Company

ERNST GROB AG

Cold forming machines
Special purpose machines
Slotting machines

General information

- ERNST GROB AG is a Swiss manufacturer of cold forming machines for a wide field of different applications e.g. splines on sheet or solid material parts as well as for slotting machines for sheet metal applications

History

- 1962 Foundation of the company by Dr. h. c. Ernst Grob
- 1963 Export of the first machines to Germany, Italy and Japan

Today

- 3 Company locations
  - Männedorf
  - Oetwil am See
  - Beijing
- 15 Agencies worldwide
- 100 Employees and 6 trainees
- Over 1’000 machines built
- ERNST GROB AG introduction movie

Product & information

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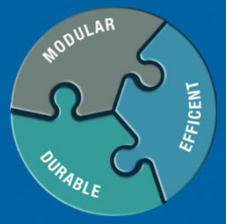
Cold forming machines
Special purpose machines
Slotting machines

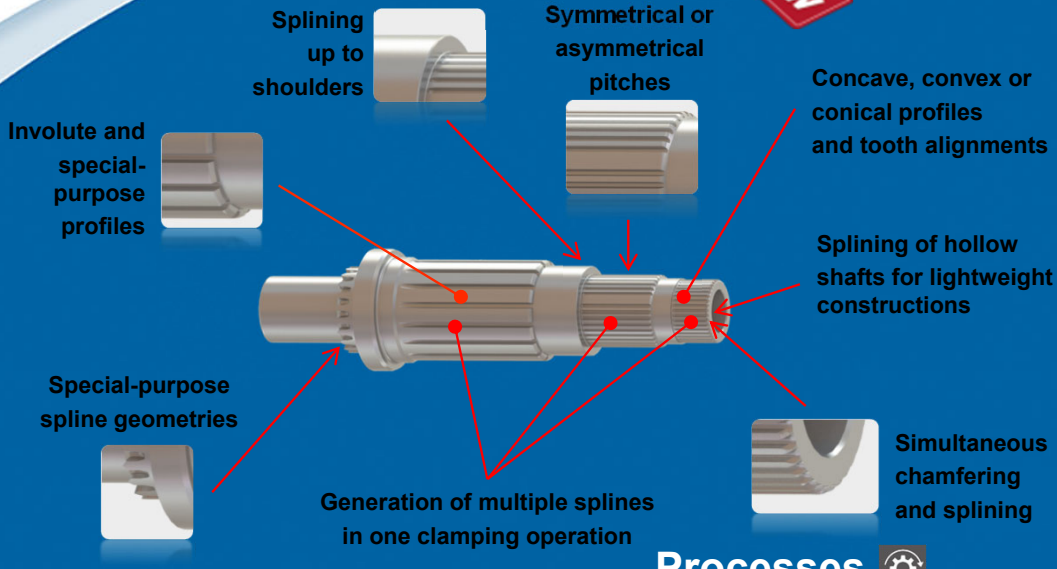
A-Series New

Cold forming solid/sheet material

Machine

our NEW A-Series combines it all





Processes

Cold forming solid material

Cold forming sheet metal

Intermittent forming solid material

Intermittent forming sheet metal

Necking/reduction sheet metal

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Information

Cold forming solid material

Cold forming machines
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Lightweight rotor shaft e-motor (study)

Applications

.. Automotive

- Propeller/cardan shafts
- Drive shafts
- NEW e-mobility E-Motor shaft(s)
- Camshafts
- Axle shafts and axle housings
- Break cam shafts
- Bevel gear shafts
- Shafts in transmissions
- Splines in gearboxes
- Splines on crankshafts
- Steering applications

.. Industrial

- Pump shafts // extruder shafts
- Shredder shafts // crane shafts
- Splines for special applications and machinery

…… and many more

Merits

.. Economically

- Short cycle time // short machine changeover time
- No tool wear (no change of geometry during tool life)
- Economic machine investment / Economic tool costs
- Flexible machine layout

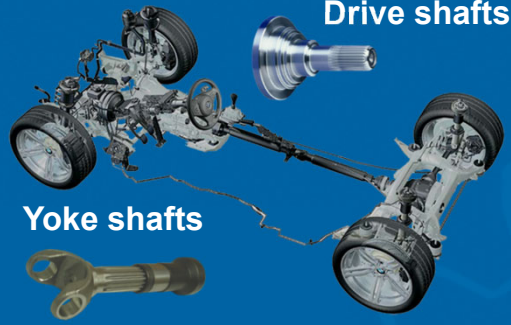
.. Quality

- Spline quality DIN 5* - 7 (* partly possible, e.g. DIN 5480, 3960 or 3962)
- Surface roughness at least Ra 0,4 ~ N5
- Superficial surface hardening
- No cutting of the natural material grain flow

.. Flexibility

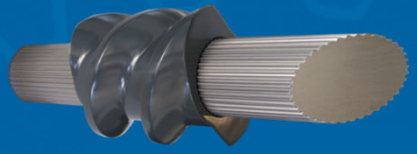
- Almost no limits in design and shape of spline (involute, parallel, ball bearing, sawtooth, helix,….)
- Less distortion when heat treatment is applied
- Forming of material up to 1500 N/mm² (HV 464 / HB 441 / HRc 46)
- Module range from 0.5 up to 10 (for larger modules, tests are required)
- Forming of hollow parts
- Up to 3 splines in one clamping **(with shifting option)**

Drive shafts



Yoke shafts

Extruder shaft



Camshafts (Audi and Mercedes)

Product &information

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Cold forming machines
Special purpose machines
Slotting machines

R3

Spinning sheet metal

Machine

Applications ..

.. Automotive .. Industrial

- Production of preforms for GROB T12 and i9 cold forming and S8 slotting machines
- Production of precision, light-gauge and rotationally symmetric hollow workpieces with constant or variable wall thicknesses

Merits ..

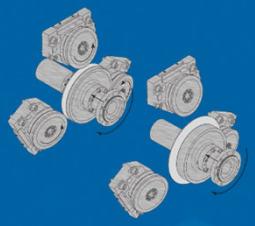
.. Economically

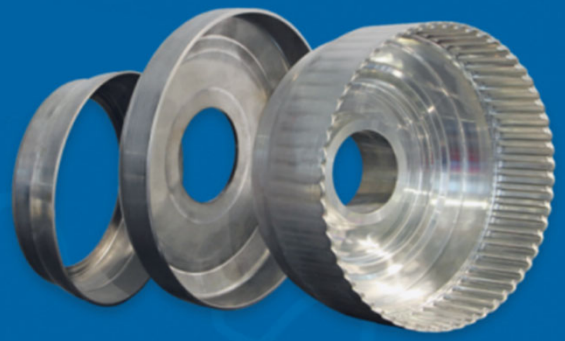
- Extremely short cycle times // short machine changeover time
- No tool wear (no change of geometry during tool life)
- Economic tool costs
- Economic machine investment
- Flexible machine layout

.. Quality

- State of the art CNC machine controls
- ….. for the compensation of the m. spring back as example
- ….. with Siemens ONE or FANUC 31iB

Process





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Product & information

Cold forming sheet metal

Cold forming machines
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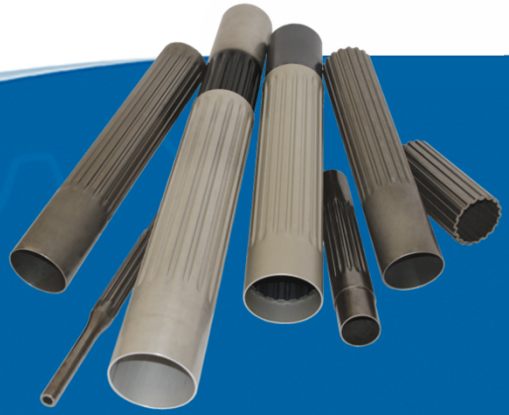
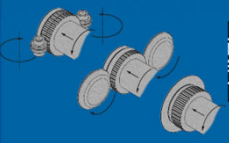
T12



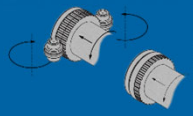
Machine

Processes

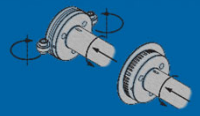
Spinning and cold forming



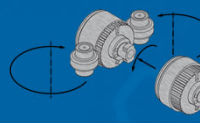
Cold forming



Direct cold reduction



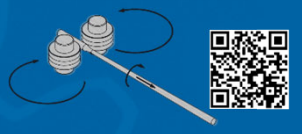
Cold reduction



Stroke stamping

Intermittent forming

Cold reduction bar stocks



Information

Cold forming sheet metal

Cold forming machines
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Slotting machines

Applications

.. Automotive

- Inner and/or outer splines on clutch plate carriers for ...
  - … automatic transmissions
  - … e-mobility rotor carrier e-motor
  - … various hydraulic and magnetic clutches (e.g. double clutch DSG)
- Tubular drive shafts
- Tubular steering applications
- Starter gears and flex plates
- Pulleys
- Sensor disks
- Lightweight brake disc carriers (e-mobility)

.. Industrial

- Splines for special applications and machinery
- And many more

Merits

.. Economically

- Economic machine investment (e.g. compare to other processes)
- Short cycle time // short machine changeover time
- No process necessary before forming (e.g. soaping/bonding)
- No tool wear (no change of geometry during tool life)
- Economic tool costs

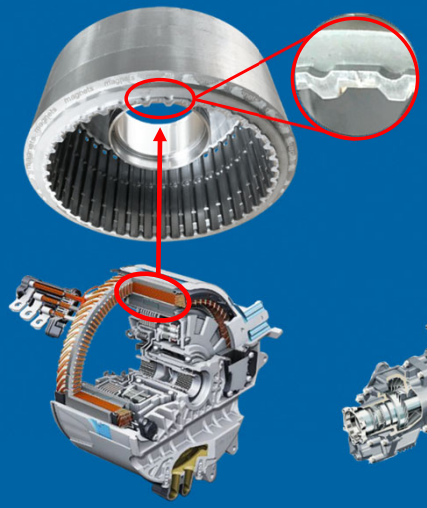
.. Flexibility

- Usable spline inside/outside or combined
- Mat. tensile strength up to 1100 N/mm²
- State of the art CNC machine controls …
  - … for the compensation of the material spring back as example
  - … with Siemens ONE or FANUC 31iB

.. Quality

- High spline qualities // complex spline geometries
- Surface roughness at least Ra 0,4 ~ N5
- Superficial surface hardening in area of deformation
- No cutting of the natural material grain flow

Rotor carrier e-motor (e-mobility) gearbox



Clutch plate Carrier (DSG)

Lightweight brake disc carriers

Product & information

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Cold forming machines
Special purpose machines
Slotting machines

i9

Internal forming solid/sheet material

Machine

Applications ..

.. Automotive .. Industrial

- Classic lightweight sheet-metal clutch plate carriers
- Hollow ring gears for planetary gear assemblies
- Thick-walled workpieces with internal splines
- Ring shaped workpieces or w. with closed base contours
- Direct joining through forming or clinching

Merits

.. Economically

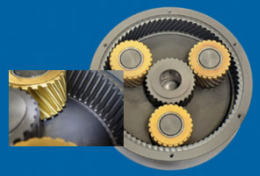
- No tool wear / Economic tool costs
- Flexible machine layout
- Multiple tools (revolver-type tool holder)

.. Quality

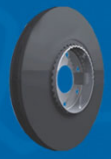
- Superficial surface hardening
- No cutting of the natural material grain flow

.. Flexibility

- Efficient manufacturing of inner contours with negative forms
- Usable spline inside/outside or combined
- Thick-walled workpieces with internal splines
- Ring shaped workpieces or w. with closed base contours
- Direct joining through forming or clinching
- State of the art CNC machine controls (Siemens ONE or FANUC 31iB)



Processes

Internal forming thick-walled	Internal forming thin-walled	Direct joining & clinching
		

Product & information

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Cold forming machines
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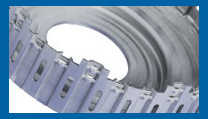
S8

Slotting, trimming, coining and forming sheet metal

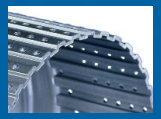
Machine

Processes

Trimming to length and forming of snap ring grooves



Punching of holes and slots



Forming of end stops and oil dams

Forming of lead in chamfers (inside/outside)

Punching of castle teeth and sensor holes

Merits

.. Economically

- Fast processing (265 strokes/min. x 4 workstations)
- Short machine changeover time
- Economic tool costs
- Dry process

.. Quality

- Mechanical punch and die movement (mech. defined end position)
- Mat. tensile strength up to 1100 N/mm² (HV 340 / HB 323 / HRc 34)

.. Flexibility

- Compact design
- Flexible layout 1 - 4 workstations
- Additional dedicated station (e.g. turning, milling, …)
- Process controlled and adjustable by full CNC controlled machine (Siemens ONE or FANUC 31iB)

Application

.. Automotive .. Industrial

- Various slotting, trimming and forming steps ..
- .. on clutch plate carriers for automatic transmissions
- .. various hydraulic and/or magnetic clutches (e.g. double clutch)
- .. on brake disc carriers
- .. on round sheet metal parts in general

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Service

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Automation and combination/integration