CLAMPING SYSTEMS
NEW CLAMPING SYSTEMS FOR FASTER MACHINING AND OPTIMIZED PROCESSES

Increasing pressure to keep costs down has increased the need for shorter processing times. A great deal of time is spent on setting up the machine and clamping the workpiece. The ability to position the workpiece precisely and absorb the process forces is crucial to the quality of the results. Precise positioning and secure clamping in conventional systems, however, generally contradict the need for quick and efficient clamping.

Development of new clamping techniques

The Fraunhofer IPT has and is developing a variety of new clamping systems to meet the individual needs of its partners and industrial clients:

- Friction-locked clamping
- Shrinking
- Adhesion
- Casting
- Mechatronic processes
- Hydraulic processes
- Magnetic processes
- Pneumatic processes
- Other processes

Our specialties

- Experienced designers at the Fraunhofer IPT and many years of accumulated scientific and practical competencies in a number of manufacturing techniques are the basis for convenient clamping solutions.
- We analyze clamping problems in a comprehensive way and make the most of economic potential in order to optimize our clients' entire manufacturing processes.
- We test clamping systems series production conditions using our extensive machine pool – without interrupting clients' running systems.
- We use comprehensive metrology and the relevant expertise to ensure that the newly developed clamping systems meet the tolerances required by your production environment.
- We use Finite Elements Method (FEM) simulations to develop highly sophisticated solutions right at the prototype stage.

Our offer

- Analysis of your individual clamping needs on site
- Design of new clamping techniques for your process
- Development and design of individually modified clamping systems
- Integration of the new clamping process into your processes
- Modification of clamping systems for entire product families
- Production and commissioning of individual clamping systems
CLAMPING SYSTEMS THAT REDUCE VIBRATIONS – FOR STABLE WORKPIECE MACHINING

During machining, component vibrations can lead to deviations in shape and reduce the machined surface quality. A regenerative rattling may occur that can fracture the tool cutting edge or lead to components being rejected. Specialized clamping systems can reduce or even prevent vibrations entirely. The performance of the machine, the quality of the machined result and the process stability can all be improved significantly if clamping systems are used to dampen vibrations.

Clamping techniques to dampen vibrations

- Elimination of the cause of vibration using modified workpiece fixation methods
- Integration and design of damping elements
- Process modifications to improve vibration behavior
- Research into and development of mechatronic controls for active vibration compensation

Our offer

- On-site analysis of causes and effects of vibrations
- Simulation and depiction of the vibration via modal analyses and response spectrum analyses (Finite Elements Method)
- Design and development of clamping systems modified to meet the demands of your specific process

Our specialties

- Professional vibration measurements
- Systematic analysis of causes
- Simulations of process dynamics
- Experimental depiction of processes
- Systematic design method for long-term clamping system design
SELF-POSITIONING CLAMPING SYSTEMS – COMPLEX WORKPIECES ALIGNED FASTER

Complex workpiece geometries are often difficult to position in the clamp. There is a lot of work involved in aligning and measuring the workpiece, and adjusting the process to match the workpiece is complicated. Intelligent positioning methods speed up the adjustment process, increase process stability and help to save time and money.

Self-positioning clamping techniques

• Clear geometric workpiece positioning using intelligent clamping system design
• Autonomous component positioning using sophisticated kinematics
• Sensor-assisted position controls
• Mechatronic positioning controls for clamping processes

Our offer

• We analyze your processes and determine the right degree of automation for your company
• Design and development of clamping devices – from automatic machines to turn-key systems

Our specialties

• Extensive technical expertise in the field of self-positioning clamping systems
• Systematic optimization strategies for entire processes