www.dmgmoriseikiusa.com

Grinding / Grind Hardening

- Integration of Operations
- Simplified operation sequence
- Perfect for a Small batch production

Types of Grinding processes implemented

- Conventional grinding
- Viper Grinding
- High Velocity grinding
- Creep feed grinding
- Grind Hardening

DMG MORI SEIKI

Grinding Packages configured to specific applications

Mori Seiki offers special grinding packages for grinding on the CNC machine.

The special packages typically include

a. Coolant wash and protectors for the way covers
b. Seals on the guideways

The packages are designed to help extend the machine life with grinding. Additionally, a high pressure coolant unit with appropriate filters is specified.

All types of wheels supported

The machine can support

- Electroplated bond
- Vitrified bond
- Resin bond

Applications

- Finish Grinding of cams for camshafts, crankshafts in IC engines
- Sealing surfaces on pumps, valves and etc.
- Bearing Journal diameters

Enabling Technol

Machine Configuration

Grinding implementation involves integration of many new processes such as dressing and coolant delivery. The design of multi-tasking machines from DMG/MS is suitable to accommodate these new processes. We have developed some unique and patented technologies to assist grinding process in a CNC environment.

a. Lower turret for wheel dressing
b. Programmable coolant nozzle
c. In machine measurement of the ground parts
d. Tool changeable through coolant adapter

Why Grind in a CNC multi tasking center?

Efficient operation for small batch sizes

- Conventional grinding
- Consolidated operations

Exotic applications like grinding of Ni based materials that need

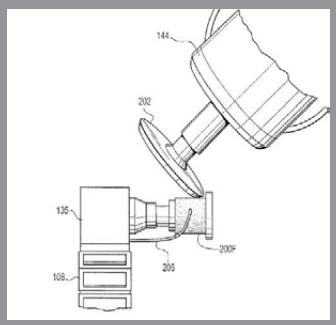
- Wheel changes
- Dresser changes
- Nozzle changes
- CNC control of coolant pressure or volume

Grind Hardening

- Hardening selected areas of part with significant energy savings
- Consolidated operation
- Reduced work in process

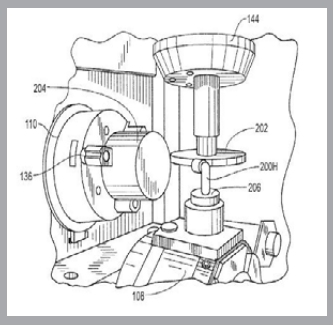
Patented Technologies

Dressing from turret



US Patent 7797074

Programmable coolant nozzle



US Patent US8074543

ogies for Grinding in a CNC machine

Dressing Operation

The DD Motor and design of lower turret allows to perform single point and roll from dressing of wheels

Programmable Coolant Nozzle

Programmable coolant nozzle allows to adjust the location of the coolant delivery using CNC program. This helps in:

- Use of different diameter grinding wheels
- Compensation for in- process grinding wheel wear

Tool changeable head with through coolant

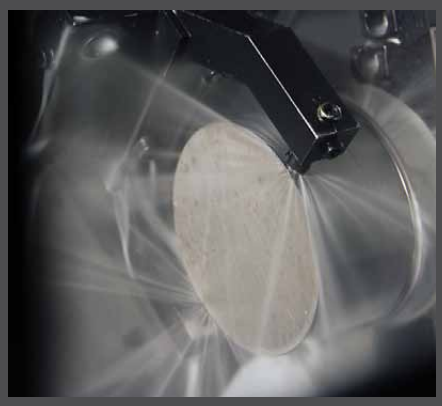
Patent Pending

Grind Hardening

Patent Pending

Grill: Grinding and Milling

Hydrogage : In Machine & accurate measurement of Ground workpieces

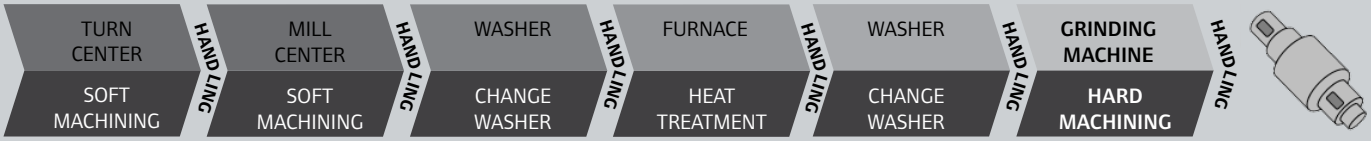


Grind Hardening

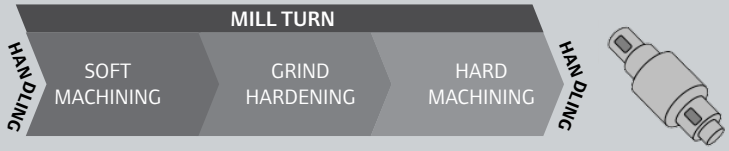
- Grind-hardening is a short-time austenizing technology and can replace flame hardening,induction hardening furnace or laser hardening
- Suitable for most ferrous materials which are suitable for surface hardening by induction, furnace or flame hardening
- Significant energy savings 60%-85% ($/part)
- Harden only the areas you really need
- Harden selectively (gradient hardness) when desired
- Achieved a hardness depth of 2 mm and 62 HRC surface hardness
- Excellent repeatability of hardening process
- In combination with finish grinding or hard turning the part can be machined complete in a single operation

Various Grind Hardened parts

Conventional process chain with separate heat treatment



Heat treatment integrated process chain on mill turn center



Machine-internal automated
Workpiece transfer between
Workpiece main and sub spindle

Example Application

- Material: 1040
- Hardness Reqd : 56-60 RC, 1.5-2.0 mm depth
- Cycle time: 4-15 sec/sq in [0.05-0.21 sec/sq cm]

Inquiries
Please contact your local distributor
We need
- Part prints
- Material Specs
- Hardness Specs

Partners

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