



Perfect
mastery of surfaces



WELCOME TO THE FUTURE OF PRECISION.

The new spark erosion machine *EAGLE G5 Precision*

OPS  INGERSOLL
Fly with the eagle!

EAGLE G5 Precision: A new era in spark erosion



Rainer Jung, Managing Director
Developer, Mastermind, Enthusiast

With the introduction of the *EAGLE G5 Precision* we have started a new era in spark erosion. Numerous customers have already confirmed us, that we have reached unprecedented precision and surface qualities with minimum wear with this new machine generation.

The new and fully closed design of the *EAGLE G5 Precision* in combination with the active temperature control, provides extremely high thermal stability, which is essential for maximum precision and perfect results – both with graphite and copper electrodes. The encapsulation does not limit the manual accessibility and full automation capabilities as a guarantee for the cost-effectiveness of our machines.

The new *EAGLE PowerSPARK* Generator makes it possible to achieve worldwide unique surface qualities with graphite that no one would have imagined. One more proof of the incomparable innovative strength of OPS-INGERSOLL.

The machine delivers optimum results especially in multi-cavity machining – with incredibly low wear! In combination with a new and more powerful drive and control package from a single source and an innovative, user-friendly programming software with numerous new functions, the *EAGLE G5 Precision* is the prototype of a new generation of EDM machines.

- Maximum precision
- Increased thermal stability
- More than 50% less wear during finishing
- Matt-glossy surfaces with graphite up to VDI 8
- Completely optimised: Generator – Control – Design – Software
- 40% shorter machining times
- Significant reduction of production times

Be an Eagle Team - be a champion!



Innovative machine concept for maximum precision

Unique machine design

The closed design and active temperature control of the machine makes it possible to minimize temperature fluctuations. The temperature compensation effectively prevents any remaining temperature drift. Especially in multi-cavity machining, which requires maximum precision, the machine delivers optimal results.

- Gantry construction for maximum precision
“< 5 µm on the part”
- Thermosymmetric design with unique temperature compensation
- Integrated dielectric tank in the machine bed for maximum temperature stability and flow optimised infeed
- Minimum footprint – large travel ways
- Designed for full automation



Integrated precision features



Active dielectric cooling

The entire machine base is completely flushed by the active temperature controlled dielectric fluid. This results in the highest possible stability of the entire machine temperature, which responds very slowly to environmental influences. The circulation is flow-optimized to achieve an extremely uniform temperature adjustment.



Position- and geometric compensation

Highest precision and positioning accuracy is achieved by measuring the linear axes with calibrated measuring standards and laser interferometers.



Temperature compensation

Our intelligent temperature compensation detects smallest temperature fluctuations caused by the process or the environment and compensates reliably any shift of the machining position.



Increase of precision and repeatability

Maximum machine precision is achieved by adjusting the whole dielectric- and machine-cooling system and validation of the position accuracy by highly precise laser interferometer at the customer production site, directly in the working environment of the machine.

Unique fine surfaces with graphite



As the technology leader, we have again pushed the limit for graphite. With the new *EAGLE* PowerSPARK the *EAGLE* G5 Precision achieves surfaces with a fineness that was previously not possible with graphite. For the first time ever, due to the revolutionary *EAGLE* PowerSPARK Generator, it is possible to achieve matt-glossy surfaces with maximum cost-effectiveness. According to Fraunhofer IPT Aachen this results in optimal demoulding properties and substantially less polishing time of the finished work-pieces, compared to milled surfaces.



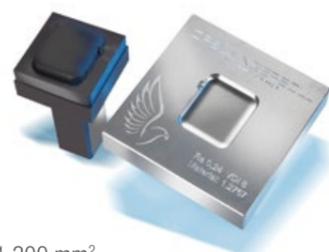
VDI 10
Area: 14,000 mm²



VDI 11
Area: 12,500 mm²



VDI 10
Area: 4,000 mm²



VDI 8
Area: 1,300 mm²



Multi-cavity machining with 50% less wear and up to 40% shorter machining times

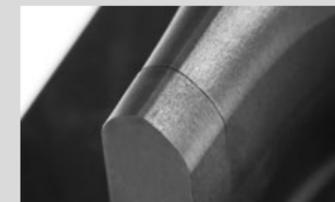


VDI 18
8 cavities with 3 electrodes



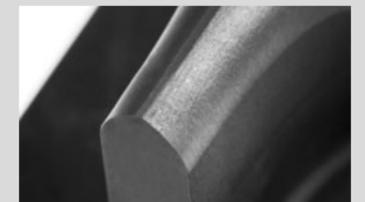
Precision and cost-effectiveness are especially important in multi-cavity machining. The new *EAGLE* PowerSPARK Generator reduces wear by up to 50%, due to the unique adaptive pulse form, now also in finishing.

Example: Result after finishing of 5 cavities with one electrode



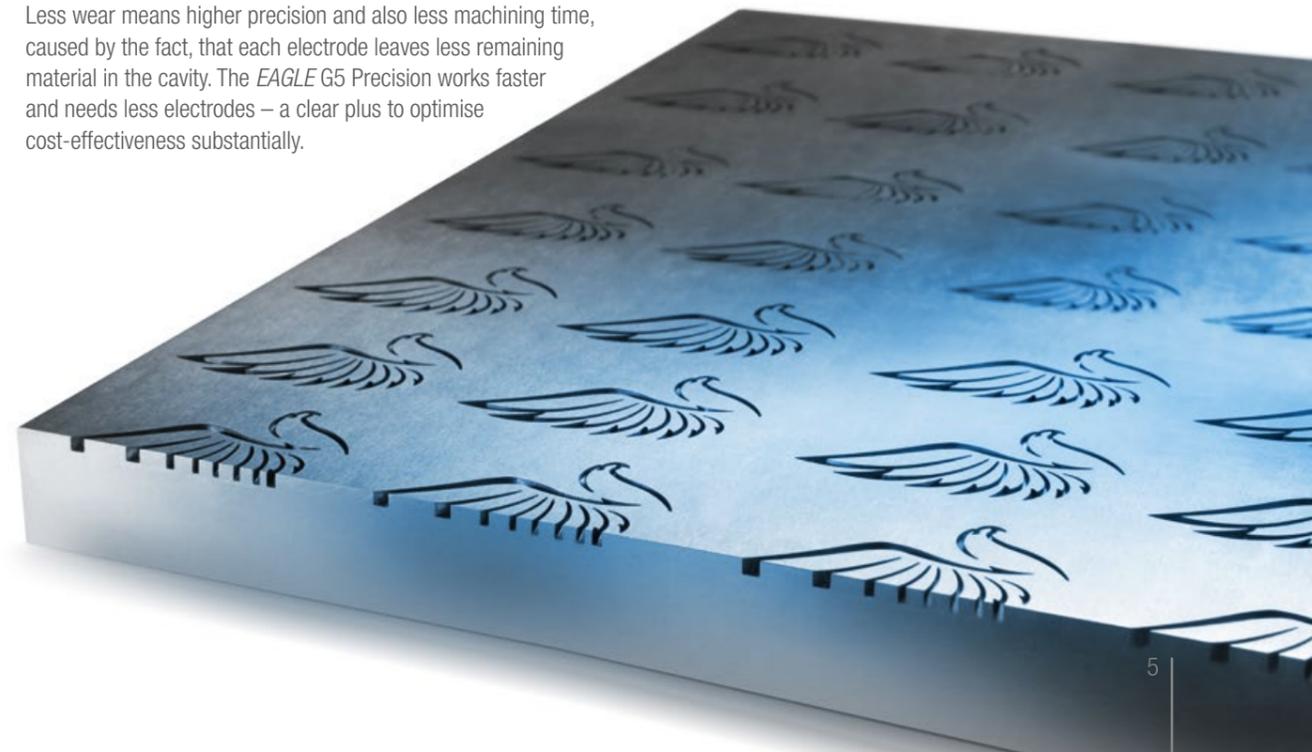
Wear with conventional generator: 78 µm

... you can see the difference!



Wear with *EAGLE* PowerSPARK: 21 µm

Less wear means higher precision and also less machining time, caused by the fact, that each electrode leaves less remaining material in the cavity. The *EAGLE* G5 Precision works faster and needs less electrodes – a clear plus to optimise cost-effectiveness substantially.



New copper technology



Not only the graphite technology, but also the copper technology of the *EAGLE G5 Precision* has been significantly improved. For surfaces below VDI 16 with numerous cavities, the highest precision can be obtained with copper. The new clean finish step provides homogeneous and spot-free surfaces – even in 3D geometries!

- Multi-cavity machining below VDI 16
- Minimal wear
- Finest homogeneous surfaces due to the new clean finish step
- No spots
- Maximum precision



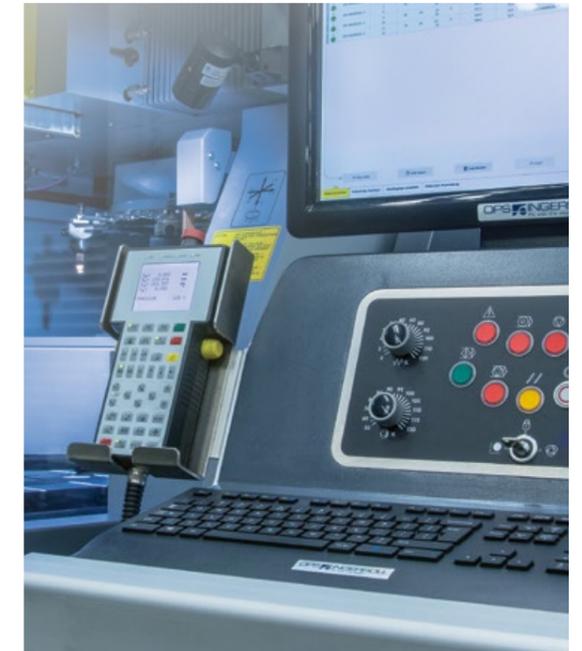
VDI 12
4 cavities with 2 electrodes

EAGLE PowerSPARK One

New control technology

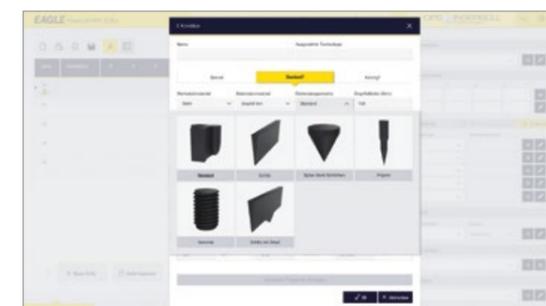
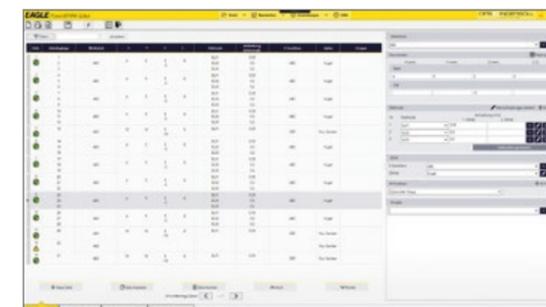
With the new *EAGLE* PowerSPARK One controller, the machine has a perfectly matched control and drive package for maximum dynamics and precision. Due to the increased processing capacity it is possible to implement complex movement cycles in order to achieve unprecedented EDM machining results. The advanced hand pilot significantly simplifies the handling of the *EAGLE G5 Precision*. More functionality, optimised key layout and fewer clicks per function save time and facilitate operation of the machine.

- New, future-sustainable architecture
- Control and drive package from one source
- Very compact
- New orbit strategies like the clean finish step for spot-free surfaces
- Integrated safety technology
- Optional operating mode 4 acc. to CE-standard



EAGLE PowerSPARK Editor

Maximum user-friendliness for complex tasks



The new programming software *EAGLE* PowerSPARK Editor not only achieves excellent erosion results, but also redefines user-friendliness. It is now easy to create and adapt even large programs – especially for multi-cavity machining. With only a few clicks, you can configure the number of uses for each electrode and implement a wear compensation in the electrode manager, to achieve a new level of efficiency; of course, the system is also prepared for full automation.

- Short loading times
- Easy handling of programs with numerous cavities and electrodes
- New: Fast and easy programming for multi-cavity machining
- Interface for data import from CAD systems
- Optimal electrode and workpiece management

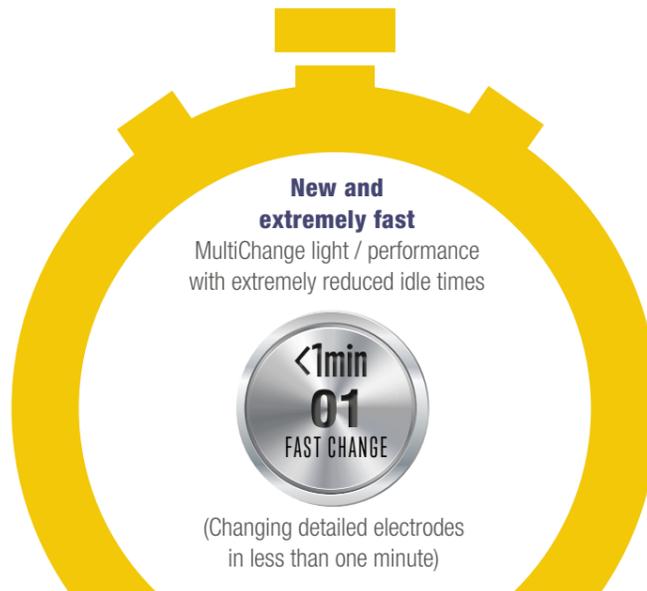
Multi-flexible automation – all from a single source

Flexible connection of handling systems

The market is defined by requirements for shorter delivery times, diversity of production variants and constantly rising cost and competition pressure.

We offer automation solutions that will substantially reduce costs and turnaround times.

All of our machines are prepared for automation, whether as a single machine, as a cell, or a line automation. OPS-INGERSOLL can supply the entire process chain, including automation, measuring machine, cleaning station and software.



Optimal accessibility – excellent user friendliness

The option to load the machine with workpieces or electrodes from multiple sides, offers the ideal conditions for compact automation solutions without limiting the operator's accessibility to the work space.

The capability of completely lowering the protection guard and fully retracting the machine head makes it possible to load even heavy workpieces from above by crane.



Precision and accuracy ...

... also possible by automation!

MultiChange light / performance



EAGLE G5 Precision

with MultiChange light or performance
for up to 232 electrodes and 10 workpiece pallets (variable configuration)



MultiChange light / performance

The handling system is equipped with a magazine for the storage of workpieces and electrodes.

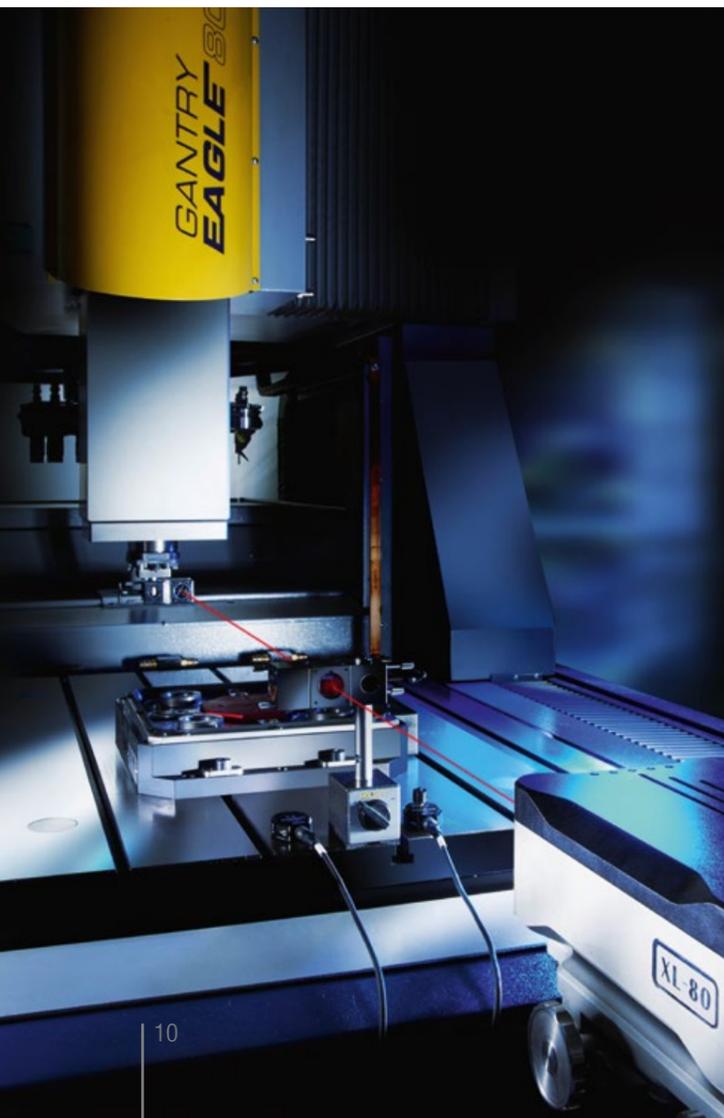
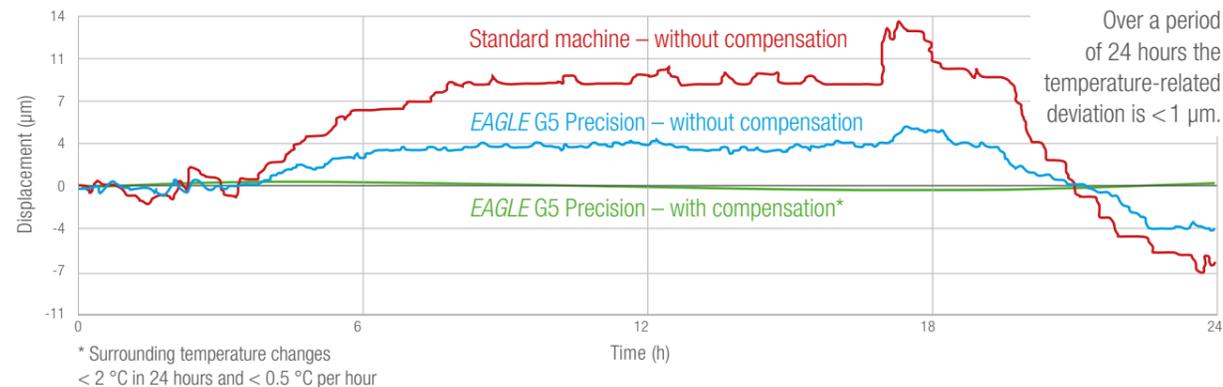
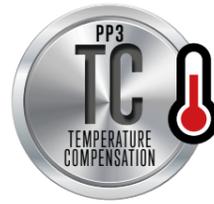
An optional electrode double gripper guarantees fast changes.

Further options are a turning gripper for turning the electrodes, chip identification and job management functions.

A connection for up to two machines is possible.

Temperature compensation

From the design to construction, a high thermal dynamic is placed at the highest priority, assisting the temperature control. This is achieved by the extremely low temperature range of the machine with less than 3 °C, guaranteed between the non-operating time and heavy-duty machining. Due to the capsulation, the machine reacts very slowly to external temperature fluctuation. Thus, the deviation can be reduced to a minimum even without compensation. In an ideal environment*, a part accuracy below 5 µm can be achieved. If the surroundings are not ideal, the deviation can be reduced to under 50% compared to a standard machine.



Increased machine precision and repeatability

Specially developed precision packages increase the precision and repeatability of the machine. Maximum machine precision is achieved by a dielectric and machine-cooling system, geometric thermal error compensation and high precision determination of axis positioning by a laser interferometer measurement at the customers working environment of the machine. IPR – the guarantee for maximum precision over the entire travelling range.

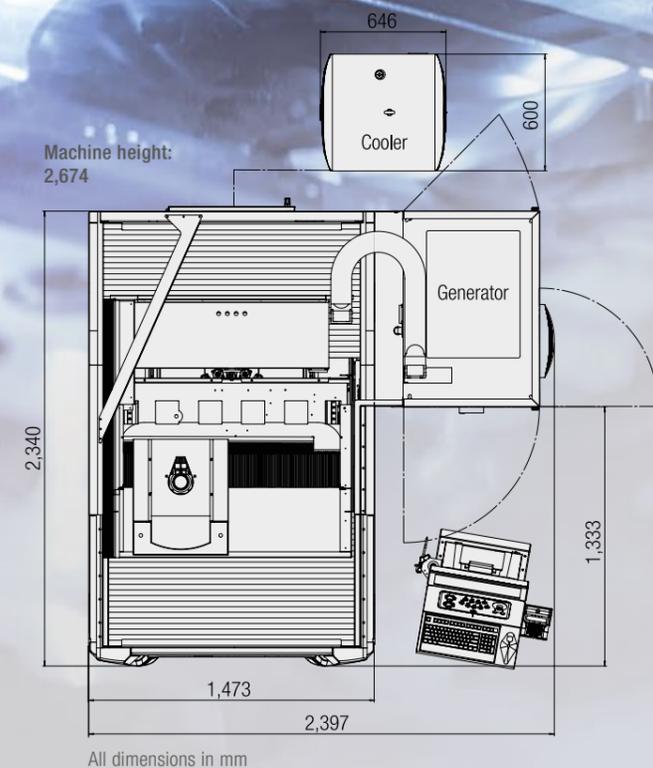


Setup – Technical data

EAGLE G5 Precision

MACHINE		
Machine weight	kg	5,350
Generator weight	kg	640
Power input	kVA	16
Fuse protection	A	32
Voltage / Frequency	V/Hz	400/50
WORK TANK		
Type	Rise and fall tank – filled movable	
Clear dimensions (L x W x H)	mm	770 x 670 x 440
Dielectric fluid level max. programmable/automatic	mm	375
WORK HEAD		
Max. head load	kg	100
Distance electrode-clamping chuck to work table min./max.	mm	135/585*
INTEGRATED C-AXIS		
RPM (adjustable)	1/min.	1-20
Angle positioning	degree	0.001
Load capacity for manual electrode change	kg	50*
Load capacity for automatic electrode change	kg	15*
Movement of inertia, max.	kg · m ²	0.4*
WORK TABLE		
Surface (L x W)	mm	750 x 650
Load capacity	kg	1,000
TRAVEL WAYS		
X / Y / Z inside the work tank	mm	525 x 400 x 450
Y (by electrode changing position)	mm	675
CONTROL EAGLE PowerSPARK One		
HMI	Windows® 7 ultimate	
Type of drive	digital AC-servo-drive	
X, Y, Z rapid traverse	mm/min.	max. 5,000
Power Jump Z max.	mm/min.	18,000
Power Jump Plus X, Y (option)	mm/min.	5,000
DIELECTRIC SUPPLY		
Filter system	Cartridge (integrated)	
Filter surface area	m ²	16
Dielectric fluid, total volume	ltr.	400
ELECTRODE CHANGER		
Type (option)	Pick-up rotary disc	
Positions (option)	20 (30)	
Electrode weight		
- Single electrode	kg	15*
- Total weight	kg	60*
GENERATOR		
Type	Adaptive current	
Machining power, max. (option)	A	60 (110)
ADDITIONAL FEATURES		
Automatic lubrication	Standard	
Chiller, cooling power	kW	3.9
CO ₂ -fire extinguisher, DIN 14497, size	kg	6

* Note: The indicated values are maximum values that can be lower depending on the selected clamping system. We reserve the right to make technical changes.



The 4 success factors for profitable process organisation:

- 1 *EAGLE* technologies
- 2 Automation solutions
- 3 Process experts
- 4 Application know-how



The **EXPERT** Principle

Complete process performance

OPS-INGERSOLL is your technology partner for tool and mould making of the highest standards. We develop and produce EDM and HSC machines as standalone systems, for use in composite technology, or fully automated – which can boost the efficiency of your production by up to 50%.

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