Leistritz

LEISTRITZ PRODUKTIONSTECHNIK GMBH

Internal Whirling
INNOVATION 200

- Finish machining
- Cost-effectiveness
- Highest workpiece quality

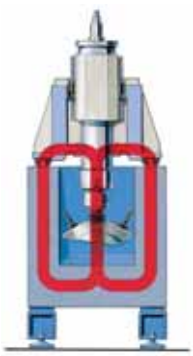
Internal Whirling Machine INNOVATION 200

The performance features

- Finish machining
- Finish quality of the workpieces
- Hard and soft machining
- Short cycle time
- Highest profile accuracy
- Very high rate of metal removal
- Gantry loading
- Low manning due to workpiece buffer

1. Stiffness
The enclosed construction with very stable U-shaped bed is the basis for short, symmetrical and above all enclosed force paths, achieving very high static and dynamic stiffness.

Vibration-damping base of high quality polymer concrete Mineralit ®



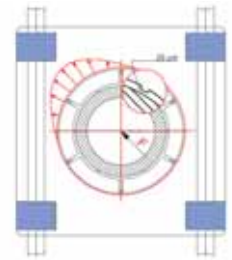
Machine base with portal slides

The Innovation 200 concept: very stable modules high rates of metal removal, free evacuation of chips

Highest Workpiece Quality

2. Precision slides

The tailstock moves in the Z axis on the oil pockets of the backlash-free, frictionless non-wearing hydrostatic slide. The thin film of oil offers the best conceivable damping as the basis for high surface quality and long tool life, despite an interrupted cut.



Hydrostatic slide principle

3. Thermal stability

The headstock motor, headstock spindle and tailstock, control cabinet and machine base are liquid cooled. Absolute scales ensure sustained high accuracy.

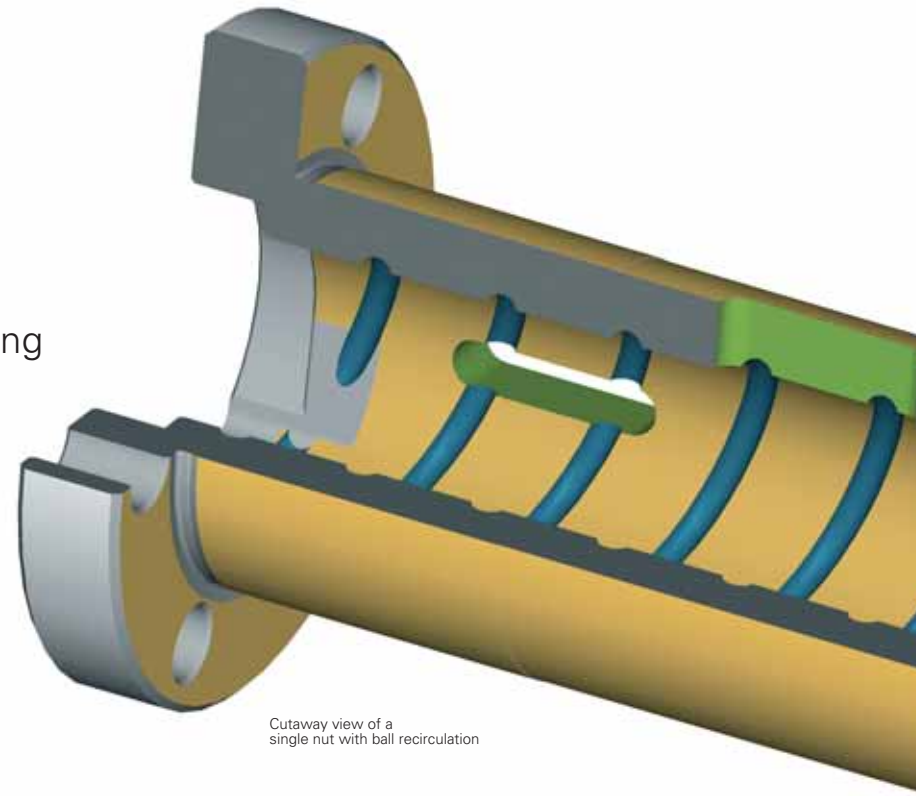
All the machine elements that determine accuracy are connected to the liquid cooling circuit.

4. Dynamic stiffness

Since it is the workpiece and not the tool that the headstock drives in the main X, Y and Z axes, the tool holder can be very robust and configured optimally for the machining duty.The tool holder is integrated into the machine base directly and to its full extent. This type of mounting offers high static and dynamic stiffness.

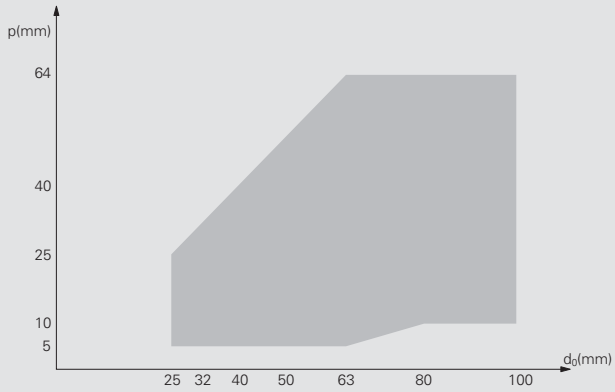
Complete machining

- Turning
- Milling
- Whirling



Cutaway view of a
single nut with ball recirculation

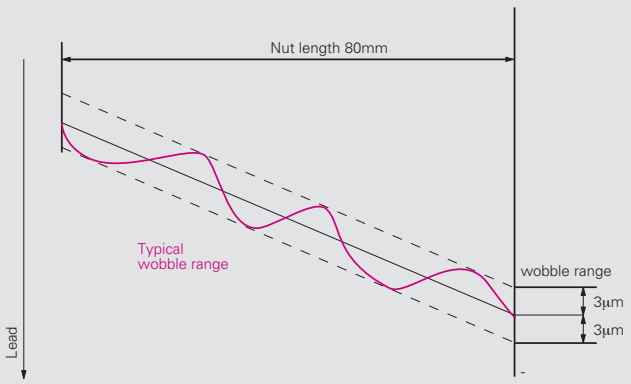
Range of application



d_0 = Nut internal diameter, p = Lead

Maximum nut track length L max = 200 mm
Ball size DW from 3 to 15.9 mm

Quality features

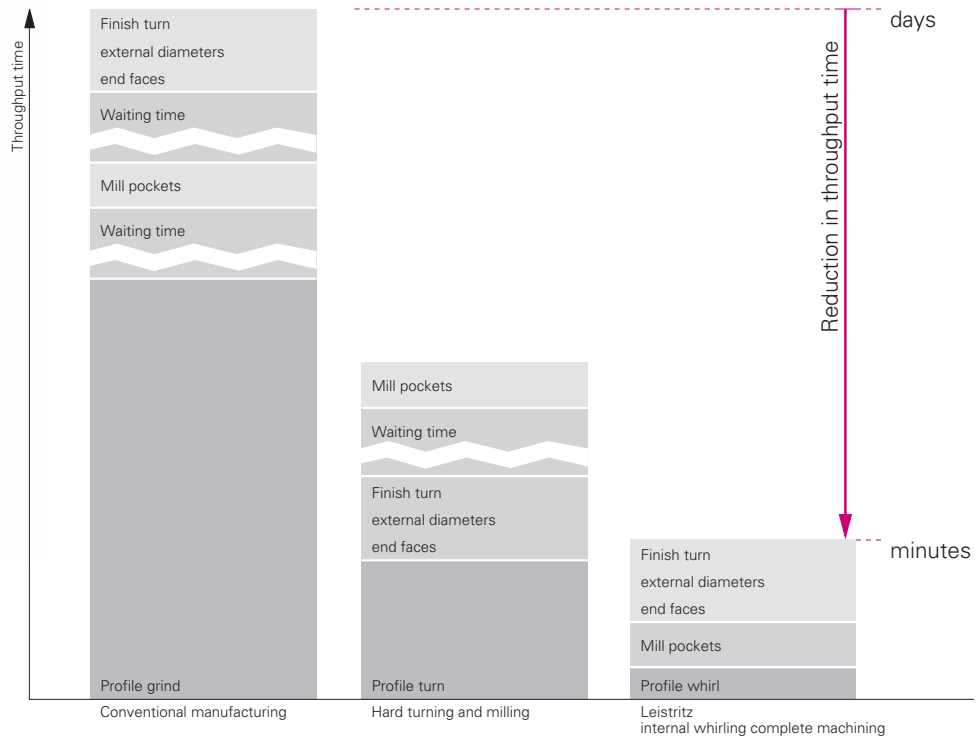


Wobble range tolerance of an internally whirled nut

Complete Machining of Ballscrew Nuts with the INNOVATION 200

The best productivity and highest accuracy is achieved by complete machining of ballscrew nuts in a single clamping.

Reduction in throughput time due to complete machining



Examples of machining times
Ballscrew nut 32x5x80, ball size: 3.969:

	Operation time
Pick up and clamping workpiece	5 s
Internal turning (rough and finish, cutting speed 160 m/min) - if necessary	58 s
External turning and end face turning (cutting speed 180 m/min)	29 s
Profile whirling (cutting speed 165 m/min)	196 s
Pick up workpiece and place on conveyor belt	10 s
Over all cycle time (without internal turning)	240 s

Machine Tool Components for complete Machining

The internal whirling oscillator IWO 100, thermally stabilised

■ Internal Whirling Oscillator

The IWO 100 works on a NC-controlled reciprocating axis for stepless stroke setting.The stroke length depends on the lead and bore diameter of the nut. After setting the stroke, the reciprocating axis is hydraulically clamped. The water-cooled drive motor drives the tool through a belt drive.

■ Block Toolholder

- Facing to length, external and internal cylindrical turning
- Vibration-damped tooling
- Capto tool post
- Air-cooled cutters
- Water-cooled toolholders

Block toolholder for holding 2 turning tools

■ HSC Milling Shaft

- Water-cooled motor shaft. Shaft nose protected with air barrier
- Tool interface HSK-C63 DIN 69063 – 1
- The motor shaft with its rotor is mounted on hybrid bearings
- The bearings are grease lubricated for life

High speed cutting. For milling the recirculation pockets.

Measuring system integral to the machine

Measurement System

- Automatic reference point finding for milling the recirculation pockets
- Tool pre-positioning using proximity switch
- Measurement of length of nut
- Marposs measurement sensor

The internal whirling tool

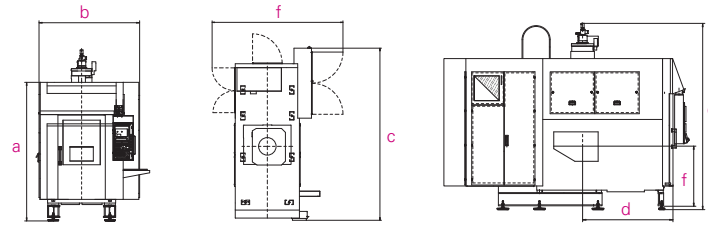
The tooling system is designed as a modular structure, and with only small variations covers the entire parts range. The machine can perform both soft and hard whirling. A variety of different profiles can be realised. Thread tolerances can be maintained even on very long nuts, since the whirling head is positively supported by the guide hand running within the internal bore of the nut.

■ Guide hand
■ Whirling spindle
■ Clamping plate
■ Whirling tip

Technical Data

Dimensions in mm

a: 2,750 e: ~3,500
b: 2,000 f : 1,100
c: 4,450 g: ~3,400
d: 1,645



Working Range		
Chuck diameter	mm	260 (optionally 315)
Workpiece length max.	mm	200
Workpiece internal diameter max.	mm	100
Workpiece external diameter max.	mm	200
Axis travel X/Z	mm	850/315
Internal whirling oscillator IWO 100		
Max. power	kW	11
Tool arbor	HSK	40
Max. tool speed at stroke = 0	rpm	2,285
CNC axis for stroke setting		stepless
Position sensing with Marposs sensor and proximity switch		
Headstock		
Headstock to DIN 55026	size	8
Headstock front bearing	mm	120
Max. speed	rpm	4,000
Headstock		
Max. power	kW	58
Full power available from shaft speed	rpm	900
Max. torque	Nm	620
Travel Drive		
High speed axis travel X/Z	m/min	45/30
Axis force X/Z	kN	11
Ballscrew shaft diameter	mm	50/40
Block Toolholder		
Toolholder DIN 69880	size	40
For 2 tools		
Milling Shaft		
Nominal power	kW	15
Nominal speed	rpm	3,000
Max. speed	rpm	12,000
Nominal torque	Nm	48
Tool arbor HSK-C63 DIN 69063 -1		
Clamping force	kN	15 - 30
Footprint	m^2	6.7
Weight	approx. kg	9,900

Changes reserved

Leistritz Product-Range of Whirling Machines

The perfect machine solution for each application

Performance-Line

LWN 65	Small gear worms · bone screws
LWN 90	Steering worms · gear worms
LWN 160	Ball screw spindles · spindles · eccenteric worms

Tech-Line

LWN 190 HP **LWN 300 HP**	Pump screws · eccenteric worms · ball screw spindles · plastification worms

System-Line

INNOVATION 200	Complete and hard machining of thread nuts
COMBINATION 65 **COMBINATION 90**	Highest surface finish quality for steering worms and small gear worms

Partner for modern Technology

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