

# Course Programme



THE WORLD'S  
LARGEST  
CNC ACADEMY!  
**DMG MORI**  
ACADEMY

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DMG MORI Academy

## Your partner for practical training straight from the manufacturer.

Improve your productivity and keep your employees up to date. The DMG MORI Academy is a subsidiary of the DMG MORI SEIKI Group and a global leader in the teaching of expertise in CNC machine tools. Our comprehensive range of courses meets all the criteria for the technical advanced training of programmers, operators and maintenance and repair staff for DMG MORI machines. The results will be reflected in improved productivity and production safety. Schedule training for your employees with the DMG MORI Academy and take advantage of the expertise of a globally leading manufacturer of machine tools.

## CNC Training

# Increase productivity through knowledge.

CNC Training can give your productivity some real momentum. The success will become visible in your company after a short period of time. In our training courses, we rely on teaching professional programming and the efficient set-up and operation of your DMG MORI machines. The practical teaching of the training content by our qualified and didactically certified trainers and personal lessons in small groups allow you to attain the highest level of learning success. We provide practical training and further education in modern CNC Training centres in Europe, America and Asia with our modular range of courses. We will also gladly train your employees on site, wherever you are in the world.

**Example:** Modular course offer for the DMU series with the Heidenhain iTNC control system.

### OPTIMAL TRAINING SUCCESS

**Professional e.g.:**  
Parameter programming  
Heidenhain iTNC 530

**Advanced e.g.:**  
Plane transformation  
Heidenhain iTNC 530

**Basic e.g.:**  
Programming and operating  
Heidenhain iTNC 530 with  
FollowUp Training

### INITIAL SITUATION

### Step by step – optimal results

- + Increased productivity, for instance through shorter machine integration or reduced programming and set-up times
- + Efficient programming and minimisation of operating errors
- + Optimally trained and re-motivated employees
- + **FollowUp Training – the online training course and perfect training supplement**

### Your benefits

- + Modular and practical training in how to program, set-up and operate your DMG MORI machines
- + Training courses tailored to your requirements in our modern training centres
- + Training in small groups using the machine itself
- + Analysis of your company-specific training requirements with Training Plus is possible
- + Continuous adaptation of the training content to your requirements
- + Most modern equipment, didactically innovative courses
- + High quality training documentation, specifically for every training
- + DMG MORI certificate for your employees upon conclusion of the training
- + Highly qualified trainers with methodical and didactic certification





Maximum productivity thanks to sustainable, personalised qualification:



#### MAXIMUM PRODUCTIVITY

**Training:** Employee-specific training, e.g. programming of variables and parameters

**Conceptualisation:** Development of a training concept, specifically matched to your requirements

**Analysis:** Joint analysis of the individual training requirements of your employees

#### INITIAL SITUATION

Please contact us for personalised advice:

**Turning technology:**  
training.drehen@dmgmori.com  
T: +49 (0) 52 05 / 74 25 03

**Milling technology and  
ULTRASONIC / LASERTEC:**  
training.fraesen@dmgmori.com  
T: +49 (0) 83 63 / 89 42 24

#### Training Plus

## Individual solutions for your company.

Training leads to a considerable increase in productivity. Continue this process with Training Plus. We will determine the requirements of your employees jointly with you and develop a training concept specifically matched to these requirements – in your company. The optimisation of existing programs or the programming of variables and parameters are just some examples of the content, tailored to your requirements. Reach the maximum level of productivity with the advantages of Training Plus!

#### Training Plus – Your benefits:

- + Full exploitation of the potential of your DMG MORI machines
- + Optimisation of programme sequences
- + Increasing the technical know-how of your employees
- + Increasing employee motivation
- + Tailor-made training perfectly matched to your requirements



### Highlights

- + Answering of questions arising during practical application
- + Two hour deepening of the training contents
- + Direct communication with a qualified trainer via the internet and by phone
- + Live demonstration of programme steps – as in the classroom
- + On-line access to programming and training software
- + Comfortable participation at the workplace without travel time or costs

### FollowUp Training

## Knowledge consolidation online.

Efficient handling of questions and problems with online experts after a CNC Training course. After your employees have participated in face-to-face training, further questions during the application of the learned matter can arise in practice. With the FollowUp Training we now offer your employees the opportunity to discuss these questions and to further deepen their knowledge. One of our experienced trainers will carry out the FollowUp Training in a virtual classroom and present the training content over the internet.

#### **TRAINING**

Learning the control systems / machine in one of our training centres.

#### **PRACTICAL PHASE**

Application of the training content in the workplace.

#### **FOLLOWUP TRAINING**

Consolidation of knowledge – with experts in the workplace over the internet.

ProductivityPlus

# Manufacture more efficiently!

Are your processes lean? Are you happy with the productivity of your mechanical production chain? Are there products in your company which don't earn a penny? Improve your profit margin with more efficient production processes! Add structure to your logistics! Use the experience and innovative power of DMG MORI to maximise your economic success. With *ProductivityPlus* we analyse and evaluate your production together with our technology partners. Based on that, we will develop solution proposals perfectly matched to your requirements for more performance, productivity and competitive opportunities. **A contact partner throughout the entire project – everything from a single source!** For a complete service ranging from analysis to the implementation of solutions, DMG MORI is only one contact, but it represents the know-how of a number of leading companies.

## Highlights

- + Reduction of production and item costs through reduction of non-productive time
- + Higher machine availability
- + Efficient use of human and machine
- + Planning and process safety
- + New products, customers and markets
- + Competitiveness
- + Securing investments and the future



### DMG MORI

- + Programming
- + Application technology
- + Machine operation
- + Qualification
- + Automation
- + Software solutions
- + Tool set-up
- + Energy efficiency

### SANDVIK Coromant

- + Unit cost optimisation
- + New technologies
- + Adapted tools
- + Cutting strategies
- + Component optimisation
- + Process safety

### SCHUNK

- + Optimal clamping technology
- + Efficient and safe gripper systems



- + Set-up magnet
- + Cost reduction
- + Process control and optimisation
- + Order coordination
- + Transport management / logistics
- + Time management
- + AVP

## Qualification measures

# Officially supported qualification measures at the DMG MORI Academy – German certification under AZAV.

You can complete officially supported qualification measures with us – whether you're currently looking for work or an employee of a company. The DMG MORI Academy has been certified under German AZWV/AZAV for carrying out official qualification measures since 2006. Besides the latest professional expertise, all of our trainers have extensive experience in adult education. We convey knowledge in accordance with the latest labour market and industrial requirements.



### That's why you can count on us

- + Programming, set-up and operation of CNC machine tools with Siemens and Heidenhain control systems
- + Classroom training followed by practical training on the machine itself
- + The latest equipment and a comprehensive machine outfit
- + Continuous adaptation of the training content to the latest developments
- + High-quality training documents
- + Certified training partners from Heidenhain and Siemens
- + Highly qualified trainers with methodical and didactic certification
- + Small groups of up to 12 participants
- + Upon successful completion of the course: a certificate with a high industrial market value

### Let us tell you more about our certified qualification measures:

Please contact us on the following number: +49 (0) 52 05 / 74 12 513  
or at [qualifizierung@dmgmori.com](mailto:qualifizierung@dmgmori.com)



Course Programme – User training

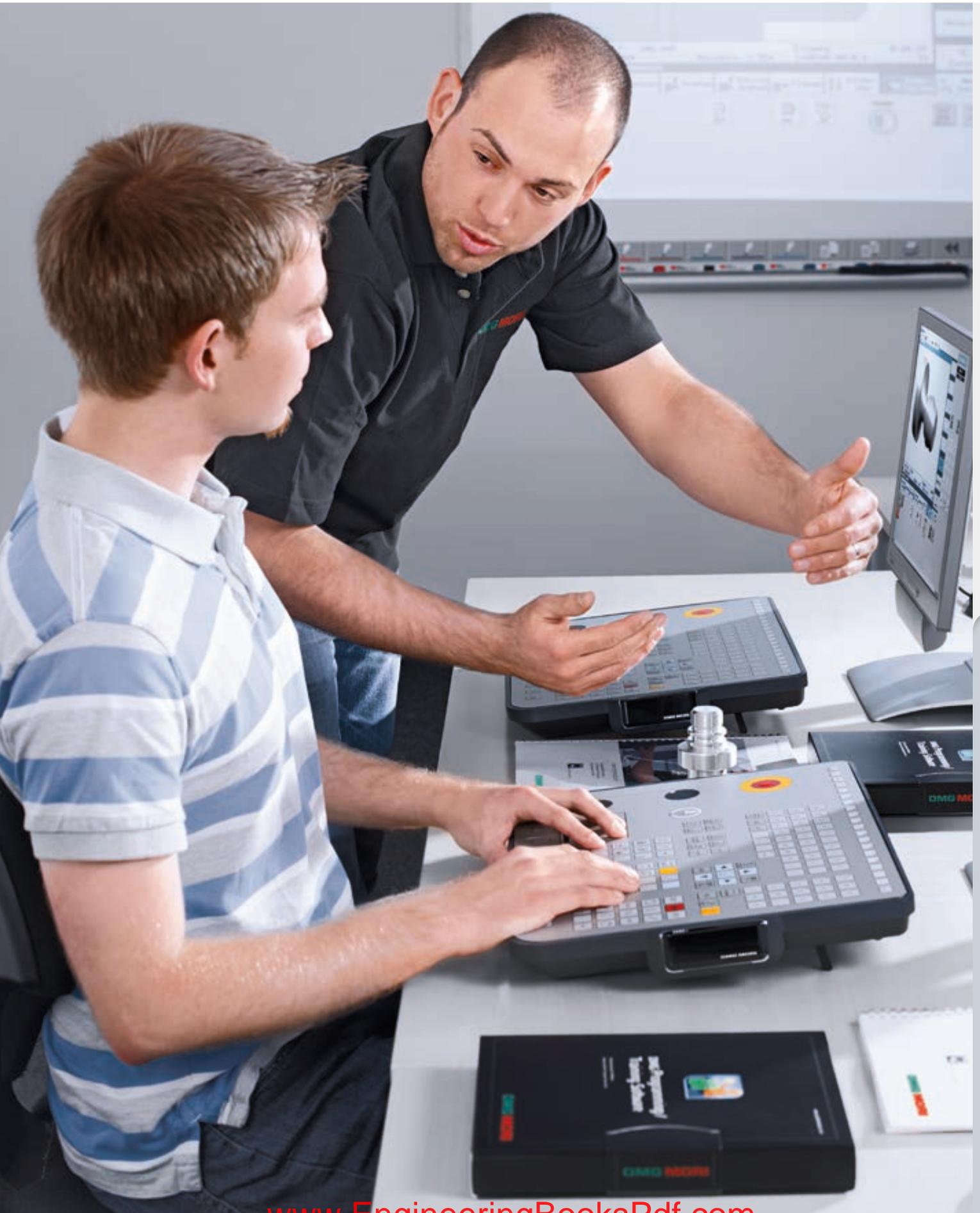
# CNC Training



Information on all courses:

**Turning courses:** T: +49 (0) 52 05 / 74 25 03 or  
training.drehen@dmgmori.com

**Milling courses:** T: +49 (0) 83 63 / 89 42 24 or  
training.fraesen@dmgmori.com



**Course finder CNC Training**

› **Turning technology**

› Milling technology

› ULTRASONIC / LASERTEC

Course descriptions CNC Training

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Course finder CNC Training

# Turning technology

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**Course finder CNC Training**

▸ Turning technology

▸ Milling technology

▸ ULTRASONIC / LASERTEC

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\* We provide FollowUp Training for these courses. For more information, see page 05.

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**CTX delta / NT6600****SIEMENS**

Please contact us at [training.drehen@dmgmori.com](mailto:training.drehen@dmgmori.com) or on the following number: +49 (0) 52 05 / 74 25 03.  
We would be happy to offer training courses for the CTX delta / NT 6600 with Siemens on request.

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**Course finder CNC Training**

▸ Turning technology

▸ Milling technology

▸ ULTRASONIC / LASERTEC

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\* We provide FollowUp Training for these courses. For more information, see page 05. Information about all our turning courses at: training.drehen@dmgmori.com or tel.: +49 (0) 52 05 / 74 25 03

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**COURSES ON REQUEST**

Please contact us at training.drehen@dmgmori.com or on the following number: +49 (0) 52 05 / 74 25 03.  
We would be happy to offer training courses for the TWIN and GMX ranges on request.

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**MITSUBISHI MAPPS IV**

Please contact us at training.drehen@dmgmori.com or on the following number: +49 (0) 52 05 / 74 25 03.  
We would be happy to offer training courses for the Mitsubishi MAPPS IV control system on request.

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We would be happy to offer training courses for the FANUC control system on request.

Course finder CNC Training

› Turning technology

› Milling technology

› ULTRASONIC / LASERTEC

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- › Turning technology
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\* We provide FollowUp Training for these courses. For more information, see page 05.

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› Turning technology

› **Milling technology**

› ULTRASONIC / LASERTEC

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\* We provide FollowUp Training for these courses. For more information, see page 05. Information about all our milling courses at: training.fraesen@dmgmori.com or tel.: +49 (0) 83 63 / 89 42 24

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**Course finder CNC Training**

› Turning technology

› **Milling technology**

› **ULTRASONIC / LASERTEC**

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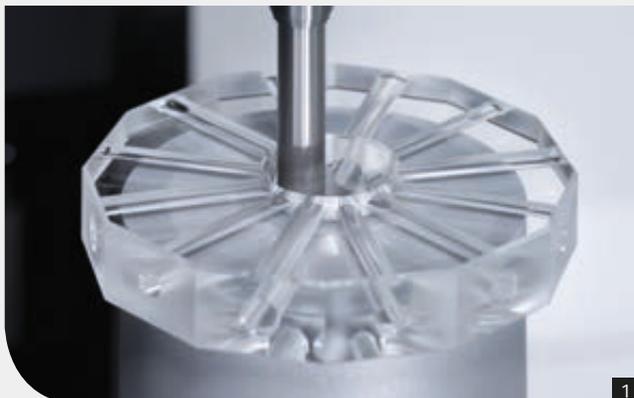
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1: ULTRASONIC – Full machining of a glass component in under 10 minutes 2: LASERTEC – Perfect cutting edges, clearance angles and chip breakers in precision tools

Course descriptions CNC Training

## » Turning technology



Information on all courses  
for CNC Training in turning:

**Don't hesitate to contact us for more advice:**  
[training.drehen@dmgmori.com](mailto:training.drehen@dmgmori.com)  
 T: +49 (0) 52 05 / 74 25 03

3: CELOS – From the idea to the finished product. 21.5" multi-touch screen for quick and easy operation 4: Machining on an NEF 400 with integrated, liquid-cooled 340 Nm spindle motor for maximum cutting performance and temperature stability

**COURSES // CNC TRAINING // TURNING TECHNOLOGY**

1. Basic

2. Advanced

3. Professional

**A-D110\***

*Programming, set-up and operation, without C- / Y-axis, ShopTurn*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of turning technology and basic knowledge of CNC technology

**COURSE CONTENTS**

- + Machine and workpiece coordinates
- + Machine set-up
- + Basic features of the control interface
- + Program and tool management
- + Program heading
- + General machining cycles
- + Graphical contour definition with contour elements
- + Contour turning
- + Zero point offsets
- + Subprogram technology
- + Computational functions
- + Simulation
- + Start-up routine
- + Manual operation
- + T, S, M menus
- + Machine set-up
- + Clamping devices
- + Setting up and measuring tools
- + Program input
- + Tool-changing point

- + Positioning, machining and optimising workpieces
- + Tool correction
- + Preventative maintenance
- + Data back-up

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D111\***

*Programming, set-up and operation, without C- / Y-axis, Siemens Operate, ShopTurn*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Machine and workpiece coordinates
- + Machine set-up
- + Tool set-up
- + Program heading
- + Contour definition
- + Contour turning
- + Contour elements
- + Zero point offsets
- + Subprograms
- + Computational functions
- + Simulation
- + Data back-up
- + Start-up routine
- + MDA (manual data input) mode
- + Machine set-up
- + Clamping devices
- + Tools
- + Program input
- + Tool-changing point
- + Simulation and optimisation
- + Retracting and processing parts
- + Tool correction

- + Preventative maintenance
- + Setting up and measuring tools

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## A-D120\*

*Programming, set-up and operation, with C- / Y-axis, ShopTurn***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of turning technology and basic knowledge of CNC technology

**COURSE CONTENTS**

- + Machine and workpiece coordinates
- + Machine set-up
- + Basic features of the control interface
- + Program and tool management
- + Program heading
- + General machining cycles
- + Graphical contour definition with contour elements
- + Contour turning
- + Zero point offsets
- + Subprogram technology
- + Computational functions
- + Simulation
- + Start-up routine
- + Manual operation
- + T, S, M menus
- + Machine set-up
- + Clamping devices
- + Setting up and measuring tools
- + Program input
- + Zero point offsets
- + Tool-changing point
- + Positioning, machining and optimising workpieces
- + Tool correction
- + Working with driven tools
- + Programming the C-axis
- + Programming the Y-axis
- + Preventative maintenance
- + Data back-up

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-D121\*

*Programming, set-up and operation, with C- / Y-axis, Siemens Operate, ShopTurn***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Machine and workpiece coordinates
- + Machine set-up
- + Tool set-up
- + Program heading
- + Contour definition
- + Contour turning
- + Contour elements
- + Zero point offsets
- + Subprograms
- + Computational functions
- + Simulation
- + Data back-up
- + Start-up routine
- + MDA mode
- + Machine set-up
- + Clamping devices
- + Tools
- + Program input
- + Zero point offsets
- + Tool-changing point
- + Simulation and optimisation
- + Retracting and processing parts
- + Tool correction
- + Preventative maintenance
- + Setting up and measuring tools
- + Working with driven tools
- + Programming the C-axis
- + Programming the Y-axis

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

**A-D140** *Programming, set-up and operation, rear-sided machining, ShopTurn*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D120\*

**COURSE CONTENTS**

- + Working area situation
- + Zero point offset
- + Zero point mirroring
- + Programming the counter spindle
- + Counter spindle functions: complete / drawing / gripping / rear-facing
- + Tools for rear-sided machining
- + The counter spindle as a tailstock
- + Bar machining
- + Automatic finished part unloading

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D141** *Programming, set-up and operation, rear-sided machining, Siemens Operate, ShopTurn*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D121\*

**COURSE CONTENTS**

- + Programming the counter spindle
- + Zero point offsets
- + Zero point mirroring
- + Calculation of the working area
- + Counter spindle technology
- + Tools for rear-sided machining
- + Rear-sided machining: complete / drawing / gripping
- + The counter spindle as a tailstock
- + Bar machining
- + Automatic finished part unloading

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

1–8 persons

**A-D180\*** *Programming, ShopTurn, DIN-ISO*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Knowledge of programming with ShopTurn or participation in course A-D120\* or A-D110\*

**COURSE CONTENTS**

- + Programming in G-Code
- + M-functions
- + G-functions
- + Machining cycles
- + C-axis machining
- + Y-axis machining
- + Programming exercises
- + Integration of subprograms
- + Program repetitions

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## A-D181

*Programming, Siemens Operate, ShopTurn, DIN ISO***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Experience in ShopTurn programming or participation in course A-D120\* / A-D110\* / A-D321 or A-D311

**COURSE CONTENTS**

- + Programming in G-Code
- + M-functions
- + G-functions
- + Machining cycles
- + C-axis machining
- + Y-axis machining
- + Programming exercises
- + Integration of subprograms
- + Program repetitions

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-D210

*Structured programming of production turning machines, Siemens***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Sound knowledge of CNC turning technology

**COURSE CONTENTS**

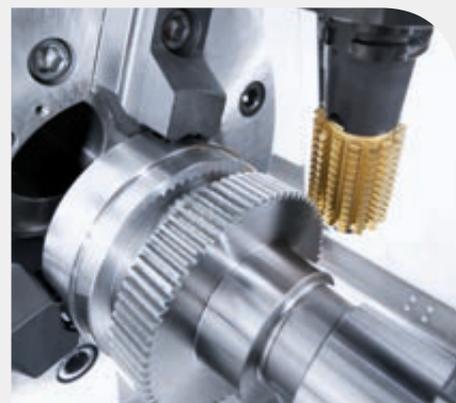
- + Machine set-up
- + Structured program generation (single channel, dual channel)
- + Machining programs
- + Subprogram technology
- + Simulation
- + Operating modes of SINUMERIK 840D
- + Basic geometrical functions
- + Tool parameters
- + GILDEMEISTER and SINUMERIK cycles
- + RG parameters
- + Zero points
- + Main program structure
- + Programming the C-axis
- + Transformations (frame instructions)
- + Slide synchronisation
- + Programming the Y-axis
- + 4-axis machining
- + Input and output of data

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons



COURSES // CNC TRAINING

TURNING TECHNOLOGY

A-D211

*Structured programming, turning / milling centres, single-channel, ShopTurn 3G*

**TARGET GROUP**

Programmers and operators of CNC turning and milling centres

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Machine and workpiece coordinates
- + Machine set-up
- + Tool set-up
- + Program heading
- + Contour definition
- + Contour turning
- + Contour elements
- + Zero point offsets
- + Subprograms
- + Computational functions
- + Simulation
- + Data back-up
- + Start-up routine
- + MDA mode
- + Machine set-up
- + Clamping devices
- + Tools
- + Program input
- + Tool-changing point
- + Simulation and optimisation
- + Retracting and processing parts
- + Tool correction

- + Offsetting the tool in the machine
- + Preventative maintenance
- + Working with driven tools
- + Programming the C-axis
- + Programming the Y-axis

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

A-D212

*Structured programming, turning / milling centres, Siemens DIN*

**TARGET GROUP**

Programmers and operators of turning and milling centres with GILDEMEISTER structured programming

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Machine set-up
- + Structured program generation (single channel / dual channel)
- + Machining programs
- + Subprogram technology
- + Simulation
- + Operating modes of Siemens SINUMERIK 840D
- + Basic geometrical functions
- + Tool parameters
- + Standard and manufacturer's cycles
- + RG parameters
- + Zero points
- + Main program structure
- + Programming the C-axis
- + Transformations (frame instructions)
- + Slide synchronisation
- + Programming the Y-axis
- + 4-axis machining
- + Input and output of data
- + Coordinate system of slide 1, B-axis

- + Tool coordinates system
- + Turning with the B-axis
- + B-axis changes in the machining program
- + Special features when using a neutral tool
- + Special corrections for tools on the inclined B-axis
- + TOWWCS and TOWSTD
- + ATRANS and AROT
- + Examples of milling
- + Milling and boring cycles
- + "Shift" subprogram
- + Additive zero offset

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

## A-D213\*

*Structured programming, turning / milling centres, single-channel, ShopTurn 3G***TARGET GROUP**

Programmers and operators of CNC turning and milling centres

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>+ Machine set-up</li> <li>+ Structured program generation (single channel)</li> <li>+ Machining programs</li> <li>+ Subprogram technology</li> <li>+ Simulation</li> <li>+ Operating modes of Siemens SINUMERIK 840D</li> <li>+ Basic geometrical functions</li> <li>+ Tool parameters</li> <li>+ Standard and manufacturer's cycles</li> <li>+ RG parameters</li> <li>+ Workpiece zero points</li> <li>+ Main program structure</li> <li>+ Programming the C-axis</li> <li>+ Transformations (frame instructions)</li> <li>+ Slide synchronisation</li> <li>+ Programming the Y-axis</li> <li>+ 4-axis machining</li> <li>+ Input and output of data</li> <li>+ Coordinate system of slide 1, B-axis</li> <li>+ Tool coordinates system</li> </ul> | <ul style="list-style-type: none"> <li>+ Turning with the B-axis</li> <li>+ B-axis changes in the machining program</li> <li>+ Special features when using a neutral tool</li> <li>+ Special corrections for tools on the inclined B-axis</li> <li>+ TOWWCS and TOWSTD</li> <li>+ ATRANS and AROT</li> <li>+ Examples of milling</li> <li>+ Milling and boring cycles</li> <li>+ "Shift" subprogram</li> <li>+ Additive zero offset</li> </ul> |
|--|--|

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

## A-D214\*

*Structured programming, turning / milling centres, dual-channel, ShopTurn 3G***TARGET GROUP**

Programmers and operators of CNC turning and milling centres

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>+ Machine set-up</li> <li>+ Structured program generation (single channel / dual channel)</li> <li>+ Machining programs</li> <li>+ Subprogram technology</li> <li>+ Simulation</li> <li>+ Operating modes of Siemens SINUMERIK 840D</li> <li>+ Basic geometrical functions</li> <li>+ Tool parameters</li> <li>+ Standard and manufacturer's cycles</li> <li>+ RG parameters</li> <li>+ Zero points</li> <li>+ Main program structure</li> <li>+ Programming the C-axis</li> <li>+ Transformations (frame instructions)</li> <li>+ Slide synchronisation</li> <li>+ Programming the Y-axis</li> <li>+ 4-axis machining</li> <li>+ Input and output of data</li> <li>+ Coordinate system of slide 1, B-axis</li> </ul> | <ul style="list-style-type: none"> <li>+ Tool coordinates system</li> <li>+ Turning with the B-axis</li> <li>+ B-axis changes in the machining program</li> <li>+ Special features when using a neutral tool</li> <li>+ Special corrections for tools on the inclined B-axis</li> <li>+ TOWWCS and TOWSTD</li> <li>+ ATRANS and AROT</li> <li>+ Examples of milling</li> <li>+ Milling and boring cycles</li> <li>+ "Shift" subprogram</li> <li>+ Additive zero offset</li> </ul> |
|--|---|

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

**COURSES // CNC TRAINING**

**TURNING TECHNOLOGY**

**A-D215\***

*Programming, ShopTurn 3G, structure, CTX beta 4A, SPRINT*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Machine set-up
- + Structured program generation (single channel / dual channel)
- + Machining programs
- + Subprogram technology
- + Simulation
- + Operating modes of SINUMERIK 840D
- + Basic geometrical functions
- + Tool parameters
- + Standard and manufacturer's cycles
- + RG parameters
- + Zero points
- + Main program structure
- + Programming the C-axis
- + Transformations (frame instructions)
- + Slide synchronisation
- + Programming the Y-axis
- + 4-axis machining
- + Input and output of data

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

**A-D220**

*Basics of programming for operators, production turning machines, Siemens*

**TARGET GROUP**

Operators of CNC production turning machines

**REQUIREMENTS**

Solid basic knowledge in the operation of CNC turning machines

**COURSE CONTENTS**

- + Machine set-up
- + GILDEMEISTER structured program generation (single channel / dual channel)
- + Structure of machining programs
- + Simulation
- + Operating modes of SINUMERIK 840D from Siemens
- + Tool parameters
- + RG parameters
- + Zero points
- + Main program structure
- + Status parameters
- + Input and output of data

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D222**

*Basics of programming for operators, turning / milling centres, Siemens DIN*

**TARGET GROUP**

Operators of turning and milling centres with GILDEMEISTER structured programming

**REQUIREMENTS**

Solid basic knowledge in the operation of CNC turning machines

**COURSE CONTENTS**

- + Machine set-up
- + GILDEMEISTER structured program generation (single channel / dual channel)
- + Structure of machining programs
- + Simulation
- + Operating modes of Siemens SINUMERIK 840D
- + Tool parameters
- + RG parameters
- + Zero points
- + Main program structure
- + Status parameters
- + Input and output of data

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## COURSES // CNC TRAINING

## TURNING TECHNOLOGY

**A-D224** *Basics of programming for operators, turning / milling centres, ShopTurn 3G / solutionline DIN*
**TARGET GROUP**

Operators of CNC turning and milling centres

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Machine set-up
- + GILDEMEISTER structured program generation (single channel / dual channel)
- + Structure of machining programs
- + Simulation
- + Operating modes of Siemens SINUMERIK 840D
- + Tool parameters
- + RG parameters
- + Zero points
- + Main program structure
- + Status parameters

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–8 persons

**A-D230** *Set-up and operation, Siemens 840D, CTV*
**TARGET GROUP**

Programmers and operators of CNC production turning machines

**REQUIREMENTS**

Participation in course A-D120 or A-D220

**COURSE CONTENTS**

- + Machine concept
- + Control system structure
- + Keyboard layout
- + Input of parameters
- + Calculation of zero points
- + Structure and application of the GILDEMEISTER structured program
- + Machine set-up
- + Working in AUTOMATIC mode
- + Returning to the program
- + Program optimisation
- + Tool correction

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D231** *Set-up and operation, single-channel, ShopTurn solutionline structure, CTX beta / gamma TC*
**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D214\* or A-D224

**COURSE CONTENTS**

- + Machine concept
- + Keyboard layout
- + Start-up routine
- + Manual operation
- + Slide operation
- + Spindle assignment
- + Tool changing, channel 1
- + Setting up the machine
- + Setting up the standard workpiece
- + Clamping device selection and set-up
- + Setting the clamping pressure

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

**A-D232** *Set-up and operation, single-channel, Siemens DIN, CTX gamma TC*

**TARGET GROUP**

Programmers and operators of CNC turning and milling centres

**REQUIREMENTS**

Participation in course A-D212 or A-D222

**COURSE CONTENTS**

- + Machine concept
- + Keyboard layout
- + Start-up routine
- + Manual operation
- + Slide operation
- + Spindle assignment
- + Tool changing
- + Setting up the machine
- + Setting up the standard workpiece
- + Clamping device selection and set-up
- + Setting the clamping pressure
- + Program creation
- + Clamping device travel monitoring
- + Tool input
- + Calculation of parameters
- + Start-up routine with and without a component
- + Tool correction
- + Program optimisation
- + Resuming the machining program
- + Data back-up

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D234** *Set-up and operation, single-channel, ShopTurn 3G, structure, CTX beta / gamma TC*

**TARGET GROUP**

Programmers and operators of CNC turning and milling centres

**REQUIREMENTS**

Participation in course A-D214\* or A-D224

**COURSE CONTENTS**

- + Machine concept
- + Keyboard layout
- + Start-up routine
- + Manual operation
- + Slide operation
- + Spindle assignment
- + Tool changing, channel 1
- + Setting up the machine
- + Setting up the standard workpiece
- + Clamping device selection and set-up
- + Setting the clamping pressure
- + Program creation
- + Clamping device travel monitoring
- + Tool input
- + Calculation of parameters
- + Start-up routine with and without a component
- + Tool correction
- + Program optimisation
- + Resuming the machining program
- + Data back-up

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D235** *Set-up and operation, ShopTurn 3G, structure, CTX beta 4A, SPRINT*

**TARGET GROUP**

Programmers and operators of CNC turning and milling centres

**REQUIREMENTS**

Participation in course A-D215\*

**COURSE CONTENTS**

- + Machine concept
- + Control system structure
- + Keyboard layout
- + Input of parameters
- + Calculation of zero points
- + Structure and application of the GILDEMEISTER structured program
- + Machine set-up
- + Synchronisation
- + Working in AUTOMATIC mode
- + Returning to the program
- + Program optimisation
- + Tool correction
- + Input and output of data
- + Preventative maintenance

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## A-D236

*Set-up and operation, single-channel, ShopTurn 3G, structure, NTX***TARGET GROUP**

Programmers and operators of CNC turning and milling centres

**REQUIREMENTS**

Participation in course A-D214\* or A-D224

**COURSE CONTENTS**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>+ Machine concept</li> <li>+ Keyboard layout</li> <li>+ Start-up routine</li> <li>+ Manual operation</li> <li>+ Slide operation</li> <li>+ Spindle assignment</li> <li>+ Tool changing, channel 1</li> <li>+ Setting up the machine</li> <li>+ Setting up the standard workpiece</li> <li>+ Clamping device selection and set-up</li> <li>+ Setting the clamping pressure</li> </ul> | <ul style="list-style-type: none"> <li>+ Clamping device travel monitoring</li> <li>+ Program creation</li> <li>+ Tool input</li> <li>+ Calculation of parameters</li> <li>+ Start-up routine with and without a component</li> <li>+ Tool correction</li> <li>+ Program optimisation</li> <li>+ Resuming the machining program</li> <li>+ Data back-up</li> </ul> |
|---|--|

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-D242

*Set-up and operation, dual-channel, Siemens DIN, CTX gamma TC***TARGET GROUP**

Programmers and operators of turning and milling centres with GILDEMEISTER structured programming

**REQUIREMENTS**

Good knowledge of the operation of CNC machines, participation in course A-D212 or A-D222 and A-D232

**COURSE CONTENTS**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>+ Tool changing, channel 2</li> <li>+ Special features of dual-channel machining</li> <li>+ Tooling and setting up the lower turret</li> <li>+ Expanding the standard workpiece for dual-channel machining</li> <li>+ Global RG parameters</li> <li>+ Adaptation of the main program</li> <li>+ Start-up routine with and without a component</li> <li>+ Tool correction</li> </ul> | <ul style="list-style-type: none"> <li>+ Program optimisation</li> <li>+ Resuming the machining program</li> <li>+ Data back-up</li> </ul> |
|--|--|

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-D244

*Set-up and operation, dual-channel, ShopTurn 3G, structure, CTX beta / gamma TC***TARGET GROUP**

Programmers and operators of CNC turning and milling centres

**REQUIREMENTS**

Participation in course A-D214\* or A-D224 and A-D236

**COURSE CONTENTS**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>+ Tool changing, channel 2</li> <li>+ Special features of dual-channel machining</li> <li>+ Tooling / setting up the lower turret</li> <li>+ Expanding the standard workpiece for dual-channel machining</li> <li>+ Global RG parameters</li> <li>+ Adaptation of the main program</li> <li>+ Start-up routine with and without a component</li> <li>+ Tool correction</li> </ul> | <ul style="list-style-type: none"> <li>+ Program optimisation</li> <li>+ Resuming the machining program</li> <li>+ Data back-up</li> </ul> |
|--|--|

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

A-D245

*Programming, set-up and operation, tailstock, ShopTurn 3G, structure, CTX beta 4A, SPRINT*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in courses A-D215\* and A-D235

**COURSE CONTENTS**

- + RG parameters
- + Zero points for tailstock machining
- + Program structure
- + Program templates
- + Machining options
- + Returning to the program

**DURATION**

1.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

A-D246

*Set-up and operation, dual-channel, ShopTurn 3G, structure, NTX*

**TARGET GROUP**

Programmers and operators of CNC turning and milling centres

**REQUIREMENTS**

Participation in course A-D214\* or A-D224 and A-D236

**COURSE CONTENTS**

- + Tool changing, channel 2
- + Special features of dual-channel machining
- + Tooling / setting up the lower turret
- + Expanding the standard workpiece for dual-channel machining
- + Global RG parameters
- + Adaptation of the main program
- + Start-up routine with and without a component
- + Tool correction
- + Program optimisation
- + Resuming the machining program
- + Data back-up

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–6 persons

A-D261

*Set-up and operation, ARTIS tool breakage detection*

**TARGET GROUP**

Programmers and operators of CNC turning and milling centres

**REQUIREMENTS**

Participation in a programming, set-up and operation course Siemens 840D, good knowledge of machine operation

**COURSE CONTENTS**

- + Getting to know the various ways of monitoring
- + Recording the machining forces
- + Getting to know the programming commands
- + Practical exercises in monitoring for “blunt”, “missing” and “breakage”
- + Optimising monitoring

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–6 persons



## A-D311

*Programming, set-up and operation, without C- / Y-axis, ShopTurn 3G, ShopTurn, CTV***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and basic knowledge of CNC technology

**COURSE CONTENTS**

- + Machine and workpiece coordinates
  - + Machine set-up
  - + Tool set-up
  - + Program heading
  - + Contour definition
  - + Contour turning
  - + Contour elements
  - + Zero point offsets
  - + Subprograms
  - + Computational functions
  - + R-parameters
  - + Programming in G-Code
  - + Simulation
  - + Data back-up
  - + Machine set-up
  - + Start-up routine
  - + MDA (manual data input)
  - + Machine set-up
  - + Clamping devices
  - + Tools
  - + Program input
  - + Zero point offsets
  - + Tool-changing point
  - + Simulation and optimisation
- + Retracting and processing parts
  - + Tool correction
  - + Offsetting tools in the machine
  - + Preventative maintenance
  - + Working with driven tools

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–8 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

A-D313

*Programming, ShopTurn, Operate / solutionline, single-channel, GMX, CTX TC*

**TARGET GROUP**

Programmers, setters and operators of turn-mill centres with ShopTurn programming

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Machine set-up
- + Program heading
- + Contour definition
- + B-axis kinematics
- + Contour turning
- + Contour elements
- + Burring
- + Thread cutting
- + Computational functions
- + Fitting
- + Internal machining
- + Programming the counter spindle
- + Swivel cycle
- + Zero point offsets
- + Tool-changing point
- + Simulation and optimisation
- + Tool input
- + Tool management
- + HSK tools and tool coordinates
- + Corrections with a positioned B-axis
- + Milling and boring cycles
- + Insights into DIN/ISO

- + ShopTurn programming exercises
- + Full machining including turning and milling
- + Programming (programGUIDE)

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

A-D314\*

*Programming, ShopTurn, 3G, ShopTurn, dual-channel, CTX TC, NT, NTX*

**TARGET GROUP**

Programmers, setters and operators of turn-mill centres with ShopTurn programming

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Machine set-up
- + Program heading
- + Contour definition
- + B-axis kinematics
- + Contour turning
- + Contour elements
- + Burring
- + Thread cutting
- + Computational functions
- + Fitting
- + Internal machining
- + Programming the counter spindle
- + Swivel cycle
- + Zero point offsets
- + Tool-changing point
- + Simulation and optimisation
- + Tool input
- + Tool management
- + HSK tools and tool coordinates
- + Corrections with a positioned B-axis
- + Milling and boring cycles
- + programSYNC

- + ShopTurn dual-channel block programming
- + Programming exercises
- + Full machining including turning and milling
- + Insights into DIN and ISO programming (programGUIDE)

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## A-D315\*

*Programming, ShopTurn 3G, ShopTurn, CTX beta 4A***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Machine set-up
  - + Program heading
  - + Contour definition
  - + B-axis kinematics
  - + Contour turning
  - + Contour elements
  - + Burring
  - + Thread cutting
  - + Computational functions
  - + Fitting
  - + Internal machining
  - + Programming the counter spindle
  - + Swivel cycle
  - + Zero point offsets
  - + Tool-changing point
  - + Simulation and optimisation
  - + Tool input
  - + Tool management
  - + HSK tools and tool coordinates
  - + Corrections with a positioned B-axis
  - + Milling and boring cycles
  - + programSYNC
- + ShopTurn dual-channel block programming
  - + Programming exercises: Full machining including turning and milling
  - + Insights into DIN and ISO programming (programGUIDE)

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

## A-D321

*Programming, set-up and operation, with C- / Y-axis, ShopTurn 3G, ShopTurn, CTV***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and basic knowledge of CNC technology

**COURSE CONTENTS**

- + Machine and workpiece coordinates
  - + Machine set-up
  - + Tool set-up
  - + Program heading
  - + Contour definition
  - + Contour turning
  - + Contour elements
  - + Zero point offsets
  - + Subprograms
  - + Computational functions
  - + R-parameters
  - + Programming in G-Code
  - + Simulation
  - + Data back-up
  - + Machine set-up
  - + Start-up routine
  - + MDA (manual data input)
  - + Machine set-up
  - + Clamping devices
  - + Tools
  - + Program input
  - + Tool-changing point
  - + Simulation and optimisation
  - + Tool correction
- + Retracting and processing parts
  - + Offsetting tools in the machine
  - + Preventative maintenance
  - + Working with driven tools
  - + C-axis
  - + Y-axis

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

A-D332

*Set-up and operation, single-channel, ShopTurn solutionline, CTX beta / gamma TC*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D312

**COURSE CONTENTS**

- + Start-up routine
- + Machine control panel and keyboard
- + Manual machine operation
- + Slide operation
- + Moving the spindle when the booth door is open
- + Moving the spindle with the handwheel
- + ShopTurn settings
- + General tool management
- + Magazine list and tool list
- + Loading tools
- + T, S, M menus
- + Switching tools
- + Inspecting tools
- + Entering wear compensation
- + Clamping device selection and set-up
- + Setting the clamping pressure
- + Clamping device travel monitoring
- + Zero point calculation
- + Setting up tools and offsetting in the machine
- + Programming exercises
- + Full machining including turning and milling
- + Setting up the standard workpiece
- + Start-up routine with and without a workpiece
- + Program influence
- + Resuming the machining program
- + Completing and optimising the workpiece program
- + Tool correction
- + Corrections with a positioned B-axis
- + Retracting a squint tool with FF\_ANG
- + Workpiece transfer
- + Retracting the slide after an interrupted tool change with FF\_MAG
- + Special features of multi-task tools
- + Reference shifts on the main and counter spindles
- + GILDEMEISTER applications / CUSTOM menu
- + Preventative maintenance
- + Data management and back-up

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

A-D334

*Set-up and operation, single-channel, ShopTurn 3G, ShopTurn, CTX beta / gamma TC*

**TARGET GROUP**

Programmers, setters and operators of turn-mill centres with ShopTurn programming

**REQUIREMENTS**

Good knowledge of the operation of CNC machines, participation in course A-D314\*

**COURSE CONTENTS**

- + Machine concept
- + Keyboard layout
- + Start-up routine
- + Manual operation
- + Slide operation
- + Spindle programming
- + Tool changing
- + Setting up the machine
- + Setting up the standard workpiece
- + Clamping device selection and set-up
- + Setting the clamping pressure
- + Program creation
- + Clamping device travel monitoring
- + Tool input
- + Calculation of parameters
- + Start-up routine with and without a component
- + Tool correction
- + Program optimisation
- + Returning to programming the machining process
- + Data back-up
- + Insights into DIN/ISO

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

**A-D335** *Set-up and operation, ShopTurn 3G, ShopTurn, CTX beta 4A***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D315\*

**COURSE CONTENTS**

- + Machine concept
- + Control system structure
- + Keyboard layout
- + Input of parameters
- + Calculation of zero points
- + Setting up the machine
- + Setting up the standard workpiece
- + Clamping device selection and set-up
- + Clamping pressure settings
- + Clamping device travel monitoring
- + Tool input
- + Synchronisation (programSYNC)
- + Calculation of parameters
- + Start-up routine with and without a component
- + Tool correction
- + Program optimisation
- + Resuming the machining program
- + Data back-up
- + Insights into DIN and ISO programming (programGUIDE)

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D336** *Set-up and operation, single-channel, ShopTurn 3G, ShopTurn, NTX***TARGET GROUP**

Programmers, setters and operators of turn-mill centres with ShopTurn programming

**REQUIREMENTS**

Good knowledge of the operation of CNC machines, participation in course A-D314\*

**COURSE CONTENTS**

- + Machine concept
- + Keyboard layout
- + Start-up routine
- + Manual operation
- + Slide operation
- + Spindle programming
- + Tool changing
- + Setting up the machine
- + Setting up the standard workpiece
- + Clamping device selection and set-up
- + Clamping pressure settings
- + Program creation
- + Clamping device travel monitoring
- + Tool input
- + Calculation of parameters
- + Start-up routine with and without a component
- + Tool correction
- + Program optimisation
- + Returning to programming the machining process
- + Data back-up
- + Insights into DIN and ISO programming (programGUIDE)

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D344** *Set-up and operation, dual-channel, ShopTurn 3G, ShopTurn, CTX beta / gamma TC***TARGET GROUP**

Programmers, setters and operators of turn-mill centres with ShopTurn programming

**REQUIREMENTS**

Good knowledge of the operation of CNC machines, participation in courses A-D314\* and A-D334

**COURSE CONTENTS**

- + Tool changing, channel 2
- + Special features of dual-channel machining
- + Tooling / setting up the lower turret
- + Expanding the standard workpiece for dual-channel machining (programSYNC)
- + Adaptation of the main program
- + Start-up routine with and without a component
- + Tool correction
- + Program optimisation
- + Returning to programming the machining process
- + Data back-up
- + DIN/ISO programming (programGUIDE)

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

**A-D345** *Programming, set-up and operation, tailstock, ShopTurn 3G, ShopTurn, CTX beta 4A*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in courses A-D315\* and A-D335

**COURSE CONTENTS**

- + RG parameters
- + Zero points for tailstock machining
- + Program structure for tailstock machining
- + "DUMMY" subprogram
- + Program templates
- + Machining options
- + Returning to the program
- + Setting up a workpiece with tailstock machining

**DURATION**

1.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D346** *Set-up and operation, dual-channel, ShopTurn 3G, ShopTurn, NTX*

**TARGET GROUP**

Programmers, setters and operators of turn-mill centres with ShopTurn programming

**REQUIREMENTS**

Good knowledge of the operation of CNC machines, participation in courses A-D314\* and A-D336

**COURSE CONTENTS**

- + Tool changing, channel 2
- + Special features of dual-channel machining
- + Tooling / setting up the lower turret
- + Expanding the standard workpiece for dual-channel machining (programSYNC)
- + Adaptation of the main program
- + Start-up routine with and without a component
- + Tool correction
- + Program optimisation
- + Resuming the machining program
- + Data back-up
- + DIN/ISO programming (programGUIDE)

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D381** *Programming, set-up and operation, tailstock / steady rest option*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in a (Siemens) programming, set-up and operation course for the specific machine

**COURSE CONTENTS**

- + Personal training in how to program and operate the tailstock / steady rest function
- + Zero points and reference points of the steady rest and tailstock
- + Program structure
- + Machining options
- + GILDEMEISTER cycles

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

1–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## A-D382

*Measuring sensor, Siemens***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid knowledge of programming with the SINUMERIK control system from Siemens

**COURSE CONTENTS**

- + Using a machine with a measuring sensor
- + The measuring sensor in automatic mode
- + Measuring sensor hardware
- + Sensor calibration
- + Programming measurement cycles
- + Zero point calculation
- + Tool correction
- + Generating measurement protocols

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

1–6 persons

## A-D383

*Gear hobbing (HOB\_CYCLE)***TARGET GROUP**

Programmers and operators of turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Positioning a gear cutter for hobbing
- + Tool parameters
- + Cutting individual teeth with a DIN/ISO program and with the SINGLE\_HOB\_SET cycle
- + Modification of teeth using SINGLE\_HOB\_DO1 and \_DO2
- + Cycle definition: HOB\_MILL\_OFF cycle, HOB\_TOOL\_DATA, HOB\_CYCLE cycle
- + Using the milling tool by staggering the teeth on the cutter
- + Explanation of the SHIFT cycles, methods 20 and 30
- + Milling helical gearing and a worm gear with WORM\_CYCLE
- + Cycle definition: WORM\_CYCLE cycle
- + Programming examples

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-D384

*Eccentric machining (CRANK\_TURN, CRANK\_MILL)***TARGET GROUP**

Programmers and operators of turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Cycle definition: CRANK\_TURN, CRANK\_MILL
- + Description of parameters for these cycles
- + Application on a workpiece with turning and milling
- + Examples of programming in DIN/ISO format

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–6 persons



**A-D410**

*Programming, set-up and operation, without C- / Y-axis, Heidenhain Plus iT, DINPlus*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + DINPlus mode
- + Structure of the program
- + Tool definition
- + Raw and finished parts descriptions
- + Machining stages: Cycles, G- and M-functions, file management
- + Subprogram technology
- + Exercises
- + Tool parameters
- + Machine set-up
- + Clamping devices
- + Start-up routine
- + Operation
- + Tools
- + Clamping devices
- + Workpiece start-up
- + Corrections
- + Returning to the program
- + Program optimisation

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D411\***

*Programming, set-up and operation, without C- / Y-axis, Heidenhain CNC Pilot 620*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Using the CNC Pilot 620
- + Pre-setting the main operating modes
- + Cycle programming in the dialogue
- + Creating cycles
- + Contour programming with ICP
- + Contour cutting
- + Simulation
- + Data back-up
- + Machine set-up
- + Maintenance information
- + Start-up routine
- + Setting up the workpiece
- + Clamping device and pressure
- + Zero point offset
- + Internal / external measurement of tools
- + Definition of protective zones
- + Automatic mode and cutting
- + Safe workpiece start-up
- + Tool correction
- + Shut-down routine

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## A-D412\*

*Programming, set-up and operation, without C-axis, Heidenhain CNC Pilot 640, units***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology

**COURSE CONTENTS**

- + Using the CNC Pilot 640
- + Pre-setting the main operating modes
- + Cycle programming of Smart.Turn units
- + Program generation with the turning units
- + Contour programming with ICP
- + Contour cutting
- + Simulation
- + Data back-up
- + Machine set-up
- + Maintenance information
- + Start-up routine
- + Setting up the workpiece
- + Clamping device and pressure
- + Zero point offset
- + Internal / external measurement of tools
- + Definition of protective zones
- + Automatic and cutting operating modes
- + Safe workpiece start-up
- + Tool correction
- + Shut-down routine

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-D421\*

*Programming, set-up and operation, with C- / Y-axis, Heidenhain CNC Pilot 620***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Using the CNC Pilot 620
- + Pre-setting the main operating modes
- + Cycle programming in the dialogue
- + Creation of turning cycles
- + Contour programming with ICP
- + Contour cutting
- + C-axis coordinate system
- + C-axis boring cycles
- + Milling on faces and lateral surfaces
- + Simulation
- + Data back-up
- + Machine set-up
- + Start-up routine
- + Manual operating mode
- + Setting up the workpiece
- + Clamping device and pressure
- + Zero point offset
- + Internal / external measurement of tools
- + Using driven tools for C-axis machining
- + Definition of protective zones
- + Automatic mode
- + Machining involving boring and milling
- + Tool correction
- + Shut-down routine

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

A-D422\*

*Programming, set-up and operation, with C-axis, Heidenhain CNC Pilot 640, units*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology

**COURSE CONTENTS**

- + Using the CNC Pilot 640
- + Pre-setting the main operating modes
- + Cycle programming of Smart.Turn units
- + Programming with the units turning and milling
- + Contour programming with ICP
- + C- / Y-axis coordinate systems
- + C- / Y-axis boring cycles
- + Milling on faces and lateral surfaces
- + Simulation
- + Data back-up
- + Machine structure, maintenance information
- + Start-up routine
- + Manual operating mode
- + Setting up the workpiece
- + Clamping device and pressure
- + Zero point offset
- + Internal / external measurement of tools
- + Using driven tools for C- / Y-axis machining
- + Definition of protective zones
- + Automatic mode
- + Machining involving boring and milling
- + Tool correction
- + Shut-down routine

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

A-D440

*Programming, set-up and operation, C- / Y-axis, Heidenhain Plus iT, DINPlus*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Comprehensive knowledge of programming, set-up and operation with DINPlus or participation in course A-D410

**COURSE CONTENTS**

- + Machining options with the C- / Y-axis
- + Coordinate systems
- + Machining faces and lateral surfaces
- + DINPlus program structure
- + G- and M-functions
- + Creating cycles
- + Exercises
- + Practice on the machine
- + Set-up of driven tools

**DURATION**

2.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

**A-D441**                      *Structured programming, set-up and operation, Heidenhain Plus iT, DINPlus*
**TARGET GROUP**

Programmers, setters and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D410 or comprehensive knowledge of programming, set-up and operation with DINPlus

**COURSE CONTENTS**

- + DINPlus structured programming
  - + Structure of a machining program with B-axis and counter spindle
  - + Status parameters
  - + 4-axis machining
  - + Synchronisation
  - + Expanded programming exercises
  - + Workpiece transfer to the counter spindle
  - + Special features when using a neutral tool
- + Turning with slides 1 and 2 on the main and counter spindles with B-axis and turret
  - + Corrections with a positioned B-axis
  - + Using the disc magazine
  - + Full machining of a workpiece

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D442**                      *Programming, set-up and operation, rear-sided machining, Heidenhain CNC Pilot 640, units*
**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D422\*

**COURSE CONTENTS**

- + Programming the counter spindle with Smart.Turn units
  - + Zero point offsets
  - + Calculation of the working area
  - + Counter spindle technology
  - + Tools for rear-sided machining
  - + Rear-sided machining: complete / drawing / gripping
  - + The counter spindle as a tailstock
  - + Bar machining
- + Automatic finished part unloading

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D450**                      *Programming, set-up and operation, rear-sided machining, Heidenhain DINPlus*
**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Comprehensive knowledge of programming, set-up and operation with DINPlus or participation in courses A-D410 and A-D440

**COURSE CONTENTS**

- + Machine set-up
  - + Start-up routine
  - + Machine set-up
  - + Clamping devices
  - + Tools
  - + Program transfer
  - + Simulation and optimisation
  - + Starting up and finishing a workpiece
  - + Setting up and measuring tools
  - + Tool definition during rear-sided machining
  - + Start-up routines
- + Additional zero points on the counter spindle
  - + Workpiece transfer
  - + Program structure during rear-sided machining
  - + Expert programs
  - + Preventative maintenance
  - + Attributing error messages
  - + Specific safety information

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

A-D481

*Programming units with DINPlus, Heidenhain CNC Pilot 620*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D421\* or A-D411\*

**COURSE CONTENTS**

- + Programming in Smart.Turn
  - + Tool editor and technology storage
  - + Program structure
  - + Unit programming
  - + Contour programming
  - + Milling and boring on faces and lateral surfaces
  - + DINPlus programming
  - + Simulation
  - + Program organisation
- + Subprograms, expert programs
  - + Data back-up

**DAUER3**

days

**NUMBER OF PARTICIPANTS**

3–8 persons

A-D510\*

*Programming, Heidenhain Plus iT, TurnPlus*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + TurnPlus mode
  - + Raw and finished parts descriptions
  - + Contour generation
  - + Tool definitions
  - + Automation and work plan generation
  - + Interactive work plan generation
  - + Simulation
  - + DIN-Plus mode
  - + Getting to know G- and M-functions
  - + Machine mode
- + Editing and optimising programs
  - + Service mode
  - + Generating lists of predefined words
  - + Material and cutting materials
  - + Parameter mode
  - + Tools
  - + Technology
  - + Parameters

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

A-D512\*

*Programming, set-up and operation, without C- / Y-axis, Heidenhain CNC Pilot 640, TurnPlus*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Using the CNC Pilot 640
  - + Pre-setting the main operating modes
  - + Cycle programming of Smart.Turn units
  - + Automatic program generation with TurnPlus AAG
  - + Contour programming with ICP
  - + Contour cutting
  - + Simulation
  - + Data back-up
  - + Machine set-up
  - + Maintenance information
- + Start-up routine
  - + Setting up the workpiece
  - + Clamping device and pressure
  - + Zero point offset
  - + Internal / external measurement of tools
  - + Definition of protective zones
  - + Automatic and cutting operating modes
  - + Safe workpiece start-up
  - + Tool correction
  - + Shut-down routine

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## A-D522\*

*Programming, set-up and operation, with C- / Y-axis, Heidenhain CNC Pilot 640, TurnPlus***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Using the CNC Pilot 640
- + Pre-setting the main operating modes
- + Cycle programming of Smart.Turn units
- + Automatic program generation with TurnPlus AAG
- + Contour programming with ICP
- + C- / Y-axis coordinate system
- + C- / Y-axis boring cycles
- + Milling on faces and lateral surfaces
- + Simulation
- + Data back-up
- + Machine set-up
- + Maintenance information
- + Start-up routine
- + Manual operating mode
- + Setting up the workpiece
- + Clamping device and pressure
- + Zero point offset
- + Internal / external measurement of tools
- + Using driven tools for C-axis machining
- + Definition of protective zones
- + Automatic modes
- + Machining involving boring and milling
- + Shut-down routine

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-D530

*Set-up and operation, without C- / Y-axis, Heidenhain Plus iT, TurnPlus***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Good programming knowledge of TurnPlus or participation in course A-D510\*

**COURSE CONTENTS**

- + Machine set-up
- + Start-up routine
- + Machine set-up
- + Clamping devices
- + Tools
- + Program input
- + Program transfer
- + Simulation
- + Optimisation
- + Retracting and processing parts
- + Tool correction
- + Working with protective zones
- + Setting up and measuring tools in the machine
- + Definition of tools in the program
- + Preventative maintenance
- + Attributing error messages
- + Specific safety information
- + Inspection cycle

**DURATION**

2.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-D540

*Programming, set-up and operation, C- / Y-axis, Heidenhain Plus iT, TurnPlus***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in courses A-D510\* and A-D530

**COURSE CONTENTS**

- + Machining options with the C- / Y-axis
- + Coordinate systems
- + Machining faces and lateral surfaces
- + Program generation with TurnPlus
- + Generation of a DINPlus program
- + G- and M-functions
- + Creating cycles
- + Exercises
- + Practice on the machine
- + Set-up of driven tools

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

A-D542

*Programming, set-up and operation, rear-sided machining, Heidenhain CNC Pilot 640, TurnPlus*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D522\*

**COURSE CONTENTS**

- + Programming the counter spindle with Smart.Turn units
- + Zero point offsets
- + Calculation of the working area
- + Counter spindle technology
- + Tools for rear-sided machining
- + Rear-sided machining: complete / drawing / gripping
- + The counter spindle as a tailstock
- + Bar machining
- + Automatic finished part unloading

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–6 persons

A-D550

*Programming, set-up and operation, rear-sided machining, Heidenhain Plus iT, TurnPlus*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Good programming knowledge with TurnPlus or participation in courses A-D510\*, A-D530 and A-D540

**COURSE CONTENTS**

- + Machine set-up
- + Start-up routine
- + Machine set-up
- + Clamping devices
- + Tools
- + Program transfer
- + Simulation and optimisation
- + Starting up and finishing a workpiece
- + Setting up and measuring tools
- + Tool definition during rear-sided machining
- + Start-up routines
- + Additional zero points on the counter spindle
- + Workpiece transfer
- + Program structure during rear-sided machining
- + Expert programs
- + Preventative maintenance
- + Attributing error messages
- + Specific safety information

**DURATION**

2.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

A-D551

*Structured programming, multi-channel, TurnPlus*

**TARGET GROUP**

Programmers, setters and operators of CNC turning machines

**REQUIREMENTS**

Participation in courses A-D510\* / A-D530 / A-D540 or comprehensive knowledge of programming with TurnPlus

**COURSE CONTENTS**

- + Structured programming with DINPlus / TurnPlus
- + Structure of a machining program with B-axis and counter spindle
- + Status parameters
- + 4-axis machining
- + Synchronisation
- + Expanded programming exercises
- + Workpiece transfer to the counter spindle
- + Special features when using a neutral tool
- + Turning with slides 1 and 2 on the main and counter spindles with B-axis and turret
- + Corrections with a positioned B-axis
- + Using a disc magazine
- + Full machining of a workpiece

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## COURSES // CNC TRAINING

## TURNING TECHNOLOGY

**A-D552** *Structured programming, set-up and operation, single-channel, without counter spindle, TurnPlus*
**TARGET GROUP**

Programmers, setters and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D510\* or A-D530 and A-D540, or comprehensive knowledge of programming, set-up and operation with TurnPlus

**COURSE CONTENTS**

- + Machine concept
- + Working area
- + Machining options with the B-axis
- + Programming with DINPlus
- + Generation of the single-channel structured program
- + Turning and milling with the B-axis
- + Machining faces and lateral surfaces with the C- / Y-axes
- + Practice on the machine
- + Start-up routine
- + Tool correction
- + Coordinate system of the B-axis
- + Tool management of the disc magazine
- + Setting up and machining workpieces
- + Resuming the machining program
- + Data back-up

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D562** *Programming, set-up and operation, single-channel, with counter spindle, TurnPlus*
**TARGET GROUP**

Programmers, setters and operators of CNC turning machines

**REQUIREMENTS**

Participation in courses A-D510\* / A-D530 or A-D540 and A-D552, or comprehensive knowledge of programming, set-up and operation with TurnPlus

**COURSE CONTENTS**

- + Counter spindle handling system
- + Machine concept
- + Workpiece transfer to the counter spindle
- + Turning with slide 1 on the main and counter spindles with B-axis
- + Corrections with a positioned B-axis
- + Structure of a machining program with B-axis and counter spindle
- + Block search
- + Using the disc magazine
- + Full machining of a workpiece

**DURATION**

1.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D610** *Programming and operation, MAPPS IV, G-Code, NL, NLX*
**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + X-, Y-, Z-, B-axes
- + Coordinate system
- + G- and M-code
- + S-, T- and F-code
- + Program format / structure
- + Control panel
- + MAPPS monitors
- + Workpiece zero point
- + Tool: Magazine / measurement
- + Pallet changer
- + Machine set-up

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

**A-D611** *Programming and operation, MAPPS IV, G-Code, CL, SL, VL*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + X-, Y-, Z-axes
  - + Coordinate system
  - + G- and M-code
  - + S-, T- and F-code
  - + Program format / structure
  - + Control panel
  - + MAPPS monitors
  - + Workpiece zero point
- + Tool: Magazine / measurement
  - + Machine set-up

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D612** *Programming and operation, MAPPS IV, G-Code, NVL*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + X-, Y-, Z-, A-, C-axes
  - + Coordinate system
  - + G- and M-code
  - + S-, T- and F-code
  - + Expanded zero points G54.1
  - + Dynamic workpiece zero point
  - + G54.2 shift
- + Workpiece set-up errors
  - + G54.4 compensation
  - + Suitable workpiece coordinates
  - + G68.2 rotation
  - + 3D G68 coordinate rotation
  - + Program format / structure

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D613** *Programming, MAPPS IV, G-Code, NZX, NZX-S*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + X-, Z-, C-axes
- + Coordinate system
- + G- and M-code
- + S-, T- and F-code
- + Program format / structure

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D614** *Programming, MAPPS IV, G-Code, NTX 1000*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

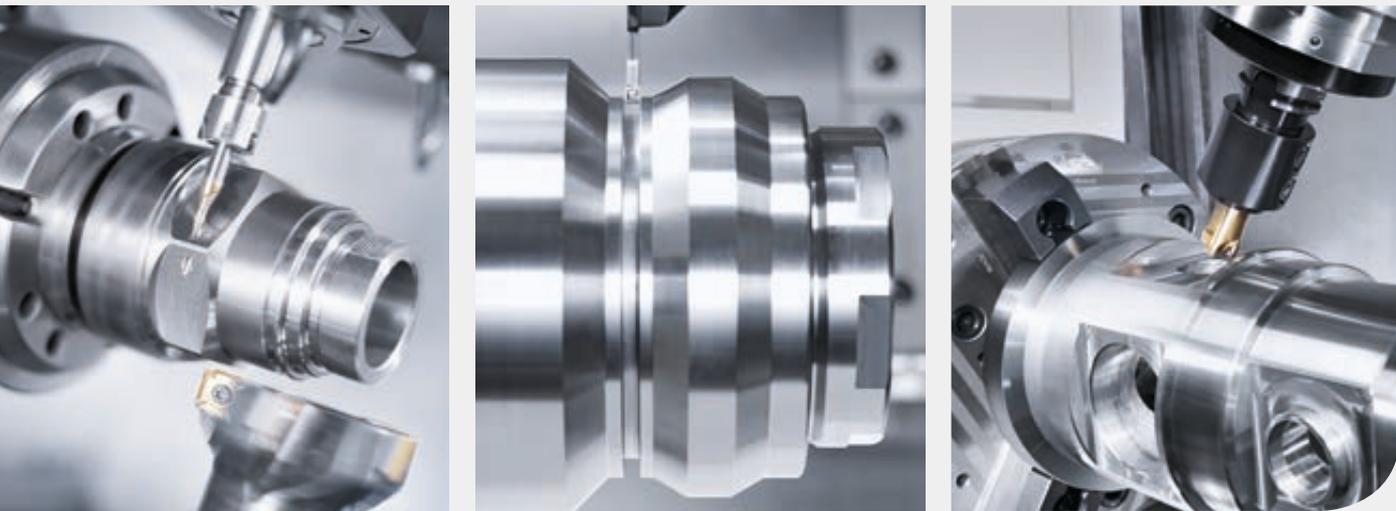
- + X-, Z-, C-axes
- + Coordinate system
- + G- and M-code
- + S-, T- and F-code
- + Program format / structure

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D615***Programming, MAPPS IV, G-Code, NT, NTX***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + X-, Z-, C-axes
- + Coordinate system
- + G- and M-code
- + S-, T- and F-code
- + Program format / structure

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D623***Programming, MAPPS IV, G-Code, multi-channel, NZX, NZX-S***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D613 or sound knowledge of G-Code programming

**COURSE CONTENTS**

- + Y-, B-axes
- + Takeover
- + Parts grippers
- + Counter spindle / tailstock
- + Multiple channels
- + Balance machining
- + Work process structure

**DURATION**

1.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

**A-D624** *Programming, MAPPS IV, G-Code, multi-channel, NTX 1000*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D614 or sound knowledge of G-Code programming

**COURSE CONTENTS**

- + Y-, A-, B-, BW-axes
- + Takeover
- + Parts grippers
- + Counter spindle / tailstock
- + Multiple channels
- + Balance machining
- + Work process structure

**DURATION**

1.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D625** *Programming, MAPPS IV, G-Code, multi-channel, NT, NTX*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D615 or sound knowledge of G-Code programming

**COURSE CONTENTS**

- + Y-, A-, B-axes
- + Takeover
- + Parts grippers
- + Counter spindle / tailstock
- + Multiple channels
- + Balance machining
- + Work process structure

**DURATION**

1.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D710** *Programming and operation, MAPPS IV, APL, NL, NLX*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Basic data input
- + Dialogue parameters
- + Boring
- + 2D milling contour, pocket
- + 2.5D milling
- + Multi-sided machining
- + Program structure
- + Control panel
- + MAPPS monitors
- + Workpiece zero point
- + Tool: Magazine / measurement
- + Pallet changer
- + Machine set-up

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D711** *Programming and operation, MAPPS IV, APL, CL, SL, VL*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Basic data input
- + Dialogue parameters
- + Boring
- + 2D milling contour, pocket
- + 2.5D milling
- + Program structure
- + Control panel
- + MAPPS monitors
- + Workpiece zero point
- + Tool: Magazine / measurement
- + Machine set-up

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## A-D712

*Programming and operation, MAPPS IV, APL, NVL***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Basic data input
- + Dialogue parameters
- + Boring
- + 2D contour and pocket milling
- + 2.5D milling
- + Expanded zero points G54.1
- + Workpiece set-up errors
- + G54.4 compensation
- + Dynamic workpiece zero point shift G54.2
- + Suitable workpiece coordinates
- + G68.2 rotation
- + Program structure

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

## A-D713

*Programming, MAPPS IV, AP-NZ, NZX, NZX-S***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Basic data input
- + T-code
- + Turning, burring, threads, boring
- + C-axis contour and pocket milling
- + C-axis boring
- + Program structure
- + Dialogue parameters

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

1–6 persons

## A-D714

*Programming, MAPPS IV, AP-NT, NTX 1000***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Basic data input
- + Turning, burring, threads, boring
- + C-, Y-, B-axis contour and pocket milling
- + C-, Y-, B-axis boring
- + Takeover
- + Parts grippers
- + Counter spindle / tailstock
- + BW-axis
- + Multiple channels
- + Balance machining
- + Work process structure
- + Program structure
- + Dialogue parameters

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

## A-D715

*Programming, MAPPS IV, AP-NT, NT, NTX***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Basic data input
- + Turning, burring, threads, boring
- + C-, Y-, B-axis contour and pocket milling
- + C-, Y-, B-axis boring
- + Takeover
- + Parts grippers
- + Counter spindle / tailstock
- + Multiple channels
- + Balance machining
- + Work process structure
- + Program structure
- + Dialogue parameters

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

**A-D723** *Programming, MAPPS IV, AP-NZ, multi-channel, NZX, NZX-S*

TARGET GROUP	COURSE CONTENTS	DURATION
<p>Programmers and operators of CNC turning machines</p> <p><b>REQUIREMENTS</b></p> <p>Participation in course A-D713 or sound knowledge of AP-NZ programming</p>	<p>+ Y-axis contour and pocket milling</p> <p>+ Y-axis boring</p> <p>+ Takeover</p> <p>+ Parts grippers</p> <p>+ Counter spindle / tailstock</p> <p>+ Multiple channels</p> <p>+ Balance machining</p> <p>+ Work process structure</p>	<p>1.5 days</p> <p><b>NUMBER OF PARTICIPANTS</b></p> <p>1–6 persons</p>

**A-D724** *Programming, MAPPS IV, AP-NT, multi-channel, NTX 1000*

TARGET GROUP	COURSE CONTENTS	DURATION
<p>Programmers and operators of CNC turning machines</p> <p><b>REQUIREMENTS</b></p> <p>Participation in course A-D714 or sound knowledge of AP-NT programming</p>	<p>+ Y-, B-axis contour and pocket milling</p> <p>+ Y-, B-axis boring</p> <p>+ Takeover</p> <p>+ Parts grippers</p> <p>+ Counter spindle / tailstock</p> <p>+ BW-axis</p> <p>+ Multiple channels</p> <p>+ Balance machining</p> <p>+ Work process structure</p>	<p>1.5 days</p> <p><b>NUMBER OF PARTICIPANTS</b></p> <p>1–6 persons</p>

**A-D725** *Programming, MAPPS IV, AP-NT, multi-channel, NT, NTX*

TARGET GROUP	COURSE CONTENTS	DURATION
<p>Programmers and operators of CNC turning machines</p> <p><b>REQUIREMENTS</b></p> <p>Participation in course A-D715 or sound knowledge of AP-NT programming</p>	<p>+ Y, B-axis contour and pocket milling</p> <p>+ Y, B-axis boring</p> <p>+ Takeover</p> <p>+ Parts grippers</p> <p>+ Counter spindle / tailstock</p> <p>+ Multiple channels</p> <p>+ Balance machining</p> <p>+ Work process structure</p>	<p>1.5 days</p> <p><b>NUMBER OF PARTICIPANTS</b></p> <p>1–6 persons</p>

**A-D743** *Operation, MAPPS IV, NZX, NZX-S*

TARGET GROUP	COURSE CONTENTS	DURATION
<p>Programmers and operators of CNC turning machines</p> <p><b>REQUIREMENTS</b></p> <p>Participation in courses A-D713 and A-D723 or A-D613 and A-D623</p>	<p>+ Control panel</p> <p>+ MAPPS monitors</p> <p>+ Workpiece zero point</p> <p>+ Tool: Set-up, measurement, parameters</p> <p>+ Transfer</p> <p>+ Counter spindle</p> <p>+ Parts grippers</p> <p>+ Machine set-up</p>	<p>4 days</p> <p><b>NUMBER OF PARTICIPANTS</b></p> <p>1–6 persons</p>

\* We provide FollowUp training for these courses. For more information, see page 05.

**A-D744**      *Operation, MAPPS IV, NTX 1000***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in courses A-D714 and A-D724 or A-D614 and A-D624

**COURSE CONTENTS**

- |   |                  |
|---|------------------|
| + Control panel                         | + B-axis         |
| + MAPPS monitors                        | + BW-axis        |
| + Workpiece zero point                  | + Parts grippers |
| + Tool: Set-up, measurement, parameters | + Machine set-up |
| + Tool changing                         |                  |
| + Transfer                              |                  |
| + Counter spindle                       |                  |

**DURATION**

4 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D745**      *Operation, MAPPS IV, NT, NTX***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in courses A-D715 and A-D725 or A-D615 and A-D625

**COURSE CONTENTS**

- |   |                  |
|---|------------------|
| + Control panel                         | + B-axis         |
| + MAPPS monitors                        | + Parts grippers |
| + Workpiece zero point                  | + Machine set-up |
| + Tool: Set-up, measurement, parameters |                  |
| + Tool changing                         |                  |
| + Transfer                              |                  |
| + Counter spindle                       |                  |

**DURATION**

4 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D763**      *Tool management system, MAPPS IV, turning***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in a MAPPS IV turning, operation or programming course

**COURSE CONTENTS**

- + Set-up screen
- + Correction screen
- + Parameter set-up
- + Tool service life
- + T-, H-code
- + Twin tools

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D765**      *Tool management system, MAPPS IV, NT, NTX***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in a MAPPS IV NT(X) programming or operation course

**COURSE CONTENTS**

- + Set-up screen
- + Correction screen
- + Parameter set-up
- + Tool service life
- + T-, H-code
- + Twin tools

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

1–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

**A-D773** *Measuring sensor, MAPPS IV, turning*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in a MAPPS IV turning, operation or programming course and TMS

**COURSE CONTENTS**

- + Set-up screen
- + Calibration
- + Variables
- + Measurement cycles
- + Workpiece zero point measurement
- + Measurement of root face / groove distances
- + Bolt hole circle / tapping measurement
- + C-axis measurement

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D775** *Measuring sensor, MAPPS IV, NTX*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in a MAPPS IV NT(X) programming or operation course and knowledge of TMS

**COURSE CONTENTS**

- + Calibration
- + Variables
- + Measurement cycles
- + Workpiece zero point measurement
- + Measurement of root face / groove distances
- + C-axis measurement
- + Bolt hole circle / tapping measurement

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D801** *CELOS for Siemens, operation and process integration*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Ways to integrate CELOS into existing work processes and its economic benefits
- + (Touch-)screen interface and use
- + Setting up and using the APPs: Job Manager, Job Assistant, CAD-CAM View, Tech Calculator, Documents, Organizer, Net Service, Machine Check, Energy Savings, Settings, Status Monitor, Control
- + Creating a full sample project

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–8 persons

**A-D806** *CELOS for MAPPS, operation and process integration*

**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Solid basic knowledge of CNC turning technology and programming

**COURSE CONTENTS**

- + Ways to integrate CELOS into existing work processes and its economic benefits
- + (Touch-)screen interface and use
- + Setting up and using the APPs: Job Manager, Job Assistant, CAD-CAM View, Tech Calculator, Documents, Organizer, Net Service, Machine Check, Energy Savings, Settings, Status Monitor, Control
- + Creating a full sample project

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–8 persons

**A-D811** *Programming, production turning machines, DMG Programmer 3D Turning*
**TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Good knowledge of computers and Windows, participation in course A-D210 / A-D212 / A-D214\* or A-D215\*

**COURSE CONTENTS**

- + Structure of the software
- + Program management
- + GILDEMEISTER structured programming
- + Program templates
- + Programming syntax
- + Tool management
- + Input parameters for clamping devices, zero points and workpiece transfer parameters
- + Structure of programs
- + Object simulation
- + Creation of machining programs
- + Tool input
- + Use of the tool database
- + Module selection
- + B- and C-axis positions
- + Technology selection
- + Definition of a blank contour
- + 4-axis machining
- + Use of the wait mark manager
- + Addition of wait marks
- + CAD/CAM view
- + CAD/CAM extension for turning
- + Roughing, finishing, thread cutting, cutting in
- + Creating external and internal contours in CAD/CAM
- + Creation of milling in CAD/CAM
- + Transmit Y-axis machining
- + Cylinder interpolation
- + B-axis machining
- + Definition of the program, shift
- + Comprehensive practice phases
- + Programming a customer-specific workpiece
- + Data transfer
- + Export / import of DMG Programmer 3D Turning
- + ISO format conversion
- + Installation routine

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D812** *Customer-specific training and installation, DMG Programmer 3D Turning*
**TARGET GROUP**

Programmers of CNC turning machines

**REQUIREMENTS**

Participation in course A-D811

**COURSE CONTENTS**

- + Installation of the basic system
- + Installation of the machine
- + Activation of the right program template
- + Customer-specific adaptation of the program template
- + Tips and tricks
- + General training in DMG Programmer 3D Turning

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-D813** *Import, 2D/3D CAD data, DMG Programmer 3D Turning*
**TARGET GROUP**

Programmers of CNC turning machines

**REQUIREMENTS**

Participation in course A-D811

**COURSE CONTENTS**

- + Importing IGES / STEP / DXF data formats into DMG Programmer 3D Turning
- + Workpiece rotation
- + Definition of the zero point
- + Marking machining surfaces
- + Selection of machining processes

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

1–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

A-D820

*Operation, DMG Virtual Machine, turning technology*

**TARGET GROUP**

Operators of DMG Virtual Machine, NC programmers

**REQUIREMENTS**

Sound knowledge of computers, CAD software and programming and operating CNC control systems

**COURSE CONTENTS**

- + Virtual machine: User interface
- + Creating, loading and managing ranges of operations
- + Equipment management with storage options for templates
- + Creating and importing "simple forms" of NC programs
- + Importing available resources
- + Creating the session / tool situation using available resources
- + Starting and connecting the virtual machine
- + Transferring sessions / tool situations to the virtual machine
- + Simulating, logging and recording the session
- + Identifying and correcting collisions
- + Storing and managing sessions
- + Creation of parts
- + Set-up data generation with SolidWorks: User interface
- + Module creation
- + Compiling available raw data in the form of clamping devices and tools
- + Creating connection points (docking and position frames) using the DMG Assistant
- + Categorising resources
- + Creating resource templates (tools and clamping devices)
- + Exporting resources and the virtual machine

**DURATION**

4 days

**NUMBER OF PARTICIPANTS**

3–6 persons

A-D831

*NX, CAM for turning machines, CTX, TWIN, CTV, single-channel*

**TARGET GROUP**

Operators of DMG Virtual Machine, NC programmers

**REQUIREMENTS**

Sound knowledge of computers, CAD/CAM software and programming and operating CNC control systems

**COURSE CONTENTS**

- + Introduction to the basics of NX CAM
- + Simple machining processes based on 2D/3D geometries and the relevant machining strategies
- + Machining cycles
- + Finishing
- + Cutting in
- + Boring operations
- + Machining in Teach Mode (machining using individual process commands)
- + Thread cutting
- + Application issues
- + Special solutions
- + NC organisation
- + Adjustments
- + Machine control
- + Post-processing
- + Material removal simulation for the tools with collision monitoring

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–8 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## A-D832

*NX, CAM for turning machines, CTX, TWIN, CTV, GMX, turning and milling on up to 3-axes***TARGET GROUP**

Operators of DMG Virtual Machine,  
NC programmers

**REQUIREMENTS**

Sound knowledge of computers,  
CAD/CAM software and program-  
ming and operating CNC control  
systems

**COURSE CONTENTS**

- + Simple machining processes based on 2D/3D geometries and the relevant machining strategies
- + Machining cycles
- + Finishing
- + Cutting in
- + Boring operations
- + Machining in Teach Mode (machining using individual process commands)
- + Thread cutting
- + Application issues
- + Special solutions
- + Turning and milling in one part
- + Milling with the C-axis
- + Multi-sided machining
- + Adjustments
- + Machine control
- + Post-processing
- + Machining process based on the master model concept
- + Expected process from design to production
- + Using the operation navigation tool
- + Boring modules

**DURATION**

2 weeks

**NUMBER OF PARTICIPANTS**

3–8 persons



COURSES // CNC TRAINING

TURNING TECHNOLOGY

A-D833

*NX, CAM for turning machines, synchronisation, multi-channel*

**TARGET GROUP**

Programmers of CNC turning machines

**REQUIREMENTS**

Sound knowledge of computers, CAD/CAM software and programming and operating CNC control systems

**COURSE CONTENTS**

- + Re-ordering the sequence of tools
- + Working with synchronisation and pause events
- + Calculating machine times
- + Options in the dialogue window
- + Synchronising, displaying and deleting synchronisation information in the operations navigator

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–8 persons

A-D851

*Basics of DMG Virtual Machine, turning technology*

**TARGET GROUP**

Operators of DMG Virtual Machine, NC programmers

**REQUIREMENTS**

Sound knowledge of computers, CAD/CAM software and programming and operating CNC control systems

**COURSE CONTENTS**

- + Interface of DMG Virtual Machine
- + Creating, loading and managing ranges of operations
- + Equipment management with storage options for templates
- + Creating and importing “simple forms” of NC programs
- + Creating the session / tool situation using available resources
- + Starting and connecting the virtual machine
- + Simulating, logging and recording the session
- + Identifying and correcting collisions
- + Storing and managing sessions

**DURATION**

1.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

A-D852

*Operation of DMG Virtual Machine with equipment from SolidWorks, turning technology*

**TARGET GROUP**

Operators of DMG Virtual Machine, NC programmers

**REQUIREMENTS**

Sound knowledge of computers, CAD/CAM software and programming and operating CNC control systems

**COURSE CONTENTS**

- + Set-up data generation with SolidWorks
- + User interface
- + Creation of parts
- + Module creation
- + Compiling available raw data in the form of clamping devices and tools
- + Creating connection points (docking and position frames) using the DMG Assistant
- + Categorising resources
- + Creating resource templates (tools and clamping devices)
- + Exporting resources and the virtual machine

**DURATION**

2.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D861**      *ESPRIT Basic, turning***TARGET GROUP**

Programmers of turning machines

**REQUIREMENTS**

Basic knowledge of computers and Windows

**COURSE CONTENTS**

- + Basics of turning and milling
- + 2D geometry
- + Features
- + Layers
- + Volume models
- + Working planes
- + NC programs
- + Add-ins
- + Tool database
- + Simulation

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D862**      *ESPRIT, 5-axis machining***TARGET GROUP**

Programmers and operators of CNC turning machines

**REQUIREMENTS**

Participation in course A-D861

**COURSE CONTENTS**

- + Positioning versus simultaneous in multi-axis machining
- + Various ways to set-up the tool shafts in simultaneous machining
- + Machining strategies
- + Application issues relating to the various NC machines and control systems

Other CAD/CAM courses are available on request.

**DURATION**

2.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-D911**      *Customer-specific training on the customer's premises in Germany***TARGET GROUP**

To be agreed individually

**REQUIREMENTS**

Defined in coordination with you based on the course contents

**COURSE CONTENTS**

The course contents are agreed with special consideration for your wishes.

**DURATION**

To be agreed individually

**NUMBER OF PARTICIPANTS**

1–6 persons

COURSES // CNC TRAINING

TURNING TECHNOLOGY

A-D921

*Customer-specific training on the customer's premises outside of Germany*

**TARGET GROUP**

To be agreed individually

**REQUIREMENTS**

Defined in coordination with you based on the course contents

**COURSE CONTENTS**

The course contents are agreed with special consideration for your wishes.

**DURATION**

To be agreed individually

**NUMBER OF PARTICIPANTS**

1–6 persons

A-D931

*Customer-specific training in the DMG MORI Academy in Germany*

**TARGET GROUP**

To be agreed individually

**REQUIREMENTS**

Defined in coordination with you based on the course contents

**COURSE CONTENTS**

You can help us choose the course contents based on your requirements and use the infrastructure of the DMG MORI Academy.

**DURATION**

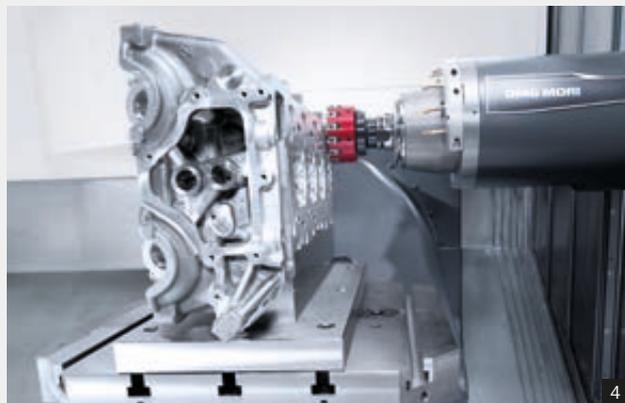
To be agreed individually

**NUMBER OF PARTICIPANTS**

1–6 persons

Course descriptions CNC Training

## » Milling technology



Information on all courses  
for CNC Training in milling:

Don't hesitate to contact us for more advice:  
training.fraesen@dmgmori.com  
T: +49 (0) 83 63 / 89 42 24

1: DMC 55 H, Siemens 840D / DIN ISO 2: DMU eVo range, 5-axis simultaneous machining with a high-performance 18,000 rpm spindle  
3: DMC V range, large working area with rigid table for workpieces weighing up to 1,500 kg 4: DMC 60 / 80 H *linear* for challenging machining tasks

**COURSES // CNC TRAINING // MILLING TECHNOLOGY**

1. Basic

2. Advanced

3. Professional

**A-E821**

*Basics of CAD/CAM with NX, full licence*

**TARGET GROUP**

CAM programmers, operators of DMG Virtual Machine and NC programmers

**REQUIREMENTS**

Solid basic knowledge of CNC production technology and Windows XP or higher

**COURSE CONTENTS**

- + The NX program package (concept / history)
- + Basics of modelling
- + Basics of parametrisation
- + Introduction to the master model concept
- + Methods of constructing a module
- + ANT module navigator
- + Basics of creating drawings
- + Basics of synchronous design
- + CAD functions in CAM
- + Importing external data

**DURATION**

1.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-E822**

*Basics of CAM with NX, CAM licence*

**TARGET GROUP**

CAM programmers, operators of DMG Virtual Machine and NC programmers

**REQUIREMENTS**

Solid basic knowledge of CNC production technology and Windows XP or higher

**COURSE CONTENTS**

- + Basics of NX
- + Introduction to the master model concept
- + Methods of constructing a module
- + ANT module navigator
- + Importing external data

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-E834**

*NX CAM turning / milling machine, milling, 5-axis simultaneous machining*

**TARGET GROUP**

Operators of DMG Virtual Machine and NC programmers

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and Windows, as well as participation in courses A-E821 / A-E822 and A-F831 / A-F832 or knowledge of NX CAM from V7.5

**COURSE CONTENTS**

- + Positioning versus simultaneous in multi-axis machining
- + Various ways to set-up the tool shafts in simultaneous machining
- + Machining strategies
- + Application issues relating to the various
- + NC machines and control systems

**DURATION**

3–8 days

**NUMBER OF PARTICIPANTS**

1–2 persons

## COURSES // CNC TRAINING

## MILLING TECHNOLOGY

## A-F001

*BA4 safety training***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + Comparison of BA2, BA3 and BA4
- + Functional restrictions of BA4
- + Application for BA4
- + Legal restrictions
- + Safety regulations
- + Practical application

**DURATION**

0.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-F021

*Programming and operation of Philips CNC 432***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Knowledge of CNC technology

**COURSE CONTENTS**

- + Using the machine / control system
- + Program and tool management
- + Cutter compensation
- + Linear and circular contour programming
- + Zero point offset
- + Mirroring
- + Distorting
- + Cycles for boring and milling
- + Contour pocket
- + Subprogram technology
- + Data transfer
- + Introduction to polar coordinates
- + Contour path with transfer G11
- + Milling and boring of practice parts
- + Introduction to the tool change system

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

## A-F022

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Knowledge of CNC technology

**COURSE CONTENTS**

- + Use
- + Program and tool management
- + Cutter compensation
- + Linear and circular contour programming
- + Zero point offset
- + Mirroring
- + Distorting
- + Cycles for boring and milling
- + Contour pocket
- + Subprogram technology
- + Introduction to polar coordinates
- + Contour path with transfer G11
- + Milling and boring of practice parts
- + Introduction to the tool change system
- + Data transfer

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

**COURSES // CNC TRAINING**

**MILLING TECHNOLOGY**

**A-F210**

*Programming and operation, Siemens 840D, DIN ISO*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Knowledge of CNC technology

**COURSE CONTENTS**

- + Program management
- + Programming practice examples under DIN ISO
- + Zero point offset
- + Multiple clamping operations
- + Transformations
- + Tool management
- + Subprogram technology
- + Data transfer with USB
- + Using the machine and control system
- + Pallet management
- + Setting zero points (setting up workpieces)
- + Running programs
- + Retracting the pallet changer
- + Retracting the tool change system

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

**A-F211\***

*Programming and operation, Siemens Operate, G-Code*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Knowledge of CNC technology

**COURSE CONTENTS**

- + Using the machine / control system
- + Program management
- + Program generation and optimisation
- + Tool management
- + Cutter compensation
- + Contour programming
- + Frames (zero point offset, mirroring, scaling)
- + Subprogram technology
- + Program part repetition
- + Boring and milling cycles
- + Data transfer

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

**A-F221**

*Configuration level: Plane transformation, Siemens Operate, G-Code*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F211\* and practical experience with the machine

**COURSE CONTENTS**

- + Getting to know solid angles, projection angles and swivel on each axis
- + Using the rotational axes
- + Correct approach to swivelling in the program
- + Creation of holes on swivelled surfaces
- + Creation of surfaces on swivelled planes
- + Creation of contours on swivelled planes

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–4 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## A-F231

*Configuration level: Measuring sensor, Siemens Operate, G-Code***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F211\* and practical experience with the machine

**COURSE CONTENTS**

- + Using the machine in connection with the measuring sensor
- + Using the measuring sensor in both manual and automatic mode
- + Measuring sensor hardware
- + Sensor calibration
- + Programming measurement cycles
- + Zero point calculation
- + Tool correction
- + Generating measurement protocols
- + Tolerance comparison and processing of the measured values

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–4 persons

## A-F271

*Configuration level: Turning option, Siemens Operate, G-Code***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in courses A-F211\* and A-DF221

**COURSE CONTENTS**

- + Differences between turning and milling
- + Tool storage, names
- + Corrections during turning
- + Basic functions of turning
- + Balancing
- + Cycles
- + Creating and optimising turning programs

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-F281

*GREENmode / OMAT feed optimisation for Siemens***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + OMAT adaptive feed optimisation

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

1–8 persons

**COURSES // CNC TRAINING**

**MILLING TECHNOLOGY**

**A-F310\***

*Programming and operation, Siemens Operate, ShopMill*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Knowledge of CNC technology

**COURSE CONTENTS**

- + Program generation in the ShopMill dialogue
- + Program management
- + Cutter compensation
- + Contour programming
- + Contour broaching
- + Zero point offset
- + Mirroring
- + Scaling
- + Subprogram technology
- + Program part technology
- + Boring cycles
- + Milling cycles
- + Reaching the reference point
- + Using the machine / control system
- + Machine set-up
- + Data transfer
- + Tool measurement
- + Running programs
- + Program interruption
- + Program start
- + Block search

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

**A-F320**

*Configuration level: Plane transformation, Siemens Operate, ShopMill*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F310\* and practical experience with the machine

**COURSE CONTENTS**

- + Getting to know solid angles, projection angles and swivel on each axis
- + Using the rotational axes
- + Correct approach to swivelling in the program
- + Creation of holes on swivelled surfaces
- + Creation of surfaces on swivelled planes
- + Creation of contours on swivelled planes

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–4 persons

**A-F330**

*Configuration level: Measuring sensor, Siemens Operate, ShopMill*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F310\* and practical experience with the machine

**COURSE CONTENTS**

- + Getting to know the measuring sensor hardware
- + Sensor calibration
- + Using the measurement cycles in manual and automatic mode
- + Alignment of workpieces
- + Calculation of workpiece zero points
- + Using measurements to correct tool geometry data

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–4 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

**A-F351** *Parameter programming with Siemens***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F211\* and practical experience with the machine

**COURSE CONTENTS**

- + Parameter programming
- + Creation of variable main and subprograms
- + R-variables
- + User variables (DEF definitions)
- + System variables (axis data / tool data)
- + Program jumps, grinding (Goto, If, For, Endfor, To, Loop, Else)
- + Generating 2 ½ and 3D contours and forms (programming with angular functions)
- + Ellipse
- + Hemisphere
- + Plane / spatial spirals
- + Tapers
- + Generating user cycles
- + Proc commands

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–4 persons

**A-F370** *Turning option, Siemens Operate, ShopMill***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F310\* and A-F320 and practical experience with the machine

**COURSE CONTENTS**

- + Differences between turning and milling
- + Tool storage, names
- + Corrections during turning
- + Basic functions of turning
- + Balancing
- + Creating and optimising turning programs

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–4 persons

**A-F382** *Option MPC, Siemens ShopMill and DIN ISO***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + How machine collisions work
- + Introduction to upper screen graphics
- + Application on tools in manual mode
- + Application on tools in automatic mode

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

3–6 persons

COURSES // CNC TRAINING

MILLING TECHNOLOGY

A-F410\*

*Programming and operation, iTNC*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Knowledge of CNC technology

**COURSE CONTENTS**

- + Program generation in Heidenhain
- + Plain text format
- + File management, contour programming
- + Cycle programming: Boring, milling, thread cutting, mirroring, rotation, zero point offset etc.
- + Program part repetition, subprogram technology
- + Contour pocket with / without island
- + Polar coordinates
- + Setting reference points
- + Storing and removing tools
- + PGM interruption
- + Tool table and management
- + Running NC programs
- + Emergency shut-off situation during machining
- + Emergency shut-off situation during the tool change process
- + DECKEL MAHO cycles
- + Operation with an open working area door with BA2 and BA3

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

A-F411

*Programming and operation, iTNC / TNC advanced*

**TARGET GROUP**

Programmers and operators of CNC milling machines with qualifications in programming and operation

**REQUIREMENTS**

Sound knowledge of programming and operating CNC milling machines and participation in course A-F410\*

**COURSE CONTENTS**

- Programming**
- + GREENmode: optimised milling with AFC (Adaptive Feed Control)
- + GREENmode: Energy management with DMG AUTOshutdown
- + Smart.NC: optimised program generation in the Smart programming language
- + DXF converter: Programming directly from the drawing data
- + Pallet management: Multiple set-up, PGM allocation
- + Irregular drilling patterns with point table PNT
- + Drilling patterns with a pattern (shear angle)
- + Speed and feed calculation with cutting data table
- + Cycles: Boring, thread milling and cutting
- + SL cycles: Roughing broach, different island heights with contour formula and bevels
- + Polar coordinates: complex bore patterns, helix milling
- + Tool-orientated machining in mass production technology
- + Integration of external programmes with PGM Call (e.g. H / HU / reset programs)
- + Creating complex contours with FK / infeed depth with Q parameters and IF command
- Operation**
- + Blum laser calibration, tool measurement, breakage monitoring
- + Preset table: Multiple clamping operations, preset management
- + DECKEL MAHO cycles (preset table definition, tool breakage 398)
- + Service life monitoring, twin tools
- + Recovery menu during tool and pallet changes
- + Network integration for machine and PC

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

## A-F420

*Configuration level: Plane transformation cycle 19 / PLANE, iTNC / TNC***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F410\* or experience in programming and operating the TNC 426 / 430 / 620 / 640 or iTNC 530 control system

**COURSE CONTENTS**

- + Getting to know solid angles, projection angles, vectors, points and Euler angles
- + Correct approach to swivelling in the program
- + Creation of holes on swivelled surfaces
- + Creation of surfaces on swivelled planes
- + Learning about milling with a positioned tool

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–4 persons

## A-F430

*Configuration level: Measuring sensor, iTNC / TNC***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Sound knowledge of programming and operating CNC milling machines and participation in course A-F410\*

**COURSE CONTENTS**

- + Using the machine in connection with the measuring sensor
- + Using the measuring sensor in both manual and automatic mode
- + Measuring sensor hardware
- + Sensor calibration
- + Programming measurement cycles
- + Zero point calculation
- + Tool correction
- + Generating measurement protocols
- + Tolerance comparison and processing

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–4 persons

## A-F451

*Advanced Training course: Geometry (FK) programming, Heidenhain iTNC / TNC***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F410\* or experience in programming and operating the TNC 426 / 430 / 620 / 640 or iTNC 530 control system

**COURSE CONTENTS**

- + Introduction to the various FK soft key functions
- + Using the various even and circular functions
- + Creating FK programs using the G111 support chart
- + Converting FK programs

**DURATION**

1.5 days

**NUMBER OF PARTICIPANTS**

3–4 persons

COURSES // CNC TRAINING

MILLING TECHNOLOGY

A-F452

*Advanced Training course: Parameter programming, iTNC / TNC*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in courses A-F410\* and A-F430 or solid knowledge of plain text programming with Heidenhain TNC

**COURSE CONTENTS**

- + Introduction to parameter programming
- + Getting to know mathematical functions
- + Creating variable contours
- + Creating 3D forms with 2 ½D programming
- + Subprogram technology
- + Jump conditions
- + Program optimisation

**DURATION**

3 days

**NUMBER OF PARTICIPANTS**

3–8 persons

A-F482

*Option MPC, Heidenhain iTNC / TNC*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F210

**COURSE CONTENTS**

- + How machine collisions work
- + Introduction to upper screen graphics
- + Application on tools in manual mode
- + Application on tools in automatic mode

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

1–8 persons

A-F510

*Programming and operation, MillPlus iT*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Basic knowledge of CNC

**COURSE CONTENTS**

- + Programming simple machining steps
- + Using the machine / control system
- + Zero point offset
- + Program and tool management
- + Cutter compensation
- + Linear and circular contour programming
- + Introduction to contour programming with ICP
- + Polar coordinates
- + Cycles for boring and milling
- + Contour pocket
- + Subprogram technology
- + Mirroring, distorting, scaling
- + Milling and boring of practice parts
- + Introduction to the tool change system
- + Data transfer

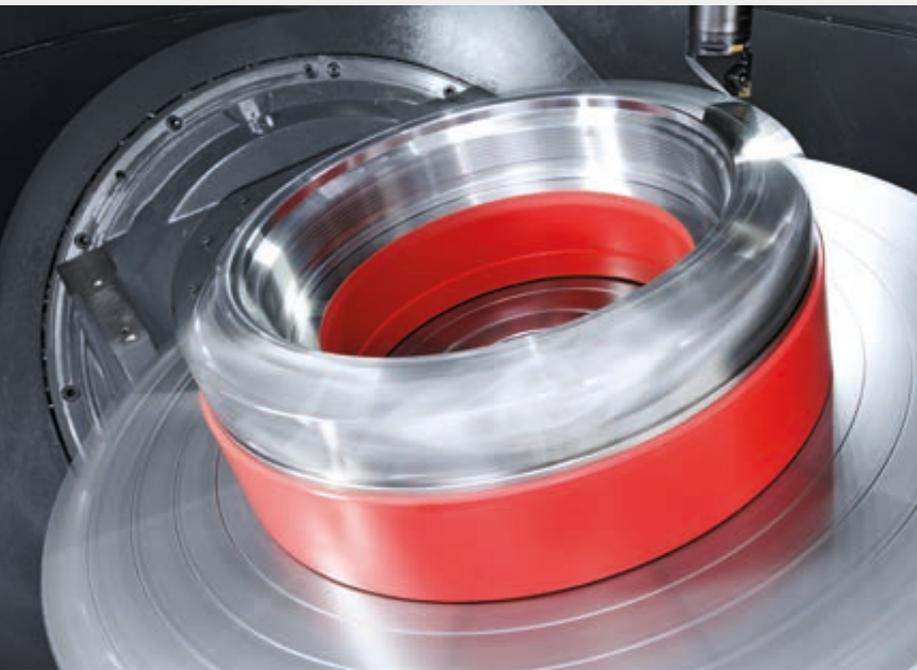
**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

\* We provide FollowUp training for these courses. For more information, see page 05.



## A-F511\*

## Programming and operation, MillPlus iT V6XX

**TARGET GROUP**

Programmers and operators of  
CNC milling machines

**REQUIREMENTS**

Basic knowledge of CNC

**COURSE CONTENTS**

- |  |   |
|--|---|
| <p><b>Programming</b></p> <ul style="list-style-type: none"> <li>+ Contour programming in DIN / with ICP NEW</li> <li>+ Look ahead during contour milling</li> <li>+ Program management</li> <li>+ Operating shortcuts</li> <li>+ Cycle programming:</li> <li>+ Boring, tapping, thread milling</li> <li>+ Cycles for pockets, grooves</li> <li>+ Rotation, mirroring, NPV</li> <li>+ NEW broaching cycles with contour formula, roughing broach, finishing</li> <li>+ Tool management: Tool and magazine tables</li> <li>+ Program part repetition, subprogram technology</li> <li>+ High-level language elements</li> <li>+ Polar coordinates</li> <li>+ Compatibility check with MillPlus-V5XX</li> <li>+ Assigning user soft keys</li> </ul> | <p><b>Operation</b></p> <ul style="list-style-type: none"> <li>+ Tool magazine</li> <li>+ Storing and removing tools</li> <li>+ Manually loading / unloading tools</li> <li>+ MDI</li> <li>+ Setting zero points, setting up workpieces</li> <li>+ Tool changer and pallet changer recovery menu</li> <li>+ Running a program during milling</li> <li>+ Interrupting a program</li> <li>+ Aborting a program</li> <li>+ Starting a program with block search</li> <li>+ Emergency shut-off situation</li> <li>+ Data transfer between PC and machine</li> </ul> |
|--|---|

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–8 persons

COURSES // CNC TRAINING

MILLING TECHNOLOGY

A-F520

*Configuration level: G7 plane transformation, MillPlus iT*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F510\* and practical experience with the machine

**COURSE CONTENTS**

- + Input steps for G7 in the program
- + Resetting G7
- + Boring on slanted surfaces
- + Milling bevels at various angles
- + Milling contours and pockets on slanted surfaces
- + Milling bevels
- + Introduction to G8, swivelling tool alignment

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–4 persons

A-F521

*Configuration level: G7 plane transformation, MillPlus iT V6XX*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F511\* and practical experience with the machine

**COURSE CONTENTS**

- + Input steps for G7 in the program
- + Resetting G7
- + Boring on slanted surfaces
- + Milling bevels at various angles
- + Milling contours and pockets on slanted surfaces
- + Milling bevels
- + Introduction to G8, swivelling tool alignment

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–4 persons

A-F530

*Configuration level: Measuring sensor, MillPlus iT*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F510\* and practical experience with the machine

**COURSE CONTENTS**

- + Using the machine in connection with the measuring sensor
- + Using the measuring sensor in both manual and automatic mode
- + Measuring sensor hardware
- + Sensor calibration
- + Zero point calculation
- + Programming measurement cycles
- + Tool correction
- + Generating measurement protocols
- + Tolerance comparison and processing of the measured values

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–4 persons

## A-F531

*Configuration level: Measuring sensor, MillPlus iT V6XX***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F511\* and practical experience with the machine

**COURSE CONTENTS**

- + Using the machine in connection with the measuring sensor
- + Sensor calibration
- + Programming measurement cycles
- + Zero point calculation
- + Tool correction
- + Tolerance comparison and processing

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–4 persons

## A-F551

*Advanced Training course: Geometry programming and IPP, MillPlus iT***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F510\* and practical experience with the machine

**COURSE CONTENTS**

- + Geometry address G64
- + Cutting point calculation
- + Parallel shift
- + Rounding off at intersections
- + Tangent point calculation
- + Circles for combining elements
- + Geometry programming with ICP
- + Parts programming with IPP

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

1–4 persons

## A-F552

*Advanced Training course: Parameter programming and IPP, MillPlus iT***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F510 and several months of practical experience with the machine

**COURSE CONTENTS**

- + Parameter programming for 2D and 2 ½D forms
- + Mathematical expressions
- + Subprogram technology
- + Program optimisation

**DURATION**

2.5 days

**NUMBER OF PARTICIPANTS**

1–4 persons

**COURSES // CNC TRAINING**

**MILLING TECHNOLOGY**

**A-F571**

*Configuration level: Turning option, MillPlus iT*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in courses A-F510 and A-F520

**COURSE CONTENTS**

- + Differences between turning and milling
- + Tool storage, names
- + Corrections during turning
- + Basic functions of turning
- + Balancing
- + Cycles
- + Creating and optimising turning programs

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-F610**

*Programming and operation, MAPPS IV, G-Code, horizontal, NH(X)*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + X-, Y-, Z-, B-axes
- + Coordinate system
- + G- and M-code
- + S-, T- and F-code
- + Program format / structure
- + Control panel
- + MAPPS monitors
- + Workpiece zero point
- + Tool: Magazine / measurement
- + Pallet changer
- + Machine set-up

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F611**

*Programming and operation, MAPPS IV, G-Code, vertical, NV, NVD, NVX*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + X-, Y-, Z-axes
- + Coordinate system
- + G- and M-code
- + S-, T- and F-code
- + Program format / structure
- + Control panel
- + MAPPS monitors
- + Workpiece zero point
- + Tool: Magazine / measurement
- + Machine set-up

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F612***Programming, MAPPS IV, G-Code, horizontal, NMH***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + X, Y, Z, A, C axes
- + Coordinate system
- + G- and M-code
- + S-, T- and F-code
- + Expanded zero points G54.1
- + Dynamic workpiece zero point
- + G54.2 shift
- + Workpiece set-up errors
- + G54.4 compensation
- + Suitable workpiece coordinates
- + G68.2 rotation
- + 3D G68 coordinate rotation
- + Program format / structure

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F613***Programming, MAPPS IV, G-Code, vertical, NMV***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + X-, Y-, Z-, B-, C-axes
- + Coordinate system
- + G- and M-code
- + S-, T- and F-code
- + Expanded zero points G54.1
- + Dynamic workpiece zero point
- + G54.2 shift
- + Workpiece set-up errors
- + G54.4 compensation
- + Suitable workpiece coordinates
- + G68.2 rotation
- + 3D G68 coordinate rotation
- + Program format / structure

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F683***Turning / milling option, MAPPS IV, G-Code, vertical***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in courses A-F613, A-F723 and A-F773

**COURSE CONTENTS**

- + Differences between turning and milling
- + Tool storage, names
- + Corrections during turning
- + Basic functions of turning
- + Balancing
- + Cycles
- + Creating and optimising turning programs

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**COURSES // CNC TRAINING**

**MILLING TECHNOLOGY**

**A-F710** *Programming and operation, MAPPS IV, APM, horizontal, NH(X)*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + Basic data input
- + Dialogue parameters
- + Boring
- + 2D contour and pocket milling
- + 2.5D milling
- + Multi-sided machining
- + Program structure
- + Control panel
- + MAPPS monitors
- + Workpiece zero point
- + Tool: Magazine / measurement
- + Pallet changer
- + Machine set-up

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F711** *Programming and operation, MAPPS IV, APM, vertical, NV, NVD, NVX*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + Basic data input
- + Dialogue parameters
- + Boring
- + 2D contour and pocket milling
- + 2.5D milling
- + Program structure
- + Control panel
- + MAPPS monitors
- + Workpiece zero point
- + Tool: Magazine / measurement
- + Machine set-up

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F712** *Programming, MAPPS IV, APM, horizontal, NMH*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + Basic data input
- + Dialogue parameters
- + Boring
- + 2D contour and pocket milling
- + 2.5D milling
- + Expanded zero points G54.1
- + Workpiece set-up errors
- + G54.4 compensation
- + Dynamic workpiece zero point shift G54.2
- + Suitable workpiece coordinates
- + G68.2 rotation
- + Program structure

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

\* We provide FollowUp training for these courses. For more information, see page 05.

**A-F713** *Programming, MAPPS IV, APM, vertical, NMV***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + Basic data input
- + Dialogue parameters
- + Boring
- + 2D contour and pocket milling
- + 2.5D milling
- + Expanded zero points G54.1
- + Workpiece set-up errors
- + G54.4 compensation
- + Dynamic workpiece zero point
- + G54.2 shift
- + Suitable workpiece coordinates
- + G68.2 rotation
- + Program structure

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F722** *Operation, MAPPS IV, APM, horizontal, NMH***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F712 or A-F612 or sound knowledge of APM programming

**COURSE CONTENTS**

- + Control panel
- + MAPPS monitors
- + Workpiece zero point
- + Tool: Magazine / measurement
- + Pallet changer
- + Expanded zero points G54.1
- + Dynamic workpiece zero point
- + G54.2 shift
- + Workpiece set-up errors
- + G54.4 compensation
- + Suitable workpiece coordinates
- + G68.2 rotation
- + 3D G68 coordinate rotation
- + Machine set-up

**DURATION**

4 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F723** *Operation, MAPPS IV, APM, vertical, NMV***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in course A-F613 or A-F713 or sound knowledge of APM programming

**COURSE CONTENTS**

- + Control panel
- + MAPPS monitors
- + Workpiece zero point
- + Tool: Magazine / measurement
- + Expanded zero points G54.1
- + Dynamic workpiece zero point
- + G54.2 shift
- + Workpiece set-up errors
- + G54.4 compensation
- + Suitable workpiece coordinates, G68.2 rotation
- + 3D G68 coordinate rotation
- + Machine set-up

**DURATION**

4 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**COURSES // CNC TRAINING**

**MILLING TECHNOLOGY**

**A-F763**

*Tool management system, MAPPS IV, milling*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in a MAPPS IV milling, operation or programming course

**COURSE CONTENTS**

- + Set-up screen
- + Correction screen
- + Parameter set-up
- + Tool service life
- + T-, H-code
- + Twin tools

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F771**

*Measuring sensor, MAPPS IV, NVX, NHX*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in a MAPPS IV milling, operation or programming course and knowledge of TMS

**COURSE CONTENTS**

- + Set-up screen
- + Calibration
- + Variables
- + Measurement cycles
- + Workpiece zero point measurement
- + Measurement of root face / groove distances
- + Bolt hole circle / tapping measurement
- + C-axis measurement

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F773**

*Measuring sensor, MAPPS IV, milling*

**TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in a MAPPS IV milling, operation or programming course and knowledge of TMS

**COURSE CONTENTS**

- + Set-up screen
- + Calibration
- + Variables
- + Measurement cycles
- + Workpiece zero point measurement
- + Measurement of root face / groove distances
- + Bolt hole circle / tapping measurement
- + C-axis measurement

**DURATION**

1 day

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F783***Turning / milling option, MAPPS IV, APM, vertical***TARGET GROUP**

Programmers and operators of CNC milling machines

**REQUIREMENTS**

Participation in courses A-F713 / A-F723 and A-F773

**COURSE CONTENTS**

- + Differences between turning and milling
- + Tool storage, names
- + Corrections during turning
- + Basic functions of turning
- + Balancing
- + Cycles
- + Creating and optimising turning programs

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

1–6 persons

**A-F801***CELOS for Siemens, operation and process integration***TARGET GROUP**

Programmers and operators of milling machines

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + Ways to integrate CELOS into existing work processes and its economic benefits
- + (Touch-)screen interface and use
- + Setting up and using the APPs: Job Manager, Job Assistant, CAD-CAM View, Tech Calculator, Documents, Organizer, Net Service, Machine Check, Energy Savings, Settings, Status Monitor, Control
- + Creating a full sample project

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–8 persons

**A-F806***CELOS for MAPPS, operation and process integration***TARGET GROUP**

Programmers and operators of milling machines

**REQUIREMENTS**

Solid basic knowledge of CNC milling technology and programming

**COURSE CONTENTS**

- + Ways to integrate CELOS into existing work processes and its economic benefits
- + (Touch-)screen interface and use
- + Setting up and using the APPs: Job Manager, Job Assistant, CAD-CAM View, Tech Calculator, Documents, Organizer, Net Service, Machine Check, Energy Savings, Settings, Status Monitor, Control
- + Creating a full sample project

**DURATION**

2 days

**NUMBER OF PARTICIPANTS**

3–8 persons

COURSES // CNC TRAINING

MILLING TECHNOLOGY

A-F820

*Operation, DMG Virtual Machine, milling technology*

**TARGET GROUP**

Operators of DMG Virtual Machine and NC programmers

**REQUIREMENTS**

Sound knowledge of computers, CAD software and programming and operating CNC control systems

**COURSE CONTENTS**

- + Interface of DMG Virtual Machine
- + Setting up Virtual Machine with the integrated editor
- + Connecting Virtual Machine to the machine control system and transferring set-up data
- + Creating and managing clamping devices, tools and workpieces with SolidWorks

**DURATION**

4 days

**NUMBER OF PARTICIPANTS**

3–4 persons

A-F831

*NX CAM milling machine with up to 3-axes*

**TARGET GROUP**

CAM programmers, operators of DMG Virtual Machine and NC programmers

**REQUIREMENTS**

Sound basic knowledge of Windows and CNC production technology, and participation in course A-E821 / A-E822 or knowledge of NX CAM

**COURSE CONTENTS**

- + Positioning versus simultaneous in multi-axis machining
- + Various ways to set-up the tool shafts in simultaneous machining
- + Machining strategies
- + Application issues relating to the various NC machines and control systems

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons



## A-F832

*NX CAM DMU / DMC FD with up to 5 axes***TARGET GROUP**

CAM programmers, operators of DMG Virtual Machine and NC programmers

**REQUIREMENTS**

Sound basic knowledge of Windows and CNC production technology, and participation in course A-E821 / A-E822 or knowledge of NX CAM

**COURSE CONTENTS**

- + Machining process based on the master model concept
  - + Expected process from design to production
  - + Using the operation navigation tool
  - + Boring modules
  - + Simple machining processes based on 2D/3D geometries with planer milling and face milling
  - + Plane roughing of complex geometries with the cavity milling module
  - + Simulation of the machining process
  - + Tool organisation
  - + NC organisation
  - + Multi-sided machining
  - + Introduction to multi-axial milling
  - + 3-axis milling functions and travel methods
  - + Volume and surface-oriented semi-finishing
  - + Finishing
  - + Machining steep and flat areas on surfaces or volumes
  - + Fillet machining
  - + Processing residual material
  - + Optimised methods of working
  - + Machining cycles
  - + Finishing
- + Positioning versus simultaneous in multi-axis machining
  - + Various ways to set-up the tool shafts in simultaneous machining
  - + Machining strategies
  - + Simple machining processes based on 2D/3D geometries and the relevant machining strategies
  - + Cutting in
  - + Boring operations
  - + Machining in Teach Mode (machining using individual process commands)
  - + Thread cutting
  - + Special solutions
  - + Turning and milling in one part

**DURATION**

2 weeks

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-F851

*Basics of DMG Virtual Machine, milling technology***TARGET GROUP**

Operators of DMG Virtual Machine, NC programmers

**REQUIREMENTS**

Sound knowledge of computers, CAD/CAM software and programming and operating CNC control systems

**COURSE CONTENTS**

- + Interface of DMG Virtual Machine
- + Creating, loading and managing ranges of operations
- + Equipment management with storage options for templates
- + Creating and importing "simple forms" of NC programs
- + Creating the session / tool situation using available resources
- + Starting and connecting the virtual machine
- + Simulating, logging and recording the session
- + Identifying and correcting collisions
- + Storing and managing sessions

**DURATION**

1.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

COURSES // CNC TRAINING

MILLING TECHNOLOGY

**A-F852** *Operation of DMG Virtual Machine including SolidWorks, milling technology*

**TARGET GROUP**

Operators of DMG Virtual Machine, NC programmers

**REQUIREMENTS**

Sound knowledge of computers, CAD/CAM software and programming and operating CNC control systems

**COURSE CONTENTS**

- + Set-up display with SolidWorks
- + User interface
- + Parts creation
- + Module creation
- + Compiling available raw data in the form of clamping devices and tools
- + Creating connection points (docking and position frames) using the DMG Assistant
- + Categorising resources
- + Creating resource templates
- + Exporting resources and the virtual machine

**DURATION**

2.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-F861** *ESPRIT Basic, milling*

**TARGET GROUP**

Programmers of turning machines

**REQUIREMENTS**

Basic knowledge of computers and Windows

**COURSE CONTENTS**

- + Basics of milling
- + 2D geometry
- + Features
- + Layers
- + Volume models
- + Working planes
- + NC programs
- + Add-ins
- + Tool database
- + Simulation

**DURATION**

4.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

**A-F862** *ESPRIT, 5-axis machining*

**TARGET GROUP**

Programmers of turning machines

**REQUIREMENTS**

Basic knowledge of computers and Windows

**COURSE CONTENTS**

- + Positioning versus simultaneous in multi-axis machining
- + Various ways to set-up the tool shafts in simultaneous machining
- + Machining strategies
- + Application issues relating to the various NC machines and control systems

**DURATION**

2.5 days

**NUMBER OF PARTICIPANTS**

3–6 persons

## A-F911

*Customer-specific training on the customer's premises in Germany, Austria and Switzerland***TARGET GROUP**

To be agreed individually

**REQUIREMENTS**

Defined in coordination with you based on the course contents

**COURSE CONTENTS**

The course contents are agreed with special consideration for your wishes.

**DURATION**

To be agreed individually

**NUMBER OF PARTICIPANTS**

1–6 persons

## A-F921

*Customer-specific training on the customer's premises outside of Germany, Austria and Switzerland***TARGET GROUP**

To be agreed individually

**REQUIREMENTS**

Defined in coordination with you based on the course contents

**COURSE CONTENTS**

The course contents are agreed with special consideration for your wishes.

**THE FOLLOWING COSTS WILL ARISE IN ADDITION TO THE PRICE OF THE TRAINING COURSE**

- + Travel expenses
- + Flight costs
- + Costs of overnight accommodation
- + Additional meal costs
- + The language used during the courses will be German or English

**DURATION**

To be agreed individually

**NUMBER OF PARTICIPANTS**

1–6 persons

## A-F931

*Customer-specific training in the DMG MORI Academy in Germany, Austria or Switzerland***TARGET GROUP**

To be agreed individually

**REQUIREMENTS**

Defined in coordination with you based on the course contents

**COURSE CONTENTS**

We give our customers the opportunity to choose the course contents based on their requirements and use the infrastructure of the DMG MORI Academy.

**DURATION**

To be agreed individually

**NUMBER OF PARTICIPANTS**

To be arranged

Registration form

# Organisational information

## ■ Registration

Please register for all training courses using the following registration form. We will send you a written confirmation and, if desired, a map showing how to find us. The number of participants is limited. Registrations will be accepted on a first come, first served basis. We will let you know immediately if courses are fully booked and indicate the next available dates.

## ■ Machine order

If you have purchased a machine which includes training, please add the purchase order confirmation number to your registration form.

## ■ Prices and services

We would be happy to tell you about our current course prices on request. Included in the price are special high-quality training documents, refreshments and lunch during the Training course. The prices are net and do not include VAT at the applicable rate on the date of the Training course. The course prices do not include participants' travel expenses and costs of overnight accommodation. The participation fee is payable upon receipt of the invoice. We would also be happy to book a hotel room for you.

## ■ Venues and times

Your contact partner will tell you where and when each course is due to be held. Normally, the courses will take place at a branch of the DMG MORI Academy. We also offer training courses on your premises.

## ■ Certificate

Participants will receive a certificate of participation after successfully completing a course.

## ■ Safety regulations

Participants are obliged to adhere to the applicable safety and accident prevention regulations at the training location. For Service Courses, participants must bring along work clothing and safety shoes.

**You can find more information in our General Terms and Conditions below.**

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Information on all courses for  
**CNC Training in turning: Bielefeld**  
Gildemeisterstraße 60, D-33689 Bielefeld  
T: +49 (0) 52 05 / 74 25 03  
training.drehen@dmgmori.com

▸ Fax: +49 (0) 52 05 / 74 25 07

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Information on all courses for CNC Training in  
**milling and ULTRASONIC / LASERTEC: Pfronten**  
Tiroler Straße 85, D-87459 Pfronten  
T: +49 (0) 83 63 / 89 42 24  
training.fraesen@dmgmori.com

▸ Fax: +49 (0) 83 63 / 89 5 07

Fax reply

# Registration form

**Sender:**

Company	PO Box
Address	Post code, city
Mr / Ms	E-mail
Tel.	Fax
Order number	
Date	Signature / Company stamp

**Registration for the following courses:** Participants can cancel free of charge up to two weeks before the course starts. Afterwards, the full amount will be charged.

Course number	Course name	Date	Surname / name of the participant

At least 3 people are required for us to carry out our courses.

**The course fee is to be charged to the following:**

- Same address as above                       Following address

Company	Dept. / name
Address	Post code, city

**The course fee is to be offset against the training course paid for in the following purchase order:**

Sale number	Machine number	Machine type
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**Arrival and overnight accommodation:**

- No room reservation required                       Yes, please reserve a room for \_\_\_\_ person(s).
- Non-smoker                       Smoker

Arrival date	Departure date
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You can find the address and fax number on page 86.

DMG MORI SEIKI Academy GmbH  
 Gildemeisterstraße 60, D-33689 Bielefeld  
 T: +49 (0) 52 05 / 74 25 01, Fax: +49 (0) 52 05 / 74 25 02  
 training@dmgmori.com, www.dmgmori.com

# DMG MORI

[www.EngineeringBooksPdf.com](http://www.EngineeringBooksPdf.com)

CNC Training // DMG MORI SEIKI Academy GmbH

# General terms and conditions

## 1. Applicability

The following General Terms and Conditions govern the contractual relationship between the customer in the training courses (hereinafter referred to as the Client) and DMG MORI SEIKI Academy GmbH on participation in courses, workshops and training events of DMG MORI SEIKI Academy GmbH. Any deviating general terms and conditions of the Client do not apply.

## 2. Validity of offers

Offers of DMG MORI SEIKI Academy GmbH are always non-binding and without obligation. Unless indicated otherwise, they shall remain valid for up to four weeks from the offer date. Once a new offer is created, all previous offers shall become invalid unless the new offer is a supplementary offer for an existing one. We are only subject to obligations in so far as set out in our written order confirmation. Supplements and amendments must be made in writing.

## 3. Registration process

Participants can register online or by post, fax or e-mail. The registration shall only become binding after DMG MORI SEIKI Academy GmbH sends a confirmation notice to the Client. The registration confirmation is also the training ID pass for the participant.

## 4. Prices

**4.1** The prices and payment conditions set out in the order confirmation shall always apply. None of our prices include statutory VAT. Unless indicated otherwise in the order confirmation, the participation fee applies per person and per training event, and it includes training documents, lunch and refreshments during training events on the premises of DMG MORI SEIKI Academy GmbH. This does not include officially required qualifications as part of the AZWV guideline. The participation fee is payable upon receipt of the invoice. Not all of the courses of DMG MORI SEIKI Academy GmbH can be promoted as an AZWV / AZAV measure; such particulars are to be clarified with the relevant training coordinators before the Training course starts.

**4.2** Unless indicated otherwise in the order confirmation, please transfer the participation fee, indicating the invoice number, to account 660 886 00 of DMG MORI SEIKI Academy GmbH at Deutsche Bank Bielefeld, BLZ 480 700 20, 14 days before the start of the course at the latest (IBAN: DE07 4807 0020 0066 0886 00, BIC: DEUTDE33XXX).

## 5. Cancellation

**5.1** The Client must inform DMG MORI SEIKI Academy GmbH in writing if a participant is unable to take part in the confirmed course, providing the name of the participant. Written changes to bookings and cancellations can be submitted up to five working days before the start of the Training course, subject to a processing fee of € 150.–. If any bookings are then cancelled as a result, we shall charge half of the participation fee. If a participant should fail to attend or cancel on the day of the event, we shall charge the full participation fee minus any expenses saved by the participant's lack of participation. Naturally, a substitute participant can be nominated at no extra cost.

**5.2** The Client is always entitled to prove that DMG MORI SEIKI Academy GmbH has suffered no damage resulting from the participant's withdrawal from the event, or that it has suffered considerably less damage than the processing fee charged by DMG MORI SEIKI Academy GmbH.

**5.3** The right of the Client to terminate the agreement for cause remains unaffected.

## 6. Cancellation of courses

DMG MORI SEIKI Academy GmbH reserves the right to cancel the course if it has legitimate cause to do so, e.g. for organisational reasons or due to force majeure (e.g. bad weather or if the speaker becomes ill). DMG MORI SEIKI Academy GmbH shall immediately inform the Client of the cancellation of the course on legitimate grounds. Any payments that have already been made towards the participation fee shall be refunded to the Client in full. In this regard, the Client has no further claims.

## 7. Certificate

Participants shall receive a certificate of participation after successfully completing the course.

## 8. Hotel booking

DMG MORI SEIKI Academy GmbH shall provide assistance with hotel booking. However, all contracts on reservations, accommodation and cancellation shall be between the hotel and the course participant. Every course participant must settle their bills with the hotel directly.

## 9. Copyrights

The training documents are protected by copyright. The rights this copyright protection entails, especially the rights to reprint, photocopy or otherwise reproduce the documents – even excerpts thereof – and to store them in data processing systems remain with DMG MORI SEIKI Academy GmbH. A reproduction, even of an excerpt, may only be made with the prior written consent of DMG MORI SEIKI Academy GmbH. Any infringements shall be prosecuted under both civil and criminal law. The training documents also include software applications that are normally installed on the training computers and used during the training courses.

## 10. Safety

The Client is obliged to adhere to the safety and accident prevention regulations applicable on the premises of DMG MORI SEIKI Academy GmbH. In the event of danger, participants must always follow the instructions of the trainer. With regard to training courses on the premises of the Client, the Client must meet all the criteria in order that the Training course can be carried out safely. DMG MORI SEIKI Academy GmbH has no insurance protection for damage caused by participants in the course on the premises of the Client for which the trainers are not responsible. Therefore, the Client undertakes to ensure that this risk is suitably covered.

## 11. Disclaimer

**11.1** In the courses and in the course documents, technical information will be transferred to the best of our knowledge. However, DMG MORI SEIKI Academy GmbH accepts no liability for any errors in the technical information which is conveyed orally or in writing during the Training course or which is contained in the course documents that are handed over to participants. The technical information does not represent an assurance and/or a warranty or guarantee with regard to the product sold to the Client or services rendered for the Client by individual companies of the GILDEMEISTER Group.

**11.2** This provision notwithstanding, DMG MORI SEIKI Academy GmbH shall only be liable, regardless of legal grounds, in cases of

- intent,
- gross negligence on the part of the owner / the company or manager,
- culpable injury to life, limb or health,
- defects which DMG MORI SEIKI Academy GmbH has concealed or

whose absence DMG MORI SEIKI Academy GmbH has guaranteed, in so far as the German product liability act (ProdHaftG) provides for liability for personal injury and damage to property on privately used items.

**11.3** In the event of a culpable breach of material contractual duties, DMG MORI SEIKI Academy GmbH shall also be liable for gross negligence on the part of employees and for ordinary negligence, although the latter is limited to the typical, reasonably foreseeable damage for this type of contract.

**11.4** DMG MORI SEIKI Academy GmbH makes no guarantee on the attainment of part production times, dimensional accuracy or surface finishes on workpieces of the Client that are produced during the Training course. Furthermore, depending on the complexity of the workpiece we reserve the right to refuse to include it in the Training course, either fully or in part.

## 12. Data protection

DMG MORI SEIKI Academy GmbH shall treat the data transferred by the Client as confidential and it shall only use the data in accordance with the applicable data protection provisions. Unless specified otherwise by the Client, DMG MORI SEIKI Academy GmbH shall use the data transferred by the Client (company name, address, e-mail address, telephone number, bank details etc.) in order to keep the Client up to date about its products and events in the future and to contact the Client by fax, e-mail or telephone. The Client can revoke this consent at any time without providing a reason by contacting DMG MORI SEIKI Academy GmbH, Leiter Training, Gildemeisterstr. 60, 33689 Bielefeld or training@dmgmori.com. DMG MORI SEIKI Academy GmbH shall take the greatest possible precautions with regard to the security of the data of the Client.

## 13. Place of jurisdiction

The place of jurisdiction for any disputes shall be Bielefeld. However, DMG MORI SEIKI Academy GmbH can also file lawsuits against the Client at its place of general jurisdiction.

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**Introduction**

[Course finder Service Courses](#)

[Course descriptions Service Courses](#)

[Organisation](#)

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Course Programme

# Service Courses



Information about all our  
Service Courses at:

**Turning technology:** T: +49 (0) 52 05 / 74 26 71  
or [reiner.anders@dmgmori.com](mailto:reiner.anders@dmgmori.com)

**Milling technology:** T: +49 (0) 81 71 / 817 3321  
or [petra.heinrich@dmgmori.com](mailto:petra.heinrich@dmgmori.com)



Service Courses

# Easily maximise your production reliability.

With DMG MORI, wherever you are in the world you can take advantage of professional service and maintenance training for your employees. Not only does the DMG MORI Academy train its own service technicians, it also passes on its expertise to its customers right on its own premises. Use your machines faster, more productively and longer with focused Service Courses. Our professional Service Courses for mechanics and electronics will improve your machine availability rate and significantly increase your machine's service life. Be it in our high-tech training centres or on-site in your workshop – with our Service Courses you'll always be one step ahead.



## We offer:

- + Practice related courses on the machine
- + High quality through continuous further training of trainers and direct contact with the production plant
- + High learning success due to small groups
- + Simulators for all standard controls
- + Flexible course design on request, tailored to meet your individual training needs

Course finder Service Courses

# Turning technology

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\* The InspectionsKey can be purchased after the course. Information about all our turning courses at: reiner.anders@dmgmori.com or T: +49 (0) 52 05 / 74 26 71

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\* The InspectionsKey can be purchased after the course.

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#### INDIVIDUAL COURSES

Please contact Reiner Anders: reiner.anders@dmgmori.com or tel.: +49 (0) 52 05 / 74 26 71.  
We would be happy to offer customer-specific training courses on request.

Course finder Service Courses

## Milling technology

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## » Turning technology



Information on all Service Courses in turning:

Mr Reiner Anders is happy to help:  
T: +49 (0) 52 05 / 74 26 71  
reiner.anders@dmgmori.com

## SERVICE COURSES

## TURNING TECHNOLOGY

## A-X207\*

## NEF 400 / 600 NEW, mechanics

## INDEPENDENTLY OF CONTROL

**OBJECTIVE**

Recognize and fit mechanical faults, using of the diagnosis, do maintenance and repair by yourself

**REQUIREMENTS**

Mechanical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure and function of the machine
- + Operation of control and machine
- + Install the machine
- + Geometry of the machine
- + Clamping device
- + Hydraulic
- + Lubrication
- + Turret
- + Slide guideways
- + Maintenance
- + Working with the machine documentation

**DURATION**

3 days

**COURSE LOCATION**

Bielefeld

## A-X507

## NEF 400 / 600 NEW, electronics

## HEIDENHAIN CNC 640

**OBJECTIVE**

Recognize and fix electrical faults, using the diagnosis, doing maintenance and repairs by yourself

**REQUIREMENTS**

Electrical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure of machine and control
- + Operation of control and machine regarding trouble shooting
- + Starting routine
- + Data backup
- + Data transfer
- + Exchange hardware
- + Working with diagnosis
- + Adjustment of reference point
- + Working with the machine documentation

**DURATION**

3 days

**COURSE LOCATION**

Bielefeld

## A-X405

## CTX alpha / beta, mechanics

## HEIDENHAIN CNC 640 / PLUS IT

**OBJECTIVE**

Recognize and fit mechanical faults, using of the diagnosis, do maintenance and repair by yourself

**REQUIREMENTS**

Mechanical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure and function of the machine
- + Operation of control and machine
- + Install the machine
- + Geometry of the machine
- + Clamping device
- + Hydraulic
- + Lubrication
- + Turret
- + Slide guideways
- + Maintenance
- + Working with the machine documentation

**DURATION**

3 days

**COURSE LOCATION**

Bielefeld

**SERVICE COURSES**

**TURNING TECHNOLOGY**

**A-X205\***

*CTX alpha / beta, mechanics*

**SIEMENS SOLUTIONLINE / OPERATE**

**OBJECTIVE**

Recognize and fit mechanical faults, using of the diagnosis, do maintenance and repair by yourself

**REQUIREMENTS**

Mechanical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure and function of the machine
- + Operation of control and machine
- + Install the machine
- + Geometry of the machine
- + Clamping device
- + Hydraulic
- + Lubrication
- + Turret
- + Slide guideways
- + Maintenance according to chap. 8 of the operating instructions
- + Resetting the maintenance message with the InspectionsKey
- + Working with the machine documentation

**DURATION**

3 days

**COURSE LOCATION**

Bielefeld

**A-X507**

*CTX alpha / beta / gamma, electronics*

**HEIDENHAIN CNC 640**

**OBJECTIVE**

Recognize and fix electrical faults, using the diagnosis, doing maintenance and repairs by yourself

**REQUIREMENTS**

Electrical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure of machine and control
- + Operation of control and machine regarding trouble shooting
- + Starting routine
- + Data backup
- + Data transfer
- + Exchange hardware
- + Working with diagnosis
- + Adjustment of reference point
- + Working with the machine documentation

**DURATION**

3 days

**COURSE LOCATION**

Bielefeld

**A-X305**

*CTX alpha / beta / gamma, electronics*

**SIEMENS SOLUTIONLINE**

**OBJECTIVE**

Recognize and fix electrical faults, using the diagnosis, doing maintenance and repairs by yourself

**REQUIREMENTS**

Electrical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure of machine and control
- + Operation of control and machine regarding trouble shooting
- + Starting routine
- + Data backup
- + Data transfer
- + SINAMICS drives basics
- + Exchange hardware
- + Working with diagnosis
- + Adjustment of reference point
- + Working with the machine documentation

**DURATION**

4 days

**COURSE LOCATION**

Bielefeld

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## TURNING TECHNOLOGY

## A-X306

*CTX alpha / beta / gamma, electronics*

SIEMENS OPERATE

**OBJECTIVE**

Recognize and fix electrical faults, using the diagnosis, doing maintenance and repairs by yourself

**REQUIREMENTS**

Electrical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure of machine and control
- + Operation of control and machine regarding trouble shooting
- + Starting routine
- + Data backup
- + Data transfer
- + SINAMICS drives basics
- + Exchange hardware
- + Working with diagnosis
- + Adjustment of reference point
- + Working with the machine documentation

**DURATION**

4 days

**COURSE LOCATION**

Bielefeld

## A-X231\*

*CTX beta 4A, mechanics*

SIEMENS OPERATE

**OBJECTIVE**

Recognize and fit mechanical faults, using of the diagnosis, do maintenance and repair by yourself

**REQUIREMENTS**

Mechanical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Operating the machine and the control regarding trouble shooting
- + Reference points settings
- + Clamping device
- + Geometry of the machine
- + Praxis orientated trouble shooting
- + Maintenance according to chap. 8 of the operating instructions
- + Resetting the maintenance message with the InspectionsKey
- + Working with the machine documentation

**DURATION**

4.5 days

**COURSE LOCATION**

Bielefeld

## A-X331

*CTX beta 4A, electronics*

SIEMENS OPERATE

**OBJECTIVE**

Recognize and fix electrical faults, using the diagnosis, doing maintenance and repairs by yourself

**REQUIREMENTS**

Electrical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + System overview
- + Menue overview
- + Circuit diagram
- + Machine documentation
- + Structure of machine and control
- + Starting routine
- + Data backup
- + Machine- and setting data
- + Encoder settings
- + SINAMICS drives basics
- + Exchange hardware
- + Data transfer
- + Diagnosis
- + Trouble shooting
- + Working with the machine documentation

**DURATION**

4.5 days

**COURSE LOCATION**

Bielefeld



## SERVICE COURSES

## TURNING TECHNOLOGY

## A-X336

## CTX beta / gamma TC, electronics

## SIEMENS OPERATE

**OBJECTIVE**

Recognize and fix electrical faults, using the diagnosis, doing maintenance and repairs by yourself

**REQUIREMENTS**

Electrical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure of machine and control
- + Tool magazin
- + Operating modes
- + Starting routine
- + Data backup
- + Data transfer
- + SINAMICS drives basics
- + Exchange hardware
- + Working with diagnosis
- + Adjustment of reference point
- + Working with the machine documentation

**DURATION**

4.5 days

**COURSE LOCATION**

Bielefeld

## A-X235\*

## CTX beta TC, mechanics

## INDEPENDENTLY OF CONTROL

**OBJECTIVE**

Recognize and fit mechanical faults, using of the diagnosis, do maintenance and repair by yourself

**REQUIREMENTS**

Mechanical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure of machine and control
- + Tool magazin (chain magazin)
- + Reference point
- + Clamping device
- + Hydraulic
- + Lubrication
- + Turret
- + Slide guideways
- + Maschine geometric
- + Maintenance according to chap. 8 of the operating instructions
- + Resetting the maintenance message with the InspectionsKey
- + Trouble shooting
- + Working with the machine documentation

**DURATION**

4.5 days

**COURSE LOCATION**

Bielefeld

## A-X236\*

## CTX gamma TC, mechanics

## INDEPENDENTLY OF CONTROL

**OBJECTIVE**

Recognize and fit mechanical faults, using of the diagnosis, do maintenance and repair by yourself

**REQUIREMENTS**

Mechanical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure of machine and control
- + Tool magazin (chain magazin)
- + Reference point
- + Clamping device
- + Hydraulic
- + Lubrication
- + Turret
- + Slide guideways
- + Maschine geometric
- + Maintenance according to chap. 8 of the perating instructions
- + Resetting the maintenance message with the InspectionsKey
- + Trouble shooting
- + Working with the machine documentation

**DURATION**

4.5 days

**COURSE LOCATION**

Bielefeld

**SERVICE COURSES**

**TURNING TECHNOLOGY**

**A-X322** *CTV series, electronics* **SIEMENS OPERATE**

**OBJECTIVE**

Recognize and fix electrical faults, using the diagnosis, doing maintenance and repairs by yourself

**REQUIREMENTS**

Electrical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure of machine and control
- + Operating modes
- + Starting routine
- + Data backup
- + Data transfer
- + Integrated workpiece storage
- + SINAMICS drives basics
- + Exchange hardware
- + Working with diagnosis
- + Adjustment of reference point
- + Working with the machine documentation

**DURATION**

4.5 days

**COURSE LOCATION**

Bielefeld

**A-X223\*** *CTV 160 XZ, mechanics* **INDEPENDENTLY OF CONTROL**

**OBJECTIVE**

Recognize and fit mechanical faults, using of the diagnosis, do maintenance and repair by yourself

**REQUIREMENTS**

Mechanical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure and function of the machine
- + Geometry of the machine
- + Clamping device
- + Hydraulic
- + Lubrication
- + Turret
- + Integrated prismatic frame conveyor belt
- + Maintenance according to chap. 8 of the operating instructions
- + Resetting the maintenance message with the InspectionsKey
- + Working with the machine documentation

**DURATION**

4.5 days

**COURSE LOCATION**

Bielefeld

**A-X507** *CTX 310 / 510 ecoline, electronics* **HEIDENHAIN CNC 640**

**OBJECTIVE**

Recognize and fix electrical faults, using the diagnosis, doing maintenance and repairs by yourself

**REQUIREMENTS**

Electrical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure of machine and control
- + Operation of control and machine regarding trouble shooting
- + Starting routine
- + Data backup
- + Data transfer
- + Exchange hardware
- + Working with diagnosis
- + Adjustment of reference point
- + Working with the machine documentation

**DURATION**

3 days

**COURSE LOCATION**

Bielefeld

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## TURNING TECHNOLOGY

A-X301

CTX 310 / 510 ecoline, electronics

SIEMENS OPERATE

**OBJECTIVE**

Recognize and fix electrical faults, using the diagnosis, doing maintenance and repairs by yourself

**REQUIREMENTS**

Electrical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

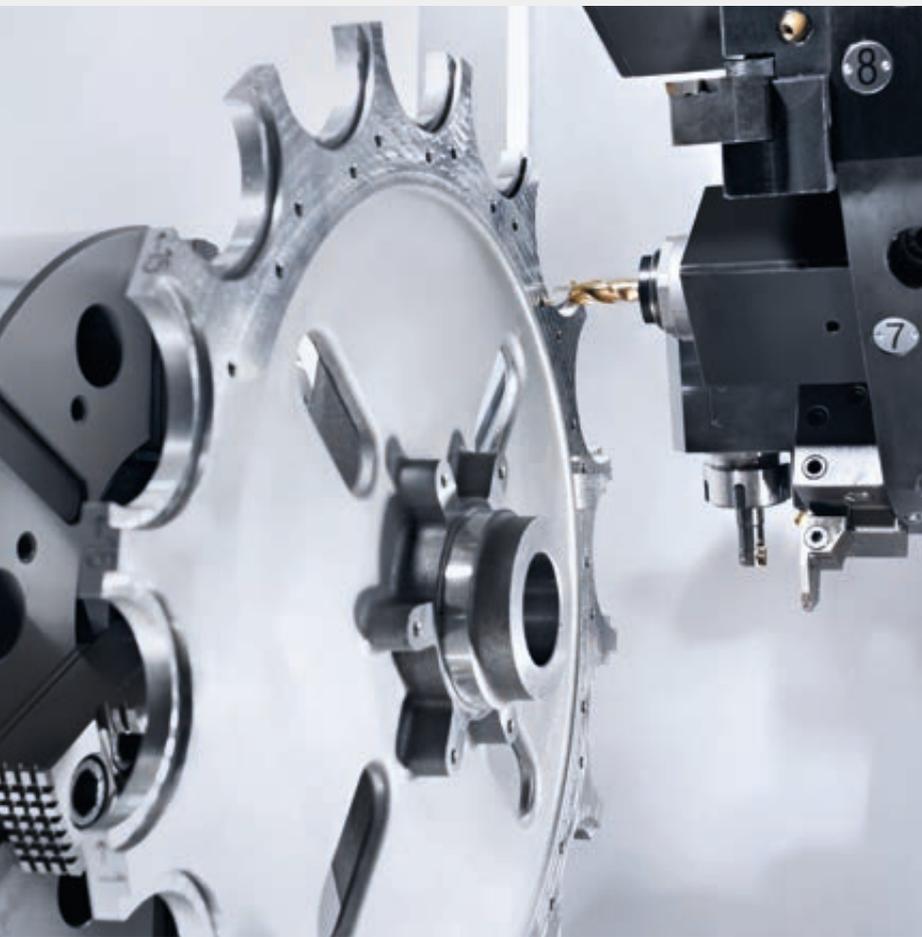
- + Safety regulations
- + Structure of machine and control
- + Operation of control and machine regarding trouble shooting
- + Starting routine
- + Data backup
- + Data transfer
- + Exchange hardware
- + Working with diagnosis
- + Adjustment of reference point
- + Working with the machine documentation

**DURATION**

2 days

**COURSE LOCATION**

Bielefeld



**SERVICE COURSES**

**TURNING TECHNOLOGY**

**A-X201**

*CTX 310 / 510 ecoline, mechanics*

**INDEPENDENTLY OF CONTROL**

**OBJECTIVE**

Recognize and fit mechanical faults, using of the diagnosis, do maintenance and repair by yourself

**REQUIREMENTS**

Mechanical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure and function of the machine
- + Operation of control and machine
- + Installation of the machine
- + Geometry of the machine
- + Clamping device
- + Hydraulic
- + Lubrication
- + Turret
- + Slide guideways
- + Maintenance
- + Working with the machine documentation

**DURATION**

2.5 days

**COURSE LOCATION**

Bielefeld

**A-X507**

*CTX 450 / 650 ecoline, electronics*

**HEIDENHAIN CNC 640**

**OBJECTIVE**

Recognize and fix electrical faults, using the diagnosis, doing maintenance and repairs by yourself

**REQUIREMENTS**

Electrical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure of machine and control
- + Operation of control and machine regarding trouble shooting
- + Starting routine
- + Data backup
- + Data transfer
- + Exchange hardware
- + Working with diagnosis
- + Adjustment of reference point
- + Working with the machine documentation

**DURATION**

3 days

**COURSE LOCATION**

Bielefeld

**A-X303**

*CTX 450 / 650 ecoline, electronics*

**SIEMENS OPERATE**

**OBJECTIVE**

Recognize and fix electrical faults, using the diagnosis, doing maintenance and repairs by yourself

**REQUIREMENTS**

Electrical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure of machine and control
- + Operation of control and machine regarding trouble shooting
- + Starting routine
- + Data backup
- + Data transfer
- + Exchange hardware
- + Working with diagnosis
- + Adjustment of reference point
- + Working with the machine documentation

**DURATION**

3 days

**COURSE LOCATION**

Bielefeld

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## TURNING TECHNOLOGY

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**A-X203** *CTX 450 / 650 ecoline, mechanics* **INDEPENDENTLY OF CONTROL**


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**OBJECTIVE**

Recognize and fit mechanical faults, using of the diagnosis, do maintenance and repair by yourself

**REQUIREMENTS**

Mechanical education

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety regulations
- + Structure and function of the machine
- + Operation of control and machine
- + Installation of the machine
- + Geometry of the machine
- + Clamping device
- + Hydraulic
- + Lubrication
- + Turret
- + Slide guideways
- + Maintenance
- + Working with the machine documentation

**DURATION**

4.5 days

**COURSE LOCATION**

Bielefeld

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**A-X803** *Data backup / Network connection* **HEIDENHAIN**


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**OBJECTIVE**

Conduct a data backup, build a network connection and integrate a machine in an existing network

**REQUIREMENTS**

None

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Conduct a data backup
- + Basic knowledge Network (Ethernet)
- + TCP/IP Protocol
- + Installation and configuration of the network
- + Integration of a Heidenhain Plus iT control in customer network
- + Integration of a Heidenhain CNC 620 control in customer network
- + Parameter settings
- + Trouble shooting

**DURATION**

1 day

**COURSE LOCATION**

Bielefeld

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**A-X804** *Data backup / Network connection* **SIEMENS 840D**


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**OBJECTIVE**

Conduct a data backup, build a network connection and integrate a machine in an existing network

**REQUIREMENTS**

None

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Conduct a data backup
- + Basic knowledge Network (Ethernet)
- + TCP/IP Protocol
- + Installation and configuration of the network
- + Integration of controls in customer network
  - Siemens 840D powerline (PCU20, PCU50)
  - Siemens 840D solutionline
  - Siemens 840D Operate
- + Parameter settings
- + Trouble shooting

**DURATION**

2 days

**COURSE LOCATION**

Bielefeld

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Introduction

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Course finder Service Courses

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**Course descriptions Service Courses**

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› Turning technology

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› **Milling technology**

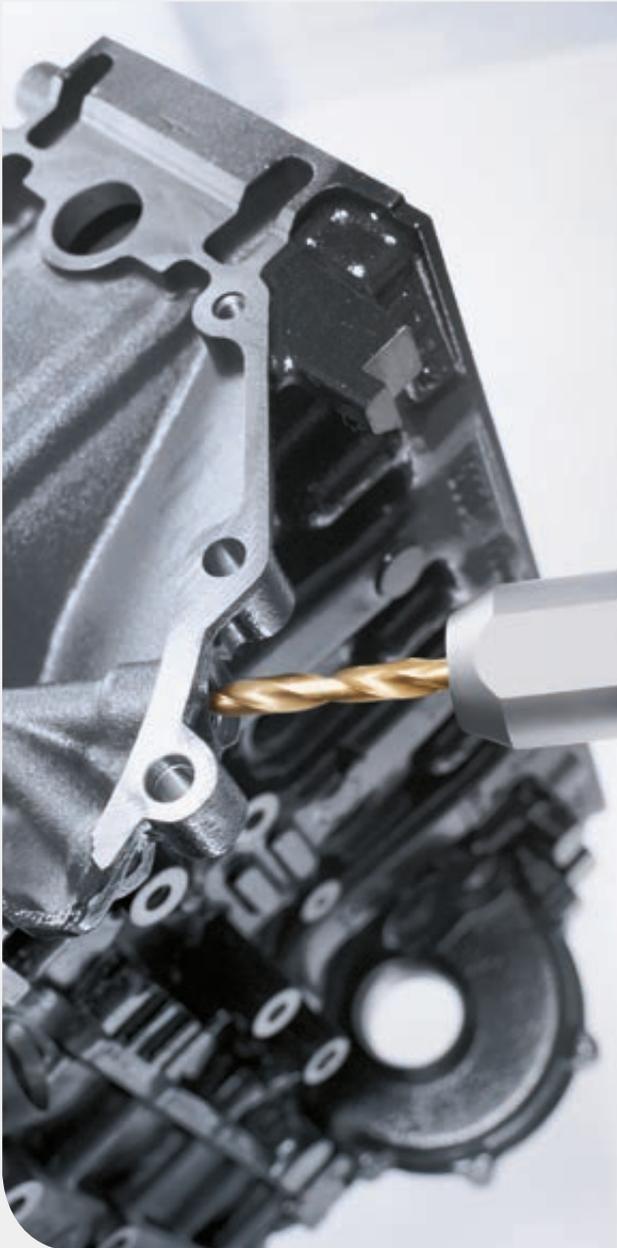
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Organisation

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Course descriptions Service Courses

## » Milling technology



Information on all Service Courses in milling:

**Ms Petra Heinrich is happy to help:**  
petra.heinrich@dmgmori.com  
T: +49 (0) 81 71 / 817 3321

## SERVICE COURSES

## MILLING TECHNOLOGY

A-Y221

DMU 50, mechanics

SIEMENS 840D SL / HMI OPERATE

**OBJECTIVE**

The course participant gains the competence to perform service work within the scope of the described seminar contents

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine / assemblies
- + Geometric installation of the machine
- + Design of the linear guide
- + Geometric adjustment work
- + Measuring system replacement
- + Design of the two-axis tilting rotary table
- + Function of the B- and C-axis digital drives
- + Dismantling and reassembly of the worm shaft of the C-axis
- + Dismantling and reassembly of the C-axis table
- + Service work on the motor spindle
- + Replacement of the ROD B-axis
- + Reference point adjustment of the rotary axes
- + Maintenance work introduction
- + Optional
  - Simultaneous table (gear table)
  - Dismantling and reassembly of the C-axis table (simultaneous table)
- + Kinematics
- + 3D quickSET®
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

A-Y421

DMU 50, mechanics

ITNC 530

**OBJECTIVE**

The course participant gains the competence to perform service work within the scope of the described seminar contents

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine / assemblies
- + Geometric installation of the machine
- + Design of the linear guide
- + Geometric adjustment work
- + Measuring system replacement
- + Design of the two-axis tilting rotary table
- + Function of the B- and C-axis digital drives
- + Dismantling and reassembly of the worm shaft of the C-axis
- + Dismantling and reassembly of the C-axis table
- + Service work on the motor spindle
- + Replacement of the ROD B-axis
- + Reference point adjustment of the rotary axes
- + Maintenance work introduction
- + Optional
  - Simultaneous table (gear table)
  - Dismantling and reassembly of the C-axis table (simultaneous table)
- + Kinematics
- + 3D quickSET®
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

## Goals of the following courses

The course participant gains the competence to perform service work within the scope of the described seminar contents.



### A-Y521

### DMU 50, electronics

### ITNC 530

#### REQUIREMENTS

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

#### WORK EQUIPMENT

Laptop, network cable, work clothing, safety footwear

#### COURSE CONTENTS

- + Safety instruction
- + Design and function of the magazine
- + Setting up work on the magazine
- + Determination of the tool change positions
- + Instruction for controller and user interface
- + Service functions
- + Date backup and network connection
- + Inputs and outputs
- + Troubleshooting and fault clearance
- + Diagnostics using PNOZmulti
- + Maintenance work introduction
- + Update

#### DURATION

4.5 days

#### COURSE LOCATION

Seebach

### A-Y223

### DMU 70, mechanics

### SIEMENS 840D SL / HMI OPERATE

#### REQUIREMENTS

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

#### WORK EQUIPMENT

Laptop, network cable, work clothing, safety footwear

#### COURSE CONTENTS

- + Safety instruction
- + Design and function of the machine / assemblies
- + Geometric installation of the machine
- + Design of the linear guide
- + Geometric adjustment work
- + Measuring system replacement
- + Main spindle and drive
- + Adjustment work on the tool clamp
- + Spindle orientation
- + Design of the two-axis tilting rotary table
- + Kinematics
- + Function of the B- and C-axis digital drives
- + Replacement of the ROD B-axis
- + Reference point adjustment of the rotary axes
- + Maintenance work introduction
- + Dismantling and reassembly of the C-axis worm shaft
- + 3D quickSET®
- + Optional: Removal of C-table from simultaneous table
- + Resetting maintenance notification with the InspectionsKey

#### DURATION

4.5 days

#### COURSE LOCATION

Seebach

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

A-Y423

DMU 70, mechanics

ITNC 530

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine / assemblies
- + Geometric installation of the machine
- + Design of the linear guide
- + Geometric adjustment work
- + Measuring system replacement
- + Main spindle and drive
- + Adjustment work on the tool clamp
- + Spindle orientation
- + Design of the two-axis tilting rotary table
- + Maintenance work introduction
- + Function of the B- and C-axis digital drives
- + Replacement of the ROD B-axis
- + Reference point adjustment of the rotary axes
- + Optional
  - Dismantling and reassembly of the C-axis worm shaft
  - Kinematics
  - 3D quickSET®
- + Optional: Removal of C-table from simultaneous table
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

A-Y523

DMU 70, electronics

ITNC 530

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the magazine
- + Setting up work on the magazine
- + Determination of the tool change positions
- + Instruction for controller and user interface
- + Service functions
- + Date backup and network connection
- + Inputs and outputs
- + Troubleshooting and fault clearance
- + Diagnostics using PNOZmulti
- + Update

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

A-Y323

DMU 50 / 70, electronics

SIEMENS 840D SL / HMI OPERATE

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the magazine
- + Setting up work on the magazine
- + Determination of the tool change positions
- + Instruction for controller and user interface
- + Date backup and network connection
- + Service functions
- + Inputs and outputs
- + Troubleshooting and fault clearance
- + Diagnostics using PNOZmulti
- + Maintenance work introduction
- + Replacement of components

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y225**

**DMU 65 / 125 monoBLOCK®, mechanics**

**SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller, Siemens 840D sI HMI-Operate, sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Schematic design of the milling machine, machine overview
- + Assemblies overview
- + A- and C-axes gear tension
- + Adjustment of C0 and A0
- + Hydraulic and pneumatic circuits
- + Tool changer (gear or chain magazine)
- + Settings on the tool changer and the associated machine parameters
- + Recovery functions for abort and power failure
- + Instructions for installation / removal and elongation of the ball screw spindle
- + Instructions for spindle and spindle mounting, tool clamp and rotary transmission feedthrough, cooling circuit.
- + Data backup on the controller
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

**A-Y325**

**DMU 65 / 125 monoBLOCK®, electronics**

**SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller, sound knowledge of laptop and operating system, programming / operating course of DMG MORI Academy (iTNC 530)

**WORK EQUIPMENT**

Laptop, network cable, USB stick 16 GB (can be obtained during the course), work clothing and safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Schematic design of the milling machine, machine overview and EPlan "ELCAD", PNOZmulti
- + Linear and rotation measurement systems
- + Adjustment of C0 and A0
- + Tool clamp feedback, leak monitoring, M19 setting
- + Tool changer (chain magazine with Pragati tool changer)
- + Diagnostics options of the controller, inputs, outputs
- + Machine parameters for the tool changer, recovery functions for abort and power failure
- + Changeover from direct to indirect measuring system for service purposes
- + Deselection of the motor spindle for spindle replacement
- + Network settings
- + Data backup

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

**A-Y425**

**DMU 65 / 125 monoBLOCK®, mechanics**

**ITNC 530 / HSCI**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller iTNC 530, sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Schematic design of the milling machine, machine overview
- + Assemblies overview and function
- + Measuring systems of the machine axes
- + A- and C-axes gear tension
- + Adjustment of C0 and A0
- + Hydraulic and pneumatic circuits
- + Tool changer (gear or chain magazine)
- + Data backup on the controller
- + Settings on the tool changer and the associated machine parameters ,recovery functions for abort and power failure
- + Instructions for installation / removal and elongation of the ball screw spindle
- + Instructions for spindle and spindle mounting, tool clamp and rotary transmission feedthrough, cooling circuit
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

A-Y525

DMU 65 / 125 monOBLOCK®, electronics

iTNC 530 / HSCI

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller, sound knowledge of laptop and operating system, programming / operating course of DMG MORI Academy (iTNC 530)

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Schematic design of the milling machine, machine overview and E-plan "ELCAD", PNOZmulti
- + Linear and rotation measurement systems
- + Adjustment of C0 and A0
- + Tool changer (chain magazine with Pragati tool changer)
- + Machine parameters for the tool changer, recovery functions for abort and power failure
- + Linear measuring system replacement
- + Diagnostics options of the controller, inputs, outputs, flags, oscillation function
- + Network settings
- + Changeover from direct to indirect measuring system for service purposes
- + Deselection of the motor spindle for spindle replacement
- + Tool clamp feedback, leak monitoring, M19 setting
- + Data backup with TNC-REMO\_NT, Logbooks / Service file

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

A-Y828

DMU 65 / 125 monOBLOCK®, DMC 65 / 85 monOBLOCK® RS3  
mechanical assemblies, mechanics

INDEPENDENTLY OF CONTROL

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller iTNC 530, sound knowledge of laptop and operating system and course A-Y225 / A-Y425 / A-Y427 or A-Y227

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + A- and C-axes:
  - Preloading the A-axis gearing
  - Setting the A 0 and C 0 positions
  - Checking the geometry of the table centre
- + Ball screw spindle replacement: e.g. X- or Y- or Z-axis
  - X- or Y- or Z-axis ball screw spindle replacement
  - Replacement of the motor spindle
  - Tool clamp open / closed setting
  - Rotary transmission feedthrough release unit replacement

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

A-Y219

DMU 40 / 60 / 80 / 100 eVo linear, mechanics

SIEMENS 840D SL / HMI OPERATE

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine / assemblies
- + Geometric installation of the machine
- + Design of the linear guide
- + Geometric adjustment work
- + Measuring system replacement
- + Function / commissioning of the linear drive
- + Design of the two-axis NC tilting rotary table
- + Gear tension adjustment
- + Replacement of the ROD B-axis / reference point setting
- + Maintenance work introduction
- + Rotor replacement of the motor spindle (EasyChange)
- + Service work on the motor spindle
- + Kinematics
- + 3D quickSET®
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y319**

*DMU 40 / 60 / 80 / 100 eVo linear, electronics*

**SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the chain magazine
- + Adjustment work on chain magazine with Siemens S110
- + Design and function of the double gripper changer
- + Determination of the tool change positions
- + Instruction for controller and user interface
- + Profibus, ASI-bus basics
- + Date backup and network connection
- + Service functions: inputs and outputs
- + Troubleshooting and fault clearance
- + Function of the cooling unit
- + Diagnostics using PNOZmulti

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

**A-Y419**

*DMU 40 / 60 / 80 / 100 eVo linear, mechanics*

**ITNC 530**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine / assemblies
- + Geometric installation of the machine
- + Design of the linear guide
- + Geometric adjustment work
- + Measuring system replacement
- + Function / commissioning of the linear drive
- + Design of the two-axis NC tilting rotary table
- + Gear tension adjustment
- + Replacement of the ROD B-axis / reference point setting
- + Maintenance work introduction
- + Rotor replacement of the motor spindle (EasyChange)
- + Service work on the motor spindle
- + Kinematics
- + 3D quickSET®
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

**A-Y519**

*DMU 40 / 60 / 80 / 100 eVo linear, electronics*

**ITNC 530**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the chain magazine
- + Adjustment work on chain magazine with Siemens S110
- + Design and function of the double gripper changer
- + Determination of the tool change positions
- + Instruction for controller and user interface
- + Profibus, ASI bus basics
- + Date backup and network connection
- + Service functions: inputs and outputs
- + Troubleshooting and fault clearance
- + Function of the cooling unit
- + Diagnostics using PNOZmulti
- + Update

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

**A-Y819** *DMU 40 / 60 / 80 / 100 eVo linear, Pallet changer, mechanics* **INDEPENDENTLY OF CONTROL**
**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, course A-Y419

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller and machine
- + Design and function of the machine
- + Function sequence of the pallet changer
- + Replacement of components
- + Settings of the pallet changer
- + geometric adjustment work
- + Recovery functions
- + Pallet monitoring

**DURATION**

2.5 days

**COURSE LOCATION**

Seebach

**A-Y215** *DMF 180-7 / 260-7, mechanics* **SIEMENS 840D SL / HMI OPERATE**
**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine / assemblies
- + Measurement with Leveltronik
- + Geometric adjustment work
- + Counterweight of the Z-axis
- + Design and function of the linear drive
- + Design and function and removal / installation of the ball screw drive
- + Removal and installation of the C-axis table integrated in the table
- + Gear tension of the C-axis
- + Gear tension of the B-axis
- + Measuring systems and travel adjustment on linear and rotary axes
- + Design and function of the swivelling milling head (B-axis)
- + Geometric adjustment work on the B-head, kinematics
- + 3D quickSET®
- + Design, function and maintenance of the cooling unit
- + Maintenance work introduction
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

**A-Y315** *DMF 180-7 / 260-7, electronics* **SIEMENS 840D SL / HMI OPERATE**
**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, course A-Y327

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Instruction for controller and user interface
- + Profibus, ASI bus basics
- + Data backup, data transmission
- + Network connection of the controller
- + Service functions
- + Troubleshooting and fault clearance
- + Replacement of components
- + Setting up work on tool changer and magazine
- + Determination of the tool change positions
- + Tool changer recovery functions

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y415** *DMF 180-7 / 260-7, mechanics* **ITNC 530**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine / assemblies
- + Measurement with Leveltronik
- + Geometric adjustment work
- + Counterweight of the Z-axis
- + Design and function of the linear drive
- + Design and function and removal / installation of the ball screw drive
- + Removal and installation of the C-axis table integrated in the table
- + Gear tension of the C-axis
- + Gear tension of the B-axis
- + Measuring systems and travel adjustment on linear and rotary axes
- + Design and function of the swivelling milling head (B-axis)
- + Geometric adjustment work on the B-head, kinematics
- + 3D quickSET®
- + Design, function and maintenance of the cooling unit
- + Maintenance work introduction
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

**A-Y515** *DMF 180-7 / 260-7, electronics* **ITNC 530**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Instruction for controller and user interface
- + Profibus, ASI-bus basics
- + Data backup, data transmission
- + Network connection of the controller
- + Service functions
- + Troubleshooting and fault clearance
- + Setting up work on tool changer and magazine
- + Determination of the tool change positions
- + Tool changer recovery functions
- + Update

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

**A-Y316** *DMF 180-7 / 260-7, electronics* **SIEMENS 840D SL**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Instruction for controller and user interface
- + Profibus, ASI-bus basics
- + Data backup, data transmission
- + Network connection of the controller
- + Service functions
- + Troubleshooting and fault clearance
- + Setting up work on tool changer and magazine
- + Determination of the tool change positions
- + Tool changer recovery functions
- + Replacement of components

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

**A-Y217** *DMF 260 / 360 / 600-11, mechanics* **SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety instruction
- + Overview machine / Structure and Function
- + Removing / installing the motor spindle
- + Operation / gear tension B-axis
- + Geometric adjustments
- + Setting the tool change positions
- + Removal / Installation ballscrew Z-axis (Gantry)
- + Removal / Installation C-axis / operation
- + Overview maintenance of the machine (if necessary ServiceKey)

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach / Geretsried

**A-Y317** *DMF 260 / 360 / 600-11, electronics* **SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller  
sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Instruction for controller and user interface
- + Profibus, ASI-bus basics
- + Data backup, data transmission
- + Network connection of the controller
- + Service functions
- + Troubleshooting and fault clearance
- + Setting up work on tool changer and magazine
- + Determination of the tool change positions
- + Tool changer recovery functions

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach / Geretsried

**A-Y417** *DMF 260 / 360 / 600-11, mechanics* **ITNC 530**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety instruction
- + Overview machine / Structure and Function
- + Removing / installing the motor spindle
- + Operation / gear tension B-axis
- + Geometric adjustments
- + Setting the tool change positions
- + Removal / Installation ballscrew Z-axis (Gantry)
- + Removal / Installation C-axis / operation
- + Overview maintenance of the machine (if necessary ServiceKey)

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach / Geretsried

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y517** *DMF 260 / 360 / 600-11, electronics* **ITNC 530**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Instruction for controller and user interface
- + Profibus, ASI-bus basics
- + Data backup, data transmission
- + Network connection of the controller
- + Service functions
- + Troubleshooting and fault clearance
- + Setting up work on tool changer and magazine
- + Determination of the tool change positions
- + Tool changer recovery functions
- + Update

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach / Geretsried

**A-Y207** *DMC 635 / 835 / 1035 V, mechanics* **SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine
- + Geometric installation of the machine
- + Measurements according to measurement report
- + Reference point adjustment
- + Service functions
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Design of milling spindle and motor
- + Design of the guide system and associated adjustment work
- + Assembly and dismantling of the motor spindle
- + Function of the tool clamping system
- + Function of the coolant system
- + Diverse options
- + Data backup
- + Parameter
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**A-Y307** *DMC 635 / 835 / 1035 V, electronics* **SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, USB stick 16 GB (can be obtained during the course), work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller and machine
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling machine-specific parameters
- + Reference point adjustment
- + Adjustment work on the tool changer
- + Spindle positioning
- + Specification of the change positions
- + Procedure for the replacement of drive modules
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Bus system
- + Diverse options
- + Data backups

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

A-Y308

DMC 635 / 835 / 1035 V, electronics

SIEMENS 840D SL

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface or course A-Y207, DMC 635 / 835 / 1035 V, mechanics, programming / operating course of DMG MORI Academy

**WORK EQUIPMENT**

Laptop, network cable, USB stick 16 GB (can be obtained during the course), work clothing and safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller and machine
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling machine-specific parameters
- + Reference point adjustment
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Procedure for the replacement of drive modules
- + Spindle positioning
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Bus system
- + Diverse options
- + Data backups

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

A-Y407

DMC 635 / 835 / 1035 V, mechanics

ITNC 530

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine
- + Geometric installation of the machine
- + Measurements according to measurement report
- + Reference point adjustment
- + Service functions
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Design of the guide system and associated adjustment work
- + Design of milling spindle and motor
- + Assembly and dismantling of the motor spindle
- + Function of the tool clamping system
- + Function of the coolant system
- + Diverse options
- + Data backup
- + Parameter
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y507**

*DMC 635 / 835 / 1035 V, electronics*

**ITNC 530**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface or course A-Y407, DMC 635 / 835 / 1035 V, mechanics, Programming / operating course of DMG MORI Academy

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller and machine
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling machine-specific parameters
- + Reference point adjustment
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Procedure for the replacement of drive modules
- + Spindle positioning
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Bus system
- + Diverse options
- + Data backups

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**A-Y807**

*DMC 635 / 835 / 1035 V P (60 tools), electronics*

**ITNC 530**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface or course A-Y808, DMC 635 / 835 / 1035 V P (60 tools), mechanics, Programming / operating course of DMG MORI Academy

**WORK EQUIPMENT**

Laptop, network cable, ServiceKey only, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller and machine
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling machine-specific parameters
- + Reference point adjustment
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Procedure for the replacement of drive modules
- + Spindle positioning
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Bus system
- + Diverse options
- + Data backups

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

A-Y808

DMC 635 / 835 / 1035 V P (60 tools), mechanics

INDEPENDENTLY OF CONTROL

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, one of the following courses must already have been completed: A-Y111 / A-Y407 / A-Y207

**WORK EQUIPMENT**

Laptop, network cable, ServiceKey only, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine
- + Geometric installation of the machine
- + Measurements according to measurement report
- + Reference point adjustment
- + Service functions
- + Function of the tool changer
- + Adjustment work on the tool changer
- + Function of the pallet changer
- + Adjustment work on the pallet changer
- + Specification of the change positions
- + Design of the guide system and associated adjustment work
- + Adjustment of the monitoring switches
- + Design of milling spindle and motor
- + Function of the tool clamping system
- + Function of the coolant system
- + Diverse options
- + Data backups
- + Parameter
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

A-Y209

DMC 650 V, mechanics

SIEMENS 840D SL / HMI OPERATE

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine
- + Geometric installation of the machine
- + Measurements according to measurement report
- + Reference point adjustment
- + Service functions
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Design of the guide system and associated adjustment work
- + Design of milling spindle and motor
- + Assembly and dismantling of the motor spindle
- + Function of the tool clamping system
- + Function of the coolant system
- + Diverse options
- + Data backup
- + Parameter
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y309**

*DMC 650 V, electronics*

**SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, USB stick 16 GB (can be obtained during the course), work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller and machine
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling machine-specific parameters
- + Reference point adjustment
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Procedure for the replacement of drive modules
- + Spindle positioning
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Bus system
- + Diverse options
- + Data backups

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**A-Y409**

*DMC 650 V, mechanics*

**TNC 640**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine
- + Geometric installation of the machine
- + Measurements according to measurement report
- + Reference point adjustment
- + Service functions
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Design of the guide system and associated adjustment work
- + Design of milling spindle and motor
- + Assembly and dismantling of the motor spindle
- + Function of the tool clamping system
- + Function of the coolant system
- + Diverse options
- + Data backup
- + Parameter
- + Resetting maintenance notification with the InspectionsKey

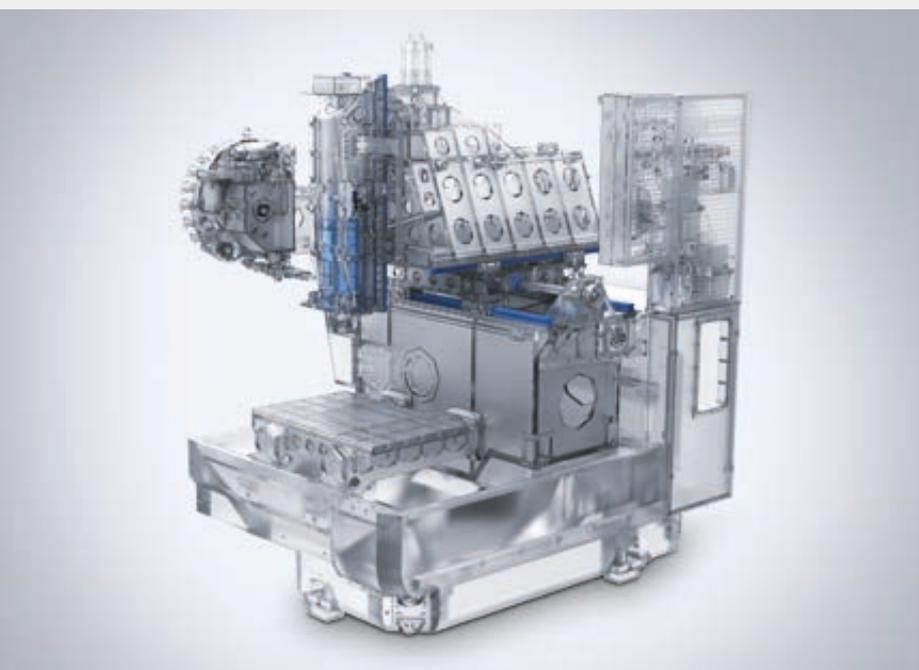
**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

\* The InspectionsKey can be purchased after the course.



A-Y509

*DMC 650 V, electronics*

TNC 640

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface or course A-Y407, DMC 635 / 835 / 1035 V, mechanics, Programming / operating course of DMG MORI Academy

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller and machine
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling machine-specific parameters
- + Reference point adjustment
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Procedure for the replacement of drive modules
- + Spindle positioning
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Bus system
- + Diverse options
- + Data backups

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y205**

*DMC 60 / 80 H linear, mechanics*

**SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine
- + Design and function of the individual assemblies
- + Checking reference point
- + Function of the tool changer
- + Function of the pallet changer
- + Spindle positioning
- + Geometric installation of the machine
- + Design of the roller guides
- + Setting up work on the tool changer
- + Change positions
- + Setting up work on the pallet changer
- + Design of the motor spindle
- + Function of the internal coolant feed
- + Function of the spindle cooling
- + Function of the tool clamp

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**A-Y305**

*DMC 60 / 80 H linear, electronics*

**SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

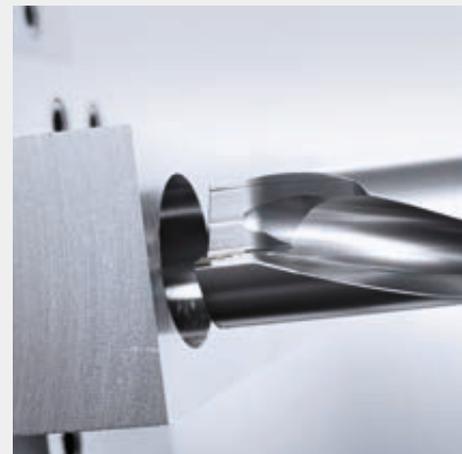
- + Safety instruction
- + Operation of the controller
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling parameters
- + Function of the tool changer
- + Function of the pallet changer
- + Profisafe
- + Procedure for drive module replacement
- + Service functions
- + Troubleshooting and fault clearance
- + Adjustment of the monitoring switches
- + Change positions
- + Options
- + Data backup

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried



\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

A-Y306

DMC 60 / 80 H linear, electronics

SIEMENS 840D SL

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling parameters
- + Function of the tool changer
- + Function of the pallet changer
- + Profisafe
- + Procedure for drive module replacement
- + Service functions
- + Troubleshooting and fault clearance
- + Adjustment of the monitoring switches
- + Change positions
- + Design of the motor spindle
- + Options
- + Data backup

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

A-Y227

DMC 65 / 85 monoBLOCK® RS3, mechanics

SIEMENS 840D SL / HMI OPERATE

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller, Siemens 840D sl HMI-Operate, sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Schematic design of the milling machine, machine overview
- + Assemblies overview and function
- + Measuring systems of the machine axes
- + A- and C-axes gear tension
- + Adjustment of C0 and A0
- + Hydraulic and pneumatic circuits
- + Tool changer (gear or chain magazine)
- + Settings on the tool changer and the associated machine parameters, recovery functions for abort and power failure
- + Instructions for installation / removal and elongation of the ball screw spindle
- + Instructions for spindle and spindle mounting, tool clamp and rotary transmission feedthrough, cooling circuit
- + Data backup on the controller
- + Resetting maintenance notification with the InspectionsKey
- + Pallet changer

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y327**

*DMC 65 / 85 monoblock® RS3, electronics*

**SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller, Siemens 840D sl HMI-Operate, sound knowledge of laptop and operating system, course A-Y227

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Schematic design of the milling machine, machine overview and E-plan "ELCAD", PNOZmulti
- + Linear and rotation measurement systems
- + Adjustment of C0 and A0
- + Tool clamp feedback, leak monitoring, M19 setting
- + Tool changer (chain magazine with Pragati tool changer)
- + Machine parameters for the tool changer, recovery functions for abort and power failure
- + Diagnostics options of the controller, inputs, outputs
- + Changeover from direct to indirect measuring system for service purposes
- + Deselection of the motor spindle for spindle replacement
- + Network settings
- + Data backup
- + Design and function of the tool changer and RS3 (change positions / recovery menu)
- + Changeover from direct to indirect measuring system
- + Practical troubleshooting on the machine

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

**A-Y427**

*DMC 65 / 85 monoblock® RS3, mechanics*

**ITNC 530 / HSCI**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller iTNC 530, sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Schematic design of the milling machine, machine overview
- + Assemblies overview and function
- + Measuring systems of the machine axes
- + A- and C-axes gear tension
- + Adjustment of C0 and A0
- + Hydraulic and pneumatic circuits
- + Tool changer (gear or chain magazine)
- + Settings on the tool changer and the associated machine parameters, recovery functions for abort and power failure
- + Instructions for installation / removal and elongation of the ball screw spindle
- + Instructions for spindle and spindle mounting, tool clamp and rotary transmission feedthrough, cooling circuit
- + Data backup on the controller
- + Resetting maintenance notification with the InspectionsKey
- + Pallet changer

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

A-Y527

DMC 65 / 85 monoBLOCK® RS3, electronics

ITNC 530 / HSCI

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller Heidenhain, sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Schematic design of the milling machine
- + Machine components
- + Machine operation
- + Data backup (with the program TNC-REMO)
- + IO-BUS (inputs and outputs)
- + Setup of function of longitudinal and rotation measurement system
- + Adjustment of C0 and A0
- + M19 setting / spindle encoder
- + Design and function of the C and B axes
- + Design and function of the tool changer
- + Determining tool change positions
- + Design and function of the tool changer and RS3 (change positions / recovery menu)
- + Changeover from direct to indirect measuring system
- + Practical troubleshooting on the machine

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

A-Y827

DMC 65 / 85 monoBLOCK® RS3 pool storage / pallet changer, mechanics

ITNC 530

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller iTNC 530, sound knowledge of laptop and operating system, course A-Y425

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Schematic design of the RS3
- + Function overview
- + Recovery menu use
- + Alignment of the pool storage
- + Adjustment of the change positions using the auxiliary axes
- + Replacement of the "W" and "V" auxiliary Y-axis motors
- + Replacing "C" rotar Y-axis motor and setting up 0 position
- + Data backup

**DURATION**

3 days

**COURSE LOCATION**

Pfronten

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y431**

*DMU 80 duobLOCK® P4, mechanics*

**TNC 640**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller iTNC 530, sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of controller and machine for troubleshooting
- + Machine overview, assembly drawings
- + M19 setting, tool changer, settings (change positions), tool magazine and auxiliary Y-axis synchronised, function and settings, help functions for abort and power failure
- + C-axis and B-axis gearing preload, C0 and B0 setting
- + Design of the pallet changer and function, settings of the switches and hydraulics, help functions
- + Instructions for spindle and spindle mounting, tool clamp and rotary transmission feedthrough, cooling circuit
- + Hydraulic and pneumatic plans
- + Assembly procedure instructions for installation / removal of the ball screw spindle, elongation
- + Reports for geometry measurement of the machine
- + Data backup on the controller
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

**A-Y531**

*DMU 80 duobLOCK® P4, electronics*

**TNC 640**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, Programming / operating course of DMG MORI Academy (iTNC530)

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of controller and machine for troubleshooting
- + Machine overview, E-plan "ELCAD", Profibus, PNOZmulti ET 200 S basics
- + Linear and rotation measurement systems of the axes
- + M19 setting, machine parameters for the "vertical chain" assembly, function and settings, help functions for abort and power failure
- + C0 and B0 setting
- + machine parameters for the pallet changer and function, Hydac pressure switch setting, help functions
- + Diagnostics options of the controller, inputs, outputs, flags, oscillation function
- + Changeover from direct to indirect measuring system for service purposes
- + Linear measuring system replacement
- + Deselection of the motor spindle for spindle replacement
- + Tool clamp feedback, leak monitoring, M19 setting
- + Data backup with TNC-REMO\_NT, Logbooks, Service file

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

**A-Y229** *DMU 80 / 100 / 125 duoBLOCK® P3, DMC 80 / 100 / 125 U* **SIEMENS 840D SL HMI OPERATE**  
*duoBLOCK® P3 FD, mechanics*

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller, Siemens 840D sl, sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller
- + Mechanical basics, function of individual assemblies
- + M19 setting, function sequence of the tool changer, settings (change positions) of the tool changer, tool magazine and auxiliary Y-axis synchronised, function and settings, recovery functions for abort and power failure
- + Field angle determination
- + C0 and B0 setting
- + Function sequence of the pallet changer, settings and recovery functions, pallet monitoring
- + Data backup on the controller
- + Working with the machine documentation

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

**A-Y329** *DMU 80 / 100 / 125 duoBLOCK® P3, DMC 80 / 100 / 125 U* **SIEMENS 840D SL**  
*duoBLOCK® P3 FD, electronics*

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller sound knowledge of laptop and operating system, programming / operating course of DMG MORI Academy (Siemens 840D sl)

**WORK EQUIPMENT**

Laptop, network cable, ServiceKey only, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of controller and machine for troubleshooting
- + Machine overview, measuring systems, E-plan "ELCAD", Profibus, PNOZ multi basics
- + Linear and rotation measurement systems of the axes
- + M19 setting
- + Machine date and macro for the "vertical chain" assembly
- + Function sequence of the tool changer, settings of the tool changer Recovery functions for abort and power failure
- + MT table field angle determination
- + C0 and B0 setting, machine date
- + Machine date and macro for the pallet changer
- + Function sequence of the pallet changer, recovery functions, pallet monitoring
- + Data backups
- + Working with the machine documentation

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y429** *DMU 80 / 100 / 125 duoBLOCK® P3, DMC 80 / 100 / 125 U duoBLOCK® P3 FD, mechanics* **ITNC 530**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller iTNC 530, sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of controller and machine for troubleshooting
- + Machine overview, assembly drawings
- + M19 setting, tool changer, settings (change positions), tool magazine and auxiliary Y-axis synchronised, function and settings, help functions for abort and power failure
- + C-axis and B-axis gearing preload, C0 and B0 setting
- + Design of the pallet changer and function, settings of the switches and hydraulics, help functions
- + Instructions for spindle and spindle mounting, tool clamp and rotary transmission feedthrough, cooling circuit
- + Hydraulic and pneumatic plans
- + Assembly procedure instructions for installation / removal of the ball screw spindle, elongation
- + Reports for geometry measurement of the machine
- + Data backup on the controller
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

**A-Y529** *DMU 80 / 100 / 125 duoBLOCK® P3, DMC 80 / 100 / 125 U duoBLOCK® P3 FD, mechanics* **ITNC 530**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller, sound knowledge of laptop and operating system, programming / operating course of DMG MORI Academy (iTNC 530)

**WORK EQUIPMENT**

Laptop, network cable, ServiceKey only, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of controller and machine for troubleshooting
- + Machine overview, E-plan "ELCAD", Profibus, PNOZmulti ET 200 S basics
- + Linear and rotation measurement systems of the axes
- + M19 setting, machine parameters for the "vertical chain" assembly, function and settings, help functions for abort and power failure
- + C0 and B0 setting
- + Machine parameters for the pallet changer and function, Hydac pressure switch setting, help functions
- + Diagnostics options of the controller, inputs, outputs, flags, oscillation function
- + Changeover from direct to indirect measuring system for service purposes
- + Linear measuring system replacement
- + Deselection of the motor spindle for spindle replacement
- + Tool clamp feedback, leak monitoring, M19 setting
- + Data backup with TNC-REMO\_NT, Logbooks, Service file

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

**A-Y829** *DMU 80 / 100 / 125 duoBLOCK® P3, DMC 80 / 100 / 125 U duoBLOCK® P3 FD, mechanics* **INDEPENDENTLY OF CONTROL**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller iTNC 530, sound knowledge of laptop and operating system, course A-Y429

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of controller and machine for troubleshooting
- + Vertical chain
  - Magazine design, function, action
  - Settings, mechanical paths, electric switches
  - Recovery menu
  - Repair inspection

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

**A-Y203** *DMC 70 / 80 / 100 / 125 H duoBLOCK®, mechanics* **SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller
- + Geometric installation of the machine
- + Measurements according to measurement report
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Checking reference point
- + Service functions
- + Function of the tool changer
- + Function of the pallet changer
- + Spindle positioning
- + Design of the roller guides
- + Adjustment of the monitoring switches
- + Setting up work on the tool changer
- + Change positions
- + Setting up work on the pallet changer
- + Design of the motor spindle
- + Assembly and dismantling of the motor spindle
- + Function of the internal coolant feed
- + Function of the spindle cooling
- + Function of the tool clamp
- + Options: data backup, parameters
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**SERVICE COURSES**

**MILLING TECHNOLOGY**



**A-Y303**

*DMC 70 / 80 / 100 / 125 H duoBLOCK®, electronics*

**SIEMENS 840D SL**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface or course A-Y203, DMC 70 / 80 / 100 / 125 H duoBLOCK®, mechanics, programming / operating course of DMG MORI Academy

**WORK EQUIPMENT**

Laptop, network cable, USB stick 16 GB (can be obtained during the course), work clothing and safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling parameters
- + Function of the tool changer
- + Function of the pallet changer
- + Profisafe
- + Procedure for drive module replacement
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Adjustment of the monitoring switches
- + Change positions
- + Options
- + Data backup

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

A-Y233

*HSC 30 linear, mechanics*

SIEMENS 840D SL HMI OPERATE

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine
- + Geometric installation of the machine
- + Measurements according to measurement report
- + Service functions
- + Hardware design
- + Design and function of the individual assemblies
- + Checking machine zero point
- + Function of the tool changer
- + Spindle positioning
- + Design of the motor spindle
- + Assembly and dismantling of the motor spindle
- + Setting up work on the tool changer
- + Change positions
- + Function of the internal coolant feed
- + Function of the spindle cooling
- + Function of the tool clamp
- + Data backup
- + Parameter
- + Resetting maintenance notification with the ServiceKey

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

A-Y433

*HSC 30 linear, mechanics*

TNC 640

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller
- + Design and function of the machine
- + Geometric installation of the machine
- + Measurements according to measurement report
- + Service functions
- + Hardware design
- + Design and function of the individual assemblies
- + Checking machine zero point
- + Function of the tool changer
- + Spindle positioning
- + Design of the motor spindle
- + Assembly and dismantling of the motor spindle
- + Setting up work on the tool changer
- + Change positions
- + Function of the internal coolant feed
- + Function of the spindle cooling
- + Function of the tool clamp
- + Data backup
- + Parameter
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y235**

*HSC 70 linear, mechanics*

**SIEMENS 840D SL HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine
- + Geometric installation of the machine
- + Measurements according to measurement report
- + Service functions
- + Hardware design
- + Design and function of the individual assemblies
- + Checking machine zero point
- + Function of the tool changer
- + Spindle positioning
- + Design of the motor spindle
- + Assembly and dismantling of the motor spindle
- + Setting up work on the tool changer
- + Change positions
- + Function of the internal coolant feed
- + Function of the spindle cooling
- + Function of the tool clamp
- + Data backup
- + Parameter
- + Resetting maintenance notification with the ServiceKey

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**A-Y435**

*HSC 70 linear, mechanics*

**TNC 640**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine
- + Geometric installation of the machine
- + Measurements according to measurement report
- + Service functions
- + Hardware design
- + Design and function of the individual assemblies
- + Checking machine zero point
- + Function of the tool changer
- + Spindle positioning
- + Design of the motor spindle
- + Assembly and dismantling of the motor spindle
- + Setting up work on the tool changer
- + Change positions
- + Function of the internal coolant feed
- + Function of the spindle cooling
- + Function of the tool clamp
- + Data backup
- + Parameter
- + Resetting maintenance notification with the ServiceKey

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

A-Y335

*HSC 30 / 70 linear, electronics*

SIEMENS 840D SL HMI OPERATE

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling parameters
- + Checking reference point movement
- + Function of the tool changer
- + Procedure for drive module replacement
- + Spindle positioning
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Change positions
- + Linear drives

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

A-Y535

*HSC 30 / 70 linear, electronics*

TNC 640

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling parameters
- + Checking reference point movement
- + Function of the tool changer
- + Procedure for drive module replacement
- + Spindle positioning
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Change positions
- + Linear drives

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y113**

*DMU 50 ecoline, mechanics*

**SINUMERIK 810D SL / HMI OPERATE / TNC 620**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller, sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, Netzwerkkabel, Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine / assemblies
- + Geometric installation of the machine
- + Design of the linear guide
- + Geometric adjustment work
- + Main spindle and drive
- + Adjustment work on the tool clamp
- + Design of the two-axis tilting rotary table
- + Function of the B- and C-axes digital drives
- + Reference point adjustment of the rotary axes
- + Maintenance work introduction
- + Dismantling and reassembly of the worm shaft of the C-axis
- + Dismantling and reassembly of the C-axis table
- + Service work on the motor spindle
- + Kinematics
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

**A-Y313**

*DMU 50 ecoline, electronics*

**SINUMERIK 810D SL**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Instruction for controller and user interface
- + Data backup and network connection
- + Service functions
- + Inputs and outputs
- + Troubleshooting and fault clearance
- + Diagnostics using PNOZmulti
- + Design and function of the disk magazine
- + Setting up work on the disk magazine
- + Determination of the tool change positions
- + Safety instruction

**DURATION**

4.5 days

**COURSE LOCATION**

Seebach

**A-Y111**

*DMC 635 / 1035 V ecoline, mechanics*

**TNC 620 / SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller sound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine
- + Geometric installation of the machine
- + Measurements according to measurement report
- + Reference point adjustment
- + Service functions
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Design of milling spindle and motor
- + Design of the guide system and associated adjustment work
- + Assembly and dismantling of the motor spindle
- + Function of the tool clamping system
- + Function of the coolant system
- + Diverse options
- + Data backup
- + Parameter
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

A-Y311

DMC 635 / 1035 V *ecoline*, electronics

SIEMENS 810D

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface or course programming / operating course of DMG MORI Academy

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller and machine
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling machine-specific parameters
- + Reference point adjustment
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Procedure for the replacement of drive modules
- + Spindle positioning
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Bus system
- + Diverse options
- + Data backups

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

A-Y511

DMC 635 / 1035 V *ecoline*, electronics

TNC 620

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, basic knowledge of the user interface or course A-Y111, DMC 635 / 1035 V *ecoline*, mechanics, programming / operating course of DMG MORI Academy

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller and machine
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Handling machine-specific parameters
- + Reference point adjustment
- + Adjustment work on the tool changer
- + Specification of the change positions
- + Procedure for the replacement of drive modules
- + Spindle positioning
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Bus system
- + Diverse options
- + Data backups

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y237**

*MILLTAP 700, electronics*

**SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Design and function of the machine
- + Geometric installation of the machine
- + Measurements according to acceptance report
- + Reference point adjustment
- + Service functions
- + Adjustment work on the tool changer
- + Setting up the changer, change positions
- + Design of the guidance system and corresponding settings
- + Design of milling spindle and motor
- + Assembly and dismantling of the motor spindle
- + Function of the tool clamping system
- + Function of the coolant system
- + Options
- + Data backup
- + Parameter
- + Resetting maintenance notification with the InspectionsKey

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

**A-Y337**

*MILLTAP 700, electronics*

**SIEMENS 840D SL**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system

**WORK EQUIPMENT**

Laptop, network cable, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Operation of the controller
- + Design and function of the machine
- + Hardware design
- + Design and function of the individual assemblies
- + Error list
- + Parameter
- + Reference point adjustment
- + Adjustment work on the tool changer
- + Setting up the changer, change positions
- + Spindle positioning
- + Data transmission
- + Service functions
- + Troubleshooting and fault clearance
- + Bus system
- + Options
- + Data backup

**DURATION**

4.5 days

**COURSE LOCATION**

Geretsried

\* The InspectionsKey can be purchased after the course.



A-Y891

*Kinematics / 3D quickSET®, DMU series  
40 / 100 eVo, mechanics*

SIEMENS 840D SL HMI OPERATE, ITNC 530, TNC 620

**REQUIREMENTS**

Experience in mechanical engineering / with machine controllersound knowledge of laptop and operating system, course A-Y113 / A-Y219 / A-Y419 / A-Y221 / A-Y421 or A-Y423

**WORK EQUIPMENT**

Laptop, network cable, ServiceKey only, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Machine overview
- + Plane transformation
  - › Checking basic geometry
  - › Determining kinematics values
  - › Applying determined values in the kinematics tables and in the machine constants
  - › Checking swivelling in the room
  - › Error correction
- + 3D quickSET®
  - › requirements for the 3D quickSET® option
  - › Retrofitting options
  - › Calibrating the measuring probe
  - › Setting up and executing 3D quickSET®
  - › Error correction

**DURATION**

3 days

**COURSE LOCATION**

Seebach

**SERVICE COURSES**

**MILLING TECHNOLOGY**

**A-Y892**

*Kinematics, 840D sl / 3D quickSET® for all duoBLOCK® and monoBLOCK® machines, mechanics*

**SIEMENS 840D SL / HMI OPERATE**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller Siemens 840D sl, sound knowledge of laptop and operating system, course A-Y225 / A-Y227 or A-Y229

**WORK EQUIPMENT**

Laptop, network cable, ServiceKey only, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Determining kinematics values (head offset, table rotation centre)
- + Applying determined values in appropriate tables and in the machine constants
- + Check of the kinematics using TRAORI, deepening of the material learned

**DURATION**

4.5 days

**COURSE LOCATION**

Pfronten

**A-Y893**

*Kinematics, iTNC / 3D quickSET® for all duoBLOCK® and monoBLOCK® machines, mechanics*

**ITNC 530**

**REQUIREMENTS**

Experience in mechanical engineering / with machine controller iTNC 530, sound knowledge of laptop and operating system, course A-Y425 or A-Y427 or A-Y429

**WORK EQUIPMENT**

Laptop, network cable, ServiceKey only, work clothing, safety footwear

**COURSE CONTENTS**

- + Safety instruction
- + Data backup
- + Machine overview, checking basic geometry
- + Manual measurement of the kinematics, recording of the values and checking
- + Calibrating the measuring probe
- + Measuring head offset, determining Cycle 19 coordinates using a measuring probe
- + Applying determined values in the kinematics tables and in the machine constants
- + Checking of the Cycle 19 function using practical exercises
- + Checking with the "QuickSet" measuring tool kit and the associated program

**DURATION**

3 days

**COURSE LOCATION**

Pfronten

\* The InspectionsKey can be purchased after the course.

## SERVICE COURSES

## MILLING TECHNOLOGY

**A-Y806** *Motor spindle and components replacement / EasyChange, mechanics* **INDEPENDENTLY OF CONTROL**
**OBJECTIVE**

The course participant gains the competence to perform service work within the scope of the described seminar contents

**REQUIREMENTS**

Experience with DMG machines, course A-Y419

**WORK EQUIPMENT**

Working clothes, safety shoes

**COURSE CONTENTS**

- + Safety instruction
- + Theory
  - › Motor spindle basics
  - › Stator manufacture
  - › Limits
  - › Tool clamping system
  - › Releasing unit
  - › Rotary transmission feedthrough
  - › Process cooling
  - › Sensor system
  - › Spindle bearings and their lubrication
  - › Causes of spindle damage
- + Practical experience
  - › Removal of the rotor of the EasyChange spindle
  - › Removal of the motor spindle
  - › Dismantling and reassembly of the releasing unit
  - › Replacing the rotary transmission feedthrough
  - › Rotary encoder replacement
  - › Motor spindle removal
  - › Setting M19 position
  - › Checking the geometry and kinematics

**DURATION**

3 days

**COURSE LOCATION**

Seebach

**A-Y931***Individual courses, specific to the customer***SPECIFIC TO THE CUSTOMER****OBJECTIVE**

Individual training is orientated at specific requirements of the customer and it educates your technicians according your needs

**REQUIREMENTS**

Depending of training contents:  
Mechanical education, Electrical education

**COURSE CONTENTS**

If you don't find a training in this catalogue which fits to your requirements, please contact us. Together we will tune course contents and create a course which fits to your needs.

**DURATION**

Specific to the customer

**COURSE LOCATION**

Seebach,  
Geretsried,  
Pfronten

Registration form

# Organisational information

## ■ Registration

Please register for all training courses using the following registration form. We will send you a written confirmation and, if desired, a map showing how to find us. The number of participants is limited. Registrations will be accepted on a first come, first served basis. We will let you know immediately if courses are fully booked and indicate the next available dates.

## ■ Machine order

If you have purchased a machine which includes training, please add the purchase order confirmation number to your registration form.

## ■ Prices and services

We would be happy to tell you about our current course prices on request. Included in the price are special high-quality training documents, refreshments and lunch during the Training course. The prices are net and do not include VAT at the applicable rate on the date of the Training course. The course prices do not include participants' travel expenses and costs of overnight accommodation. The participation fee is payable upon receipt of the invoice. We would also be happy to book a hotel room for you.

## ■ Venues and times

Your contact partner will tell you where and when each course is due to be held. Normally, the courses will take place at a branch of the DMG MORI Academy. We also offer training courses on your premises.

## ■ Certificate

Participants will receive a certificate of participation after successfully completing a course.

## ■ Safety regulations

Participants are obliged to adhere to the applicable safety and accident prevention regulations at the training location. For Service Courses, participants must bring along work clothing and safety shoes.

**You can find more information in our General Terms and Conditions below.**

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Information about all our Service Courses milling technology: **Reiner Anders**  
Gildemeisterstraße 60, D-33689 Bielefeld  
T: +49 (0) 52 05 / 74 2671  
reiner.anders@dmgmori.com

• **F: +49 (0) 52 05 / 74 26 72**

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Information about all our Service Courses turning technology: **Petra Heinrich**  
Lausitzer Straße 7, D-82538 Geretsried  
T: +49 (0) 81 71 / 817 3321  
petra.heinrich@dmgmori.com

• **F: +49 (0) 81 71 / 817 3366**

Fax reply

# Registration form

**Sender:**

Company	PO Box
Address	Post code, city
Mr / Ms	E-mail
Tel.	Fax
Order number	
Date	Signature / Company stamp

**Registration for the following courses:** Participants can cancel free of charge up to two weeks before the course starts. Afterwards, the full amount will be charged.

Course number	Course name	Date	Surname / name of the participant

At least 4 people are required for us to carry out our courses.

**The course fee is to be charged to the following:**

- Same address as above                       Following address

Company	Dept. / name
Address	Post code, city

**The course fee is to be offset against the training course paid for in the following purchase order:**

Sale number	Machine number	Machine type
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**Arrival and overnight accommodation:**

- No room reservation required                       Yes, please reserve a room for \_\_\_\_ person(s).
- Non-smoker                       Smoker

Arrival date	Departure date
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You can find the address and fax number on page 86.

DMG MORI SEIKI Academy GmbH  
 Gildemeisterstraße 60, D-33689 Bielefeld  
 T: +49 (0) 52 05 / 74 25 01, Fax: +49 (0) 52 05 / 74 25 02  
 training@dmgmori.com, www.dmgmori.com

# DMG MORI

Service Courses // DMG MORI SEIKI Academy GmbH

# General terms and conditions

## 1. Applicability

The following General Terms and Conditions govern the contractual relationship between the customer in the training courses (hereinafter referred to as the Client) and DMG MORI SEIKI Academy GmbH on participation in courses, workshops and training events of DMG MORI SEIKI Academy GmbH. Any deviating general terms and conditions of the Client do not apply.

## 2. Validity of offers

Offers of DMG MORI SEIKI Academy GmbH are always non-binding and without obligation. Unless indicated otherwise, they shall remain valid for up to four weeks from the offer date. Once a new offer is created, all previous offers shall become invalid unless the new offer is a supplementary offer for an existing one. We are only subject to obligations in so far as set out in our written order confirmation. Supplements and amendments must be made in writing.

## 3. Registration process

Participants can register online or by post, fax or e-mail. The registration shall only become binding after DMG MORI SEIKI Academy GmbH sends a confirmation notice to the Client. The registration confirmation is also the training ID pass for the participant.

## 4. Prices

**4.1** The prices and payment conditions set out in the order confirmation shall always apply. None of our prices include statutory VAT. Unless indicated otherwise in the order confirmation, the participation fee applies per person and per training event, and it includes training documents, lunch and refreshments during training events on the premises of DMG MORI SEIKI Academy GmbH. This does not include officially required qualifications as part of the AZWV guideline. The participation fee is payable upon receipt of the invoice. Not all of the courses of DMG MORI SEIKI Academy GmbH can be promoted as an AZWV / AZAV measure; such particulars are to be clarified with the relevant training coordinators before the Training course starts.

**4.2** Unless indicated otherwise in the order confirmation, please transfer the participation fee, indicating the invoice number, to account 660 886 00 of DMG MORI SEIKI Academy GmbH at Deutsche Bank Bielefeld, BLZ 480 700 20, 14 days before the start of the course at the latest (IBAN: DE07 4807 0020 0066 0886 00, BIC: DEUTDE33XXX).

## 5. Cancellation

**5.1** The Client must inform DMG MORI SEIKI Academy GmbH in writing if a participant is unable to take part in the confirmed course, providing the name of the participant. Written changes to bookings and cancellations can be submitted up to five working days before the start of the Training course, subject to a processing fee of € 150.–. If any bookings are then cancelled as a result, we shall charge half of the participation fee. If a participant should fail to attend or cancel on the day of the event, we shall charge the full participation fee minus any expenses saved by the participant's lack of participation. Naturally, a substitute participant can be nominated at no extra cost.

**5.2** The Client is always entitled to prove that DMG MORI SEIKI Academy GmbH has suffered no damage resulting from the participant's withdrawal from the event, or that it has suffered considerably less damage than the processing fee charged by DMG MORI SEIKI Academy GmbH.

**5.3** The right of the Client to terminate the agreement for cause remains unaffected.

## 6. Cancellation of courses

DMG MORI SEIKI Academy GmbH reserves the right to cancel the course if it has legitimate cause to do so, e.g. for organisational reasons or due to force majeure (e.g. bad weather or if the speaker becomes ill). DMG MORI SEIKI Academy GmbH shall immediately inform the Client of the cancellation of the course on legitimate grounds. Any payments that have already been made towards the participation fee shall be refunded to the Client in full. In this regard, the Client has no further claims.

## 7. Certificate

Participants shall receive a certificate of participation after successfully completing the course.

## 8. Hotel booking

DMG MORI SEIKI Academy GmbH shall provide assistance with hotel booking. However, all contracts on reservations, accommodation and cancellation shall be between the hotel and the course participant. Every course participant must settle their bills with the hotel directly.

## 9. Copyrights

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## 10. Safety

The Client is obliged to adhere to the safety and accident prevention regulations applicable on the premises of DMG MORI SEIKI Academy GmbH. In the event of danger, participants must always follow the instructions of the trainer. With regard to training courses on the premises of the Client, the Client must meet all the criteria in order that the Training course can be carried out safely. DMG MORI SEIKI Academy GmbH has no insurance protection for damage caused by participants in the course on the premises of the Client for which the trainers are not responsible. Therefore, the Client undertakes to ensure that this risk is suitably covered.

## 11. Disclaimer

**11.1** In the courses and in the course documents, technical information will be transferred to the best of our knowledge. However, DMG MORI SEIKI Academy GmbH accepts no liability for any errors in the technical information which is conveyed orally or in writing during the Training course or which is contained in the course documents that are handed over to participants. The technical information does not represent an assurance and/or a warranty or guarantee with regard to the product sold to the Client or services rendered for the Client by individual companies of the GILDEMEISTER Group.

**11.2** This provision notwithstanding, DMG MORI SEIKI Academy GmbH shall only be liable, regardless of legal grounds, in cases of

- intent,
- gross negligence on the part of the owner / the company or manager,
- culpable injury to life, limb or health,
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whose absence DMG MORI SEIKI Academy GmbH has guaranteed, in so far as the German product liability act (ProdHaftG) provides for liability for personal injury and damage to property on privately used items.

**11.3** In the event of a culpable breach of material contractual duties, DMG MORI SEIKI Academy GmbH shall also be liable for gross negligence on the part of employees and for ordinary negligence, although the latter is limited to the typical, reasonably foreseeable damage for this type of contract.

**11.4** DMG MORI SEIKI Academy GmbH makes no guarantee on the attainment of part production times, dimensional accuracy or surface finishes on workpieces of the Client that are produced during the Training course. Furthermore, depending on the complexity of the workpiece we reserve the right to refuse to include it in the Training course, either fully or in part.

## 12. Data protection

DMG MORI SEIKI Academy GmbH shall treat the data transferred by the Client as confidential and it shall only use the data in accordance with the applicable data protection provisions. Unless specified otherwise by the Client, DMG MORI SEIKI Academy GmbH shall use the data transferred by the Client (company name, address, e-mail address, telephone number, bank details etc.) in order to keep the Client up to date about its products and events in the future and to contact the Client by fax, e-mail or telephone. The Client can revoke this consent at any time without providing a reason by contacting DMG MORI SEIKI Academy GmbH, Leiter Training, Gildemeisterstr. 60, 33689 Bielefeld or training@dmgmori.com. DMG MORI SEIKI Academy GmbH shall take the greatest possible precautions with regard to the security of the data of the Client.

## 13. Place of jurisdiction

The place of jurisdiction for any disputes shall be Bielefeld. However, DMG MORI SEIKI Academy GmbH can also file lawsuits against the Client at its place of general jurisdiction.

DMG MORI Academy – Our venues for your training!



**Bielefeld**  
Gildemeisterstraße 60  
D - 33689 Bielefeld



**Wernau**  
Antoniusstraße 14  
D - 73249 Wernau



**Moscow**  
ul. Novohohlovskaya 23/1  
RU - 109052 Moscow



**Geretsried**  
Lausitzer Straße 7  
D - 82538 Geretsried



**Klaus**  
Oberes Ried 11  
A - 6833 Klaus



**Shanghai**  
No. 331 Guangzhong  
Road, Minhang District  
Shanghai 201108, China



**Leonberg**  
Riedwiesenstraße 19  
D - 71229 Leonberg



**Stockerau**  
Josef Jessernigg-Str. 16  
A - 2000 Stockerau



**Singapore**  
3 Tuas Link 1  
SG - 638584



**Pfronten**  
Tiroler Straße 85  
D - 87459 Pfronten



**Le Locle**  
Av. Du Technicum 33  
CH - 2400 Le Locle



**Seebach**  
Neue Straße 61  
D - 99846 Seebach



**Chicago**  
2400 Huntington  
Blvd., IL-60192  
Hoffman Estates

To learn more, call or e-mail us:  
**T: +49 (0) 52 05 / 74 25 01**  
**training@dmgmori.com**