# OPUS Entwicklungs und Vertriebs GmbH Wilhelm-Raabe Strasse 4 73230 Kirchheim/Teck

CO & CEO Ralf Weissinger, Roland Aukschlat Since 1980 Customers 800, Workstations 3000 Employees 20

Development in Germany Sales and Support for Southern Germany Further Sales through System Centers (independent companies)

References

- BOSCH (Turning, Milling, Prototype to large amounts)
- LUK (Turning, Milling, Series)
- MAPAL (Turning, Milling, Eroding, Small Series)
- FLENDER (Turning, Milling, Small Series)
- VOITH Paper (Turning, Milling, Items=1)

# **OPUS Professional CAM**

Workflow



### www.opus-cam.de

### Clever bits working for you!



# History

- 1980 Contour calculation and tool radius compensation with programmable calculators.
- 1982 available to first PC Contour calculation tool radius compensation, program administration simulation
- 1984 Sirius Victor with 8080 Processor and 6 MHZ
- 1986 DNC im Hintergrund Wang PC with 80186 Processor IBM PC with 80286
- 1993 one of the first technical applications on Windows (2.11)





# How do you find a fitting CAD/CAM System?

# How do you go about this?

• Define and analyze the requirements of the parts you produce, most accurate and precise as possible. In terms of arrangements and numbers.

• Each production has its own specific characteristics, depending on the Product Composition (Standard or Special Processing) and the average Lot size.

# Where to pay particular attention to?

- The data from your existing Design and CAD environment, as an input transducer (2D and 3D Data) should be comfortably fully integrated into the programming systems interface for a perfect CAM workflow.
- You should be able to intergrate as much old Data as possible, comfortably, via interface. Not all Systems are really "open" like this. With extensive data acquisition, you save a lot of programming time.

• A CAM system must master all common operations with powerful processing modules. From a simple turning procedure, to a modern N – Axis Turning/Milling procedure.

• The ability to adapt and modify the software must be given. Otherwise you run the risk having to adjust your production to the CAM system, that is not the point of a CAM system. The CAM system must be able to be adapted flexibly to your optimized production processes. Ideally, a system can be trimmed flexibly, to very specific requirements.

# Arbeitendez 44 DECOUNDERT 1 Image: Construction of the second of the second

**CAM Software** 

# How do you find a fitting CAD/CAM System?

# NC Program Management

Here fast and easy access is important. The opportunity should also be given to find similar or even identical operations guickly, to then be able to take these over into the NC Machining Program.

# Smart Tool Management will save you money

An efficient management of your tools will tell you, what tools are being used where they are being used, or if they are free and can be used for processing. Thus, a very productive scheduling of the pending jobs is possible.

- Technology and Cutting Data must be completely stored in a Tool Database. You will save a lot of time Programming because the data is filled in automatically.
- Your expensive CNC machinery will set the tone.

# Interface to the Machine (Postprocessor)

- The output, to the manufacturing centers in the workshop, is crucial. If it comes to "communication problems", it is possible that there is no productivity increases.
- You must able to comunicate with all CNC Machines in your production, with powerful Postprocessors, no exceptions.



**CAM Software** 

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# How do you find a fitting CAD/CAM System?



# Simulation Possibilities "in real life"

• Simulate the process at your desk and then make changes to optimize it if needed. If you recognize an error at your desk, it will not cost you much, on the other hand, an error on the expensive CNC machines, might turn into a fiasco!

• A modern CAM System needs to master all steps if a Simulation. From an easy Simulation Source to a full NC-Simulation with a Machine Model. Costly error processing can be avoided to almost 100%.

# Further Points

• Continuity of the program across all modules of the CAM system.

• Usability! Easy to understand programming icons, continuous information about the next step , intuitive Program Surface, important information just a click away,.....

• The system has to be build up scalably. To take everything into operation at once isn't possible. A gradual introduction of the system must be implemented.





# • CAD Import / Construction

- Clamping Situation
- Process Definition
- Source Simulation
- Postprocessor
- Work papers (Electric or Paper)
- Simulation of the finished NC Program
- Sharing with Machine (DNC)
- Send the optimzed program back
- Compare with Original



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Halter D-Platte Gr.15 EW=93

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# **OPUS Professional**

Basic

- **OP010** Basic Package Project Management SESAM NC Editor Version Management Databases **3D** Viewer
- OP012 Geometry 2D/3D 2D / 3D Construction 2D / 3D Variants CAD Import 2D / 3D Processing of Part Blank, Tool, Clamping Drill analysis Fotos and Bitmaps



# **OP010 Basic Package**

Project Management

- All related data under one number
- Database
- NC Program
- Drawings
- Configurable Management Data
- Setup Sheets
- Any additional documents

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FORMAT1

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# **OP010 Basic Package** *Editor*

The Editor to write and change NC-Programs and or setup sheets.

- Several part Programs Parallel
- Compare Data
- Multiple Windows to one File
- Syntax Recognition / Display

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<pre>     (LET2TER SCHNITT ENTFERNT)- 135 N710 R10=12 L116-     N715 L131-     N720 G59 Z=R902 X=R901 C=R903-     (SCHLICHTEN INNEN HS)-     /1 N725 [WAIT M,20,1,2]- 140 (SCHL-I-L/P-A403 LI DMIN.21 EL70     N730 IZ DZ-     N736 M4=26 M4=33-     N746 G96 S4=220 F0.17 M4=4 M1=8-     N745 G0 22.066-     N750 G0 G41-     N755 K35.771-     N766 M4=97-     N766 G1 X36.464 Z1.866 F0.17-     N776 G1 X32 Z-2- 150 N775 G1 Z-40-     N789 G1 X18.003-     N789 G0 Z2-     N790 G0 Z2-     N790 G0 Z2-     N790 M1=9-     N790 M1=9-     N790 M1=9-     N795 M1=9-     N755 M</pre>		N670	M3=97-								
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<ul> <li>N745 G0 22.066-</li> <li>N750 G0 G41-</li> <li>N755 X35.771-</li> <li>N760 M4=97-</li> <li>N765 G1 X36.464 Z1.866 F0.17-</li> <li>N770 G1 X32 Z-2-</li> <li>N770 G1 X32 Z-2-</li> <li>N780 G1 X18.003-</li> <li>N785 G0 G40-</li> <li>N785 G0 G40-</li> <li>N790 G0 Z2-</li> <li>N795 M1=9-</li> <li>N996 C05</li> </ul>		N740	696 54=228	ە <b>F 9_1</b>	7 М4=4 I	11=8-					
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	. N735 M4=26 M4=33¬	
	- N740 G96 S4=220 F0.17 M4=4 M1=8-	
	- N745 60 22.0007 N750 C0 C017	
	N755 X35.771¬	
	150 N760 M4=97-	
	- N765 G1 X36.464 Z1.866 F0.17¬	

# **OP010 Basic Package**

Version Management

- Automatic Version with every Chan
- Number of Versions adjustable
- Contain DNC Actions

	OPUS I	Editor - [Arbei	tsdatei 18	: G200]	-					
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		N180 M3=	97-							
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		N240 G1	X75.431 Z-3	30.359-						
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# **OP010 Basic Package** *Database*

- Any Data (Pictures, Graphics, Memo Fields)
- Any Engine (Mysql, Firebird, Oracle..)
- Secure and Selective Archiving

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# **OP012 Geometry 2D/3D** 2D / 3D Construction

- **Contour Manipulation**
- **Directional Geometry**
- Help Construction
- Volume and Contour "bool"

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# **OP012 Geometry 2D/3D** 2D / 3D Variants

- Flexible Geometry
- Generate Entry Forms
- Merging 2D/3D







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# Clever bits working for you!



# **OP012 Geometry 2D/3D** CAD Import 2D / 3D

- Import of 3D Solids
- Direct work on/with the body
- Derive contours from 2D for processing
- Import of 2D Drawings
- Filter for Layers / Colors / Line Types
- Track Contour and Heal
- different 2D and 3D Formats

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### Clever bits working for you!

# **OPUS Professional** *OP012 Geometry 2D/3D*

- 2D / 3D Construction
- 2D / 3D Variants
- CAD Import 2D / 3D
- Processing of Work Piece, Blank Part, Tool, Clamping
- Hole Analysis
- Pictures and Bitmaps



# **OPUS Professional** *OP020 Tool Database*

- Complete Tools
- Individual Parts, Parts List
- Cross Reference
- Technological Data
- Pre Setup
- Assembly
- Detailing on Demand
- Datebase for Tools, Clamping System, Measuring Tools...
- Extendable to ERMS

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# **OPUS Professional** *OP030 Milling*

• Contours

- Pockets
- 3+2 Axis (Cubic Part)
- 3 Axis free forms
- Multi Clamping
- Drilling Recognition
- Mashine Cycles
- Processing Control and Material Reduction
- Tool Simulation/Part Clamping Situation
- Time Calculation

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# **OPUS Professional** *OP032 Milling 5 Axis Simultaneous*

- 5 Axis Swarf Cutting
- 5 Axis Contour Processing
- Flowline Strategy
- Diverse Finishing Operations for more Surfaces
- 3-5 Axis Conversion
- Efficient Roughing-Algorithm













# **OPUS Professional**

# **OP035** Turning

- Rough Facing
- Longitudinal Roughing
- Contour Parallel Roughing
- Roughing of falling Contours
- Processing of Threads
- Cut-Ins and Recessing Operations
- Offsets
- Graphic Control during Creation
- Pre-Processing
- Special Processing
- Allowance
- Simulation Tool/Work Piece Clamping System
- Time Calculation



# **OPUS Professional** *OP035 Turning-Milling CYB*

- Corresponds to Milling
- Only needed if Milling Module is not available
- On Shell, Face and Cutting Surfaces
- Programming and Construction for each Level Separate
- Shell Surface Programming on the corresponding 2D unwinding





# **OPUS Professional**

OP040 multi-Tool/-Spindel/ -Axis

- Synchronization of work process for multichannel operation
- Processes
- NC Sets
- Listing
- Simulation





# OPUS Professional CAM Options

- OP042 Features / Process Database
- OP060 Kinematics Module (Mashines/Clamping Systems/Tools)
- OP850 Material Removal and OP851 Collision RealNC
- OP860 Material Removal and OP861 Collision Modulworks
- Control back Simulations

# **OPUS CAM Options OP042** Features

- Import of CAD
- Processing with the same Parameters as in CAD
- Configurable Analysis via Database
- Automatic Conversion to the Processes





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# **OPUS CAM Options** *OP042 Process-Database*

- Create Process Templates
- Single Processes
- Process Steps
- Complete Processing for single Features
- Organized as Part Family or Part Type
- with Tool and mit Technology
- Flexible or unchanged
- for Turning, Milling, Drilling



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# **OPUS CAM Options**

OP860 Material Removal and OP861 Collision Modulworks

- Nail Model
- Very Fast
- Speed adjustable via Accuracy
- Optimal for Free Form Surfaces
   3 or 5 Axis

