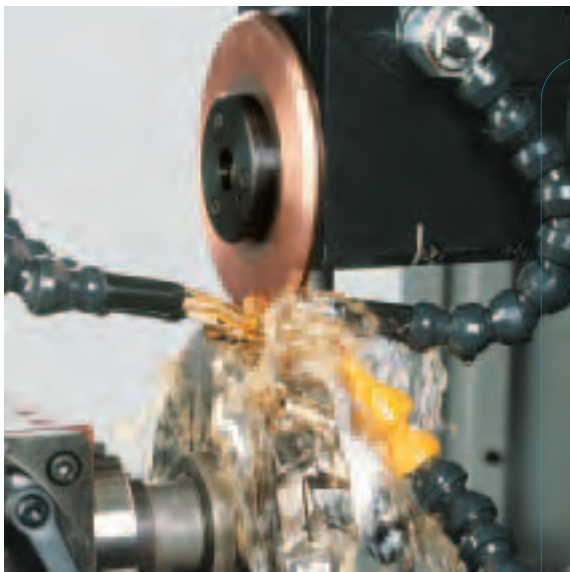



# QM 110


# QWD 760/750

**Complete machining to the highest standards**  
**High-tech erosion machines for PCD-tipped tools.**



 Ultra-precise erosion results  
with disk electrode



 Ultra-precise erosion results  
with wire electrode

## Comprehensive tooling technology from Vollmer. The pioneering high-tech erosion machine range.



### Competence

- Comprehensive expertise in the complete machining of diamond tipped-tools. High investment in research and development.
- Vollmer offers a high-tech machine range for the erosion of widely varying tool types to the highest degree of quality.
- Solution of user-specific machining needs through solid engineering know-how.
- Vollmer is a partner with key tool manufacturers world-wide.

### Experience

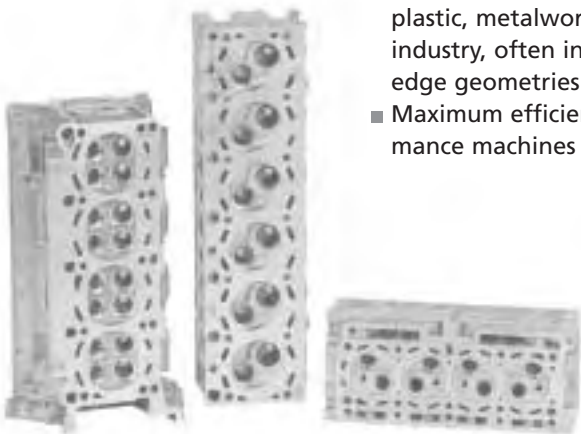
- We have been developing new ideas and solutions for PCD machining in close cooperation with users for over 10 years.
- We cooperate in partnership with external research institutes, technology centres and universities.
- Many years of experience in the manufacture and servicing of diamond-tipped tools around the world.

### Flexibility

- Matured system of operator prompting, input of only minimal data is sufficient even for complex tools.
- Drafting of tool profiles using CAD.
- High output from the erosion generator with individual selection of erosion parameters for optimum results.
- User-friendly machining menus developed specifically for the manufacture and reshaping of tools.

### Efficiency

- Maximum machining precision with either disk or wire electrode.
- Unique machine range for processing profile tools, standard and non-standard tools and saw blades.
- Universal machining of tools for the woodworking, plastic, metalworking, automotive and aerospace industry, often involving complex tool shapes and cutting edge geometries.
- Maximum efficiency and economy based on high-performance machines and fully automatic work sequences.



## Highly precise erosion results with disk or wire electrode on two new machines: QM 110 and QWD 760/750.



The new generation of Vollmer erosion machines complies with the very highest standards for tools with complex cutting edge geometries and configurations. Complete machining with disk or wire electrode. For maximum precision at the surface and cutting edge. This generally

makes subsequent grinding superfluous and substantially improves economy. Here, we are presenting two new developments with outstanding capability.

Trimming tools  
Discoid tools  
Profile tools  
Cylindrical tools  
Jointing cutting tools  
Finishing tools  
Scoring cutters  
Hoggers  
Saw blades

The new QM 110 erosion machine allows milling cutters, cylindrical and discoid tools as well as profile tools to be automatically machined using a disk-shaped electrode to a high standard of quality for the very first time.

The new QWD wire erosion machine complies with the most stringent requirements in terms of precision, even with complex tool geometries and the closest measurement tolerances. The QWD 760 was specially developed for machining tools for the metalworking industry, while the QWD 750 caters to tools used in the woodworking industry.

Both machines result from Vollmer's philosophy of offering its customers all-round, comprehensive know-how from a single, competent source. Their underlying features include:

- Highly compact, stabile structure
- Tool measuring and erosion in a single clamping operation
- Vollmer Multiprocessor system
- Erosion generator for maximum performance criteria
- Particularly easy, convenient operation
- For extremely precise cutting edges and surfaces

Profile tools  
Stepped tools  
Combination tools  
Countersinking tools  
Reamers  
Drilling tools  
Milling cutters  
Circular tools  
Bell-shaped tools  
Shaped tips  
Saw blades



# QM 110

**Impressive high standard of erosion quality  
for standard and profile tools.**

**Disk electrode. Minimal machining times.**



## Precision and reliability

- Structural rigidity
- Particularly stable machine concept using polymer concrete
- Measurement, erosion and remeasurement of tools in a single clamping operation
- Newly developed generator complies with the highest performance criteria
- 5 simultaneously path-controlled CNC axes

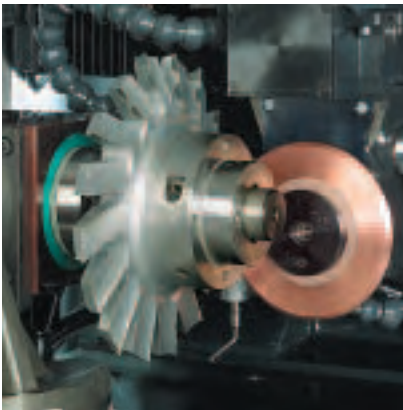
## Versatility in operation

- CNC-controlled E axis for swivel movement of the eroding disk
- Manufacture of lateral clearance angles in the profile
- High stock removal even with profile tools
- CAD-CAM system for complex profiles due to path definition
- Particularly short traversing distances, reduced machining time
- Ideal application conditions for the widest possible range of PCD-tipped tools

## Outstanding operating convenience

- Simple operation with user prompting at the LCD colour display
- Data exchange via DNC
- Unbeatable new design presented with the iF Product Design Award 2001 and the red dot award: product design
- The wide-opening door ensures ideal access to the tools and the machine interior
- All supply units are located at the back of the machine for fast, simple maintenance

## Comprehensive tooling technology Tool machining with disk electrode on the QM 110.



Finishing tool

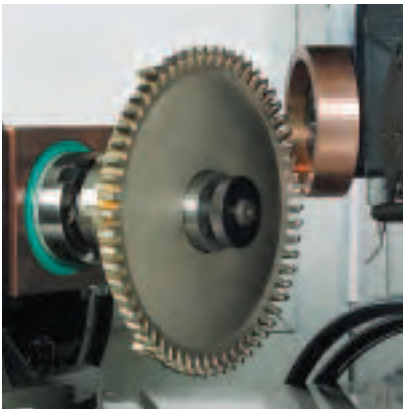


End mill cutter

Ideal application conditions for a wide range of tools on the QM 110 erosion machine. For tool production and servicing requirements. For tools for machining wood, metal and plastics. Top quality erosion results.

Erosion of PCD tools with the disk periphery

- Profile erosion
- Circular erosion



Hogger



Saw blade

Erosion of PCD tools with with the disk face surface

- Face end cutting edges
- Peripheral cutting edges
- Chamfers



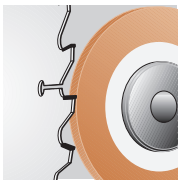
Circular cutter



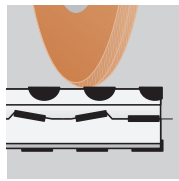
Radius profile end mill cutter

## Examples of tools for machining on the QM 110 disk electrode erosion machine.

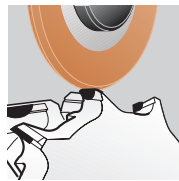
### Erosion with the disk periphery



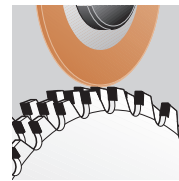
Sides  
(Saw blade)



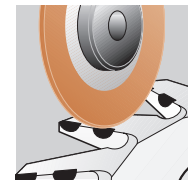
Peripheral cutting edges  
(End mill cutter)



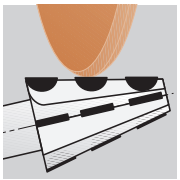
Peripheral cutting edges  
(Jointing trimmer)



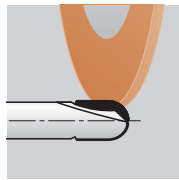
Peripheral cutting edges  
(Laminate tool)



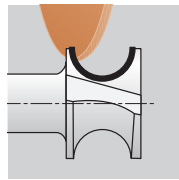
Finishing tools



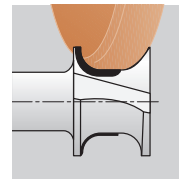
Peripheral cutting edges  
(Conical tools)



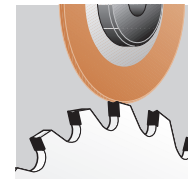
Profiles through path  
definition (profile cutter)



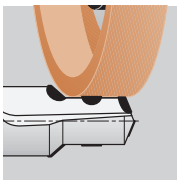
Profiles through path  
definition (profile cutter)



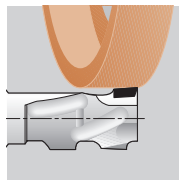
Profiled electrode  
(Profile cutter)



Profiled electrode  
(Scoring cutter)

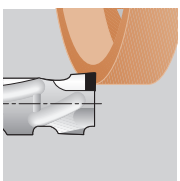


Circular chamfering  
(Drilling tool)



Circular machining  
(End mill cutter)

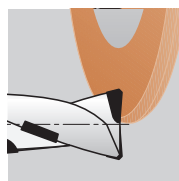
### Erosion with the disk face end



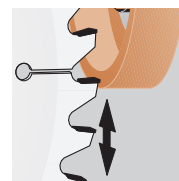
Face cutting edges  
(End mill cutter)



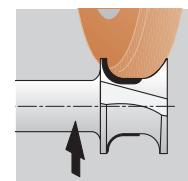
Peripheral cutting edges  
(Saw blade)



Face cutting edges  
(End mill cutter)

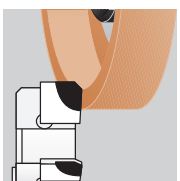


Oscillation method  
(Saw blade)

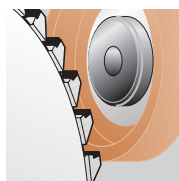


Infeed method  
(Profile cutter)

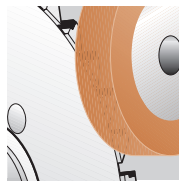
### Erosion method



Face cutting edges  
(Cutter head)

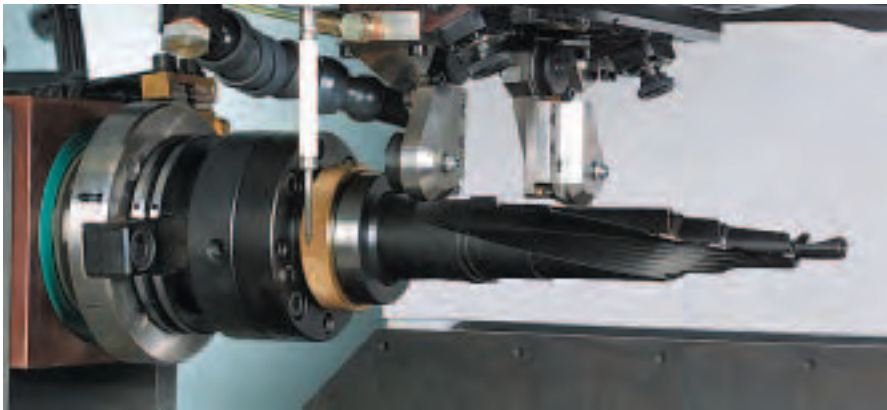


Periphery, chamfers, face  
(Hogger)



Radii  
(Hogger)

## Comprehensive tooling technology Tool machining with wire electrode on the QWD 760/750.



Helically fluted stepped tool

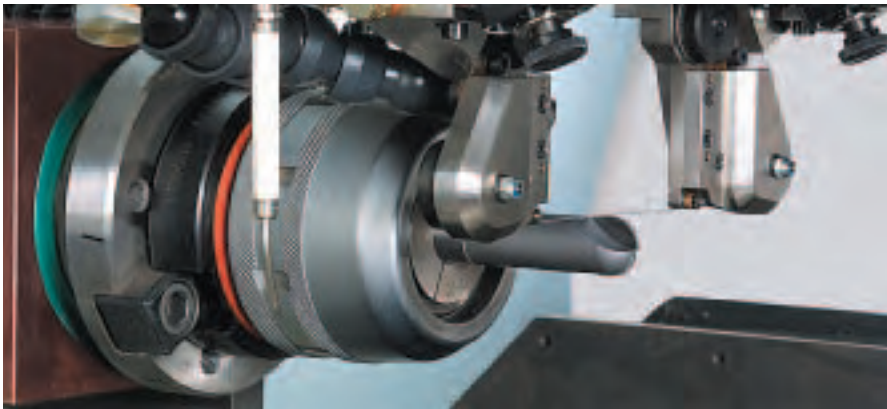
Ideal conditions for a wide range of different tools on the QWD760/750 erosion machine. For tool production and servicing. For tools for machining metals, NF metals, composite materials, plastics, wood. High quality erosion results.

Erosion of PCD tools with wire electrode:

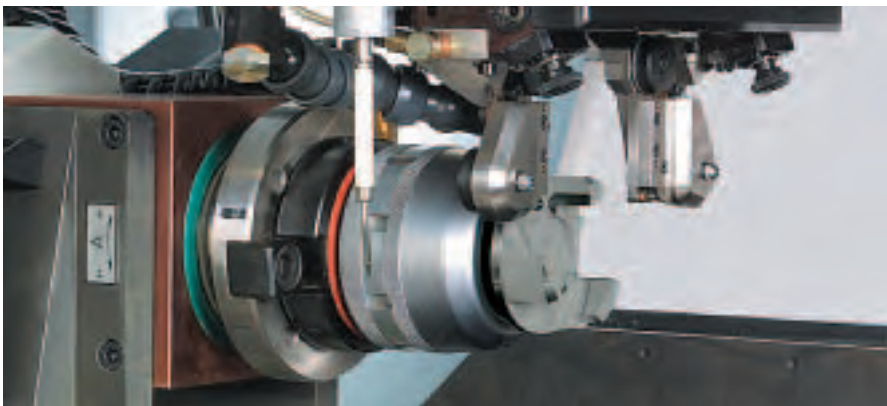
- Profile tools
- Stepped tools
- Combination tools
- Countersinking tools
- Reamers
- Drilling tools
- Cutting tools
- Circular tools
- Bell-shaped tools
- Shaped tips
- Saw blades

The QWD760/750 is the ideal processing machine for tools meeting the following criteria:

- Tool outside contour cylindrical or with profile
- Cutting edges with or without circular grinding chamfer
- Straight or helically fluted tools
- Tools with or without tail centre
- Surface finish quality up to  $R_a 0.2 \mu m$
- Dimensional tolerances up to  $\pm 1/100 \text{ mm}$



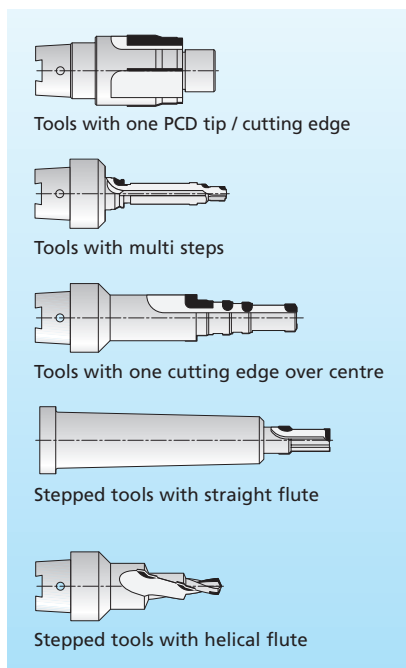
Radius profile end mill cutter



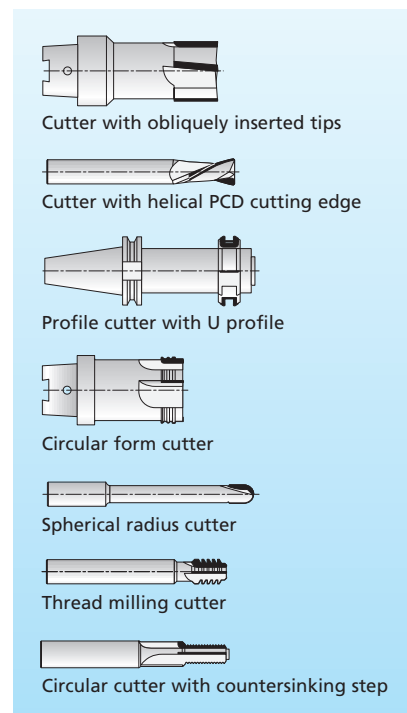
Tool with internal cutting edges (bell-shaped tool)

## Examples of tools suitable for machining on the QWD 760 wire electrode erosion machine.

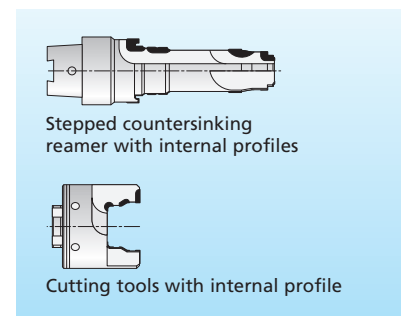
### Stepped tools (Drilling, reaming, countersinking)



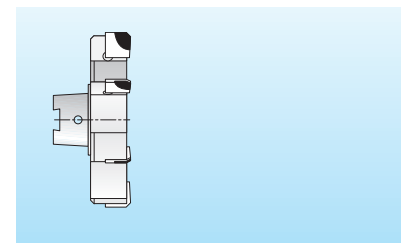
### Cutting tools



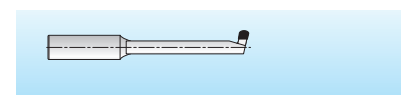
### Tools with internal cutting edge (bell-shaped tools)



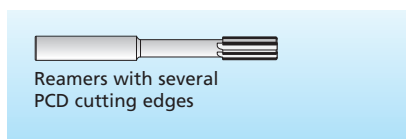
### Cutter heads



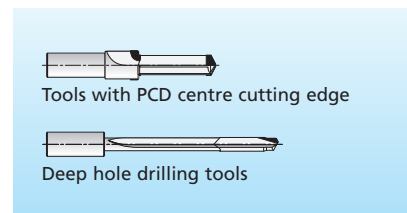
### Tools with internal turning cutting edges



### Reaming tools



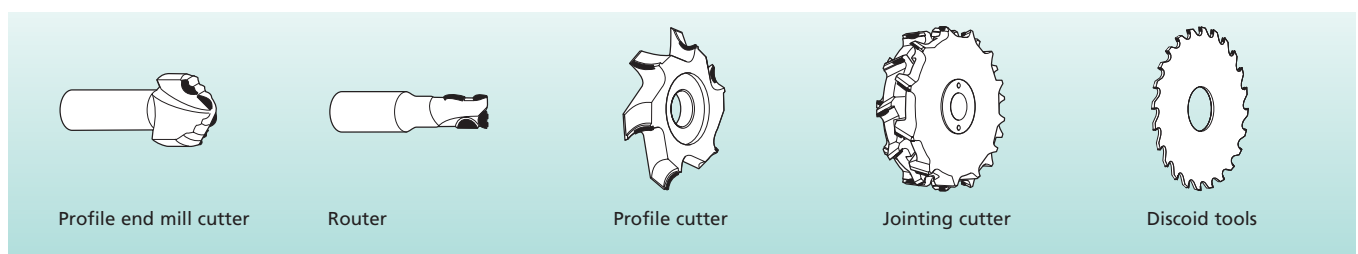
### Drilling tools



### Form tools



## Tool examples for machining on the QWD 750 Wire electrode erosion machine.





# QWD 760/750

**Maximum precision, output and surface quality.  
Erosion results with wire electrode meet the  
most rigorous requirements.**



## Precision and reliability

- Structural rigidity
- Particularly stable, machine concept with polymer concrete
- Measuring and erosion of tools in a single clamping operation
- Newly developed generator with freely accessible parameters for individual program optimization
- 5 simultaneously path-controlled CNC axes
- QWD 760 specially developed for metal cutting tools
- QWD 750 specially developed for woodworking tools

## Versatility in application

- CNC-controlled rotary E and A axes to produce the clearance angle at any optional point of the profile
- CAD-CAM system with software especially for tools used in the metalworking and woodworking industry
- Ideal conditions for a wide-ranging variety of PCD tools
- Tool machining with and without tail centre.
- Machining of tools with different axial angles

## Outstanding operating convenience

- Simple operation with user prompting at the LCD colour display
- Data exchange via DNC
- New, operator-friendly design
- Optimum access to the tool and the machine interior
- All supply units are located at the side of the machine for fast, simple maintenance.

## Simple, convenient operation.



Control panel of the QWD 760/750

Typical work sequence for machining an individual tool:

- Tool data for the measurement and erosion program are entered while a different tool is being machined.
- Tool clamping, then automatic measuring and erosion.

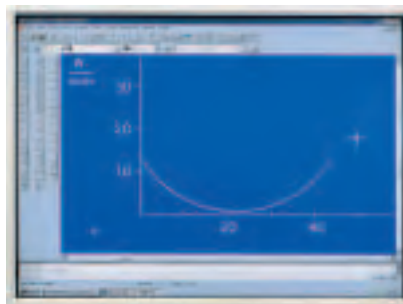
Matured, convenient operator prompting system simplifies the programming and operation of machines. This is where our many years of erosion experience are converted into customer benefits.

The Vollmer multiprocessor control system with CAD-CAM system offers maximum flexibility in the design of tool geometries. Any chosen profile can be generated on industrial standard PCs using the standard AutoCAD software. This information is transmitted to the machine via the network (DNC).

All data can be set and accessed at the central control panel. During software development, we paid attention to ensure simple operation, meaning that only a minimum amount of data has to be entered.

Other benefits: Operator prompting on the screen with graphic support, as well as wide-ranging tool and machining menus. Values from tool drawings can be used directly.

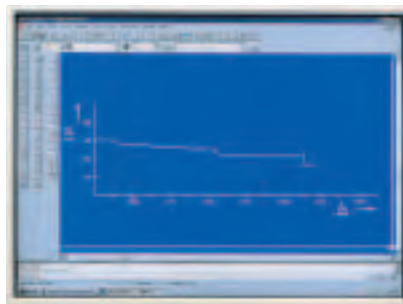
Due to the use of path curve technology, the entire processing task can be broken down according to geometrical and technological requirements into several individual tasks, e.g. with different clearance angles for each cutting edge, division into roughing and finishing operations, with different profiles on one tool.



Monitor CAD-CAM workstation



Colour display QM 110



Monitor CAD-CAM workstation



Colour display QWD 760/750

## Fully automatic sequences improve quality and economy.

### Automatic measurement and erosion with disk electrode



QM 110 Tool measuring



QM 110 Measurement program

Two processing machines, a single superior machine concept: Automatic measuring and erosion of tools in a single clamping process.

A wide range of programs for measurement and erosion work sequences are already stored in the machine. Each standard program is supplemented by customer-specific parameters and tool dimensions.

Intelligent software programs offer a range of advantages. All the machining programs permit up to four erosion stages to be selected: Coarse roughing, roughing, finishing, fine finishing, each with their own erosion parameters, and with the QWD 760/750, different wire speeds and tensions.

The active erosion stage is graphically depicted on screen. The feed amounts for the individual erosion stages can also be programmed. The gap value and the erosion speed are graphically displayed on screen as a major aid to process optimization. The higher traversing speed following lift-off from the cutting edge helps reduce downtimes.

The erosion parameters are freely accessible to the user and allow individual program optimization.



QM 110 Tool machining



QM 110 Erosion program

### Automatic measurement and erosion with wire electrode



QWD 760/750 Tool measuring



QWD 760/750 Measurement program

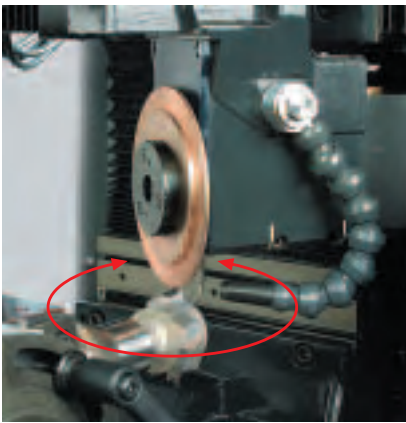


QWD 760/750 Tool machining



QWD 760/750 Erosion program

## Outstanding characteristics of the CNC-controlled E axis.



QM 110 CNC-controlled E-axis

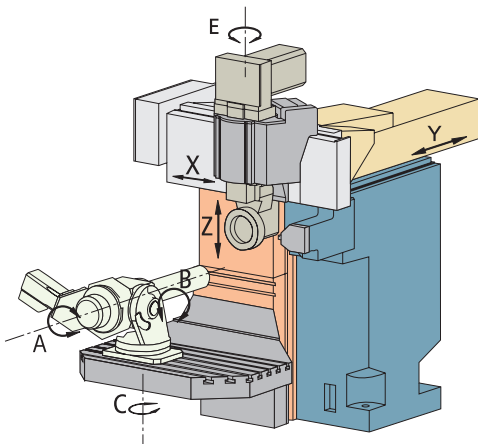


QWD 760/750 CNC-controlled E-axis

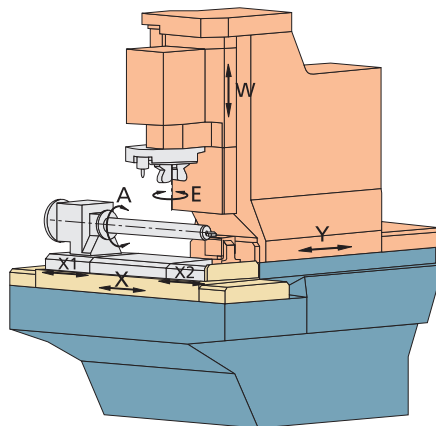
Another essential characteristic of both machines is the flexibility offered by the controlled E-axes.

The E-axis allows swivel action of the disk-shaped eroding electrode in the QM110 erosion machine, meaning that along with the radial clearance angles, lateral clearance angles can also be generated in the profile by the use of 5-axis simultaneous path travel. Tools can now be automatically chamfered in a single pass up to an angle of 70° on all sides.

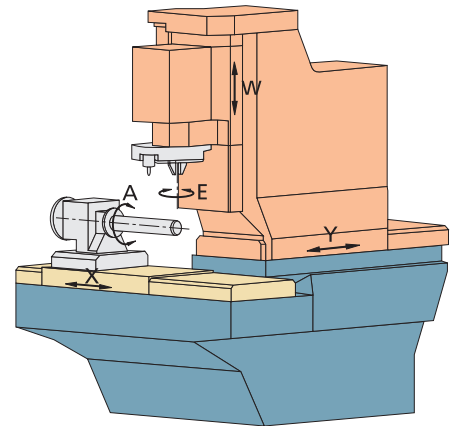
In the QWD760/750 wire erosion machine, the E-axis always cuts the point of the profile cutting edge which is currently being machined. This allows the required lateral clearance angle to be manufactured to a high degree of precision at any point of the profile.



In the QM 110 erosion machine, the X, Y, Z, A and E axes are CNC-controlled, the B and C axes are manually adjustable

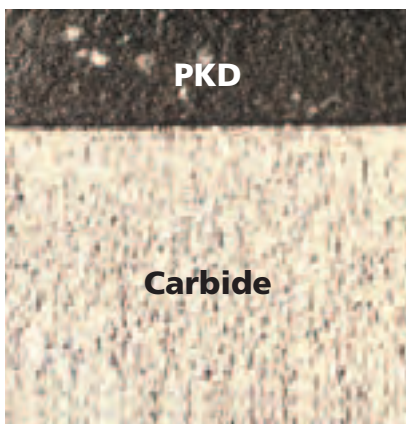


In the QWD 760 erosion machine, the X, Y, W, A and E axes are CNC controlled



In the QWD 750 erosion machine, the X, Y, W, A and E axes are CNC-controlled.

## Outstanding results with the new erosion generator.



High erosion output during roughing using the example of the QWD 760/750

The output and structure of the generator play a vital role. For this reason, we take responsibility ourselves for its development and optimise the parameters through an exhaustive process of testing. The generator we use here is the culmination of our many years of experience in PCD tool machining.



Fine surface structure during finishing using the example of the QWD 760/750

### Outstanding results

- High erosion output for the roughing processes. Feed rates of 7 mm/min and more are achieved.
- Precision finishing processes for surface roughness levels of  $R_a = 0.2 \mu\text{m}$ .
- Short machining times coupled with outstanding surface quality.

### Benefits

- Tools are completely machined in one clamping operation.
- Other finishing processes are generally no longer necessary.
- The eroded tool is finish machined and ready for use.

### Flexible application choices

- Matured software programs in accordance with stringent Vollmer standards.
- A large number of parameters are already defined, such as PCD types, CBN or carbide, roughing, finishing or fine finishing operations.
- Maximum flexibility in programming the erosion process.
- By modifying the erosion parameters in the generator menu, the erosion process can be ideally adjusted to the machining assignment.
- Breakdown of the work process into four stages with individually definable feed amounts.
- Display of the erosion process with depiction of significant elements for further optimization.

## Integration into the company data network.



Erosion machine integration into internal data networks (DNC).

- The tool and tool profile are drawn at an office workstation
- Transmission of data via a network
- Tool erosion in the eroding machine

This offers the benefit of central setting and management of the tool erosion programs.

Data exchange with the erosion machines via DNC



QM 110



QWD 760/750

## Prerequisites for maximum precision.

At Vollmer, you benefit from a comprehensive backing of expertise in the manufacture and servicing of PCD tools.

The newly developed erosion machines comply with the most rigorous requirements imposed on tools with complex cutting edge geometries and configurations.

Complete machining with disk or wire electrode for ultra-precise erosion results.

Particularly stable, machine concept using polymer concrete.

Tools are measured and eroded in a single clamping operation.

Vollmer multiprocessor control with CAD-CAM system for maximum possible flexibility in the design of tool geometries.

Particularly easy, convenient operation, matured system of operator prompting.

User-friendly machining menus, developed especially for the manufacture and resharpener of tools.

Universal machining of tools for the woodworking, plastics, metalworking, aeronautics and aerospace industry.

QWD 760 developed especially for machining tools for the metal industry, QWD 750 for machining tools used in the woodworking industry.

Erosion generator developed by Vollmer to address the most rigorous performance criteria.

Maximum flexibility due to CNC-controlled E axis, ensuring that all clearance angles are manufactured with maximum precision.

Integrated software programs with selection of up to four erosion stages. The erosion parameters are freely accessible for the operator, so allowing individual optimisation of programs.

Data exchange with the erosion machine via DNC.

## Specifications at a glance.

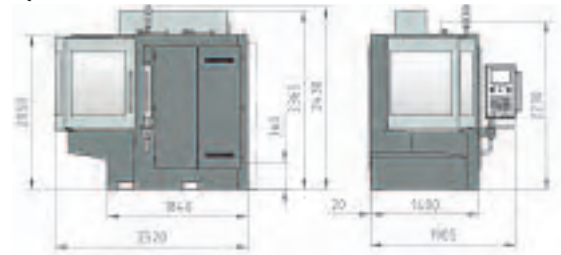
	QM 110	QWD 760	QWD 750
<b>Milling cutters</b>			
Outside diameter	to 250 mm	to 250 mm	to 320 mm
Cutting edge length	to 100 mm	to 260 mm	to 480 mm
<b>Cylindrical tools</b>			
Outside diameter	10 to 100 mm	10 to 250 mm	10 to 320 mm
Overall length		to 500 mm	to 500 mm
Cutting edge length	to 100 mm	to 260 mm	to 480 mm
<b>Discoid tools</b>			
Outside diameter	to 380 mm	to 250 mm	to 320 mm
Outside diameter with supplementary device	to 520 mm		
Cutting edge length	to 20 mm	to 260 mm	to 480 mm
Tangential clearance angle	to 6°	to 6°	to 6°
Radial clearance angle	-15° to 6°	-10° to 6°	-10° to 6°
Clearance angle	to 30°	to 30°	to 30°
Automatic chamfering	to 70°	to 45°	to 45°
Axially parallel cutting edges	•	•	•
Cutting edges with axial angle	•	•	•
Helical cutting edges	to 45°	to 45°	to 45°
Cylindrical tools	•	•	•
Conical tools	•	•	•
Profiled tools	optional	•	•
Right-hand and left-hand cutting tools	•	•	•
Tool weight	max. 20 kg	max. 20 kg	max. 20 kg
<b>Rotary electrode (QM 110)</b>			
Outside diameter with face end machining	125 mm		
with peripheral machining			
with tungsten copper electrode	150 mm		
<b>Wire electrode (QWD 760/750)</b>			
Wire diameter		0,15 to 0,3 mm	0,15 to 0,3 mm
Adjustment range, wire guide		20 to 120 mm	20 to 120 mm
Wire speed		to 7 m/min	to 7 m/min
Coils (DIN 46399)		K 125/K 160	K 125/K 160
<b>Traversing ranges</b>			
X axis	280 mm	275 mm	500 mm
Y axis	280 mm	300 mm	300 mm
Z axis (QM 110)	330 mm		
W axis (QWD 760/750)		200 mm	200 mm
A axis angular range	360°	360°	360°
Toolholding system	ISO 40	ISO 50	ISO 40
B axis swivel angle	±30°		
C axis swivel angle	210°		
E axis swivel angle	±70°	120°	120°
<b>Tail stock unit</b>			
For fixture of tools between centres.		•	
<b>Automatic measuring device</b>			
Measurement resolution	0,001 mm	0,001 mm	0,001 mm
<b>Pump delivery rate</b>			
dielectric fluid	60 l/min	60 l/min	60 l/min
Dielectric fluid capacity	100 l	140 l	140 l
Connected load	3,4 kW, 4,5 kVA	3,4 kW, 4,5 kVA	3,4 kW, 4,5 kVA
Weight	ca. 3300 kg	ca. 4500 kg	ca. 4400 kg

\* • as standard

Subject to design changes in the interests of progress. Patent pending.

## Dimensions

### QM 110



### QWD 760/750



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