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SOLIDWORKS SUMMIT RUSSIA 2019 16 октября 2019 г.





3DEXPERIENCE®

SolidWorks CAM + NESTINGWorks

Гюмюшлю Дмитрий
Заместитель начальника
технического отдела
ООО «Идеальные инструменты»

SOLIDWORKS CAM

ЧПУ программирование внутри SOLIDWORKS

Основано на CAMWorks

Обработка деталей и сборок

2.5 Осевое фрезерование(3+2)

2 Осевая токарная обработка

Моделирование обработки

Обширная библиотека

постпроцессоров



Комплексное решение для проектирования и производства

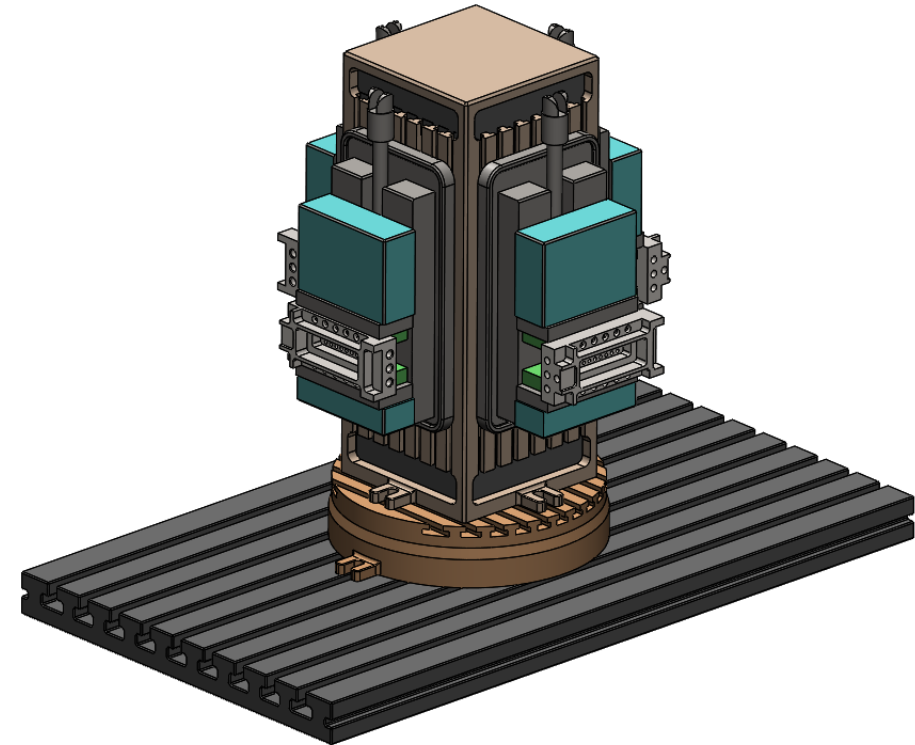


Параметры установки

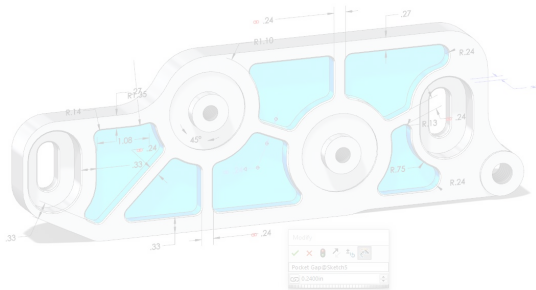
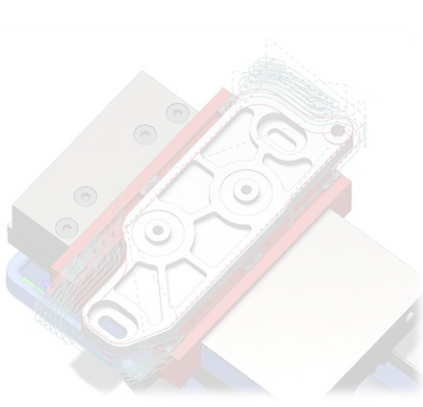
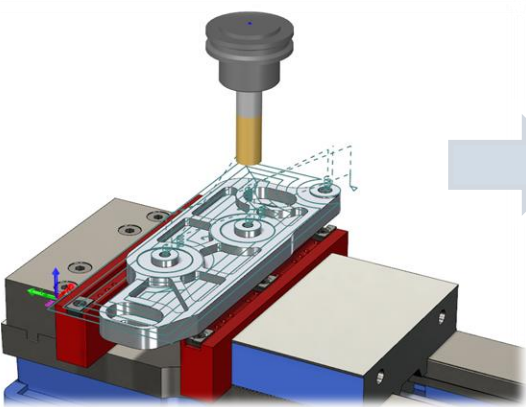
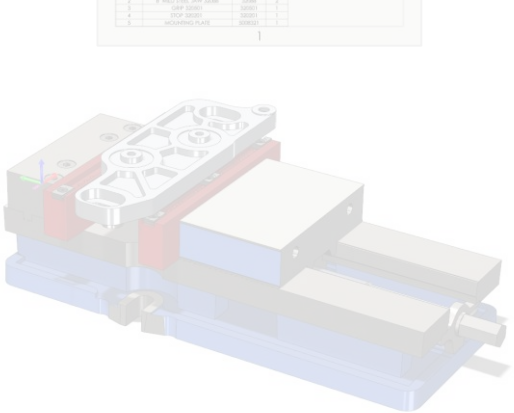
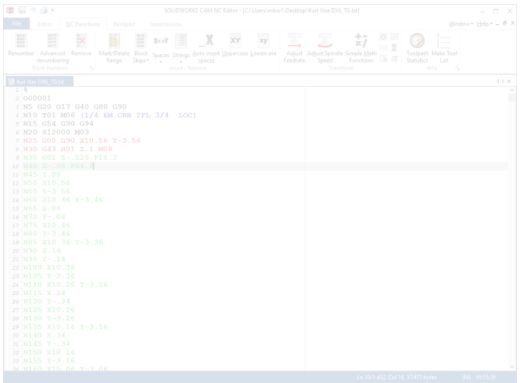
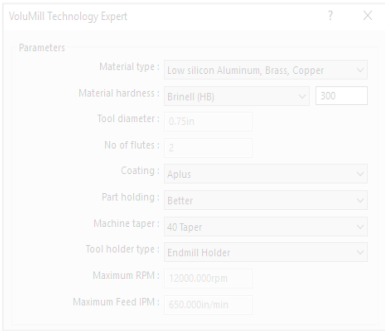
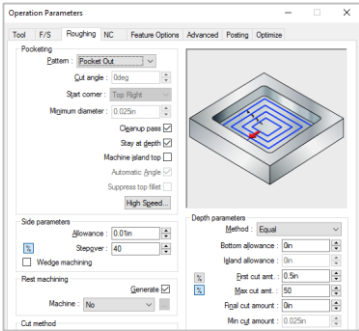
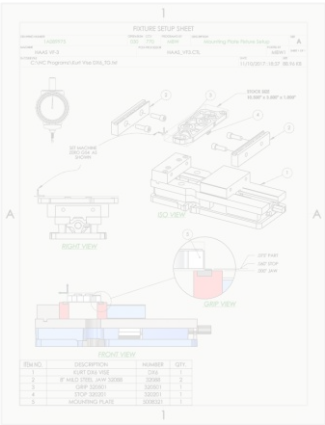
Используйте сборку SOLIDWORKS
настройки правильного крепления
детали

Автоматическое определение размера
под заготовку

Используйте возможности чертежей
SOLIDWORKS для создания
ассоциативной
документации



Программирование



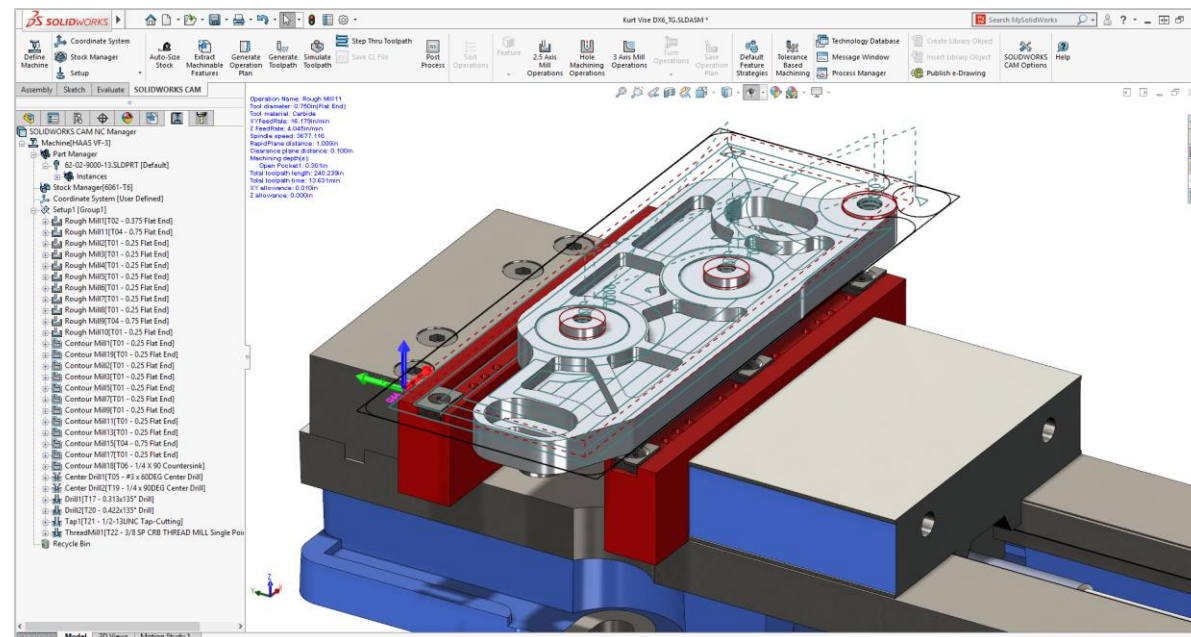
Программирование

Функция автоматического распознавания деталей

Функция ручного распознавания деталей

Запоминание «лучшей обработки» и её повторное использование

Простота в освоении и использовании

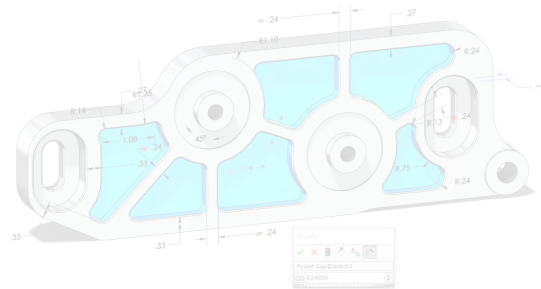
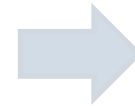
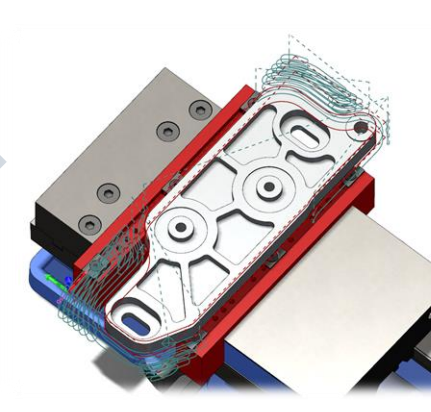
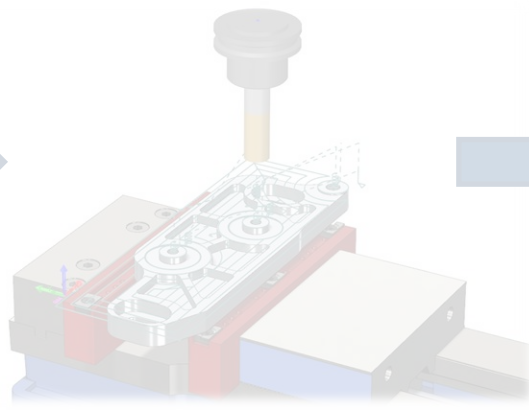
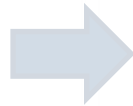
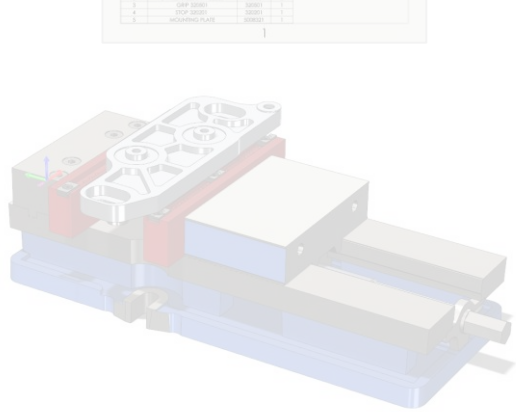
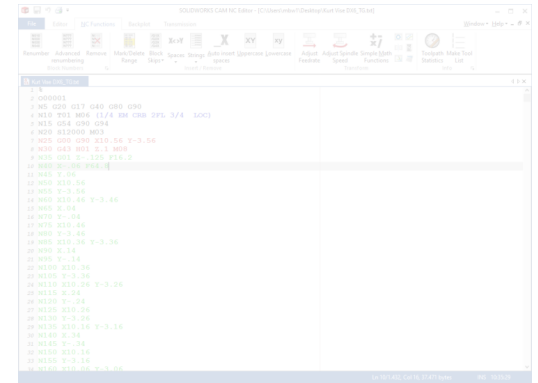
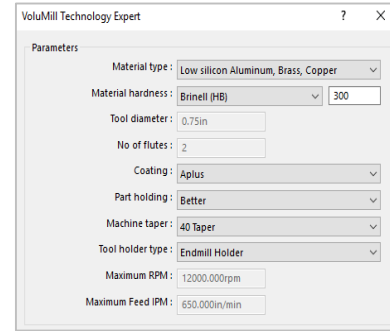
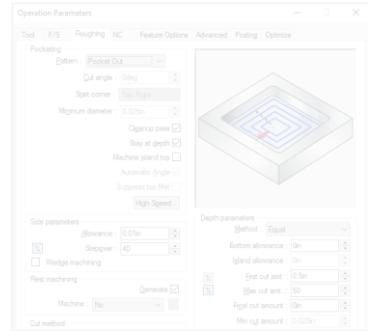
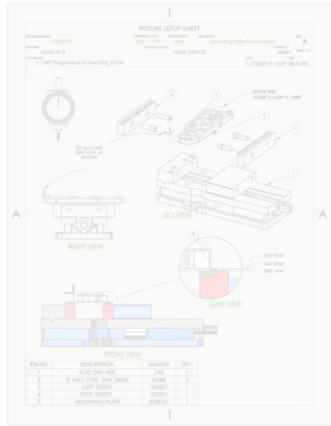


SOLIDWORKS CAM Technology Database

MIL Feature-Operation-Conditions

| Strategy | | | Feature conditions | | | | |
|----------|------------|---------|--------------------|----------|----------------|----------------|-------------------|
| Id | Strategy | Defa... | Id | Sub-Type | Base Attribute | Stock Material | Spindle Attribute |
| 1 | Drill | 1 | 3 | Blend | None | Al | Main |
| 2 | Bore | 0 | 4 | Through | None | Al | Main |
| 3 | Ream | 0 | 5 | Drilled | None | Al | Main |
| 4 | Thread | 0 | 257 | Blend | None | Al | Sub-spindle |
| 87 | Drill Only | 0 | 258 | Through | None | Al | Sub-spindle |
| | | | 259 | Drilled | None | Al | Sub-spindle |
| | | | 1203 | Blend | None | Al | Main |
| | | | 1204 | Through | None | Al | Main |
| | | | 1205 | Drilled | None | Al | Main |
| | | | 1215 | Blend | None | Al | Sub-spindle |
| | | | 1216 | Through | None | Al | Sub-spindle |
| | | | 1217 | Drilled | None | Al | Sub-spindle |

Определение стратегии обработки



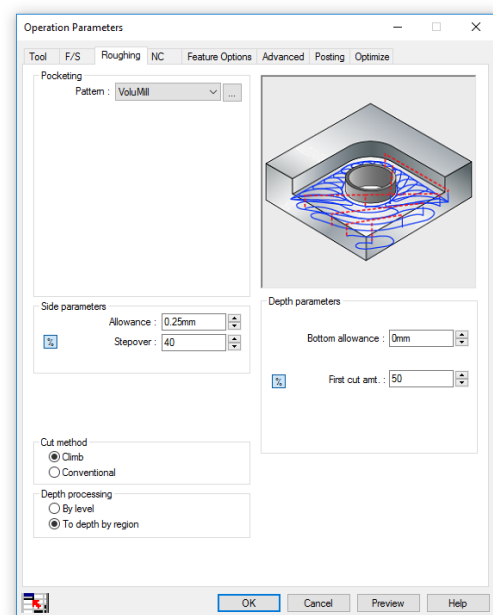
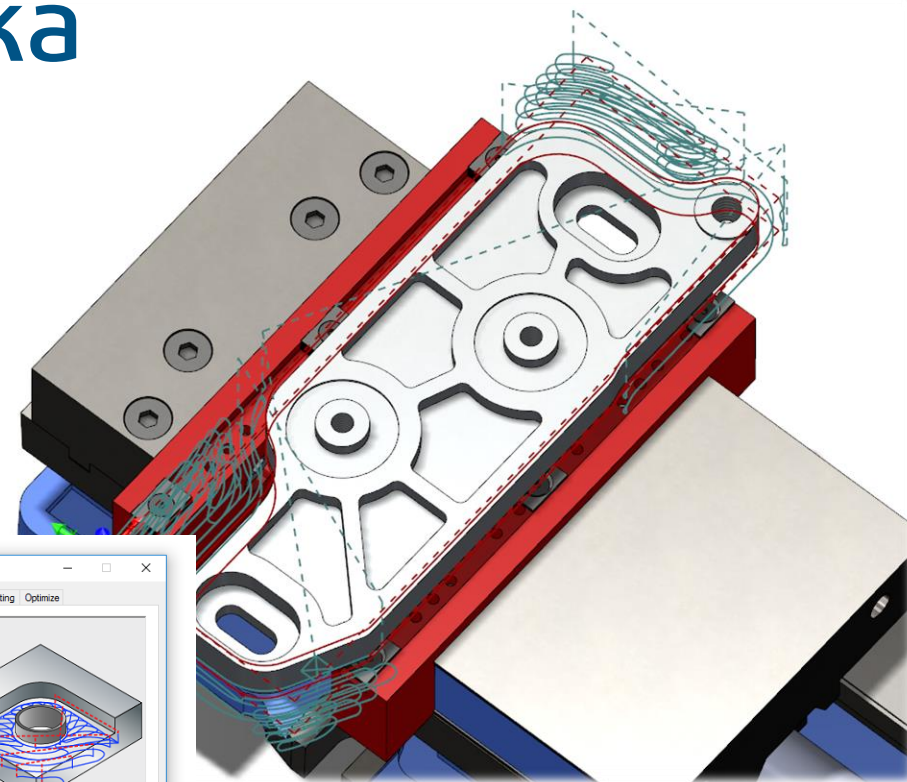
Высокоскоростная обработка

Сокращение времени на программирование сложных деталей

Фрезерование быстрее при меньшем напряжении инструмента

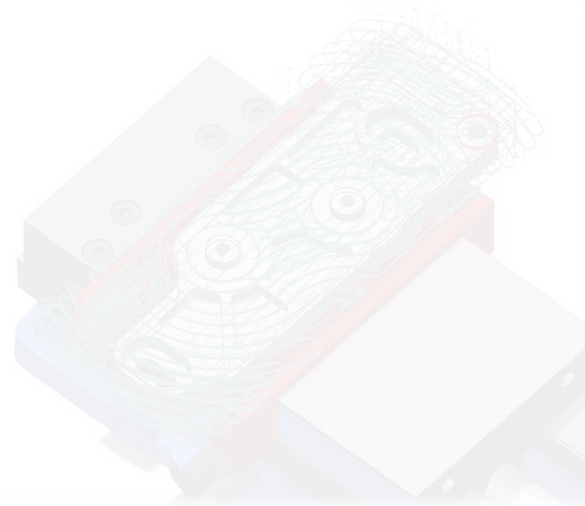
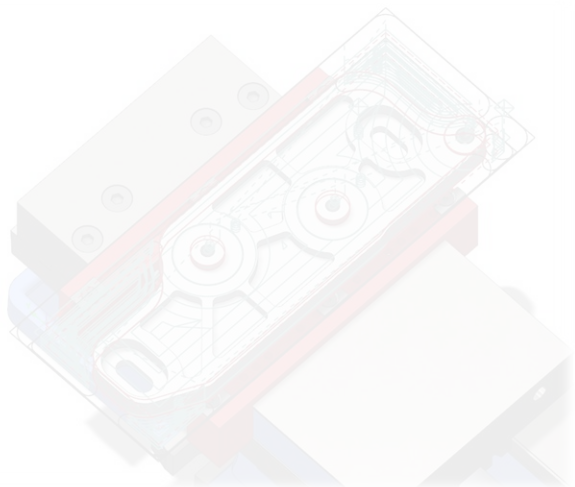
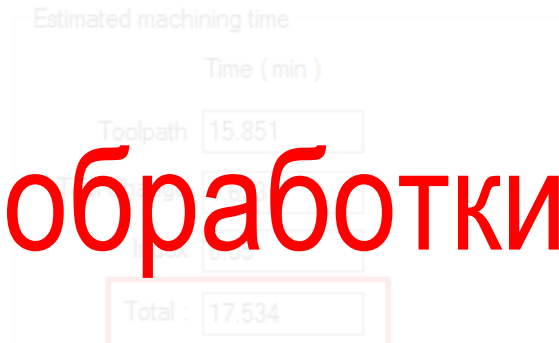
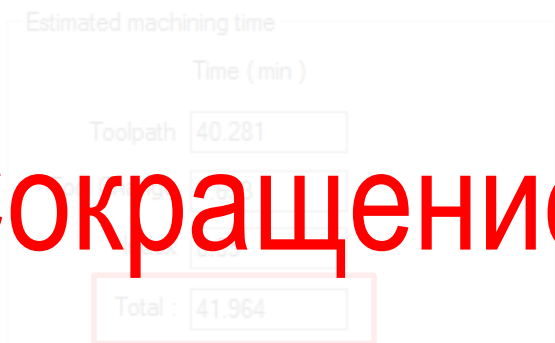
Увеличение срока службы режущего инструмента в результате равномерного распределения нагрузки

Снижение нагрузки на станок



Высокоскоростная обработка

Сокращение времени обработки на
58%!



Последние изменения и генерация G-кода

The image illustrates the workflow for generating G-code for a milling operation. It consists of several key components:

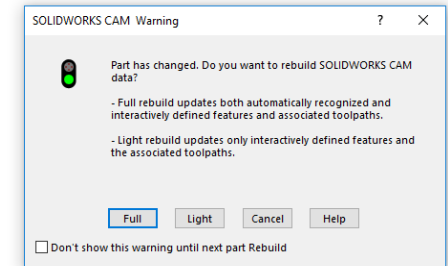
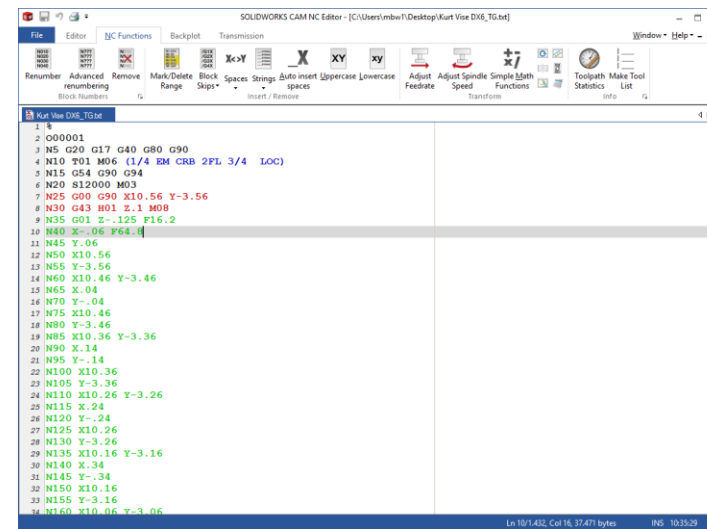
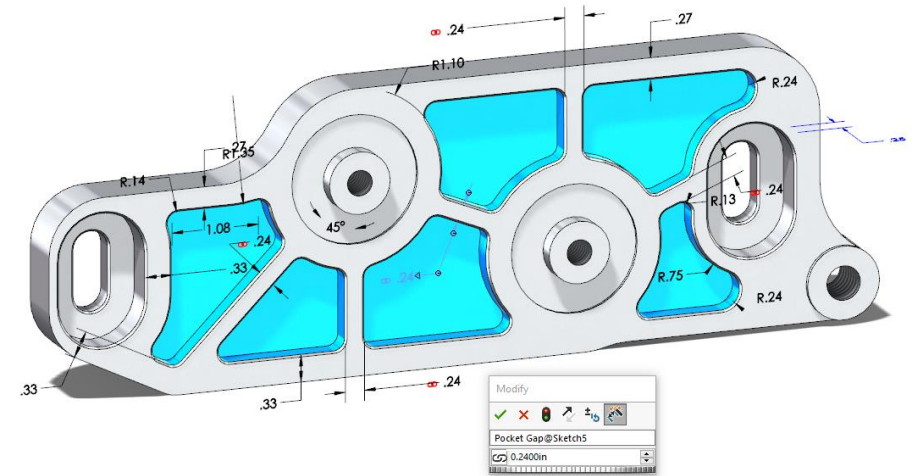
- POURURE SETUP SHEET:** A technical drawing showing various views (RIGHT VIEW, ISO VIEW, G1P VIEW) and a table of parameters.
- Operation Parameters:** A dialog box for configuring the milling operation, including tool selection, cutting parameters (cut angle, start corner, minimum diameter), and depth parameters.
- VoluMill Technology Expert:** A dialog box for selecting material type (Low silicon Aluminum, Brass, Copper), material hardness (Brinell (HB) 300), tool diameter (0.75in), and other tool-related parameters.
- SOLIDWORKS CAM NC Editor:** The main software interface showing the G-code for the operation. The code includes commands like G00, G17, G40, G80, G90, M10, T01, M06, and various G01, G02, G03, G04, G43, G54, G55, G56, G57, G58, G59, G64, G65, G68, G69, G70, G71, G72, G73, G74, G75, G76, G77, G78, G79, G80, G81, G82, G83, G84, G85, G86, G87, G88, G89, G90, G91, G92, G93, G94, G95, G96, G97, G98, G99, M00, M01, M02, M03, M04, M05, M06, M07, M08, M09, M10, M11, M12, M13, M14, M15, M16, M17, M18, M19, M20, M21, M22, M23, M24, M25, M26, M27, M28, M29, M30, M31, M32, M33, M34, M35, M36, M37, M38, M39, M40, M41, M42, M43, M44, M45, M46, M47, M48, M49, M50, M51, M52, M53, M54, M55, M56, M57, M58, M59, M60, M61, M62, M63, M64, M65, M66, M67, M68, M69, M70, M71, M72, M73, M74, M75, M76, M77, M78, M79, M80, M81, M82, M83, M84, M85, M86, M87, M88, M89, M90, M91, M92, M93, M94, M95, M96, M97, M98, M99.
- 3D Models:** A sequence of four 3D models showing the milling process: 1. The initial 3D model of the part. 2. The milling tool (end mill) positioned above the part. 3. The milling tool cutting the part. 4. The finished milled part with dimensions and a 'Modify' dialog box showing 'Pocket Gap@Surface' set to 0.2400in.

Последние изменения и генерация G-кода

Ассоциативная модель (автоматического обновления САМ части)

Обширная библиотека постпроцессоров

Встроенный редактор NC программ

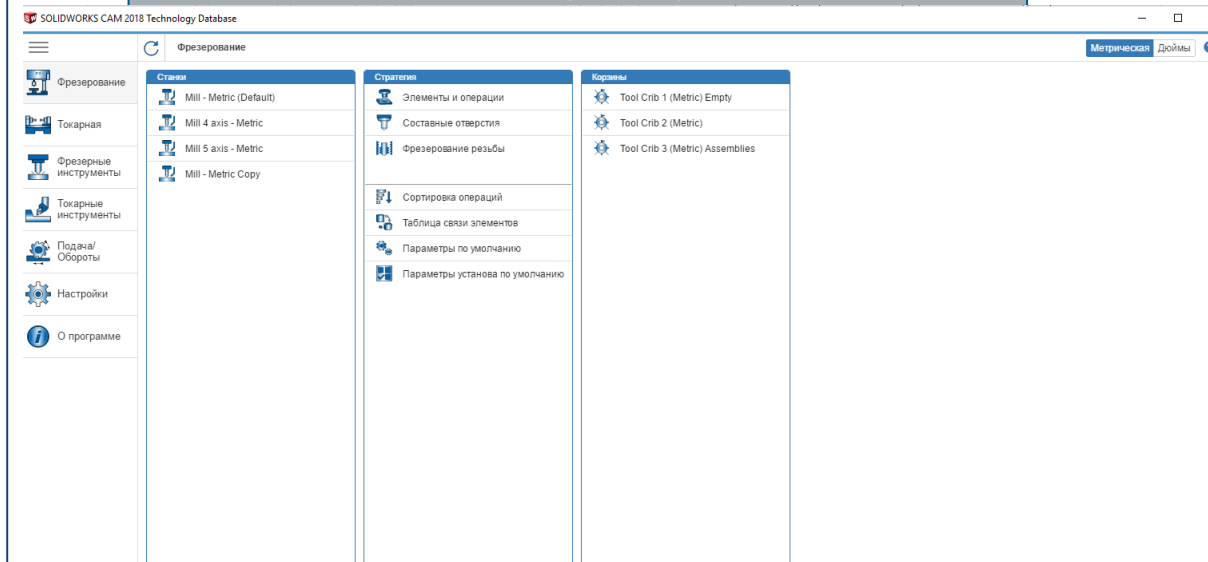


Технологическая база данных

Возможность пополнения технологической базы данных

- Создание нового или редактирование старого фрезерного или токарного оборудования
- Создание пользовательского инструмента (произвольной формы и материала)
- Создания новых «Корзин» инструментов
- Создание новых стратегий обработки (адаптация производства)
- Добавление новых материалов для инструмента и детали
- Изменение параметров подач и оборотов

Возможность создать, полностью адаптированную под производство, пользовательскую технологическую базу данных

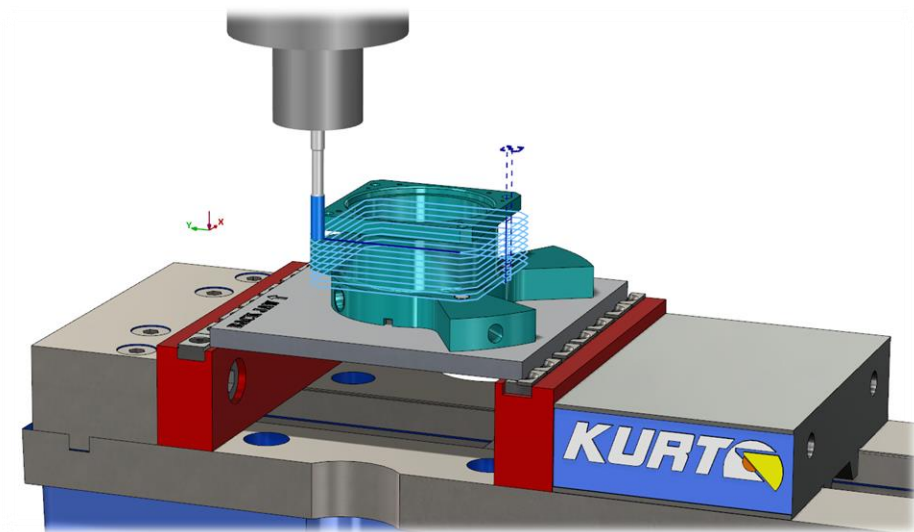


SOLIDWORKS CAM Фрезерование

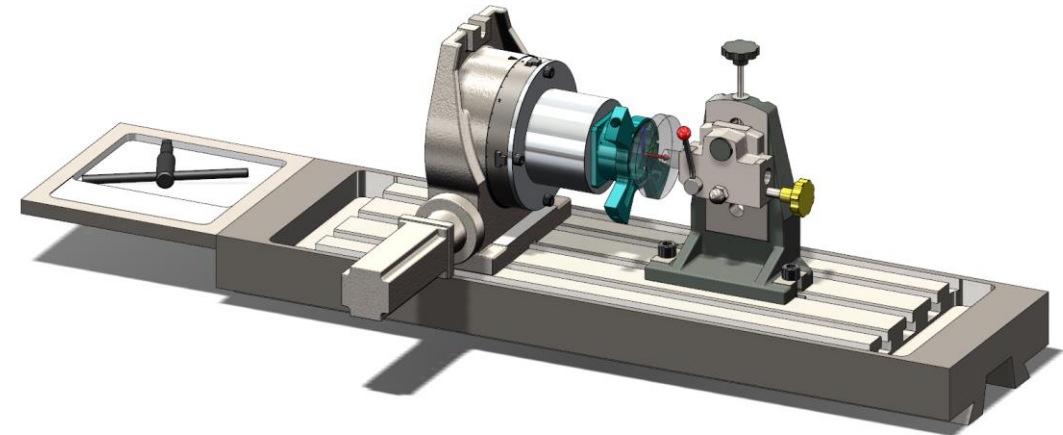
Поддержка сразу нескольких стратегий обработки

Улучшенный контроль над обработкой отверстий

Обработка в номинальном допуске значений



*Большая гибкость при работе с несколькими
машинами, исключение трудоемких
перестроений модели и увеличение срока
службы инструмента*

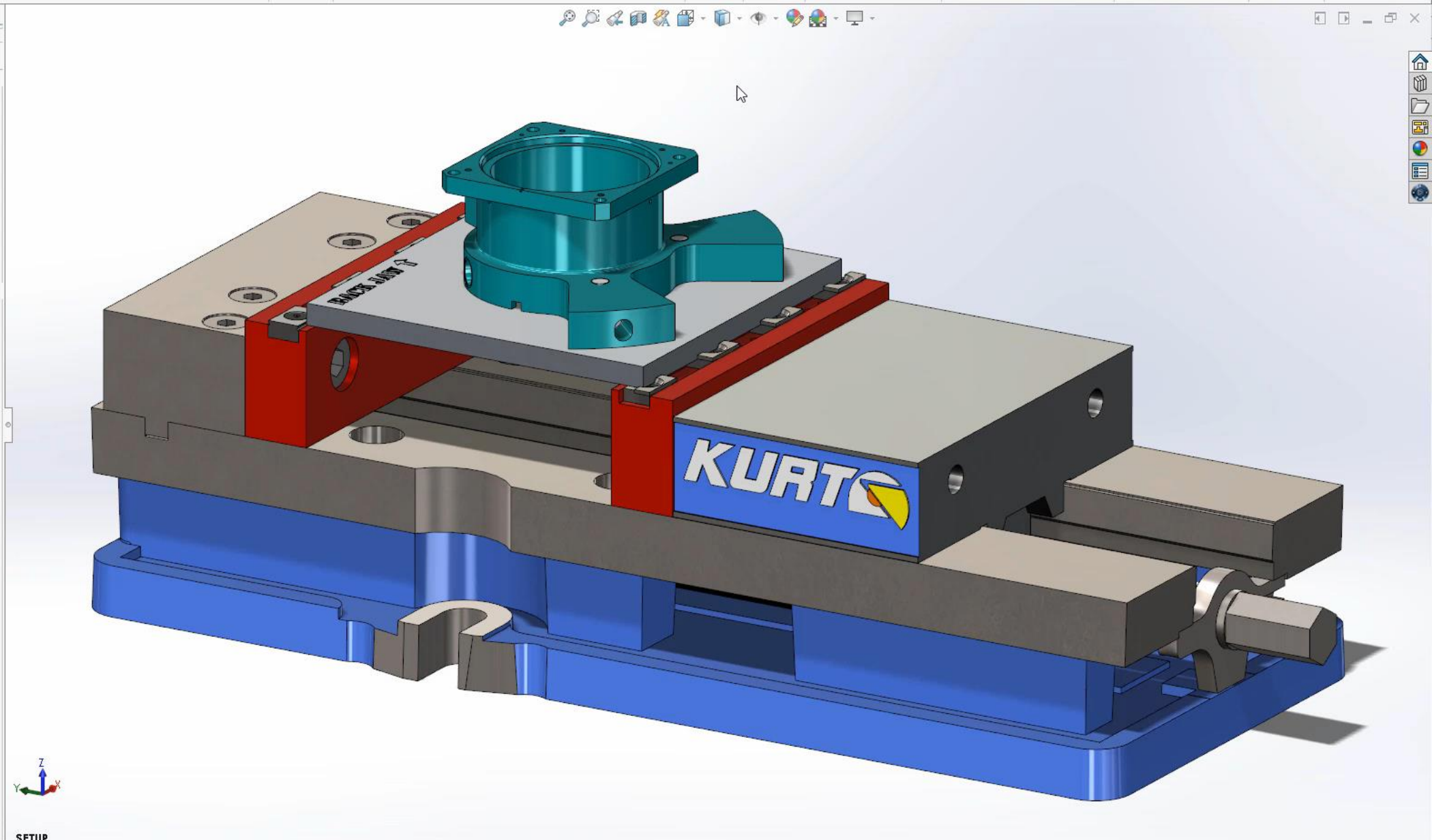


Define Machine | Coordinate System | Stock Manager | Setup | Extract Machinable Features | Generate Operation Plan | Generate Toolpath | Simulate Toolpath | Save CL File | Post Process | Sort Operations | Feature | 2.5 Axis Mill Operations | Hole Machining Operations | 3 Axis Mill Operations | Turn Operations | Save Operation Plan | Default Feature Strategies | Tolerance Based Machining | Technology Database | Message Window | Process Manager | User Defined Tool/Holder | SOLIDWORKS CAM NC Editor | Create Library Object | Insert Library Object | SOLIDWORKS CAM Options | Help | Publish eDrawings

Assembly | Sketch | Evaluate | SOLIDWORKS CAM

SOLIDWORKS CAM NC Manager

- Configurations
 - Mill - [CENTERED - Setup 2]
 - Mill - [CENTERED - Setup 1]
- Machine[Mill - Metric]
 - Part Manager
 - Camera Mount Flange.SLDPRT [Default]
 - Instances
 - Stock Manager[6061-T6]
 - Coordinate System [User Defined]
 - Setup1 [Group1]
 - Face Mill1[T12 - 50 Face Mill]
 - Rough Mill1[T05 - 20 Flat End]
 - Contour Mill1[T05 - 20 Flat End]
 - Rough Mill2[T05 - 20 Flat End]
 - Rough Mill4[T05 - 20 Flat End]
 - Contour Mill2[T01 - 6 Flat End]
 - Contour Mill6[T01 - 6 Flat End]
 - Center Drill1[T06 - 6MM X 60DEG Center Drill]
 - Drill1[T13 - 4.5x118° Drill]
 - Center Drill2[T14 - 8MM X 60DEG Center Drill]
 - Tap1[T15 - 3.0x0.5MC Tap-Cutting]
 - Center Drill3[T16 - 5MM X 60DEG Center Drill]
 - Drill2[T17 - 2x135° Drill]
 - Tap2[T18 - 2.5x0.45MC Tap-Cutting]
 - Center Drill4[T19 - 4MM X 60DEG Center Drill]
 - Center Drill5[T19 - 4MM X 60DEG Center Drill]
 - Tap3[T20 - 2.0x0.4MC Tap-Cutting]
 - Contour Mill4[T11 - 5 X 90 Countersink]
 - Contour Mill5[T21 - 45.5 Keyway]
 - Recycle Bin



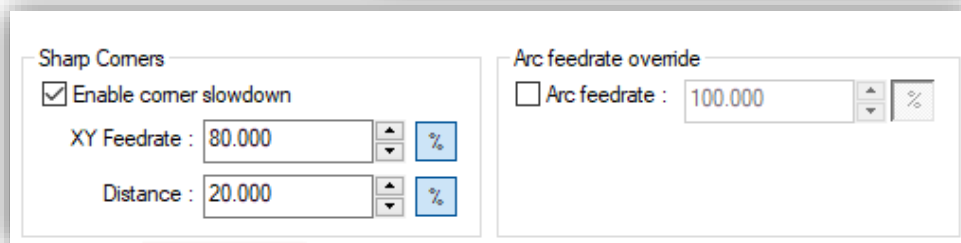
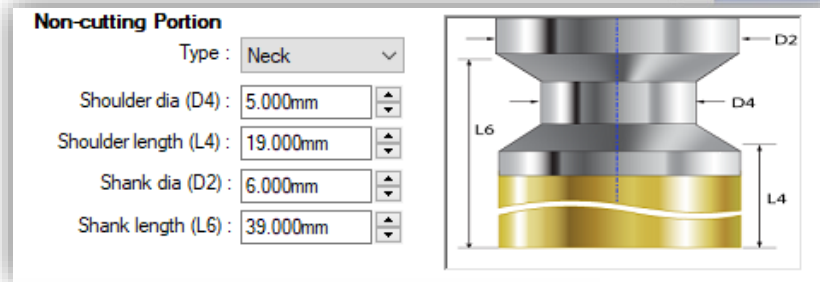
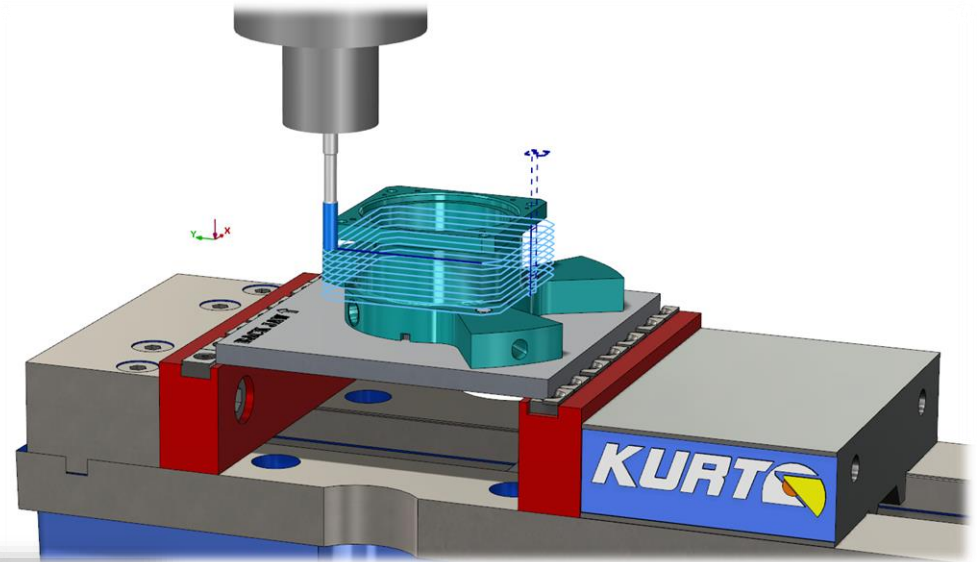
SETUP

SOLIDWORKS CAM Фрезерование

Создание NC-программы с большей легкостью

Виды инструментов для фрезерования сужений и конусов

Снижение скорости в местах изменения траектории инструмента



SOLIDWORKS CAM Токарная обработка

Соответствие размеров на основе заданных допусков

Распознавание данных из DimXpert и MBD

Регулировка ассиметричных допусков для средних значений

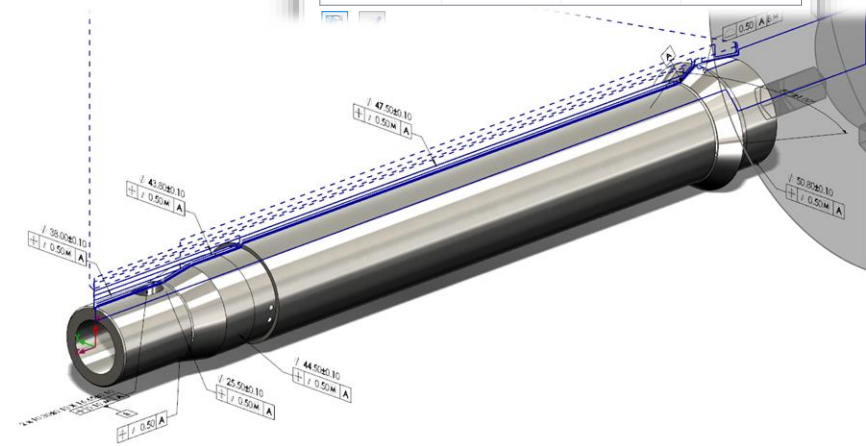
Избавьтесь от долгих часов сложного программирования!

SOLIDWORKS CAM Tolerance Based Machining(Turn) - Run

| Feature | Default Strategy | Identified features |
|--------------------------|------------------|---------------------|
| OD Feature | Rough-Finish | 0 of 1 |
| ID Feature | Thread | 0 of 1 |
| Face Feature | Thread | 0 of 1 |
| Groove Rectangular OD | Rough-Finish | 0 of 1 |
| Groove Rectangular ID | Rough-Finish | 0 of 0 |
| Groove Rectangular F... | Rough-Finish | 0 of 0 |
| Groove Half Obround ... | Rough-Finish | 0 of 0 |
| Groove Half Obround ID | Rough-Finish | 0 of 0 |
| Groove Half Obround F... | Rough-Finish | 0 of 0 |
| Groove Generic OD | Rough-Finish | 0 of 0 |
| Groove Generic ID | Rough-Finish | 0 of 0 |
| Groove Generic Face | Rough-Finish | 0 of 0 |
| Cut Off | Cut Off | 0 of 1 |

Tolerance range(s) available in the current part

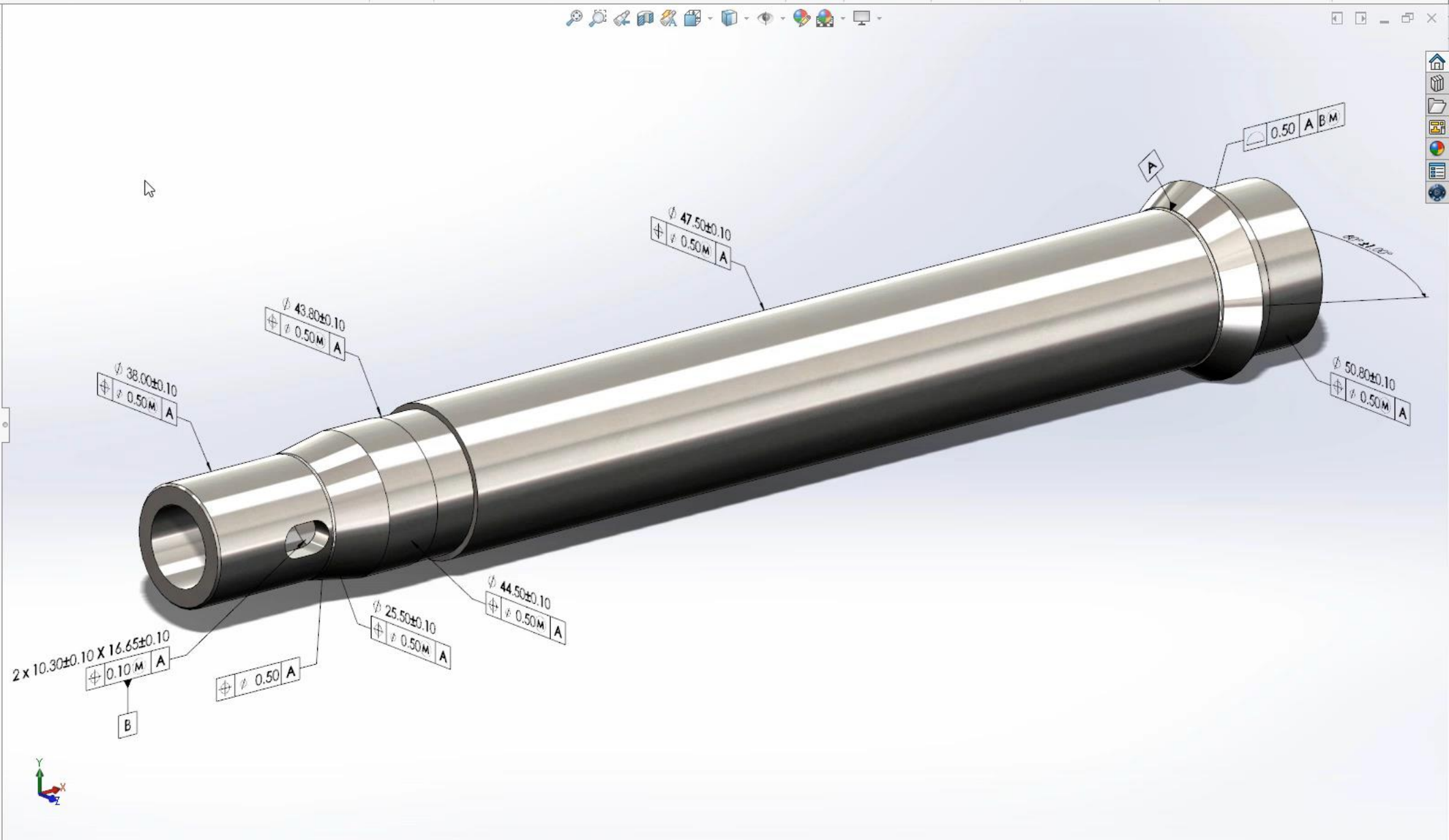
| Tolerance Range | Undersize Strategy | Nominal Strategy | Override Strategy |
|-------------------|--------------------|------------------|---------------------|
| 0 to 5 mm (0,0,0) | Rough - 2x Finish | Rough-Finish | Rough - Semi Finish |



Coordinate System, Stock Manager, Setup, Extract Machinable Features, Tolerance Based Machining (Turn)- Run, Generate Operation Plan, Generate Toolpath, Simulate Toolpath, Step Thru Toolpath, Save CL File, Post Process, Sort Operations, Feature, 2.5 Axis Mill Operations, Hole Machining Operations, 3 Axis Mill Operations, Turn Operations, Save Operation Plan, Default Feature Strategies, Tolerance Based Machining (Mill), Tolerance Based Machining (Turn), Technology Database, Message Window, Process Manager, Publish eDrawings, SOLIDWORKS CAM NC Editor, SOLIDWORKS CAM Options

Features Sketch Evaluate SOLIDWORKS CAM

SOLIDWORKS CAM NC Manager
Configurations
Machine [Turn Single Turret - Metric]
Stock Manager[6061-T6]
Coordinate System
Main Spindle [User Defined]
Turn Setup1
Face Feature1 [Rough & Finish]
ID Feature1 [Thread]
CutOff Feature1 [Cut Off]
Recycle Bin



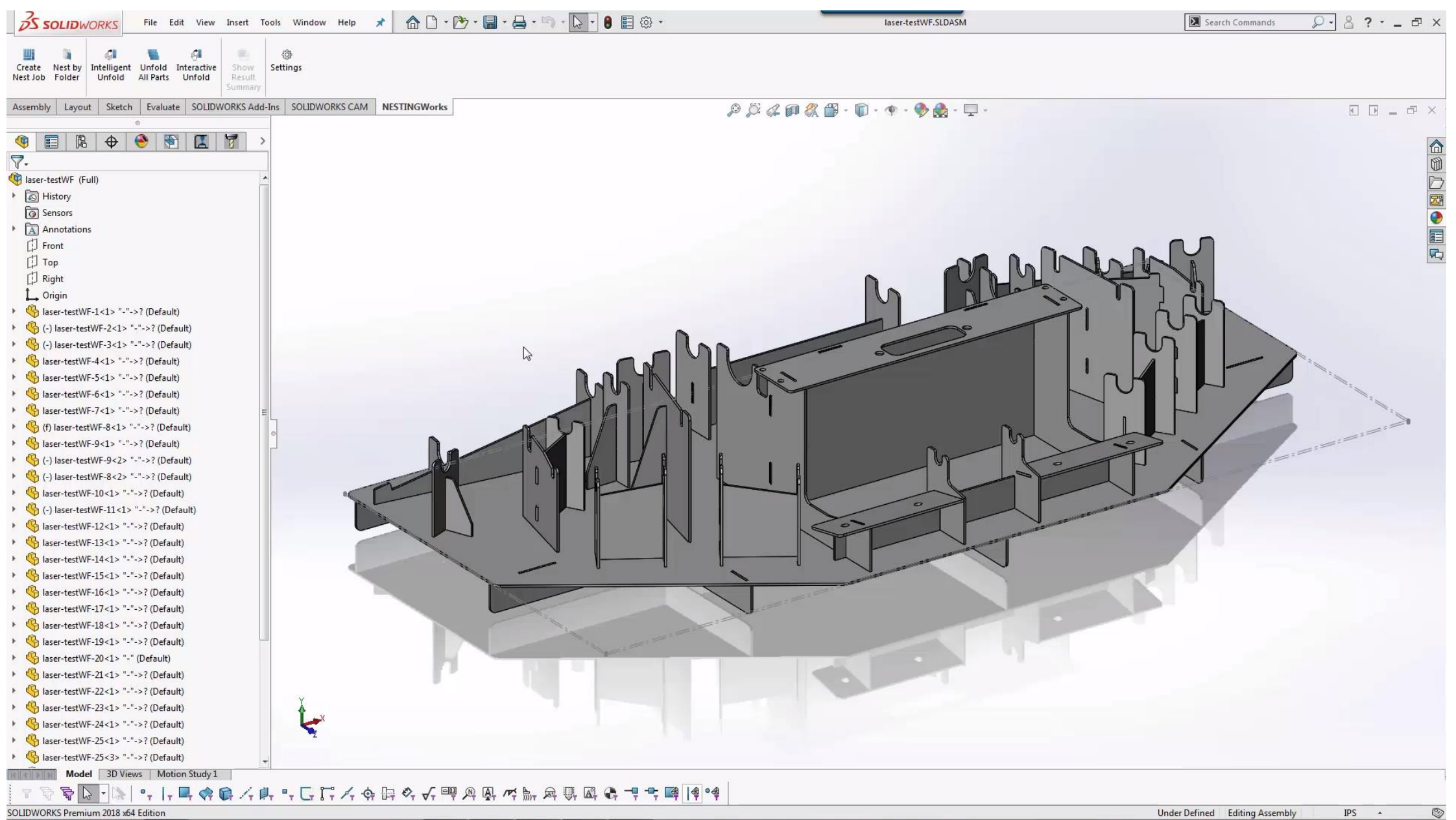
SOLIDWORKS CAM + NestingWorks



 **SOLIDWORKS**

 **IT tools**
идеальные
инструменты

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



Nesting Preview

Layout: 1 of 1

Sheet thickness : 0.134in

Utilization : 39.017

No of sheets : 1

Generate Report... Show Summary Delete Sheet

Parts & remnants in this layout :

| Part name | Quantity | Rotation |
|---------------------------------|----------|-----------|
| laser-testWF-1 [Default] | 1 | 90.00 |
| laser-testWF-24 [Default] | 1 | 0.00 |
| laser-testWF-28 [Default] | 2 | 90.00, - |
| laser-testWF-11 [Default] | 2 | 180.00, 0 |
| laser-testWF-2 [Default] | 1 | -90.00 |
| Mirrorlaser-testWF-22 [Default] | 1 | 0.00 |
| laser-testWF-22 [Default] | 1 | 0.00 |
| laser-testWF-30 [Default] | 1 | 180.00 |

Remnants Nested layout DXF

Save as sketches... Options...

Save as DXF... Save as...

All layouts All layouts

Generate Nested Assembly Cancel Help

laser-testWF-18<1> "->? (Default)

laser-testWF-19<1> "->? (Default)

laser-testWF-20<1> "- (Default)

laser-testWF-21<1> "->? (Default)

laser-testWF-22<1> "->? (Default)

laser-testWF-23<1> "->? (Default)

laser-testWF-24<1> "->? (Default)

laser-testWF-25<1> "->? (Default)

laser-testWF-25<3> "->? (Default)

laser-testWF-26<1> "->? (Default)

laser-testWF-27<1> "->? (Default)

laser-testWF-28<1> "->? (Default)

laser-testWF-28<2> "->? (Default)

laser-testWF-29<1> "->? (Default)

laser-testWF-29<2> "->? (Default)

laser-testWF-30<1> "->? (Default)

Mates

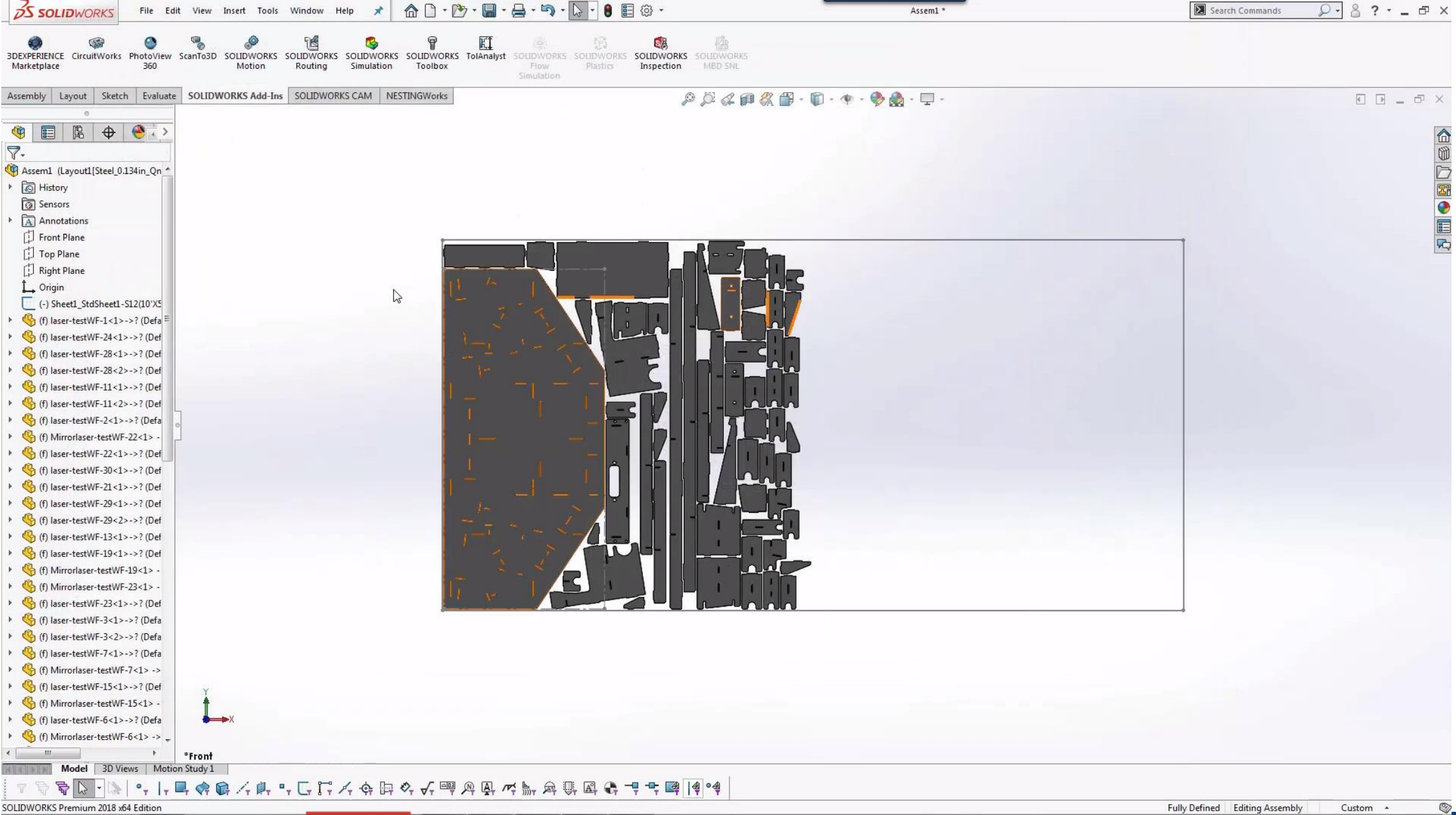
MirrorComponent1

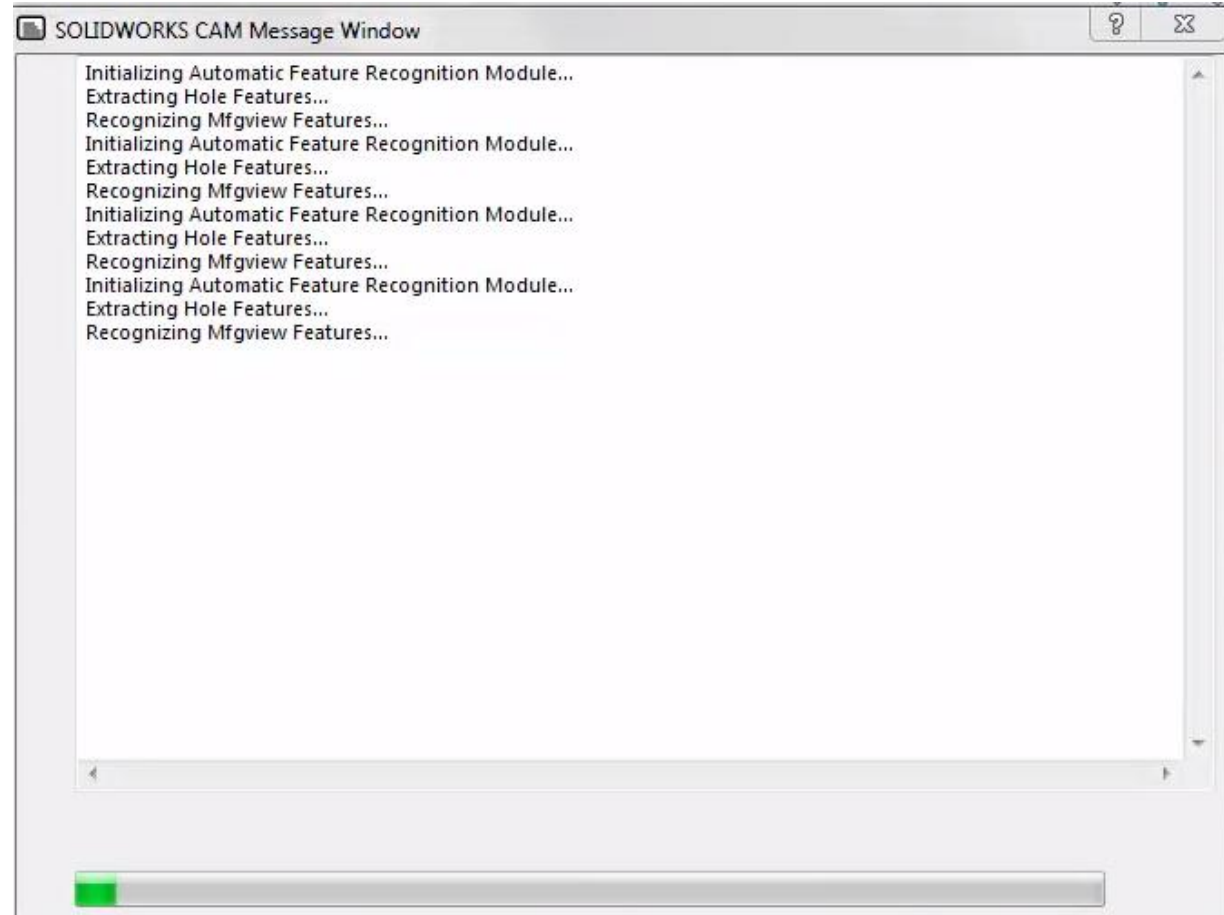
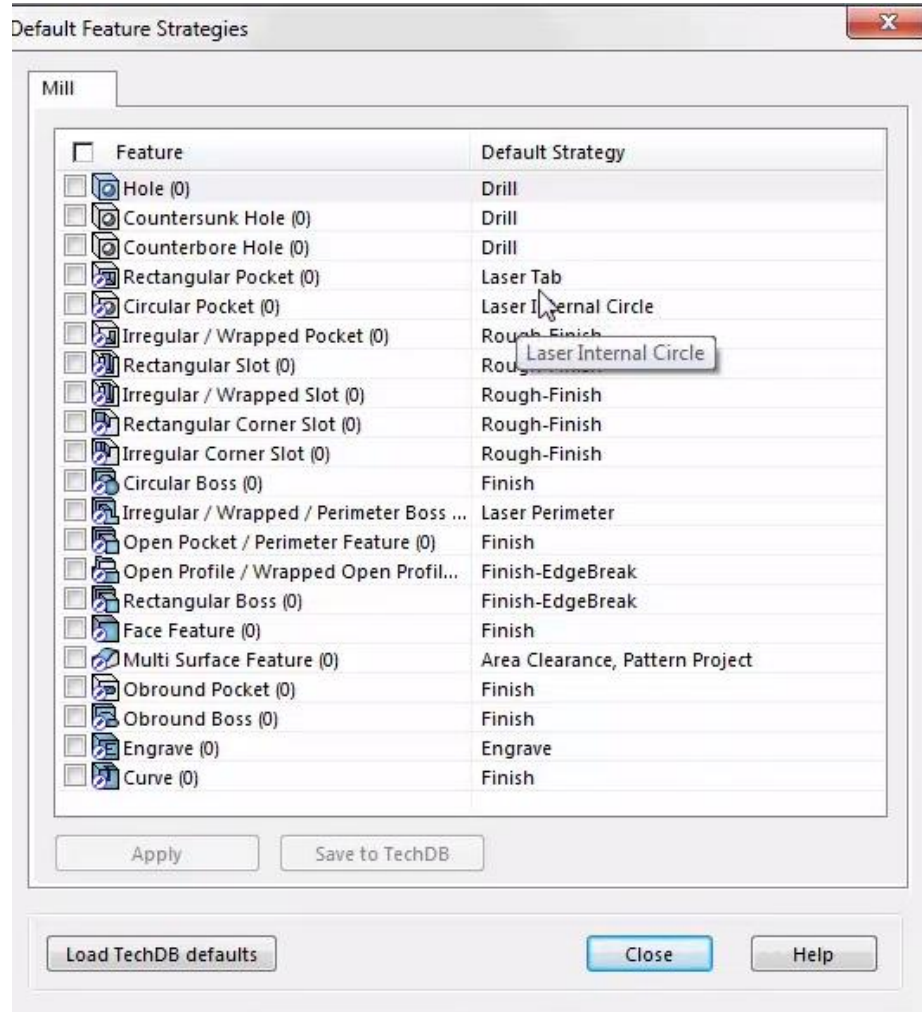
*Front

SOLIDWORKS CAM NESTINGWorks

SOLIDWORKS Routing Simulation Toolbox TolAnalyst Flow Simulation Plastics Inspection MBD SNL

SOLIDWORKS Premium 2018 x64 Edition Under Defined Editing Assembly IPS





Machine

Machine Tool Crib Post Processor Posting Setup Rotary Axis Tilt Axis

Active post processor:
C:\ProgramData\SOLIDWORKS\SOLIDWORKS CAM 2018\Posts\Mill\ANILAM_6000M

Available
C:\ProgramData\SOLIDWORKS\SOLIDWORKS CAM 2018\Posts\Mill\ANILAM_6000M

- ACRAMATIC-2100
- ALLENBRADLEY-9400
- ANILAM 1100
- ANILAM_6000M**
- XYZ_ROUTE
- BIESSE-ROVER23
- BOSTOMATIC

Do not show license expired post processors

| Parameter | Value |
|---------------------------|---------------|
| Machine Name | WILLIS RTM-40 |
| Controller Type | ANILAM 6000M |
| Z Home | 20.00000" |
| Traverse Rate | 250 |
| System License Number | |
| System License Expiration | |

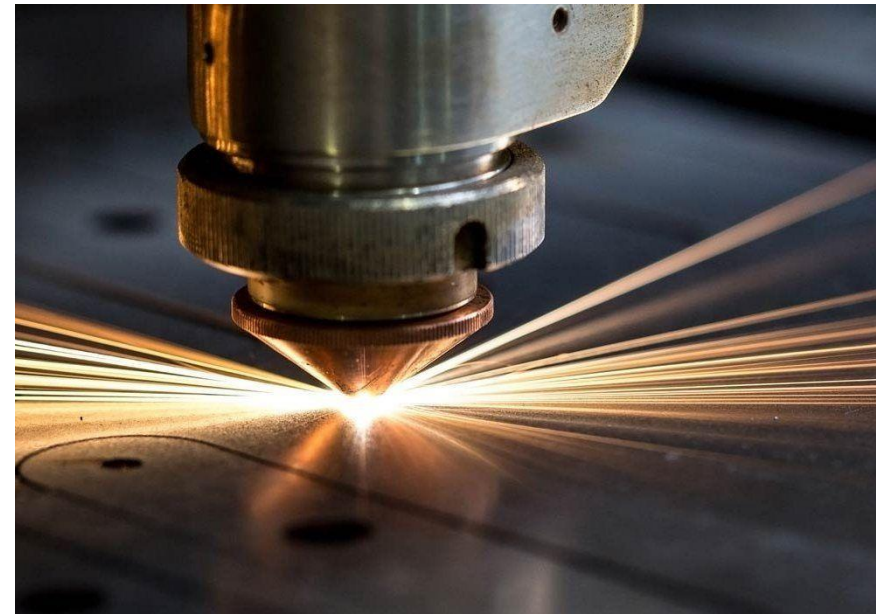
More

OK Cancel Help

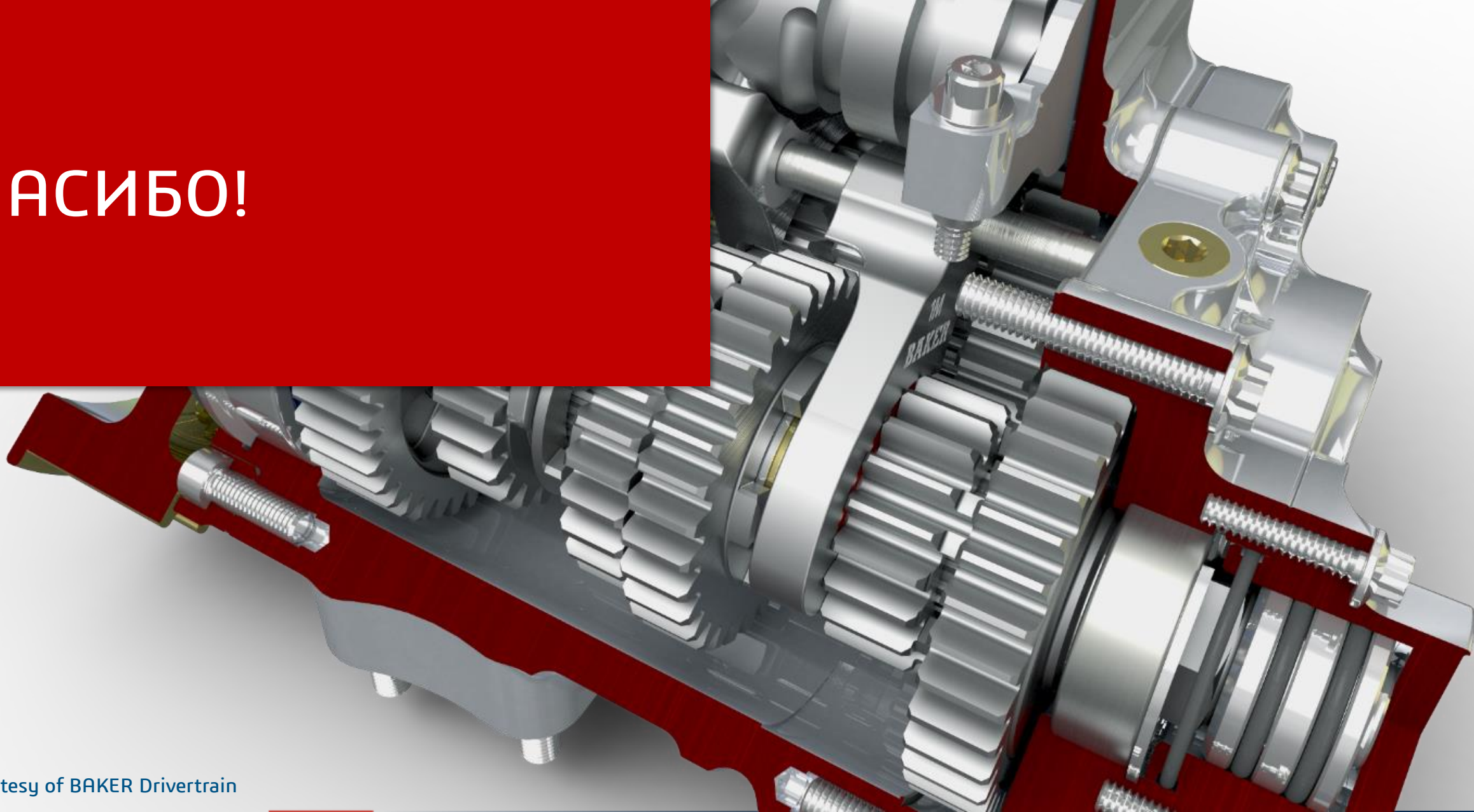
Экспорт файла

DXF

G-Code



СПАСИБО!



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