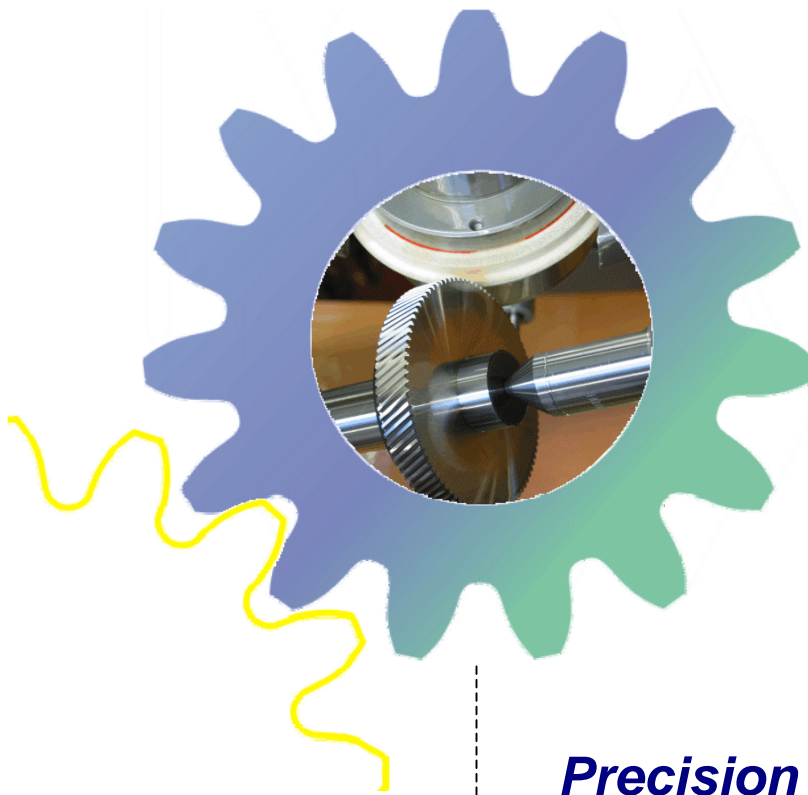
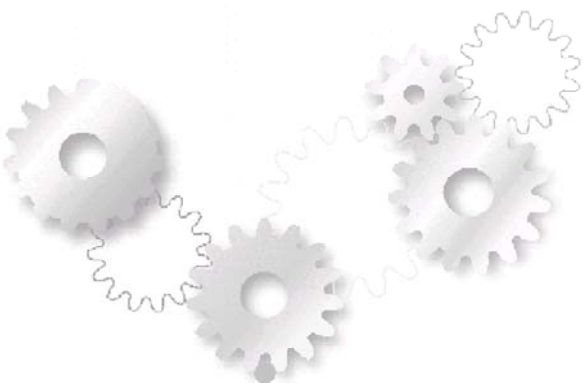




Gear and spline production



***Precision begins
with one piece***

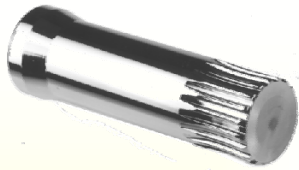


*pure
perfection*

FRENCO

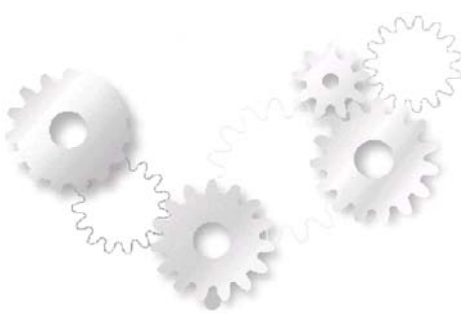
Welcome to the world of gear and spline

FRENCO produces gear and spline for single pieces or small batches. FRENCO has specialised in high precision gear and spline. In cooperation with our partner company we are also very welcome to produce whole pieces according to your wishes. Benefit from our large experience with gear and spline! Or wouldn't you like to have a partner, who has dedicated to "pure perfection" and realizes it day by day.



pure perfection

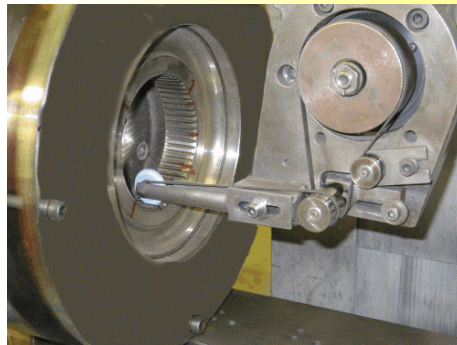
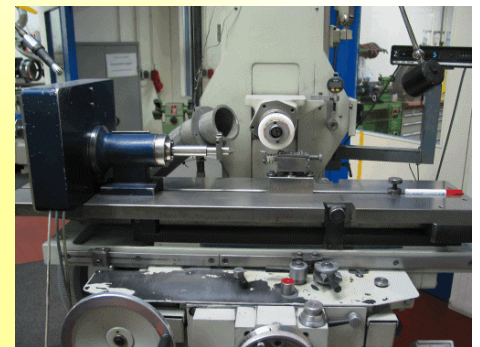
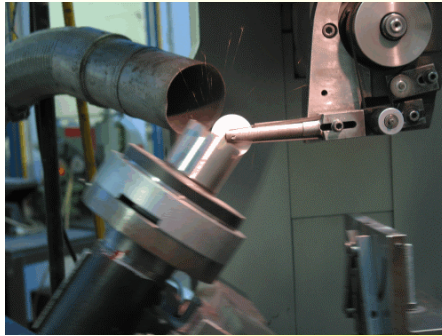
FRENCO



Producing gear and spline

Manual grinding

For the production of spur gears and splines the manual grinding has still today many advantages. This production process make high demands on the grinding specialist. The machine, the measuring technic and the grinding specialist taken together enables us to produce gears and splines accurate to a μ .



Using manual grinding gear and spline can be produced within the measurements listed below:

| | | | |
|--------------------------------------|----------------------|---------------|-------------------------|
| Max. length of work piece | external gear/spline | | 560 mm |
| | internal gear/spline | | 300 mm |
| Max. length of gear or spline | external gear/spline | | 500 mm |
| | internal gear/spline | PCD up to 30 | 70 mm |
| | internal gear/spline | PCD up to 60 | 110 mm |
| | internal gear/spline | PCD up to 150 | 150 mm |
| Max. conducting diameter | | | 300 mm |
| Max. pitch circle diameter | external gear/spline | | 300 mm |
| | internal gear/spline | | ca. 250 mm |
| Min. pitch circle diameter | internal gear/spline | | 16-18 mm |
| Max. weight of work piece | | | 50 daN |
| Material | | | steel, copper, graphite |
| Accuracy of gear or spline | DIN 3962 | | Q3 |
| | DIN 5480 | | Q3 |

NC-grinding

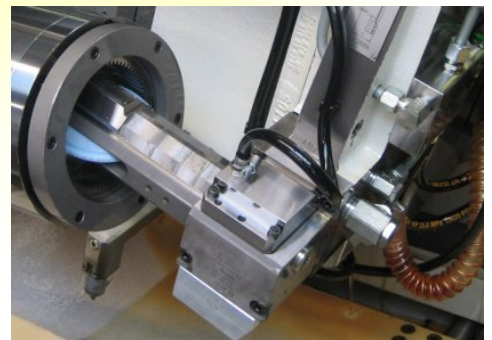
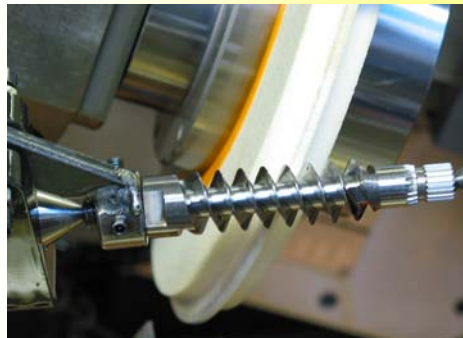
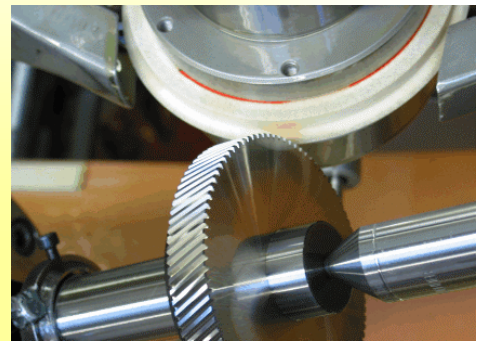
The NC-grinding of gears and splines is carried out on a KAPP VAS 55 P. This machine has been improved to highest precision for the special requirements of FRENCO. Both is in use dressed grinding disks and CBN-disks.

Specially developed software-modules allow the work on worms.

Also the topological grinding of exceptional modifications is possible.

New since 2008!!

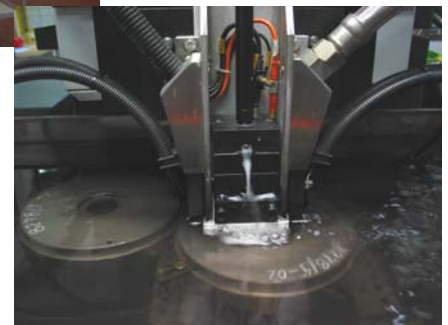
Internal grinding configuration for grinding internal splines with helix angle in highest quality.



| | | |
|--------------------------------------|-----------------------|----------------|
| Max. length of work piece | external gear/ spline | 750 mm |
| | internal gear/spline | on arrangement |
| Max. length of gear or spline | external gear/ spline | 500 mm |
| | internal gear/spline | on arrangement |
| Max. pitch circle diameter | external gear/ spline | 450 mm |
| | internal gear/spline | on arrangement |
| Max. weight of work piece | | 50 daN |
| Material | | steel, titan |
| Accuracy of gear or spline | external gear/ spline | Q2 (DIN3962) |
| | internal gear/spline | Q3 (DIN3962) |

Wire-EDM in highest precision

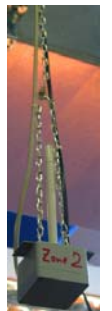
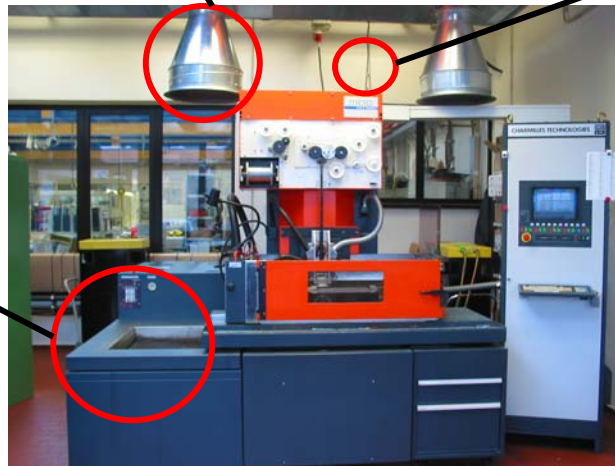
By dint of sophisticated technic our wire-EDM machines are adjusted to highest precision. Standing in a fully air-conditioned room, they are never exposed to variations in temperature. This fact combined with the know-how of the operating specialists, results in a never seen precision.



The extraction hoods provide a constant air humidity.



By an internal water cooling system the temperature of the machine is kept constantly.



By these sensors the air temperature in the room –especially around the machines– is monitored by a computer.

| | |
|--------------------------------------|----------------------------------|
| Max. length of work piece | 200 mm |
| Max. length of gear or spline | 150 mm |
| Max. conducting diameterr | 220 mm |
| Max. pitch circle diameter | Ca. 210 mm |
| Max. weight of work piece | 40 daN |
| Material | steel, copper, non-ferrous metal |
| Accuracy of gear or spline | Q3 DIN 3962 Q3 DIN 5480 |

Pre-machining

FRENCO concentrates on producing gears and splines, but we do not manufacture the pieces for it. The production of such high-precision single pieces or small batches is carried out by our cooperation partner: MUNKERT GmbH. This company features most modern production technics and a highly qualified team. The production is made precisely according to the drawing and includes the provision of materials as well as the coating and the heat treatment.

New since 2008!!

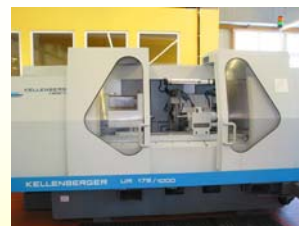
5-axis HSC-BAB
CAM: Mastercam X2
Zeiss Prismo Navigator



Turning



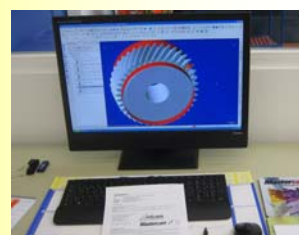
Surface grinding



Cylindrical grinding



3D-measuring



CAM



4- or 5-axis hobbing



| production technic | range |
|-----------------------------------|------------------------------|
| Cutting | max. Ø 200 |
| Conventional turning | max. L 1000, max Ø 300 |
| Turning NC | max. L 1500, max Ø 250 |
| Conventional hobbing | max. 300x200x300 |
| Hobbing NC 4 axis | max. 800x500x540 |
| HSC-hobbing 5 axis | max. 600x600x500 |
| CAM Mastercam X2; interfaces: | ASCII, DXF, DWG, IGES, STEP |
| Surface grinding | max. L 600 x 300 |
| Conventional cylindrical grinding | max. L 600, max. AØ250 IØ200 |
| Cylindrical grinding NC | max. L 1000, max. Ø 350 |
| Center grinding | max. L 600 |
| Grinding out of round | max. L 1000, max. Ø 350 |

FRENCO Product Lines



Gear and spline high precision

Spline Gages
Master Gears, master wheels
Artefacts, masters
Profiled tools
Clamping systems
Gear and spline manufacturing



Instruments for size inspection Series V

Ball inserts and pins VRK
Instruments for rocking VA
Instruments with face stop VP
Indicating Gages VM
Variable 3-Disc Gages VD
Customized solutions VS



Rotation Measuring Systems

URM - K with balls and pins
URM - R with master wheels
EWP Single flank gear rolling
ZWP Double flank gear rolling
WS Gear Rollscan



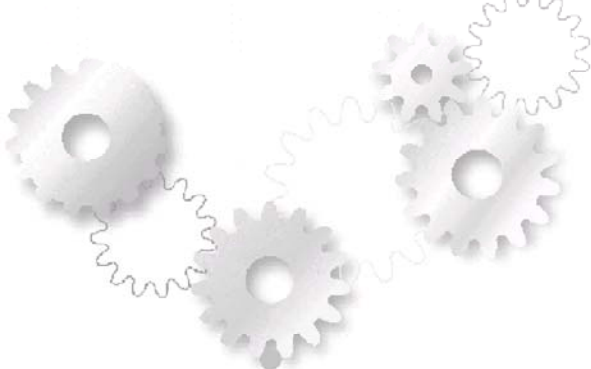
Gear and spline inspection

DKD gear calibration
Gage wear inspection
Part inspections
Deviation analysis



Know-how transfer

Software for gear and spline calculating
Training, seminars and workshops
Consulting and calculations
Literature and documents
National and international standards



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gear + spline technology

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