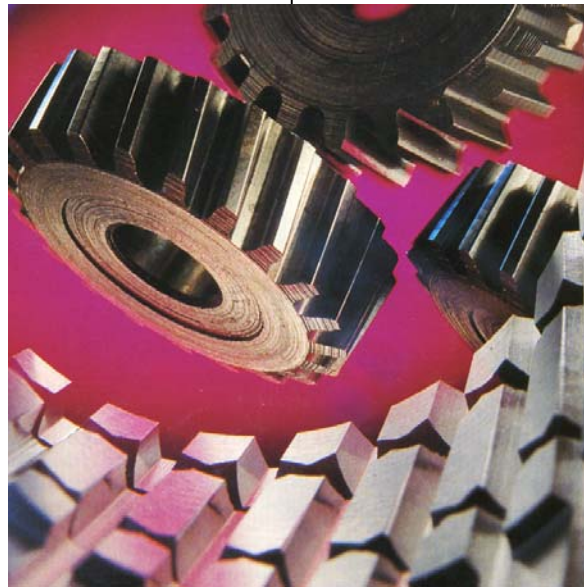




Profiled clamping systems

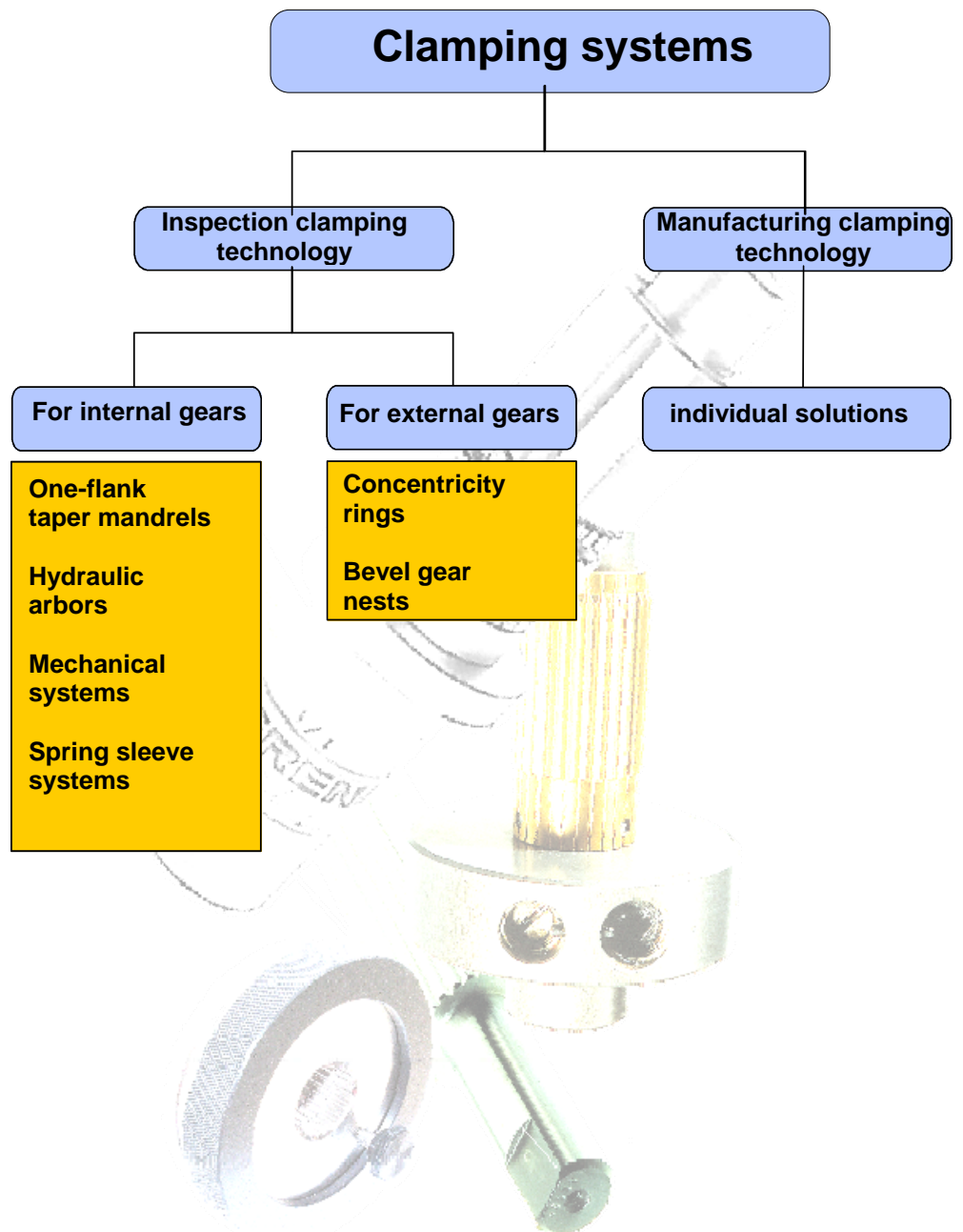


***The datum of
tooth flanks***



Overview

Clamping systems secure workpieces in the gear profile where they are centered and clamped in the tooth flanks. Both testing operations as well as machining processes are possible relative to the tooth flank datum. Arbors are used for internal gears and chucks for external gears. The constructive design of these clamping devices is diverse in its implementation. Various clamping methods may be suitable depending on the task at hand. Selection of the most appropriate methods requires expertise and knowledge. Both are offered by the FRENCO specialists as a consequence of their many years of research and experience. The basic definition of the clamping methods should only be undertaken by specialists.

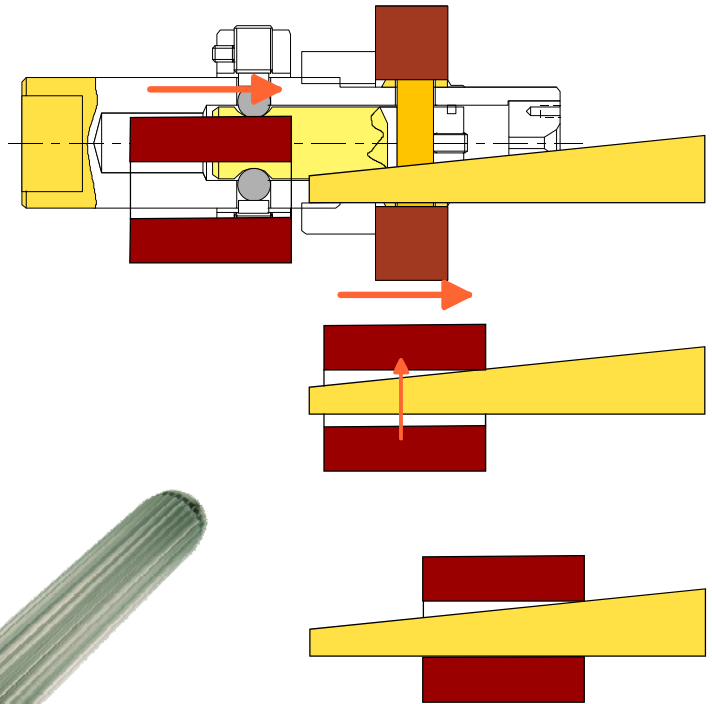


FRENCO

Inspection clamping technology for internal gears

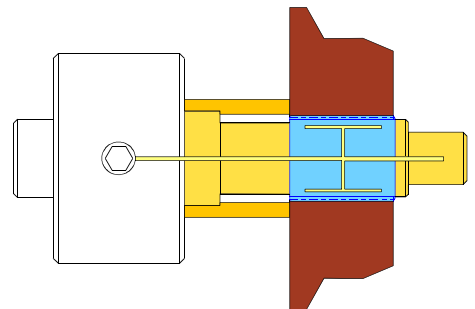
One flank taper mandrels

One flank taper mandrels are manufactured from a single piece of material. Each tooth of the high precision ground profile has one straight, non-conical tooth flank and one conically ground flank. The tooth thickness thus increases from the front to the rear. The conical tooth flank serves to clamp the workpiece while the straight tooth flanks are responsible for centering.



Hydraulic arbors

Hydraulic arbors have an expanding sleeve with ground profile. The clamping cylinder exerts pressure on the hydraulic oil inside. This pressure expands the sleeve within its elastic range and creates tension.



Mechanical clamping systems

Screws turn the inside torque shaft. The torque shaft has a slot in which a retaining lug is fixed. This lug turns the workpiece until it engages on the tooth flanks of the arbor.



untensioned



tensioned

Spring sleeve systems

Friction arises when tensioning the workpiece, between the clamping sleeve, which is axially compressed, and the workpiece, as well as between the clamping sleeve and the guide diameter of the body of the part. This friction causes imprecision in clamping and wear.



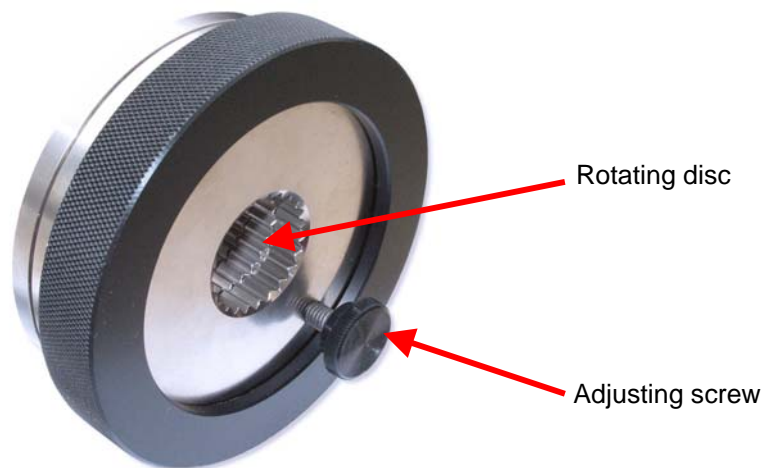
Inspection clamping technology for external gears

Concentricity rings

Concentricity rings consist of 3 profiled discs. The 2 outer discs are fixed. The middle disc rotates. Rotation is activated by the inner springs. The rotation of the middle disc rotates the specimen via contact with the tooth flank until it is aligned with the fixed tooth flanks of the outer disc. The outer diameter of the concentricity ring is ground concentric with the gear profile. This serves to measure runout deviations of the specimen, e.g. with a dial indicator.

Tension is released by means of a knurled screw, which is screwed in until the specimen is free to be removed again.

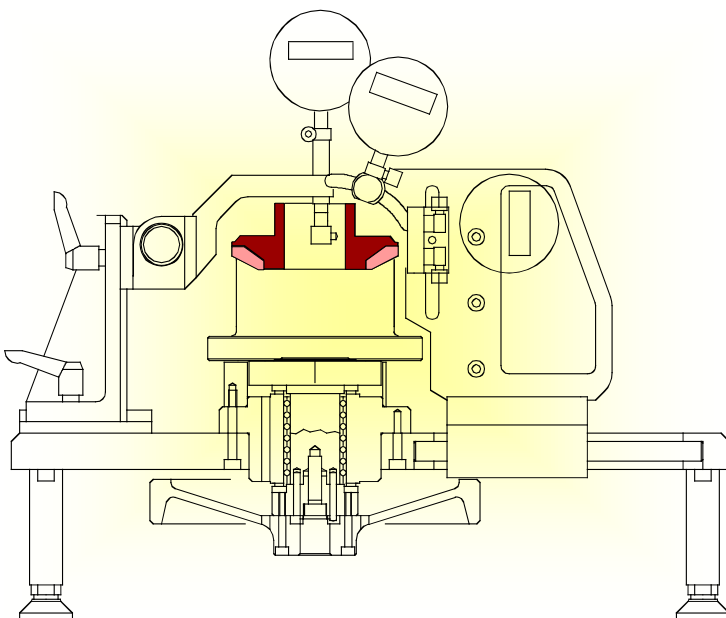
An inspection arbor belongs to every concentricity ring, with which the accuracy of the concentricity ring itself is determined and monitoring of the inspection equipment is carried out.



Bevel gear nests

Bevel gears have a positional tolerance with respect to the external geometry and the bore.

Nests serve for clamping bevel gears in the tooth flanks in order to check positional deviation or to carry out machining relative to the tooth flanks.

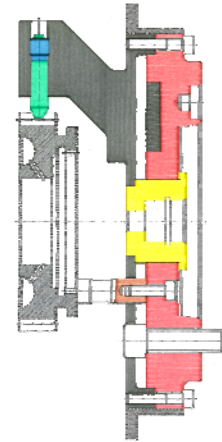


Measuring fixture for bevel gears, clamped in nests

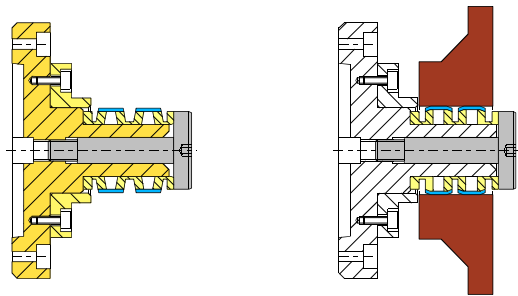
Production clamping technology

Even in cases where FRENCO does not manufacture production clamping technology itself, you can still order it from us and profit from our extensive experience with clamping technology. We work with highly competent manufacturing partners to be in a position to guarantee you the accustomed high FRENCO quality.

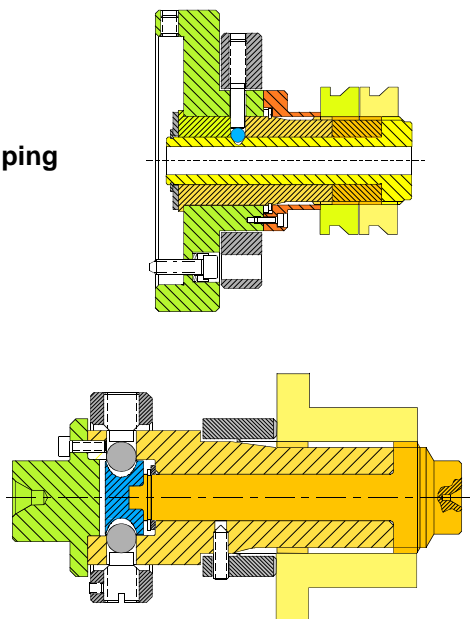
Diaphragm chuck for gears



Spring sleeve clamping system



Multiple disc clamping systems



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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