Dental Machine

The dental CAD-CAM specialist
Dental Machine is an Italian company, completely independent from material and tool producers, who has been designing and manufacturing milling machines only for dental CAD-CAM since it was established, without any compromise with other industrial sectors.

The strength of focus

Close to the client in his own laboratory
Our digital technology relieves the dental technicians of the most boring and repetitive tasks and allows them to focus on the key elements - functionality and aesthetics - in which they can fully express their professionalism and experience.

We provide a solid base so that the dental technician can focus on creating a beautiful and functional prosthesis.

We make your work easier.
We are partners, not just suppliers

"The seller must support the client and help him to do his job better and earn more, sharing the results"

We do not just sell machine; we provide our customers with our knowledge, based on 40 years of experience in numerical control machines and 10 years in dental CAD/CAM. Our aim is to help our customers to improve in terms of quality, time and productivity and share the results.
5 reasons to innovate with Dental Machine
Our machines are designed and reviewed together with the top European dental laboratories, to combine performance with ease of use.

To meet the needs of the market and of new materials, we offer continuous innovation in hardware and software, along with innovative algorithms developed specifically for dental CAM, as well as the possibility of in-field upgrading of our machines.
Free and open system

Full compatibility with the main CAD systems on the market.
We share the philosophy of completely open and transparent systems; the client is not obliged to buy any specific material or tool.
There is no mandatory need to update the CAM software every year as it will continue to work even if not updated.
Quality, delivery time and cost

The basis of digital technology is to allow the dental lab to do its jobs faster, more accurately and - last but not least - at a much lower cost compared to traditional process or to an external milling centre. In-house milling provides a full control of the process in time, quality and cost.
CAM-CAD CHARACTERISTICS

Working is... hard, but using a NC milling machine may also be enjoyable!

Thanks to a numerical control and an interface developed specifically for dental CAD-CAM, the machines are very easy to use, even by those who have no previous CAD-CAM knowledge.

Our multi-lingual interface can be easily set to customer's own language, so there is no need to learn a foreign language.

Ease of use
Continuous innovation

New materials, new prosthesis, new protocols and new software involve a continuous improvement in dental labs and milling technology.

Dental Machine works alongside material and software producers - as well as several top European dental labs – in order to cope with such evolution both by developing new machines and by looking at solutions to revamp those already in-field, to increase their service life.

We will never let you alone...
Materials and technologies
Granite is a one-of-a-kind material: it is so stable that over time the tomb of Cheops is still intact after 4,500 years. Today is mainly used in building synchrotrons and top-grade measuring instruments.

Thanks to its holocrystalline structure, it shows a very low thermal expansion and - instead of reflecting vibrations - it absorbs them and provides an exceptional stability and accuracy, far superior to all modern materials.
Any moving component heats up when working and thus it expands and loses accuracy. Measuring the average temperature of the machine is not enough since each axis heats up in a different way.

Linear encoders are high-precision digital rulers that continuously read the actual position of the tool and forward it (1,000 times per second for each axis) to the controller of the numerical control, which corrects it when necessary.

Rotary encoders do the same job on the 2 rotating axes for the disc position. Thus the system provides a maximum error of about 0.001 mm on each of the 5 axes.
All tools have some errors that affect the accuracy of the prostheses, such as an actual diameter different from the nominal one, or a small flexion of the tip compared to the stem. Thus the “working” diameter is different from the theoretical one. Dental Machine has developed an accessory that overcomes such inaccuracy by measuring the “working” diameter of the rotating tool and forwarding it to the numerical control, which changes the paths accordingly, and totally recovers the tool error.
Dental Machine numerical control system is designed specifically for dental CAD-CAM, which involves a clear dominance of curved paths over straight ones. Special algorithms avoid sudden adjustment manoeuvres, that are replaced with a slight rounding, to maintain accuracy and improve the milled surface.

The "look ahead" function takes into consideration the future spindle positions and adjusts, instant by instant, the speed of each individual axis based on "what comes next", in order to increases the average speed and reduce vibrations.
Brushless motors with precision encoder and closed loop.
Cartesian movements with ground and polished worm screws and recirculating ball bushings, with direct coupling (no belts and pulleys).
Rotary movements with lubricated-for-life hypocycloidal or epicycloidal gears with zero backlash.
Jäger spindle with high frequency electronic control.
High quality components, manufactured in Italy, Germany and Japan to guarantee top accuracy and reliability.

The components
Thanks to Dental Machine platform, the client can manage his milling machine from any place in the world – by browser / App and a PC or tablet or smartphone – like he does by the touch screen monitor of the machine itself.

In addition to that, the platform offers several additional services, such as remote diagnosis and maintenance, info on preventive maintenance, etc. and even the possibility of exchanging work between laboratories, to cope with a high workload.
Product range
Same technology and different solutions according to customer’s needs.

From “entry level” solution for soft material and small dental lab to the “heavy metal” ones, for screwed prostheses and hard alloys (Ti and CoCr), we offer a solution for any size of lab and dental clinic, any materials and any type of prosthesis.
<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Number of axes</td>
<td>5 continuous</td>
</tr>
<tr>
<td>Size - mm - WxDxH</td>
<td>660 x 1000 x 950</td>
</tr>
<tr>
<td>Weight - kg</td>
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<td>Tool change</td>
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<tr>
<td>Number of tool positions</td>
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<tr>
<td>Electro spindle</td>
<td>Jäger 0.5 kW, 60,000 rpm</td>
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<tr>
<td>Axis-tilt angle</td>
<td>A = ±30°, C = 360°</td>
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<tr>
<td>Disc diameter - mm</td>
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<td>Tool stem diameter - mm</td>
<td>3 or 4</td>
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<td>Tool length - mm</td>
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<td>Precision of tool length measure - mm</td>
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<td>Tool breakage recognition</td>
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<tr>
<td>Power supply (single-phase)</td>
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</tr>
<tr>
<td>Compressed air need</td>
<td>7 atm - 50 lit/min</td>
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<tr>
<td>Brushless motor with closed loop encoders</td>
<td>standard</td>
</tr>
<tr>
<td>Noise level</td>
<td>&lt; 60 dB</td>
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<tr>
<td>Linear axis resolution</td>
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<tr>
<td>Rotary axis resolution</td>
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<td>Wet / dry machining</td>
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<tr>
<td>Managing of vacuum unit - external</td>
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<tr>
<td>Closed-loop digital encoder on linear axes</td>
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</tr>
<tr>
<td>Closed-loop digital encoder on rotary axes</td>
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</tr>
<tr>
<td>Touch screen monitor</td>
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</table>

Table top, designed for soft materials and disilicates

- Heavy steel structure for maximum stability
- 5-axes continuous milling
- Optimised strategy for 5-axes continuous milling on all materials
- Brushless motors with high resolution (20 bit) encoders for closed loop
- Linear movements with ground and polished worm screws and recirculating ball bushings, with direct coupling (no belts and pulleys).
- Rotary movements with lubricated-for-life hypocycloidal or epicycloidal gears with zero backlash
- Automatic tool change with 8 or 16 tool positions
- Jäger 0.5 kW, 60,000 rpm HF spindle
- Wet ↔ dry change in less than one minute
Table top, designed for all materials
Heavy steel structure for maximum stability
Optimised strategies for 5-axes continuous milling
Brushless motors with high resolution (20 bit) encoders for closed loop
Linear movements with ground and polished worm screws and recirculating ball bushings, with direct coupling (no belts and pulleys).
Rotary movements with lubricated-for-life hypocycloidal or epicycloidal gears with zero backlash
Automatic tool change with 16 tool positions
Wet ↔ dry change in less than one minute
**C6 Heavy metal milling center**

- **Premium grade table top milling centre for medium-large labs and dental clinics** (any material, any prostheses, cemented or screwed)
- **Heavy steel structure for maximum stability**
- **5-axes continuous milling**
- **Optimised strategies for 5-axes continuous milling on all materials**
- **Brushless motors with high resolution (20 bit) encoders for closed loop**
- **Linear encoders on the Cartesian axes for dual closed-loop.**
- **Linear movements with ground and polished worm screws and recirculating ball bushings, with direct coupling (no belts and pulleys).**
- **Rotary movements with lubricated-for-life hypocycloidal or epicycloidal gears with zero backlash.**
- **Automatic tool change with 18 tool positions**
- **Jäger 3.0 kW, 60,000 rpm HF spindle for heavy duty metal milling with external cooling unit** (included)
- **Wet ↔ dry change in less than one minute**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Number of axes</td>
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<td>Size - mm - WxDxH</td>
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<td>Number of tool positions</td>
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<td>Tool stem diameter - mm</td>
<td>4 or 6</td>
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<td>Tool length - mm</td>
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<tr>
<td>Power supply (single-phase)</td>
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<tr>
<td>Compressed air need</td>
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<td>Brushless motor with closed loop encoders</td>
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<td>Touch screen monitor</td>
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</table>

- Heavy metal milling center
- C6

C6

- Premium grade table top milling centre for medium-large labs and dental clinics (any material, any prostheses, cemented or screwed)
- Heavy steel structure for maximum stability
- 5-axes continuous milling
- Optimised strategies for 5-axes continuous milling on all materials
- Brushless motors with high resolution (20 bit) encoders for closed loop
- Linear encoders on the Cartesian axes for dual closed-loop.
- Linear movements with ground and polished worm screws and recirculating ball bushings, with direct coupling (no belts and pulleys).
- Rotary movements with lubricated-for-life hypocycloidal or epicycloidal gears with zero backlash.
- Automatic tool change with 18 tool positions.
- Jäger 3.0 kW, 60,000 rpm HF spindle for heavy duty metal milling with external cooling unit (included).
- Wet ↔ dry change in less than one minute.
**G5**

**Granite universal milling center**

- Premium grade milling centre for medium-large labs and dental clinics (any material, any prosthesis, cemented or screwed)
- 5-axes continuous milling
- Optimised strategies for 5-axes continuous milling on all materials
- Granite gantry system with 6 operating axes (plus tool changer)
- Whole operating structure in solid granite from South Africa (not only the basement) provide exceptional accuracy and stability in time
- Off-line tool assembly on ISO20 cones: each tool may have its own stem diameter (from 2 to 10 mm) and length (both metric and non-metric)
- Automatic tool change with 20 tool positions.
- Brushless motors with high resolution (20 bit) encoders for closed loop
- Linear encoders on the Cartesian axes and rotary encoders on rotary axes provide a dual closed-loop system of an exceptional repeatability and reproducibility of variable parameters (1,000 checks per second and correction when needed, on each of the 6 axes)
- Jäger 2.1 kW, 50,000 rpm HF spindle for heavy duty metal milling with external cooling unit (included)
- Wet ↔ dry change in less than one minute
Entry level
Medium level
Heavy metal
All-jobs
Small dental lab
Medium size dental lab
Medium size dental lab or dental clinic
Large dental lab or dental clinic
First approach to dental CAD CAM; soft materials and disilicates
Soft material, disilicates and hard material (cemented Ti and CoCr)
All materials, all jobs; designed for hard material (Ti and CoCr) and screwed prosthesis
Universal machine: all jobs, all prosthesis

### Features
- **Number of axes**: Continuous Continuous Continuous Continuous Continuous
- **Size - mm - WxDxH**: 660 x 1000 x 950 660 x 1000 x 950 662 x 1000 x 950 662 x 1000 x 950
- **Weight - kg**: 221 (487 lb) 221 (487 lb) 223 (497 lb) 223 (497 lb)
- **Tool change**: Automatic Automatic Automatic Automatic Automatic
- **Number of tool positions**: 5 8 5 8 5
- **Number of tool positions**: 5 8 5 8 5
- **Electrospindle**: 37÷50 37÷50 37÷50 37÷50 37÷50
- **Axis-tilt angle**: ±30° ±30° ±30° ±30° ±30°
- **Disc diameter - mm**: 25 25 25 25 25
- **Tool stem diamete r - mm**: 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4
- **Tool breakage recognition**: Automatic Automatic Automatic Automatic Automatic
- **Precision of tool length measure - mm**: ±0.001 ±0.001 ±0.001 ±0.001 ±0.001
- **Tool breakage recognition**: Automatic Automatic Automatic Automatic Automatic
- **Power supply (single-phase)**: 220÷240 V - 50÷60 Hz 220÷240 V - 50÷60 Hz 220÷240 V - 50÷60 Hz 220÷240 V - 50÷60 Hz 220÷240 V - 50÷60 Hz
- **Compressed air need**: 7 atm - 50 lt/min 7 atm - 50 lt/min 7 atm - 80 lt/min 7 atm - 80 lt/min 7 atm - 120 lt/min

### Specifications
- **Wet/dry machining**: Standard
- **Pre-mounted/ block holder**: Optional
- **Closed loop digital encoder on linear axes**: No
- **Closed loop digital encoder on rotary axes**: No
- **Touchscreen monitor**: Optional
- **Dynamic tool measure & feedback**: Optional

(*) High precision ISO20 tool holder; any tool may have its own stem diameter
(**) Measure of the effective  tool diameter (in rotation) and automatic correction

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### Specifications
- **5 continuous**: 661 x 1000 x 950 662 x 1000 x 950 662 x 1000 x 950 662 x 1000 x 950
- **20**: 760 x 1040 x 1950
- **Continuous**: 790 (1,742 lb) 790 (1,742 lb) 790 (1,742 lb) 790 (1,742 lb)
- **G5**: 20 (*) 20 (*) 20 (*) 20 (*)
- **Jäger**: 0.5 kW - 60,000 rpm 1 kW - 60,000 rpm 2.1 kW - 55,000 rpm 3 kW - 60,000 rpm 3 kW - 60,000 rpm
- **A = ±30°  C = 360°**: 98.5 with step 98.5 with step 98.5 with step 98.5 with step 98.5 with step
- **98.5 with step**: ± 0.0008 rad ± 0.0008 rad ± 0.0008 rad ± 0.0008 rad ± 0.0008 rad
- **220÷240 V - 50÷60 Hz**: 220÷240 V - 50÷60 Hz 220÷240 V - 50÷60 Hz 220÷240 V - 50÷60 Hz 220÷240 V - 50÷60 Hz 220÷240 V - 50÷60 Hz
- **7 atm - 50 lt/min**: 7 atm - 80 lt/min 7 atm - 120 lt/min 7 atm - 120 lt/min 7 atm - 120 lt/min 7 atm - 120 lt/min
- **< 60 dB**: < 60 dB < 60 dB < 60 dB < 60 dB < 60 dB
- **± 0.00005 mm (0.05µ)**: ± 0.00005 mm (0.05µ) ± 0.00005 mm (0.05µ) ± 0.00005 mm (0.05µ) ± 0.00005 mm (0.05µ) ± 0.00005 mm (0.05µ)

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5 continuous 660 x 1000 x 950 660 x 1000 x 950 662 x 1000 x 950 662 x 1000 x 950
20 (*) 760 x 1040 x 1950 790 (1,742 lb) 790 (1,742 lb) 790 (1,742 lb) 790 (1,742 lb)
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20 (*) 760 x 1040 x 1950 790 (1,742 lb) 790 (1,742 lb) 790 (1,742 lb) 790 (1,742 lb)
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<th>Inlay</th>
<th>Onlay</th>
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<th>Automatic crown</th>
<th>Automatic bridge - cemented</th>
<th>Automatic bridge - screwed</th>
<th>Telescopic crown</th>
<th>Bar on implants - cemented</th>
<th>Bar on implants - screwed</th>
<th>Secondary bar</th>
<th>Fronts bridge</th>
<th>All-on-4 / All-on-6</th>
<th>Abutment Ti / Co-Cr</th>
<th>Hybrid abutment Ti / Co-Cr</th>
<th>Abutment from premilled</th>
<th>Scan abutment</th>
<th>Mobile prosthesis</th>
<th>Removable partial denture</th>
<th>Occlusal Splint / Bite</th>
<th>Surgical guide</th>
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Suggestions for choosing the machine: based on jobs to be performed

<table>
<thead>
<tr>
<th>G5</th>
<th>A5</th>
<th>C5</th>
<th>C6</th>
<th>QS</th>
</tr>
</thead>
</table>

Suggestions for choosing the machine: based on materials used

| POM | PMMA | PMMA composite | PEKK | PTFE | PU | Silica | Glass ceramic | Aluminium | Titanium gr | Titanium gr | Co-Cr | Co-Cr alloys | Co-Cr presintered | Cr-Co preceramic | Disilicates | Glass ceramic | PMMA composite | PMMA | PMMA composite | PMMA composite |
|-----|------|----------------|-------|------|----|--------|---------------|-------------|------------|-------------|------------|-------|----------------|----------------|-----------------|-----------------|-------------|----------------|----------|----------------|----------------|

Ideal | Feasible | Not recommended | Ideal | Feasible | Not recommended
The strength of focus

Dental Machine Srl

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