

KÖNIG - THREADED CLAMPING SYSTEM

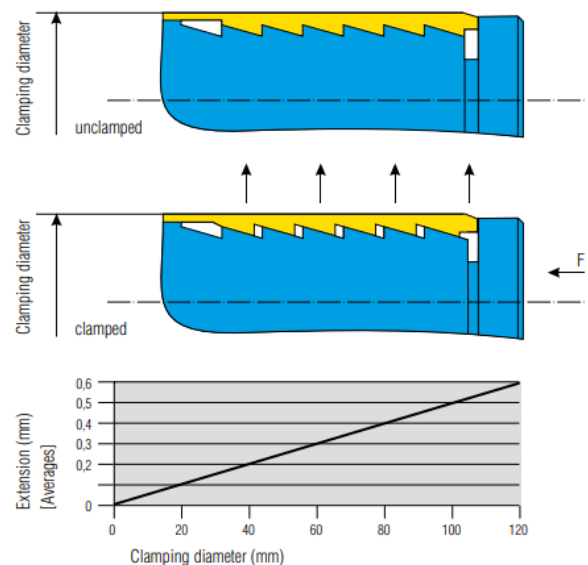
The function principle of the thread profile clamping tools

The König-mtm threaded clamping system consists of a collet that is screwed onto the base body. With the help of a threaded profile and an axial force movement, the collet is pushed over the specially ground profile. Due to the flank angle, a cylindrical expansion takes place in the radial direction, which results in the clamping of the workpiece.

The operating principle of the threaded profile clamping devices allows higher loading cycles than conventional hydraulic expansion tools. For long clamping lengths, you can achieve even cylindrical expansion. Depending on the application or clamping diameter, it is also possible to clamp tolerances up to tolerance class IT 13.

Actuation

Actuation of the mechanical clamping equipment occurs through hydraulic machine pressure, or via the tensile force or compressive force of the machine or tailstock side.



Application example from practice

Reduction of wobble in multiple toothing and increase of concentricity in gear hobbing of drive gears.

Clamping task: Double internal clamping on two different clamping diameters

Target: Increase machining accuracy and productivity by raising the cutting values

Processing: Gear hobbing

Workpiece: Drive gear

Given previous, positive experiences that a long-term customer had gained in the field of gear machining with König-mtm, he turned to the company with a new inquiry in 2021.

The manufacturing process for drive gears machined on a milling machine was to be optimized. During the machining of this workpiece, enormous problems with concentricity or wobbling of the gearing was occurring.

Together with the responsible application engineer from König, the task was discussed and an effective solution for optimizing the clamping - with the aim of significantly increasing the accuracy of the machining - was searched for.

Problem / Challenge

The existing clamping device of a competitor only clamped the drive gear below the large toothing, while the tailstock unit of the machine additionally supported it on the face side. During the machining of the two gears, the missing second clamping area and the high forces acting during gear cutting resulted in vibrations, which caused the inaccuracies. To compensate, the resulting reduced cutting values brought a slight increase in accuracy, but a corresponding reduction in productivity.

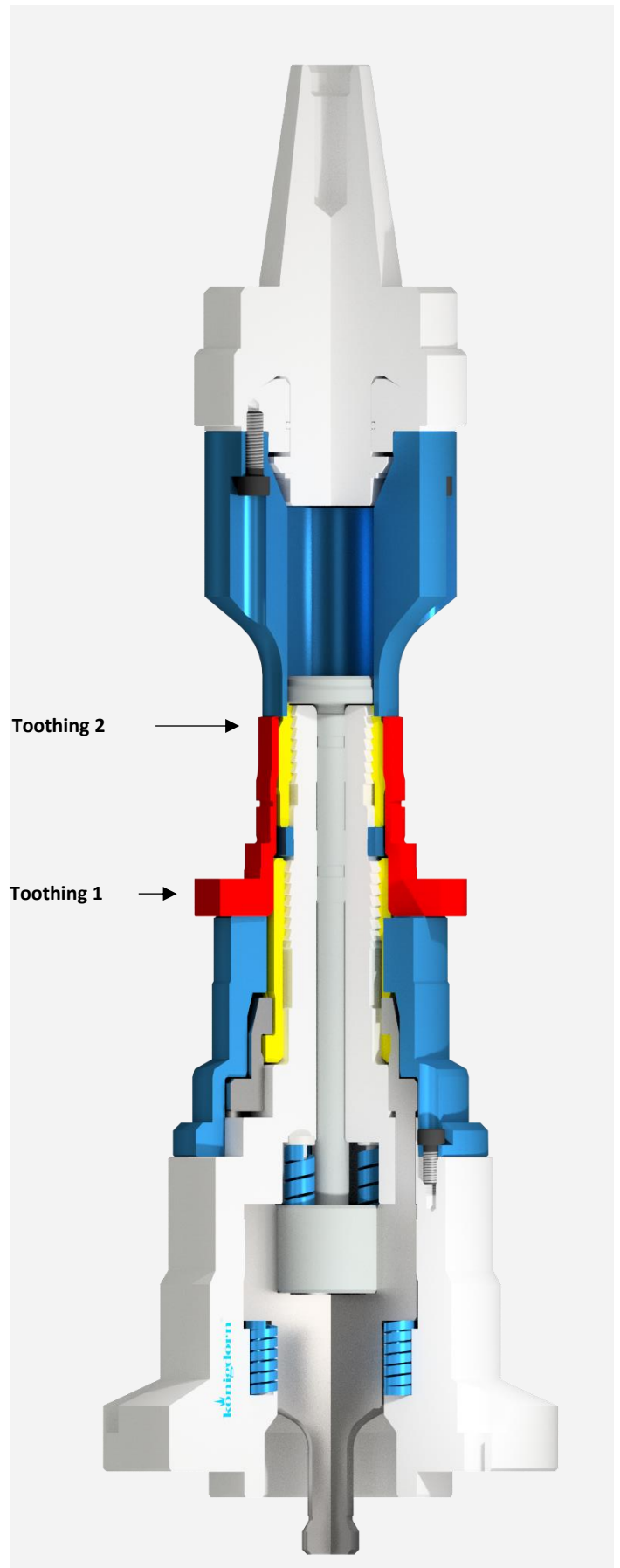


Illustration 1: Solution in use by customer

Solution

To solve the problem, a mechanical clamping solution developed by König-mtm - the double thread clamping system - seemed perfectly suited. Two clamping locations are used to center and clamp the workpiece independently of each other directly under the two gear teeth that have to be machined.

The clamping force is supplied by a drawbar on the machine side, which transmits the force to the rear collet via a puller and a clamping bolt. The clamping of the front collet is initiated via an integrated spring assembly. In addition, the front face of the drive gear is supported via a compensating clamping bell on the tailstock side.

Product benefits

- Low-deformation clamping of the thin-walled parts
- High transmittable torque
- Two independent clamping areas for repeatable workpiece alignment
- High loading clearance
- Runout accuracy of 0.005 mm
- Process reliable manufacturing

Conclusion

After almost 2 years of using the clamping device at the customer's site, the benefits of the optimized clamping process have become fully apparent.

This example shows clearly that improvements can also be achieved in running processes by optimizing the clamping device. These investments can reduce manufacturing costs and increase process reliability. As shown in this case, König-mtm is always looking to improve processes together with the customer.

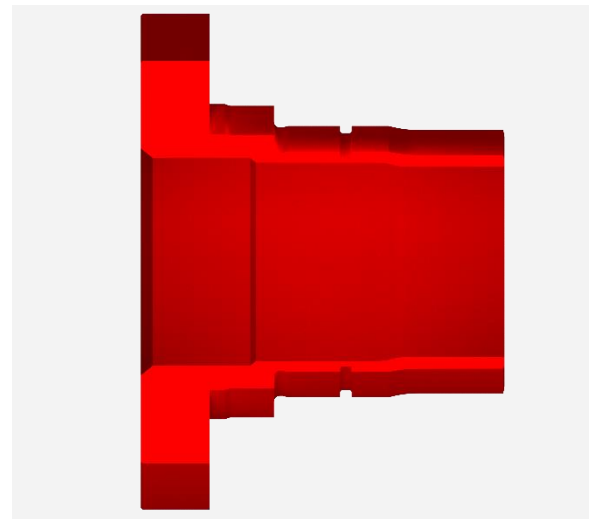


Illustration 2: Drive gear (workpiece)

Our application engineers are available for you and will be happy to advise you.



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