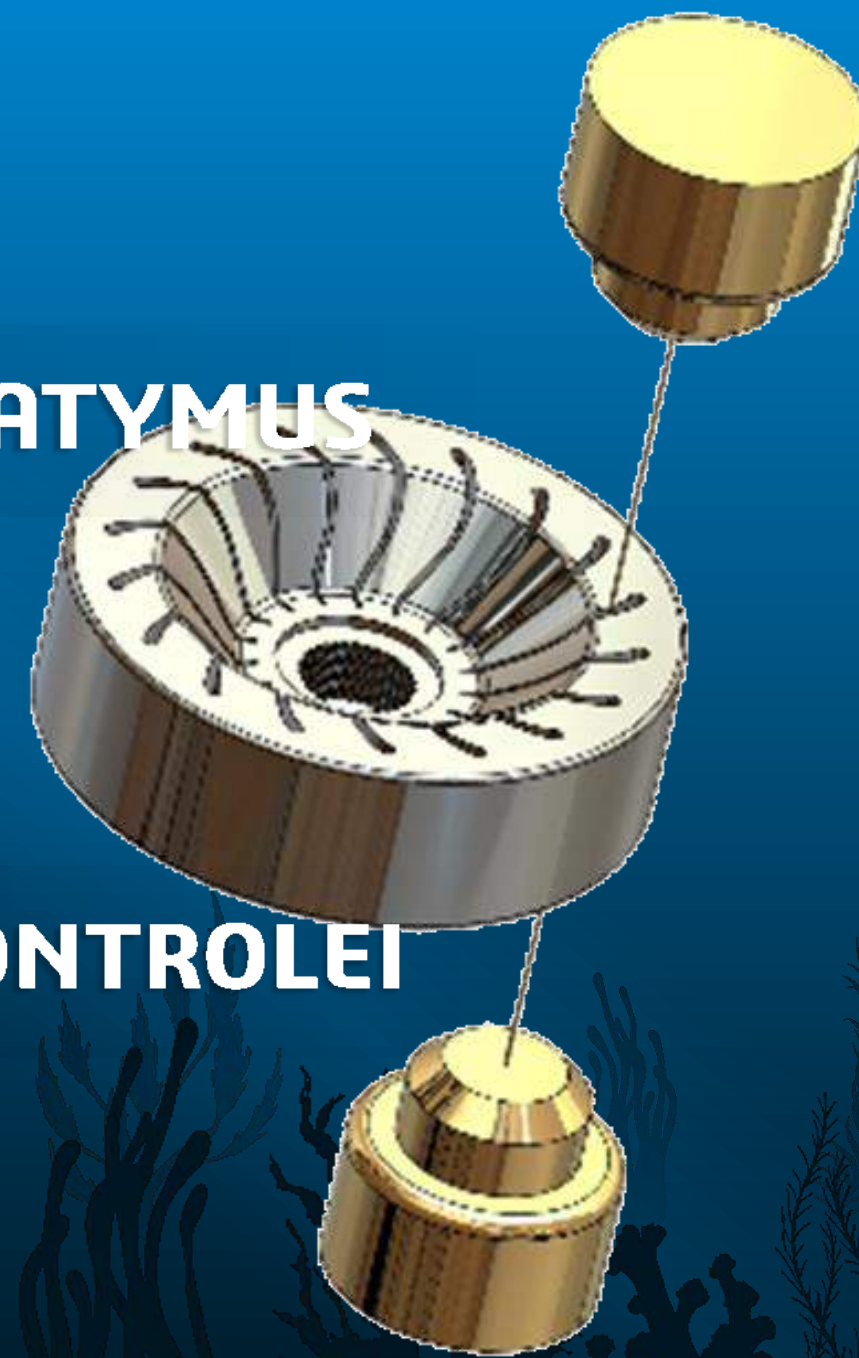
Automatiškai aptinka visas 2 ir 4 ašių apdirbamas geometrijas!
Detalės apdirbimas su vartotojo nustatytais apdirbimo parametrais!
Automatinis apdirbimo trajektorijų generavimas!

AUTOMATINIS APDIRBIMAS PAGAL PROGRAMUOTOJO NUSTATYMUS

„Glue Stops“, „Skim Passes“ parametrų nustatymai
„Lead-ins“ (įvedimas), „Lead-outs“ (išvedimas) ir daugiau!
Automatinis sudėtingų detalių programavimas per kelias sekundes!

APDIRBIMO OPERACIJŲ NUSTATYMAI PILNAI APDIRBIMO KONTROLEI

Parametrų nustatymai kiekvienai operacijai optimaliam tikslumui pasiekti
Pjovimo sąlygų nustatymai, kampų apdirbimas ir daugiau!



PATIKRINTAS SU PAŽANGIAUSIOMIS ELEKTROEROZINĖMIS VIELINĖMIS CNC STAKLĖMIS

Parametrų nustatymai kiekvienai operacijai optimaliam tikslumui pasiekti
Pjovimo sąlygų nustatymai, kampų apdirbimas ir daugiau!

AUTOMATIZUOTAS „LAND & TAPER“ PROGRAMAVIMAS!

DETALĖS APDIRBIMO SIMULIACIJA!

„CORELESS ROUGHING“ FUNKCIJA... IR DAUGIAU!



OPTIMALIAI IŠDĖSTO SOLIDWORKS DETALES IR SURINKIMUS

Automatinis optimalus detalių išdėstymas pagal detalės storį ir medžiagą.

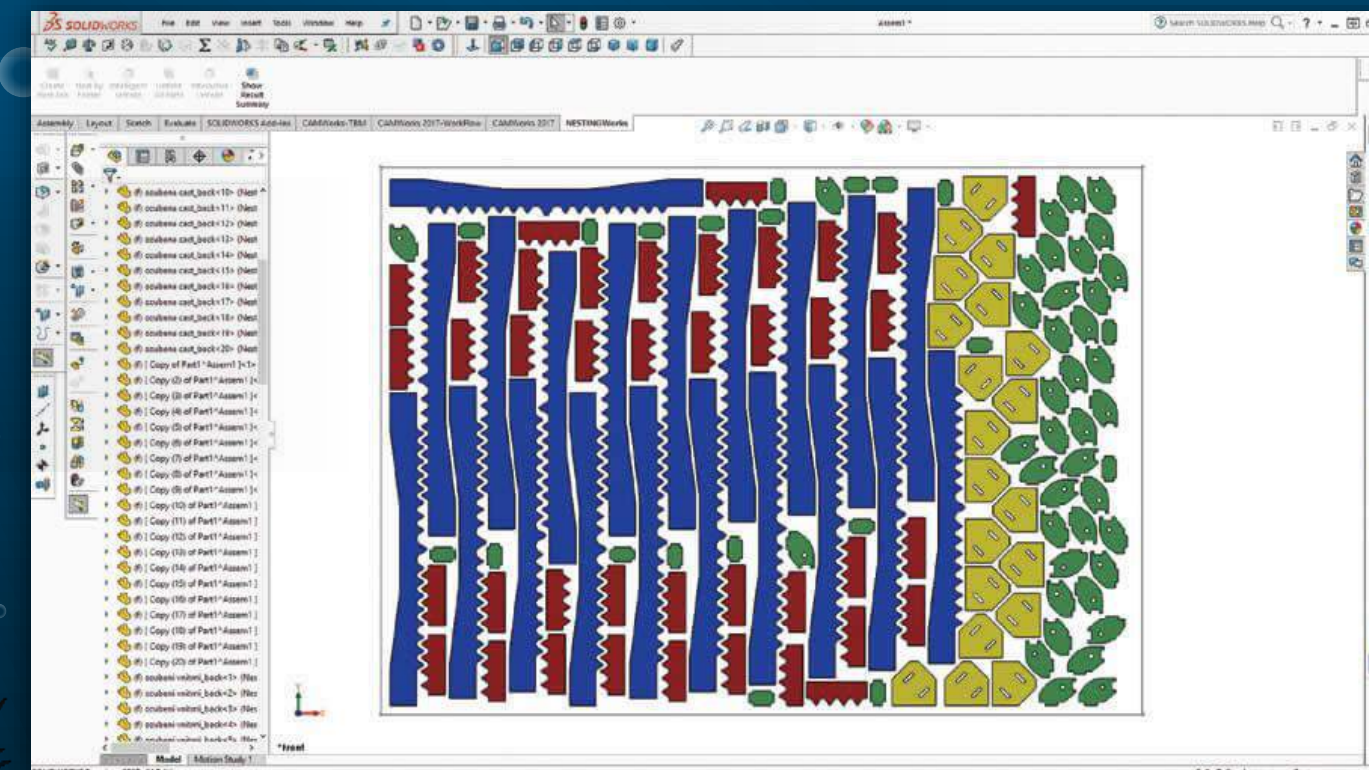
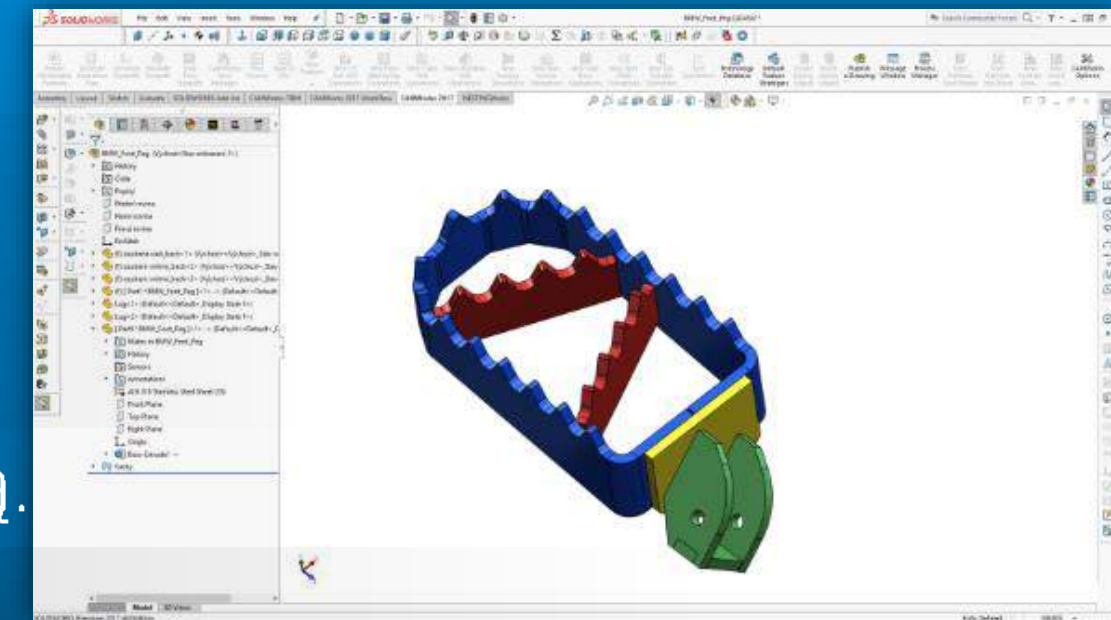
AUTOMATINIS „TRUE-SHAPE“ OPTIMALUS DETALIŲ IŠDĖSTYMAS

Naudoja viena greičiausių „HCL's Nestlib®“ optimalaus išdėstymo technologiją.

„PART IN PART“ OPTIMALUS DETALIŲ IŠDĖSTYMAS

Automatiškai sudeda mažesnes detales didesnių detalių kiurymėse.

AUTOMATINIS OPTIMALUS DETALIŲ IŠDĖSTYMAS PAGAL PLUOŠTO KRYPTĮ

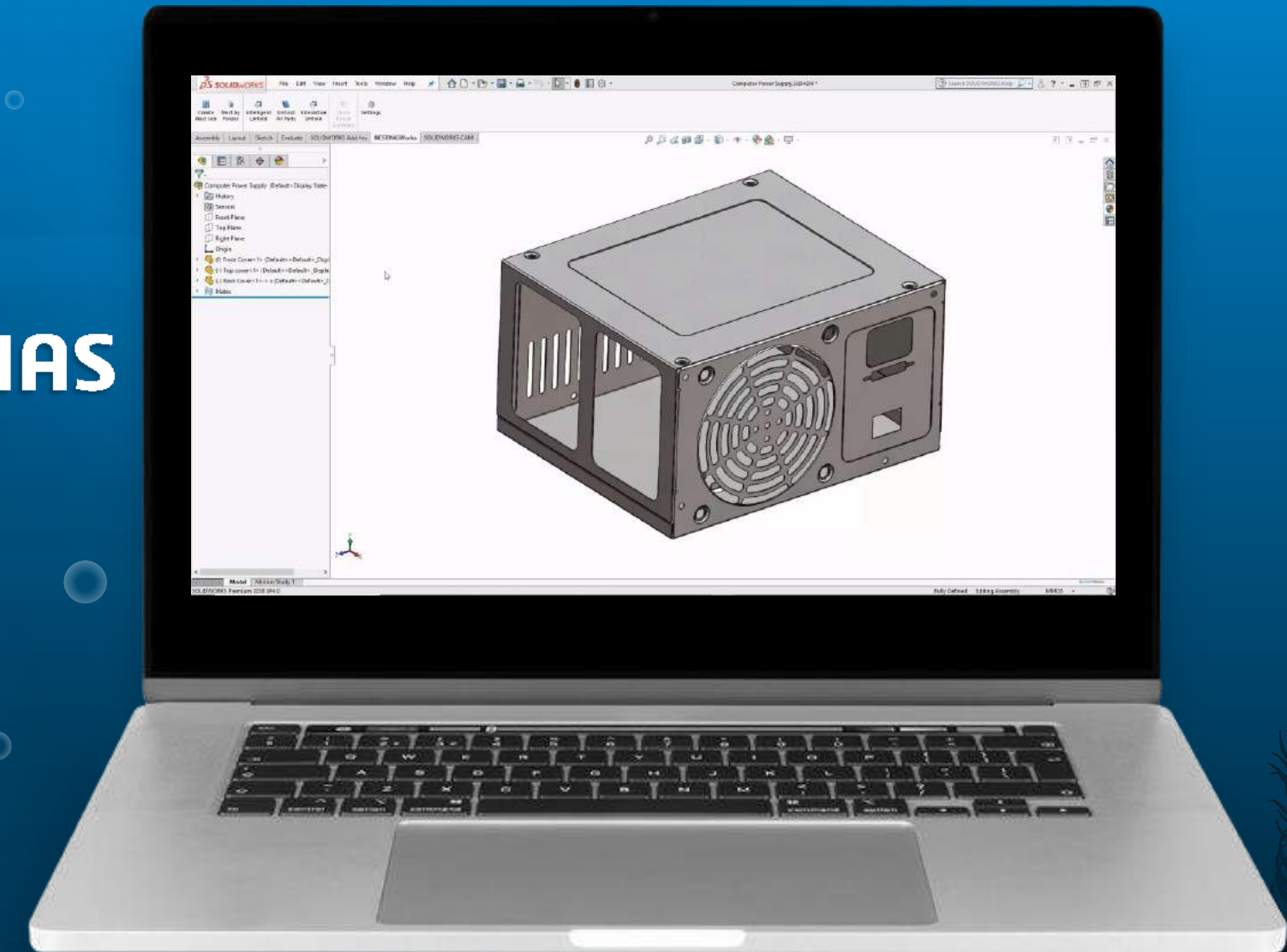


AUTOMATINIS ATLIEKŲ GENERAVIMAS

**KONFIGŪRUOJAMA LAKŠTŲ DUOMENŲ BAZĖ:
MEDŽIAGA, DYDIS IR TIPAS**

**AUTOMATINIS LAKŠTO MEDŽIAGOS PASIRINKIMAS
PAGAL DETALĖS STORĮ IR MEDŽIAGĄ**

**DXF FAILŲ PANAUDOJIMAS ĮVAIRIŲ LAKŠTŲ
FORMOMS IR DYDŽIAMS NURODYTI**



Layout1(1800mmX1150mm)

Layout : 1 of 1

Sheet thickness : 0.5mm

Utilization : 70.146

No of sheets : 1

Generate Report... Show Summary Delete Sheet

Parts & remnants in this layout :

Part name	Quantity	Rotation(s)
Front Cover [Nest-FlatPattern_De...	20	270.00
Top cover [Nest-FlatPattern_Defa...	20	270.00, ...
Back Cover [Default]	20	0.00

Remnants

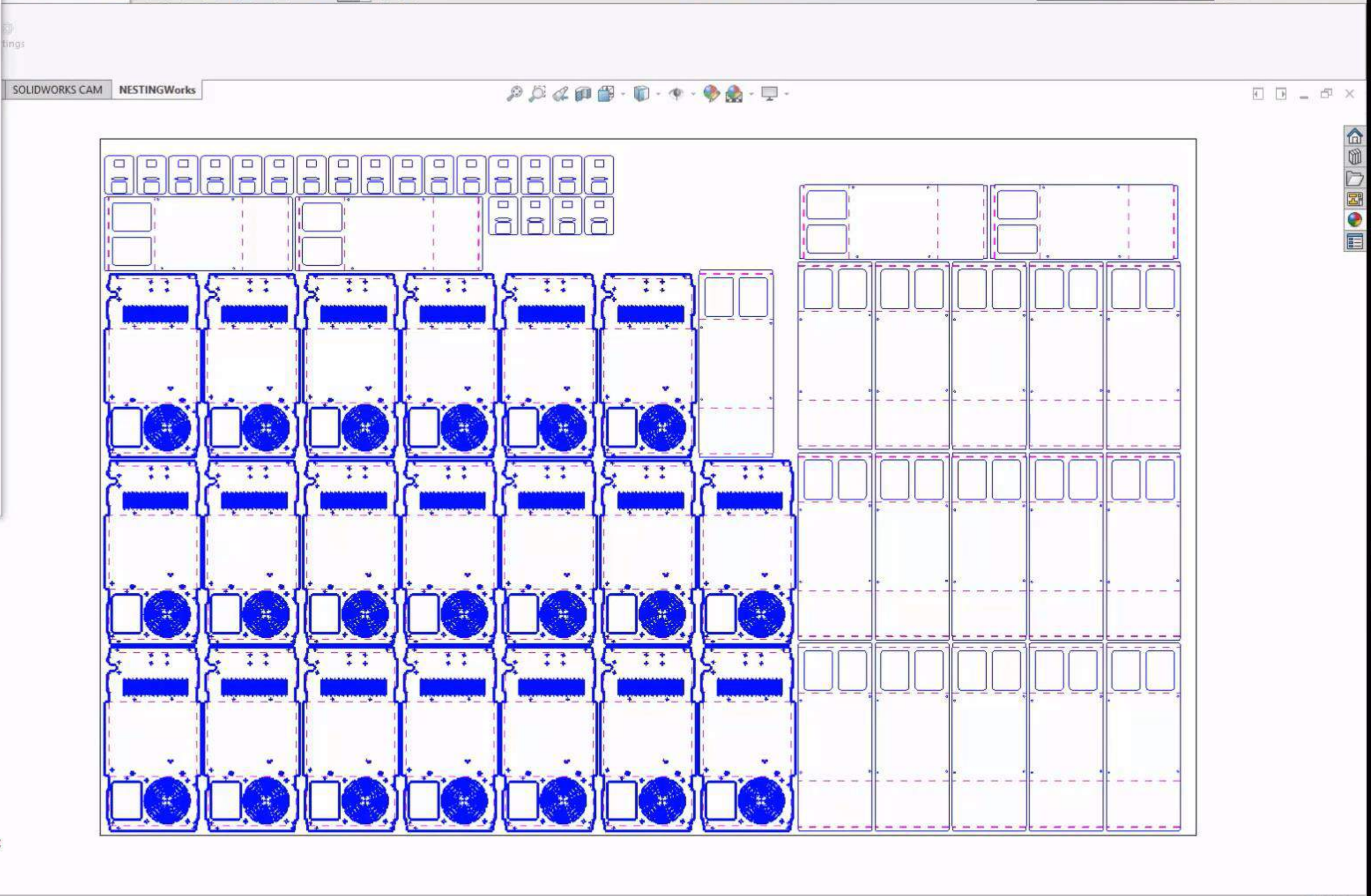
Nested layout DXF

Save as sketches... Options...

Save as DXF... Save as...

All layouts All layouts

Generate Nested Assembly Cancel Help



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Transmit status

Transfer status

Machine: Machine 1

Filename: C:\...\GCode\PVC FITTING MOLD ASSMEBLY.TXT

Bytes sent: 4.766 Remaining time: 20:55

Lines send: 212 Errors: 0

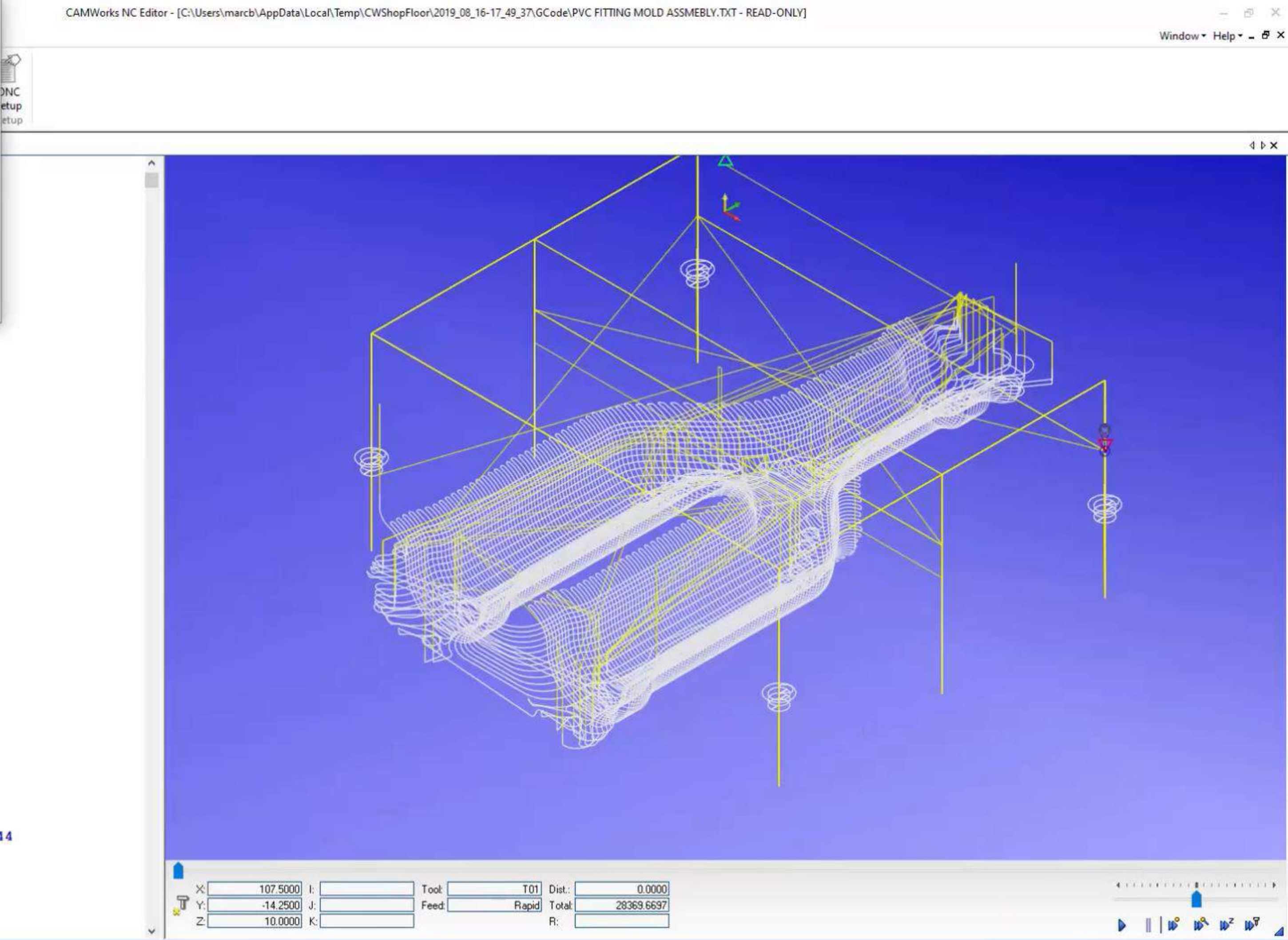
CPS: 794 Status: Sending

Hide Terminal Hide Stop

```

N198 G00 Z3.
N199 Z25.
N200 X7.5
N201 Z3.
N202 G01 Z-1.4 F125.
N203 G41 D26 X9.047 Y-92.513 F678.972
N204 X8.322 Y-91.495
N145 X7.5 Y-16.25 I-10.247 J0.2.
N146 X7.5 Y-16.147 I.005 J.1
N147 G40 G01 Y-14.25 F548.64
N148 G00 Z3.
N149 Z25.
N150 Z3.
N151 G01 Z-1.6 F125.
N152 G41 D25 X7.5 Y-12.25 F548.64
N153 G03 Y-16.25 I0 J-2. F1097.28
N154 Y-12.25 I0 J2.
N155 G40 G01 Y-14.25 F548.64
N156 G00 Z3.
N157 Z1.4
N158 G01 Z-2.8 F125.
N159 G41 D25 X7.5 Y-12.25 F548.64
N160 G03 Y-16.25 I0 J-2. F1097.28
N161 Y-12.25 I0 J2.
N162 G40 G01 Y-14.25 F548.64
N163 G00 Z3.
N164 Z25. M09
N165 G91 G28 Z0
N166 (5MM HSS 90DEG COUNTERSINK)
N167 T06 M06
N168 S9546 M03
N169 ( Contour Mill12 )
N170 G90 G54 G00 X107.5 Y-14.25
N171 G43 Z3. H06 M08
N172 G01 Z-1.4 F125.
N173 G41 D26 X109.047 Y-12.513 F678.972
N174 X108.322 Y-11.495
N175 G03 X107.998 Y-11.292 I-.407 J-.29
N176 X107.5 Y-11.25 I-.498 J-2.958 F1357.944
N177 Y-17.25 I0 J-3.
N178 Y-11.25 I0 J3.
N179 X107.002 Y-11.292 I0 J-3. F678.972
N180 X106.678 Y-11.495 I.083 J-.493
N181 G40 G01 X105.953 Y-12.513
N182 X107.5 Y-14.25

```



STAKLIŲ DERINIMAS SUTRUMPĖJA IKI 50%

VIRTUALUS CNC PROGRAMŲ PATIKRINIMAS

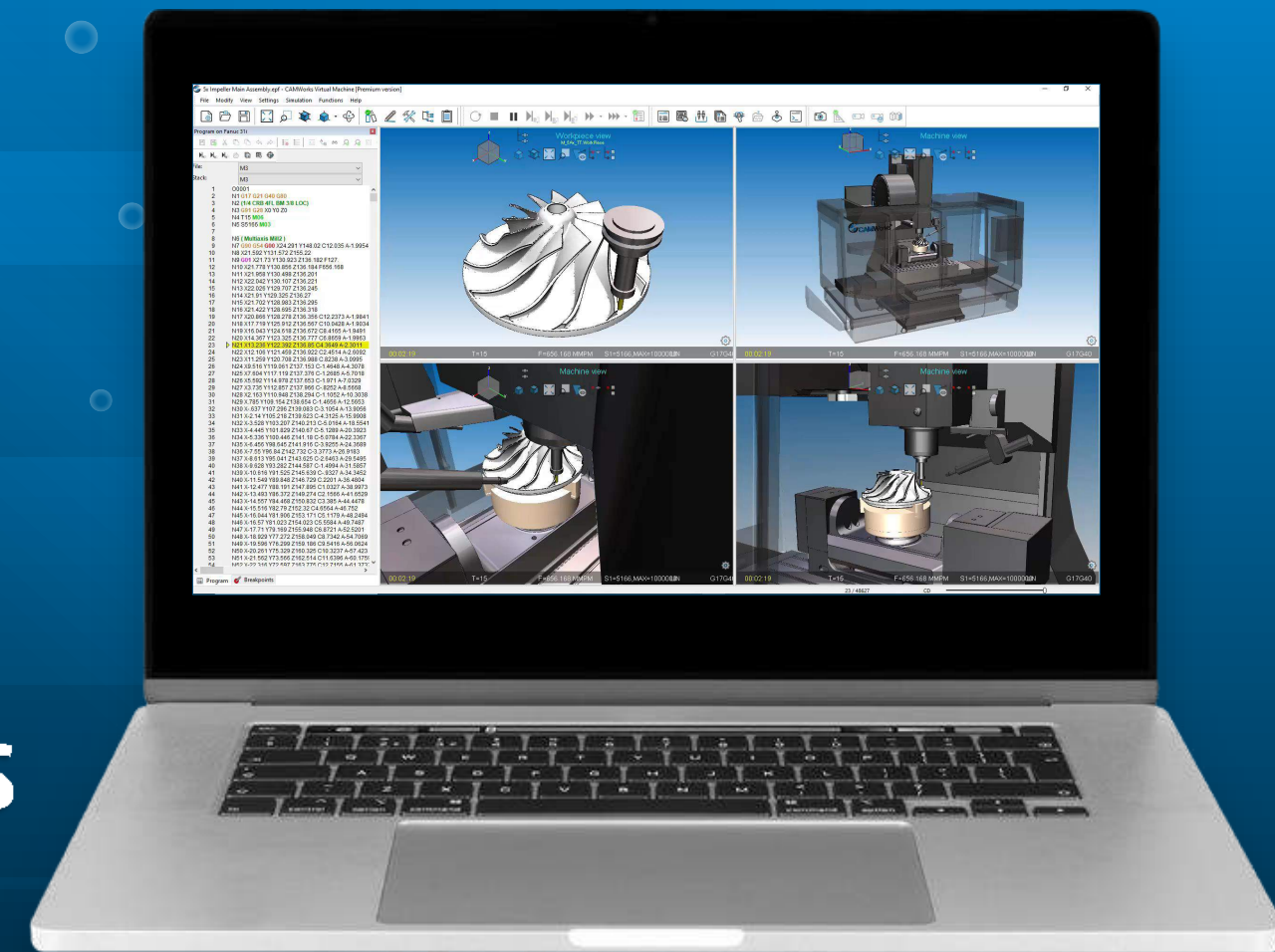
Tikra G kodo staklių simuliacija

KOLIZIJŲ APTIKIMAS

Pjovimo įrankių, įrankių laikiklių,
staklių komponentų, detalių tvirtinimo įtaisų

PRASTOVŲ IR APTARNAVIMO KAŠTŲ SUMAŽINIMAS

STAKLIŲ ILGAAMŽIŠKUMO PRAILGINIMAS





Program on Fanuc 31i



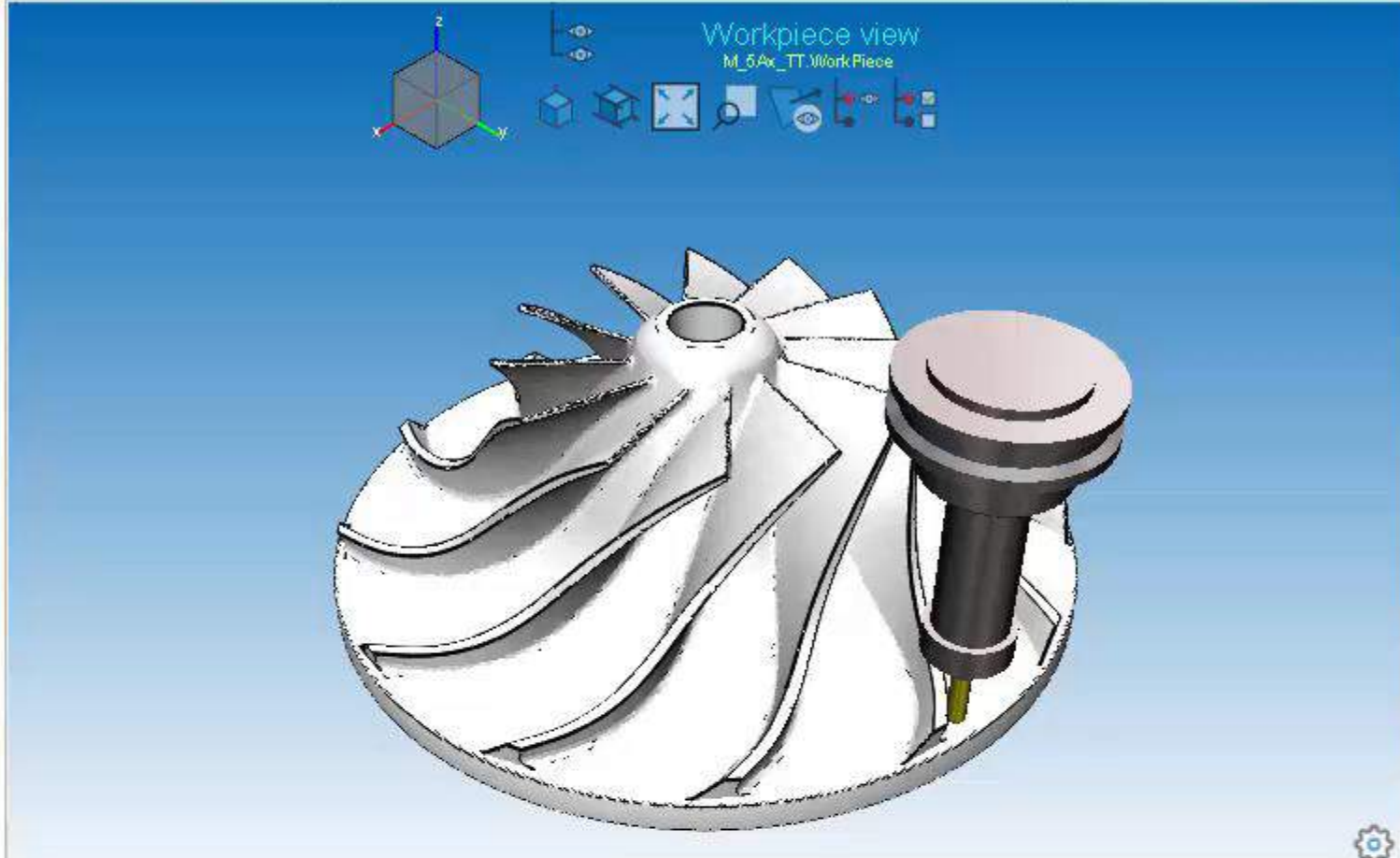
File: M3

Stack: M3

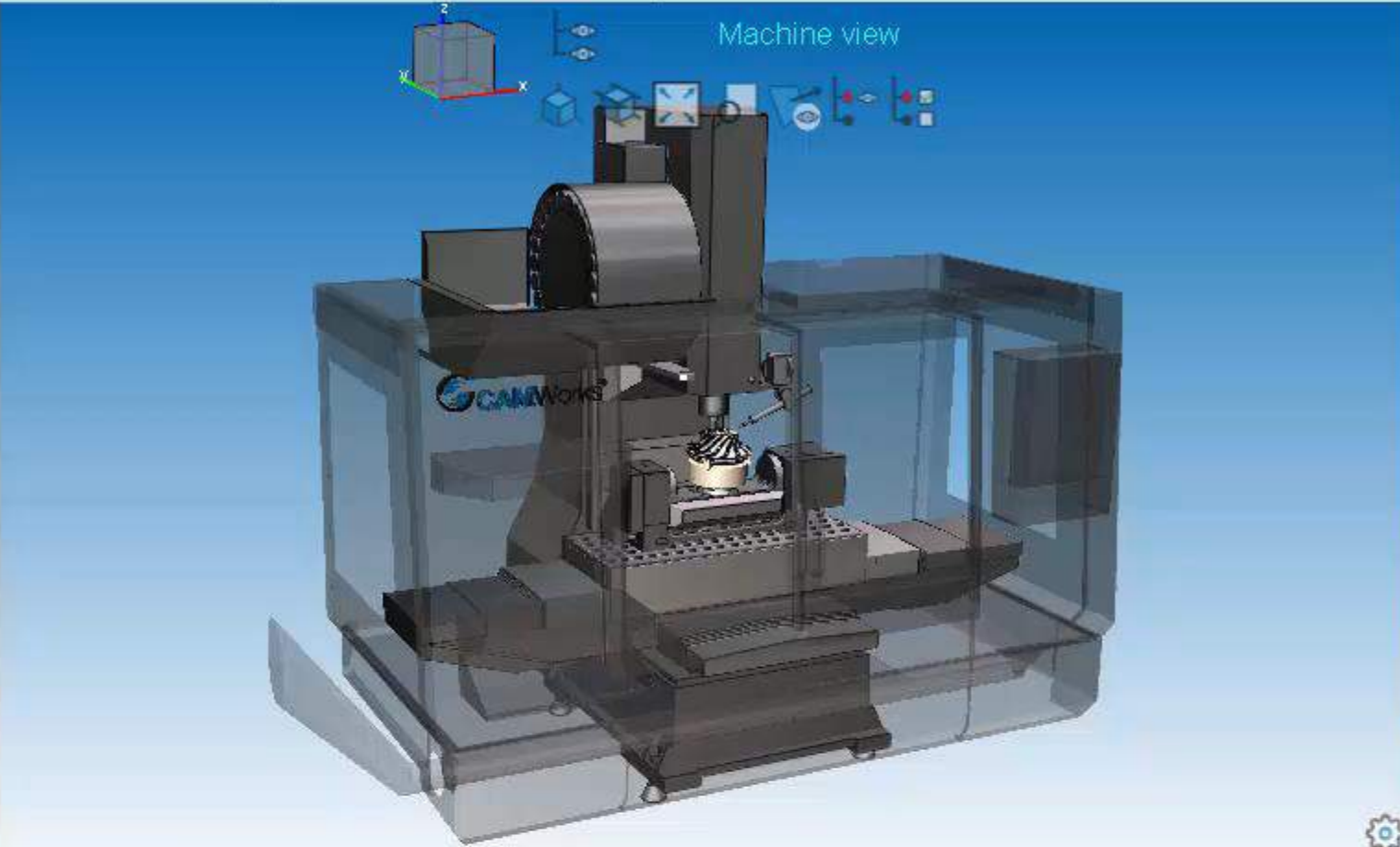
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8 N6 ( Multiaxis Mill2 )
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12 N10 X21.778 Y130.856 Z136.184 F656.168
13 N11 X21.958 Y130.498 Z136.201
14 N12 X22.042 Y130.107 Z136.221
15 N13 X22.026 Y129.707 Z136.245
16 N14 X21.91 Y129.325 Z136.27
17 N15 X21.702 Y128.983 Z136.295
18 N16 X21.422 Y128.695 Z136.318
19 N17 X20.866 Y128.278 Z136.356 C12.2373 A-1.9841
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31 N29 X.785 Y109.154 Z138.654 C-1.4656 A-12.5653
32 N30 X-.637 Y107.296 Z139.083 C-3.1054 A-13.9056
33 N31 X-2.14 Y105.218 Z139.623 C-4.3125 A-15.9908
34 N32 X-3.528 Y103.207 Z140.213 C-5.0164 A-18.5541
35 N33 X-4.445 Y101.829 Z140.67 C-5.1289 A-20.3923
36 N34 X-5.336 Y100.446 Z141.18 C-5.0784 A-22.3367
37 N35 X-6.456 Y98.645 Z141.916 C-3.9255 A-24.3689
38 N36 X-7.55 Y96.84 Z142.732 C-3.3773 A-26.9183
39 N37 X-8.613 Y95.041 Z143.625 C-2.6463 A-29.5495
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42 N40 X-11.549 Y89.848 Z146.729 C.2201 A-36.4804
43 N41 X-12.477 Y88.191 Z147.895 C1.0327 A-38.9973
44 N42 X-13.493 Y86.372 Z149.274 C2.1566 A-41.6529
45 N43 X-14.557 Y84.468 Z150.832 C3.385 A-44.4478
46 N44 X-15.516 Y82.79 Z152.32 C4.6564 A-46.752
47 N45 X-16.044 Y81.906 Z153.171 C5.1179 A-48.2494
48 N46 X-16.57 Y81.023 Z154.023 C5.5584 A-49.7487
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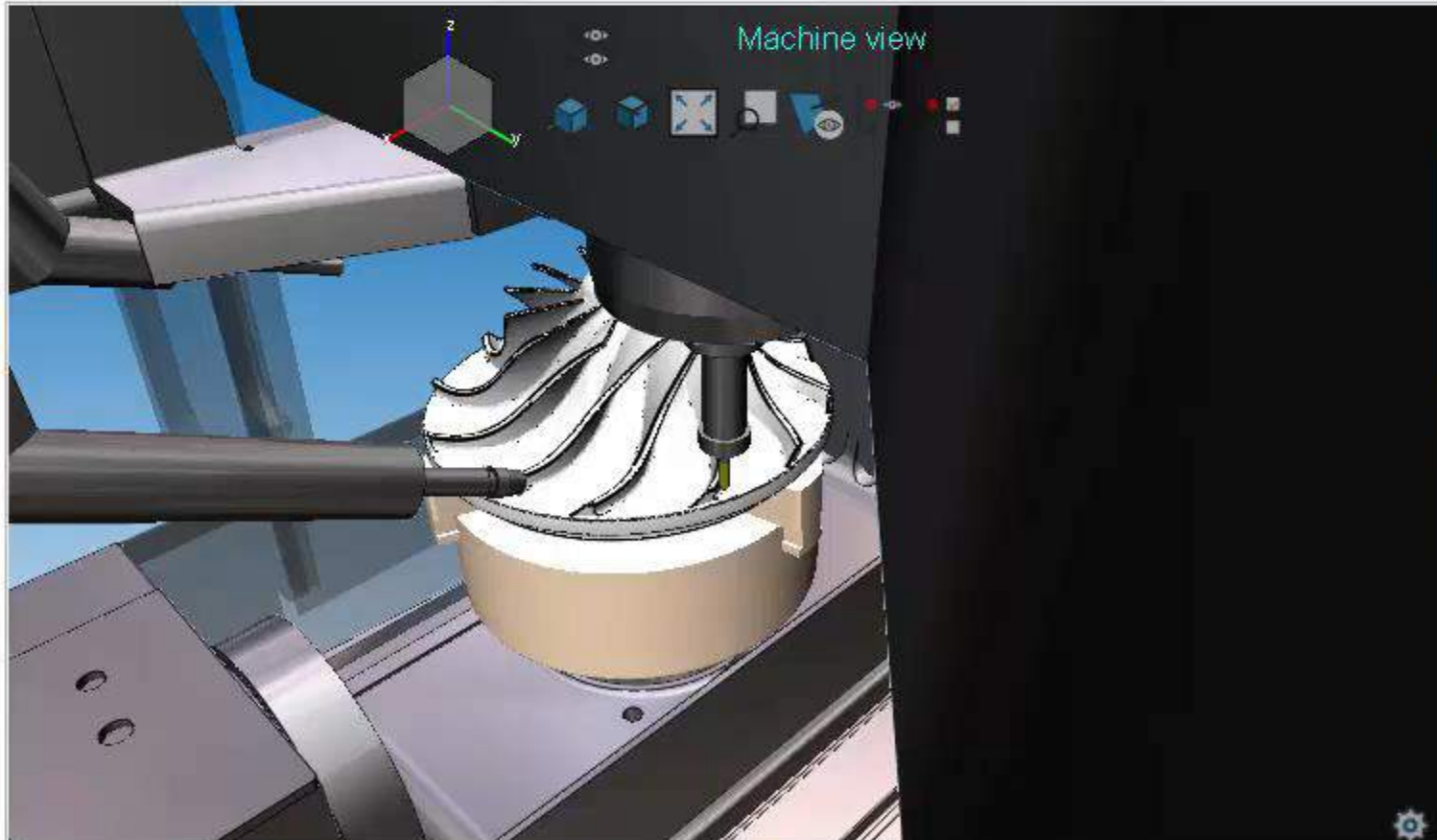
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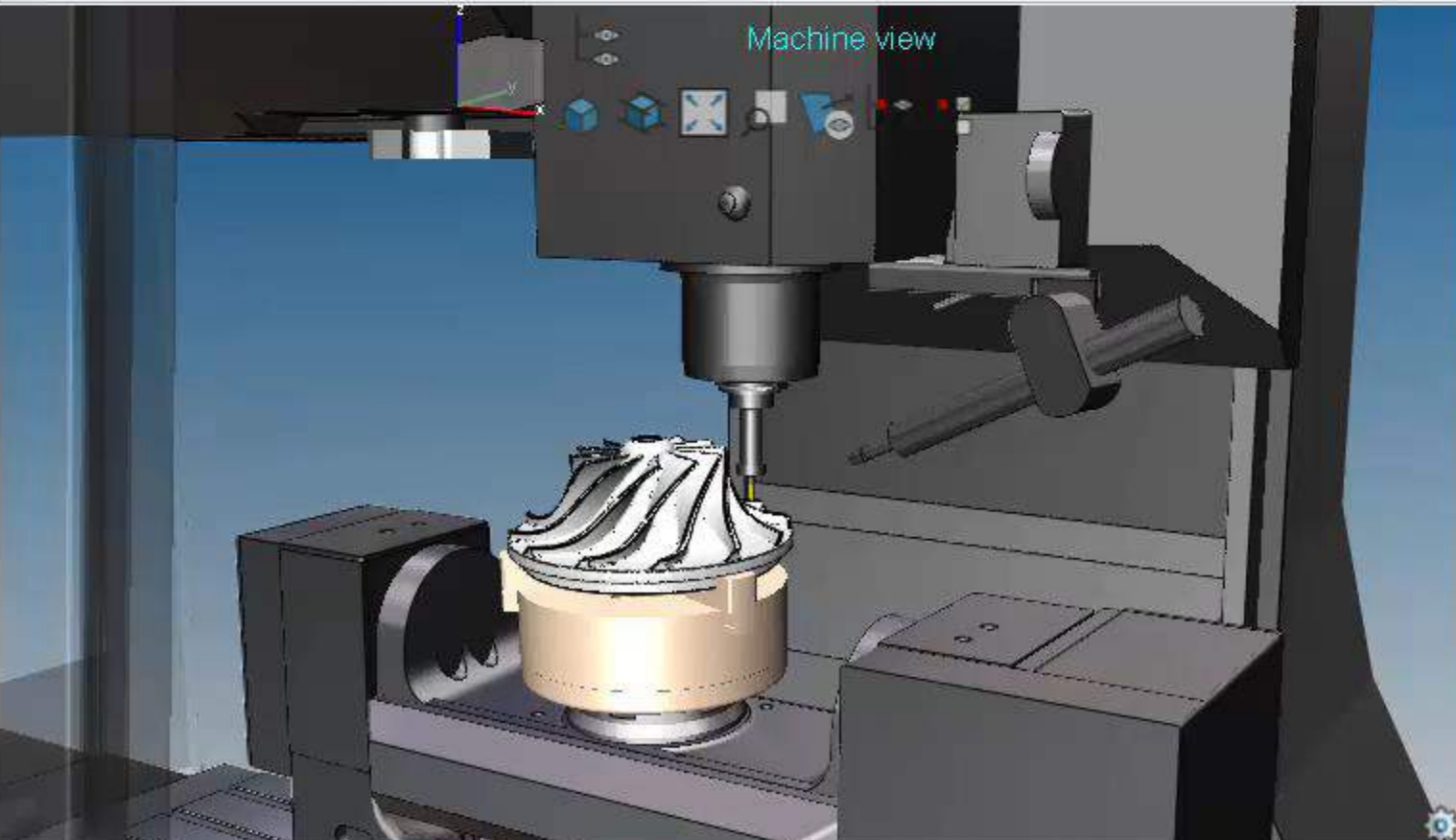
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PROGRAMUOK IŠMANIAU - GAMINK SPARČIAU



SOLIDWORKS CAM & CAMWorks

Išmanusis apdirbimo programų ruošimas SOLIDWORKS aplinkoje

WireEDM

Pažangiausias pasaulyje elektroerozinio apdirbimo programavimas

NESTINGWorks

Lakštinio metalo gaminių optimalus išdėstymas

ShopFloor

Išmanus 3D modelių, CNC programų, technologinių kortelių pateikimas.

VirtualMachine

G-kodo mašininė simuliacija, naudojant CNC staklių G-kodą.

