



M-TMD 4/2 & 6/2

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MINI DRAG FINISHING MACHINE

Range M-TMD 4/2 and 6/2

Applications

The drag finishing systems developed by TROWAL represent a special technology for surface finishing of:

- high-value, delicate components
- components with many contours and complex geometry
- extremely hard materials which are difficult to machine

The applications for the TROWAL drag finishing technology range from grinding and edge radiussing, all the way to surface smoothing and high gloss polishing of decorative parts. Processing examples include:

- end mills
- drill bits
- milling cutters
- cylinder roller cutters
made of hard metal carbide or CBN



Functional Principle

The components are attached to special fixtures and "dragged" in a planetary movement through a bed of grinding or polishing media.

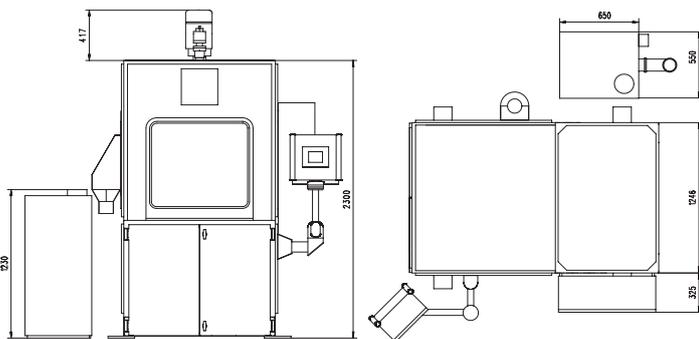
- geometrically precise radii with uniform rotation of the spindle
- adjustable grinding performance due to variable immersion depth
- components cannot touch or damage each other during the finishing process

Technical Characteristics

- main drive by means of robust geared motor
- raising / lowering of the rotary station into and out of the work bowl
- quick and easy change of media, e.g. from grinding to polishing media via simple replacement of movable work bowls
- integrated, easy-to-handle industrial PC with touch screen
- individual speed adjustment of all drives
- optional upgrade for automatic loading and unloading of the components

Processing aim

- production of defined and reproducible edge radiussing on hard metal carbide tools
- improvement of the surface quality within the chip groove and free surfaces of hard metal carbide tools
- improvement of the uptime of tools when processing difficult to machine materials
- improvement of the surface for subsequent coating processes
- smoothing of the surface after coating



Advantages

- precise edge radiussing with extremely short processing times
- fully reproducible process
- surface improvement of the free surfaces and the chip groove
- improvement of the durability of surface coatings
- extreme cost reduction due to considerably longer uptime of the tools

Equipment

- rotary disc driven via main drive
- work stations driven via separate motor
- RPM and direction of rotation of main drive and work stations independent from each other
- main drive and work stations with infinitely variable speed drives
- precise adjustment of immersion depth into the mass of grinding media

Tooling stations

- pneumatic tooling stations for quick loading and unloading
- special chucks for tools
- different shaft diameter (automatic mode)
- optional four or six tooling stations

| Technical data | M-TMD 4/2 | M-TMD 6/2 |
|--------------------------------------|-------------------|-------------------|
| Dimensions | 1700x1600x2550 | 2100x1800x2800 |
| Weight | 1580 kg | 2580 kg |
| Inner diameter / Volume of work bowl | 600 mm; 100 litre | 800 mm; 140 litre |
| RPM range - main drive | 5-30 RPM | 10-50 RPM |
| RPM range - fixturing device | 5-15 RPM | 5-15 RPM |
| Max. immersion depth | 300 mm | 350 mm |
| Diameter of components | 3-21 mm | 3-30 mm |
| Special fixturing device | Upon request | Upon request |
| Dust removal | optional | optional |
| Conditioning of grinding media | optional | optional |

**M-TMD 4/1**

TROWAL DRAG FINISHING MACHINE

Range M-TMD 4/1

Applications

The drag finishing systems developed by Trowal represent a special technology for surface finishing of:

- high-value and delicate components
- parts with many contours and complex geometry
- extremely hard materials which are difficult to machine

The applications for the Trowal drag finishing technology range from aggressive grinding and radiusing all the way to surface smoothing and high gloss polishing of decorative parts.

Examples

- surgical implants
- turbine blades
- precision compressor and pump parts
- parts made from hard metals and materials
- sintered parts, etc.



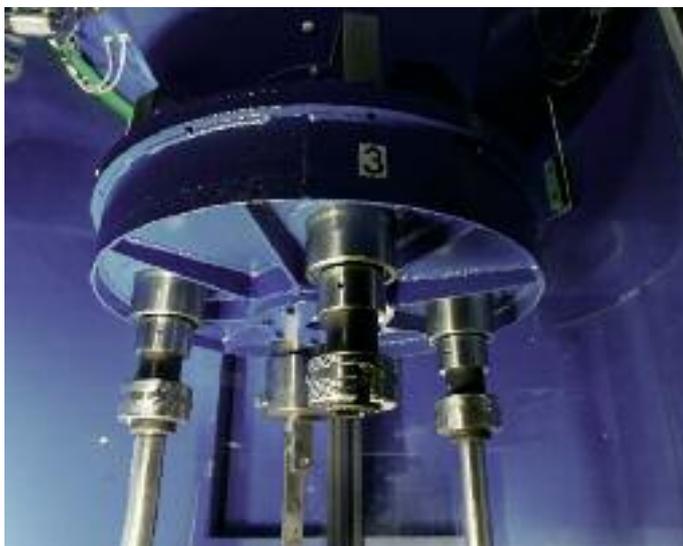
Functional principle

The components are attached to special fixtures and "dragged" in a planetary movement through a bed of grinding or polishing media.

- The process provides up to 40 times higher grinding performance, when compared to mass vibratory finishing
- The components are individually attached onto fixtures and, therefore, cannot impinge on each other

Technical characteristics

- Compact design requiring very little space
- Main rotary station driven by robust geared motor
- Raising/Lowering of the rotary drive system with positive spindle drive
- Work bowl lined with wear-resistant polyurethane
- Quick and easy change of media, e.g. from grinding to polishing media via simple replacement of movable work bowls
- "User friendly" control panel with individually selectable processing programs
- Frequency converter for variable adjustment of rotary speed



Equipment

- Work stations

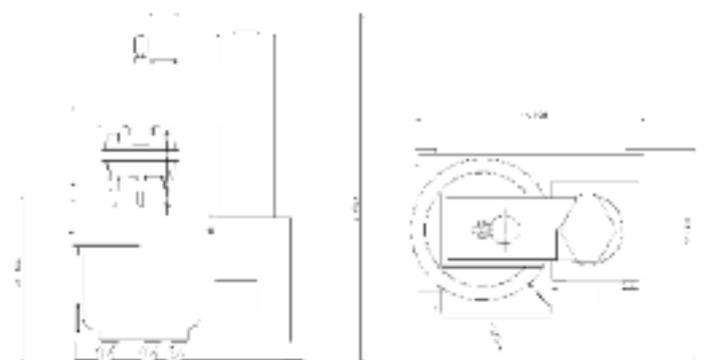
Either:

- Simple single rotary station or
- 4 rotating work stations or
- Planetary drive with up to 4 work stations

Tooling positions

- Adapter shaft with bayonet locking device or
- Tooling position "MS" for pneumatically operated locking and unlocking of the work piece fixtures
- Up to 4 tooling positions

| Technical Data | M-TMD 4/1 |
|----------------------------------|---|
| Dimensions | 1700x1600x2600 mm |
| Weight | 1560 kg |
| Dimensions work bowl | 830 mm Diameter 245 Liter Volume |
| Drive System main rotary station | RPM range – main drive 25-70 U/min RPM range – fixturing device 37-105 U/min |
| Max. work pieces | 2 tooling positions 320 mm 4 tooling positions 230 mm |
| Stroke length | 600 mm |



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