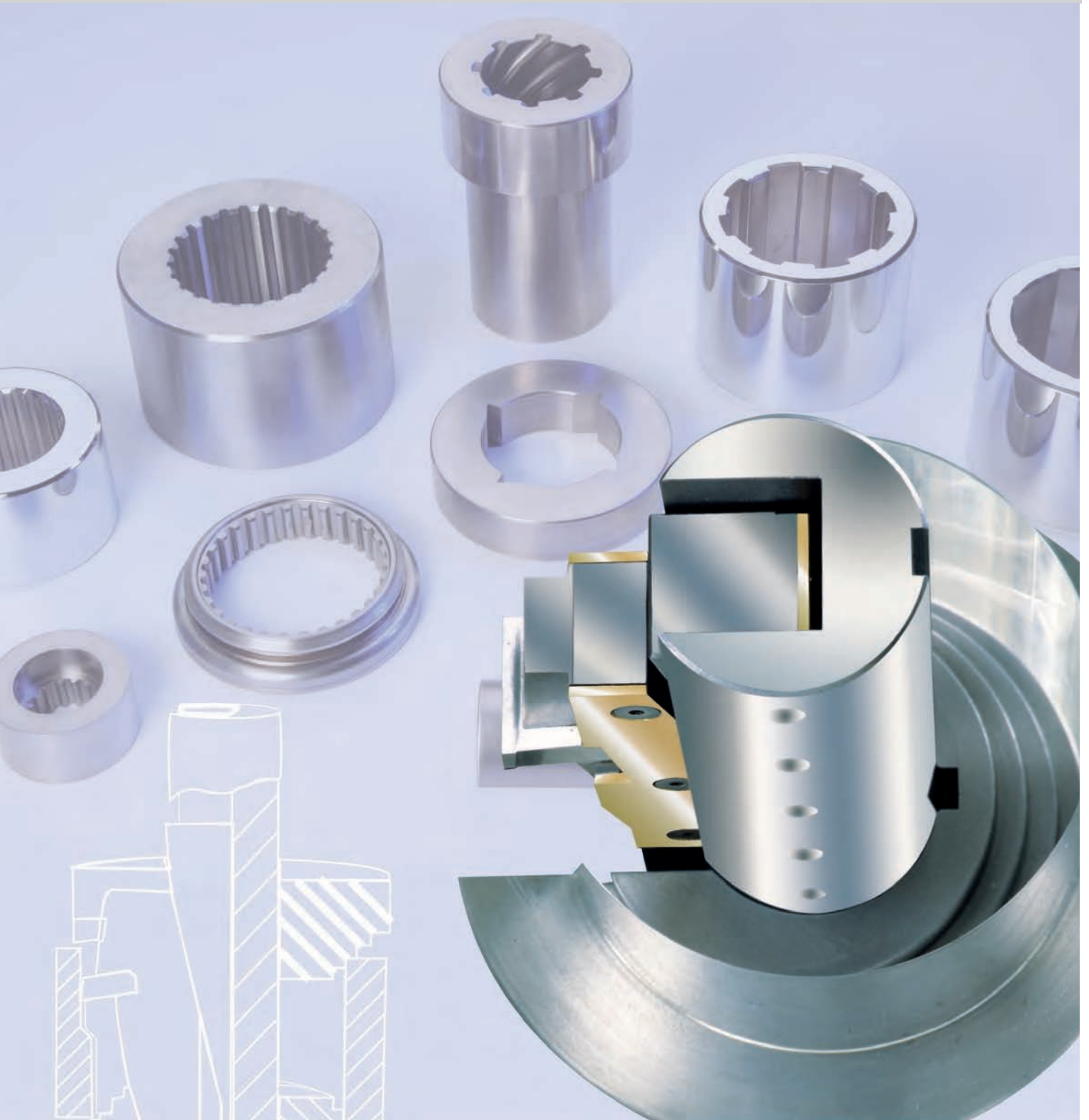


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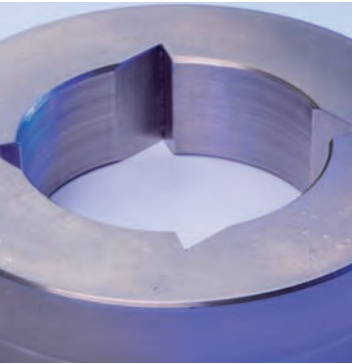


Machine Tools

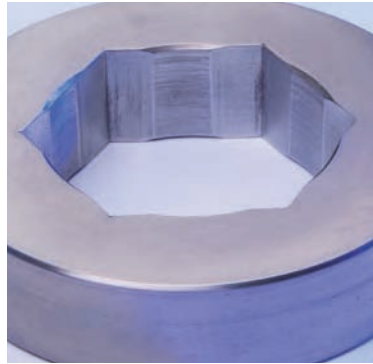


Leistritz
Profile and Keyseating Machines

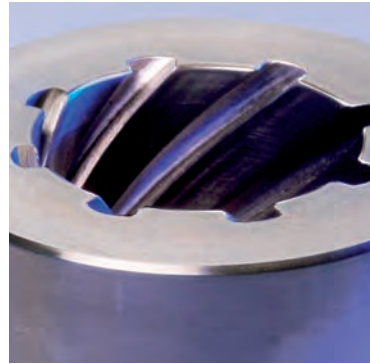
Applications for Keyseating Machines



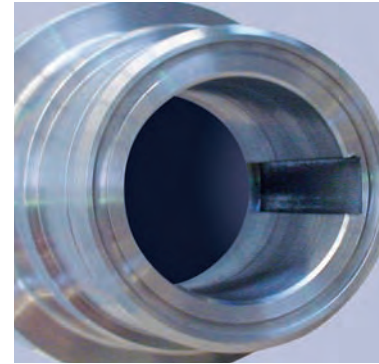
Tangential profile



Hexagonal profile



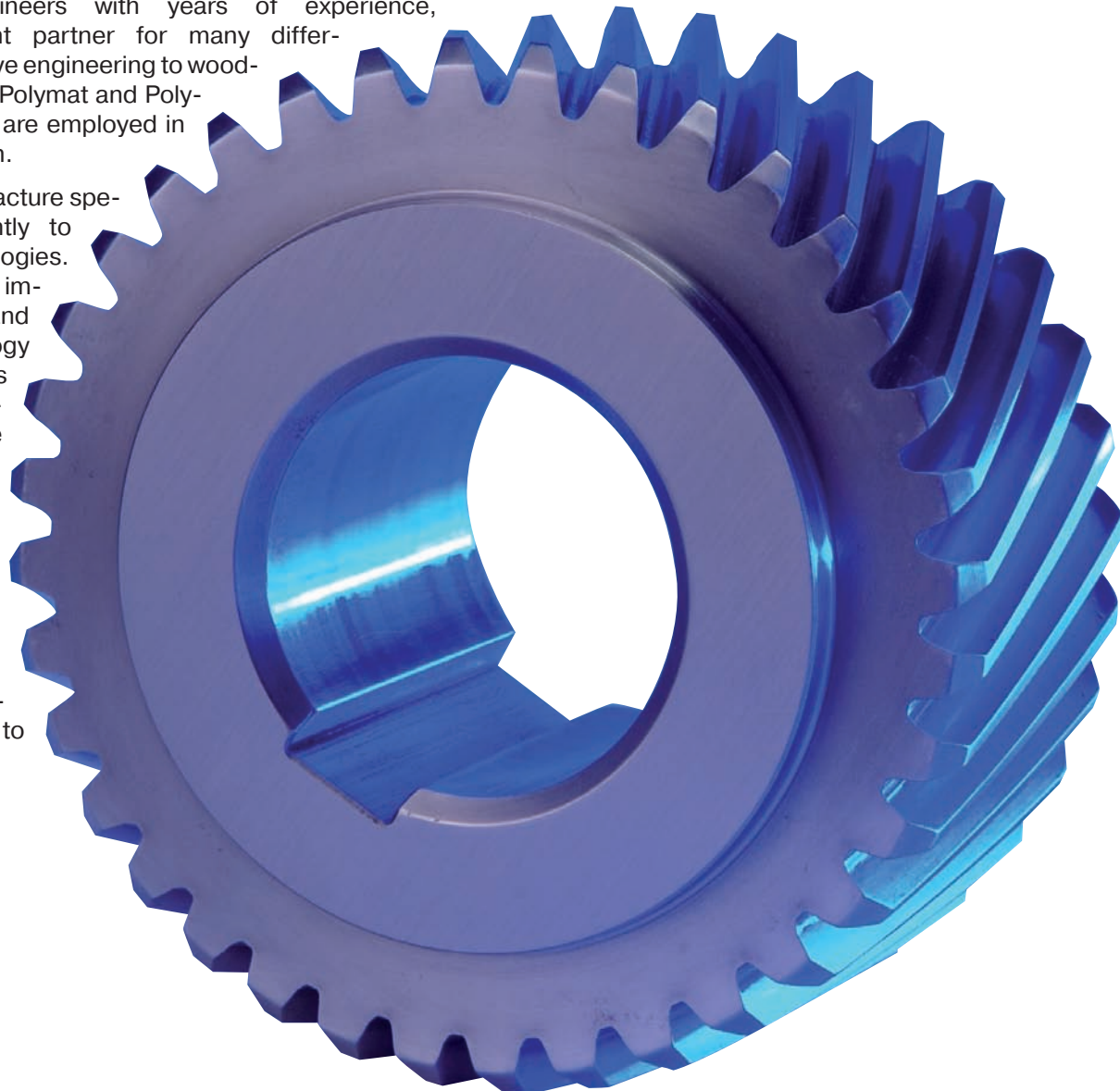
Helical keyway



Blind hole keyway

As mechanical engineers with years of experience, we are a competent partner for many different industries: from drive engineering to wood-working – the Leistriz Polymat and Poly-jet series of machines are employed in just about every branch.

Our design and manufacture specialists work constantly to advance our technologies. We have continuously improved our profile and keyseating technology over many decades to deliver the highest quality from one source. The customer's benefit is always our top priority. As a reliable partner with a global service and sales organization, we offer a 24-hour tool grinding service and accompany our customers on their path to success.



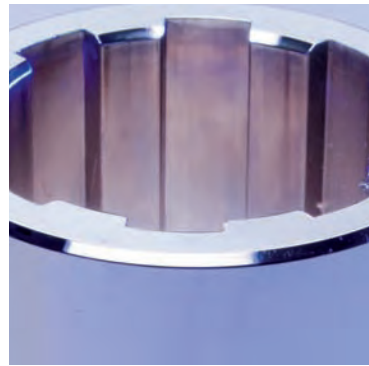
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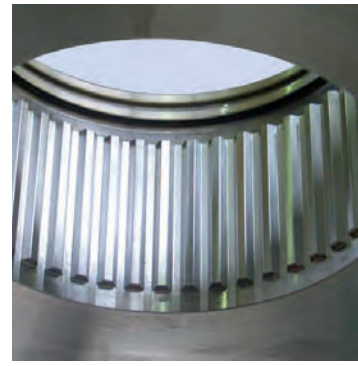
Oil groove



Feather keyway



Spline profile



Involute profile

Applications



Agriculture



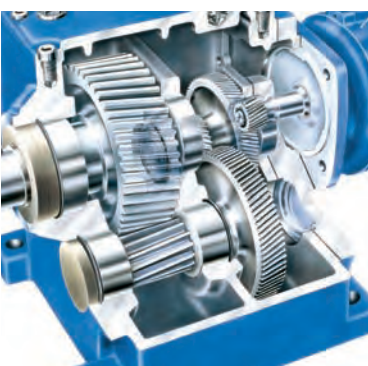
Pump industry



Pipe fittings industry



Extrusion technology



Transmission/drive engineering



Woodworking machinery



Conveyor/lift engineering



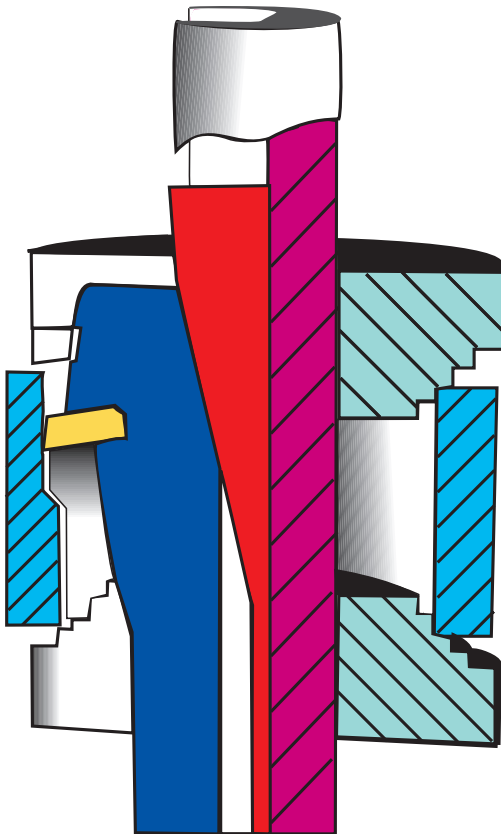
Mechanical engineering

Keyseating - Principle - Advantages

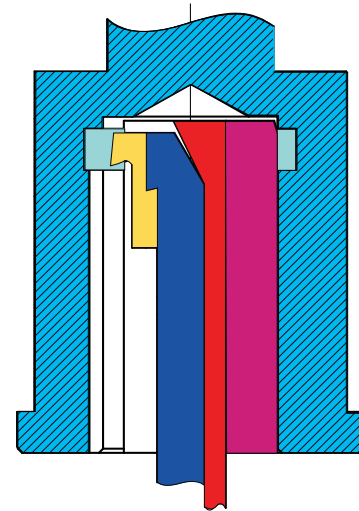
How keyseating works

The keyseating process cuts a keyway in stepwise manner. A cutter is pulled vertically with a continual stroke movement along the bore, combined with a horizontal thrust motion. The thrust is delivered after each stroke by a feed bar that thrusts the cutter in steps between the cutter guide bar and cutter bar. To ensure gentle machining for the tool and workpiece, the cutter is automatically lifted off before the upward movement. The keyseating machines are equipped with a twin-column hydraulic guidance system. The in-line arrangement of tool and tool slide creates a fully linear alignment of forces within the tool and machine system. This avoids lateral forces and leverage, so that the machine is extremely long-lasting and virtually free of wear.

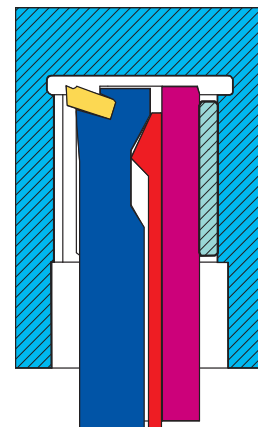
Basic function - keyseating



- Cutter guide bar
- Feed bar
- Cutter
- Workpiece
- Cutter bar
- Centerings



Additional function-blind hole cutting



Additional function – blind hole slotting

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Advantages over slotting

Precise

- Significantly greater precision, since the tool is guided over the entire keyway length (offset, depth, axis parallelism)
- Higher surface quality, since the tool and workpiece make one unit due to the centering elements

Economical

- Higher cutting values, since the cutter cannot deviate from its path while cutting (cutting speed, feed)
- Workpiece and tool are clamped into a single unit, resulting in
 - Longer tool lives
 - Optimized process parameters

Flexible

- Significantly wider and longer keyways can be cut (length up to 2000 mm and width up to 150 mm)

Advantages over broaching

Precise

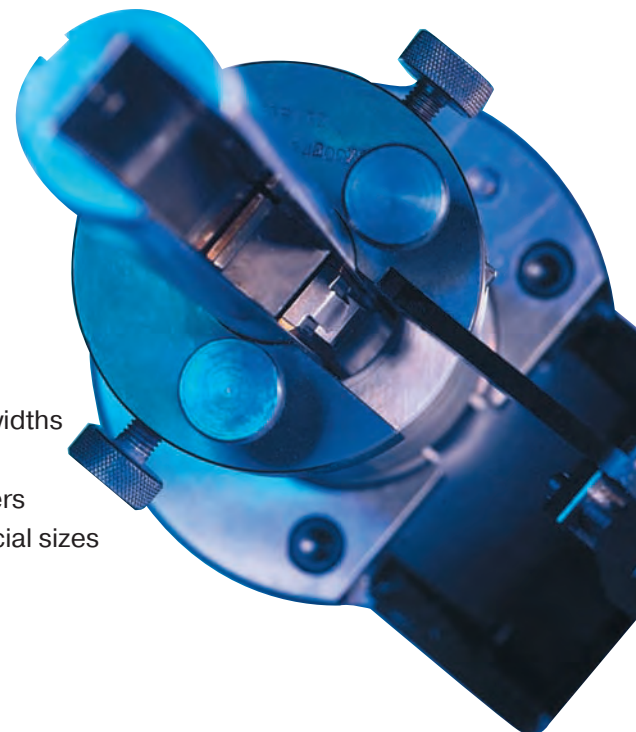
- CNC-controlled machining of
 - Keyways into blind holes
 - Helical keyways
 - Oil grooves
- at superior quality

Economical

- Low space requirements, even for large keyway lengths or widths
- Gentle cutting for the workpiece (no warp)
- Low tool costs, since the customer can re-sharpen the cutters
- Short delivery times for tools and reasonable prices for special sizes
- Economic elements for workpiece centering and clamping

Flexible

- Easiest automation with integration of quick-clamping units (hydraulic/pneumatic)
- Flexibility in adapting tool widths



Range of machines

The machine series



Polymat 25/32 NC

Machines in the NC series are an economic solution for the task of:

Cutting through-keyways/profiles into through-holes, either as single keyways or multiple keyways.

Typically, manual indexers are built onto the machine for multiple keyways.

NC machines generally come as 2-axis machines (controlled axes).



Polymat 70/100/125 CNC

CNC machines have controlled axes, which allows interpolation of the axes. Accordingly, in addition to the standard feather keyways according to DIN 6885 or custom profiles in through-holes, these machines also cut:

- Oblique keyways
- Oil grooves
- Keyways into blind holes
- Helical keyways
- Regular and irregular multiple-keyways/profiles (serrated/spline/involute profiles/...)

In addition to manual indexers, automated indexers (3rd CNC axis) can also be used on these machines.

Single copies and small batches are therefore just as economical to produce as large-scale production if, for example, the machine is integrated into a full manufacturing process, is automatically loaded and works over several hours unmanned.



Polyjet

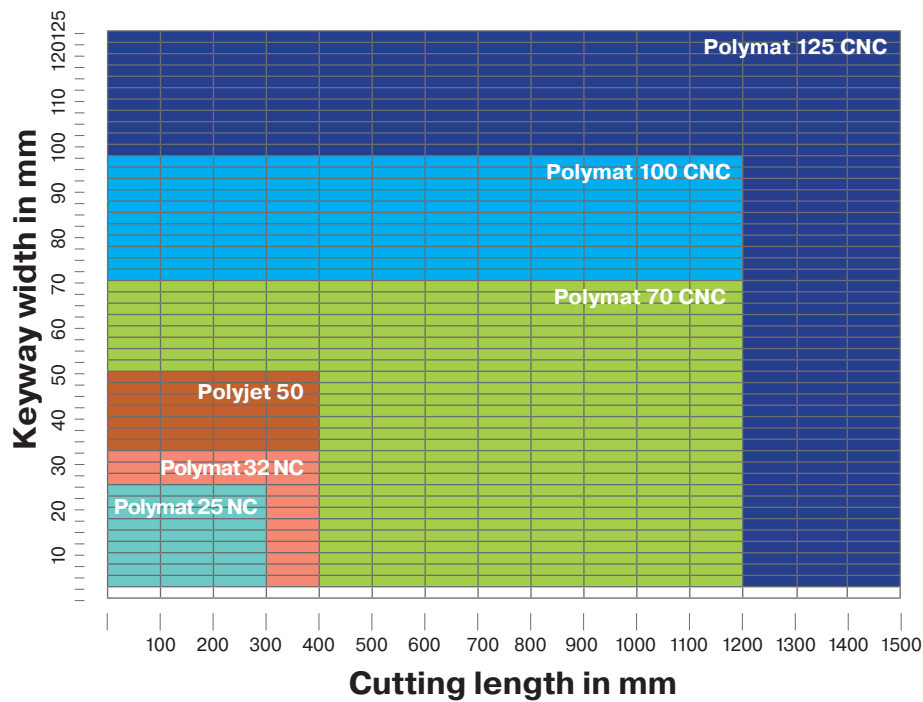
The “hard” keyseating machine POLYJET 50 offers users a new dimension in profile and keyway cutting. This new machine generation combines the performance of much more complex broaching machines with the flexibility and efficiency of keyseating machines.

The extremely high cutting speed of up to 120 m/min allows hard machining.

The Polyjet can be used for soft machining when short machining times are demanded.

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Performance data



		Polyjet	Polymat				
		Polyjet 50	25 NC	32 NC	70 CNC	100 CNC	125 CNC
Cutting width	mm	2 - 50	25	32	70	100	125
Cutting length	mm	400	300	400	300/400/500/600 800/1000/1200	400/500/600 800/1000/1200	600/800/1000/ 1200/1500
Cutting force	N	21.000	6.000	7.200	21.000	32.000	44.000
Workpiece weight	kg	10.000	10.000	10.000	20.000	25.000	25.000
Main drive connected load	kW	40	3	4	7,5	11	18
Cutting speed	m/min	0 - 120	0 - 20	0 - 20	0 - 20	0 - 20	0 - 20
Constant return speed	m/min	0 - 120	0 - 20	0 - 20	20/40	20	20
Bore dia. to DIN 6885	mm	10 - 300	10 - 95	10 - 140	10 - 330	10 - 500	10 - 750
Feed rate	mm	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5
Space requirement, incl. electronics	m x m	2,3 x 1,4	1,1 x 1,3	1,1 x 1,3	1,2 x 2,3	1,2 x 2,3	1,4 x 2,7

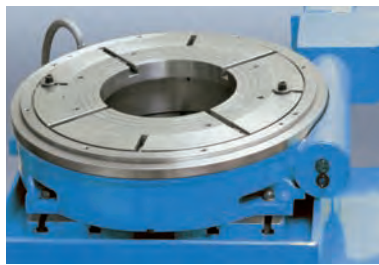
Components, Drive, Control and Operating Elements

Expansion stages

- Manual indexer
- Automatic indexer
- Remote control for bulky workpieces
- Automatic workpiece clamp
- Tilting table for conical bores
- Automation
- Automatic chip removal
- Tool lowering



Manual indexer



Automatic indexer



Tilting table



Remote control

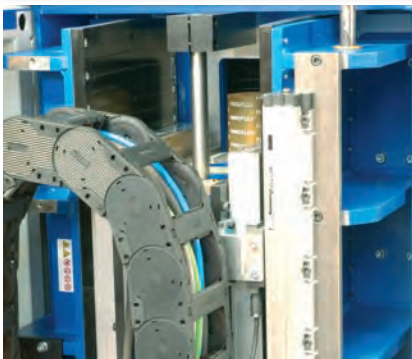


Automatic workpiece clamp



Automation

Drive- linear



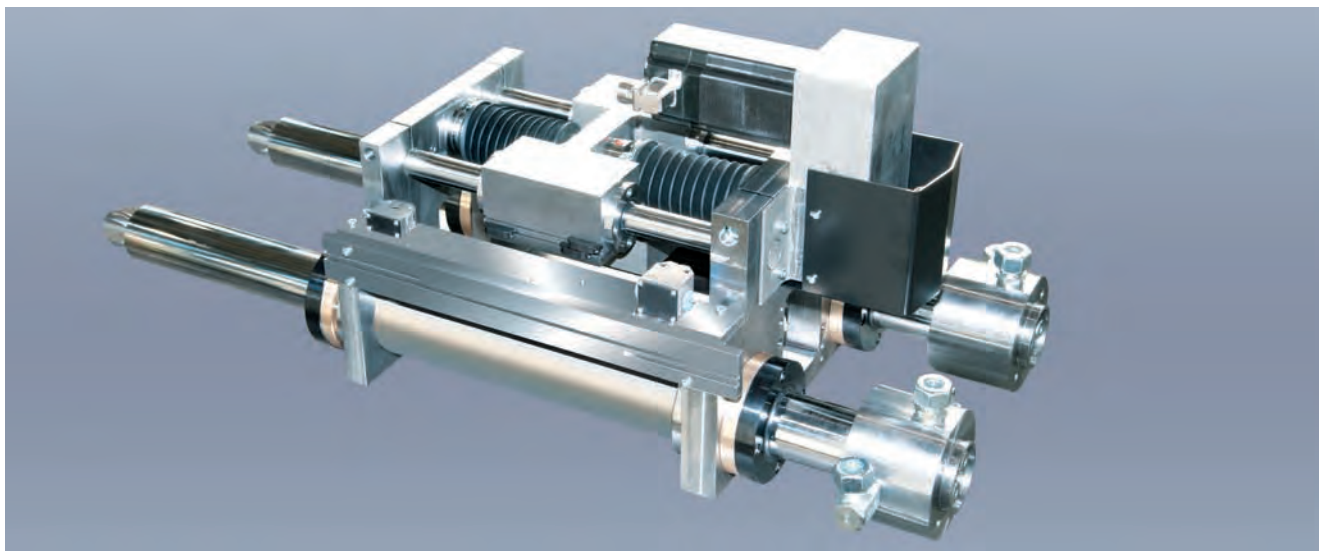
linear

The Polyjet 50 is driven by a high-dynamic linear drive. This low-maintenance and wear-free drive allows cutting speeds of up to 120 m/min.

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Drive - hydraulic

With precision-made, superfinished piston rods, the twin-column hydraulic guidance system ensures utmost precision in the tool slide. The piston rods and hydraulic oil provide guidance and drive in one unit. The hydraulic oil also ensures permanent lubrication of the system. Accordingly, the machine has no lubrication/maintenance points.



Hydraulic

Control

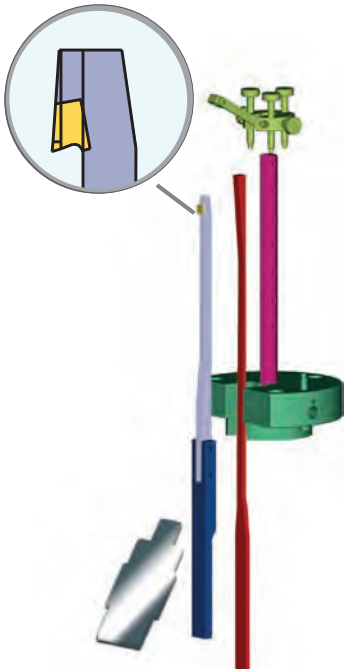
- S7-314 PLC controller, 5.7" display with membrane keypad
- Control of 2–4 CNC axes
- Tool feed (X), one rotation axis (B) for multiple keyways and expandable for automatic loading
- User guidance in local language
- Storage capacity for approx. 250 programs for all important parameters:
 - Diameter
 - Keyway width
 - Keyway depth
 - Keyway length
 - Feed rate
 - Tool type
 - Cutting speed
 - Idle stroke programming
- Precise assumption of Z-axis position using CNC technology
- High-precision rotary encoder systems in all axes
- Error diagnostics system with onscreen fault display
- Interface optional for PDA and program transfer



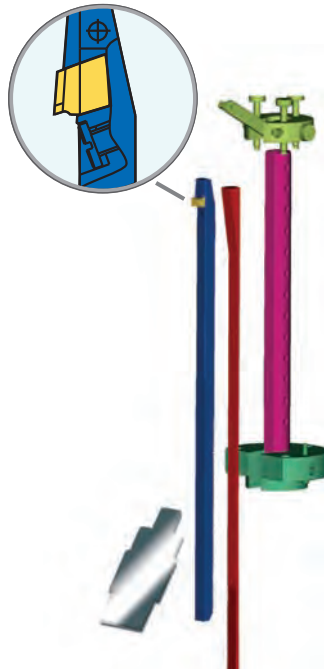
Operator panel

Tool sets, Cutters and Centering Sets

WC 2/3/4



WC 7



WC 9c/9/10/11



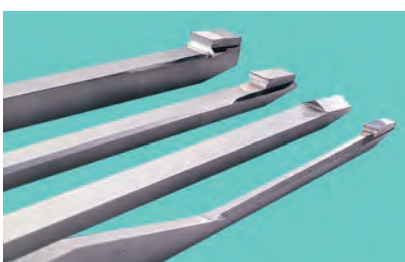
Each tool set covers a specific machining range:

- Keyway width
- Borehole diameter
- Keyway length

The respective tool must be selected to match the machining task. The cutter required for the cutting task is selected to match the defined tool set.

Standard tooling for profile and keyseating machines

Tool kit, full equipment		WC 2	WC 3	WC 4	WC 7	WC 9c	WC 9	WC 10	WC 11
Keyway length, maximum	(mm)	100	100	150	500	800	1000	1200	1500
Keyway width	(mm)	2 - 3	3 - 6	6 - 12	12 - 22	22 - 50	22 - 50	56 - 100	56 - 125
Borehole diameter	(mm)	10 - 13	13 - 20	20 - 40	40 - 85	80 - 230	85 - 230	200 - 500	230 - 750
Cutter guide bar diameter	(mm)	10	13	20	40	70	85	110	140



Cutter Type A



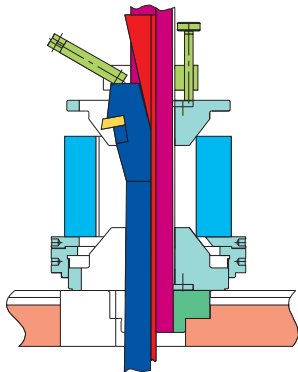
Cutter Type B



Cutter Type C

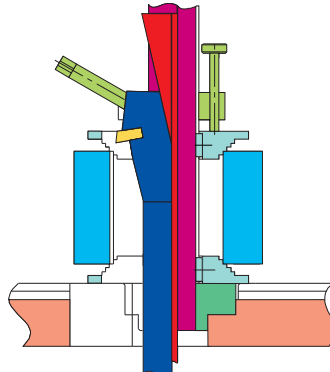
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Cone



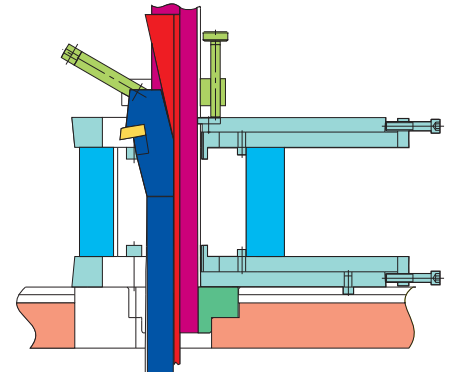
The cone steplessly centers the workpiece against the bore chamfer, positively locating it relative to the cutter tool.

Stepped bush

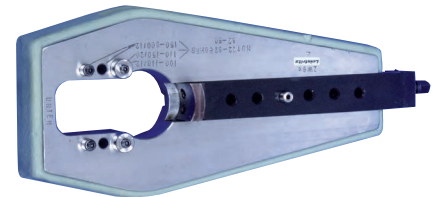


The workpiece is centered by its bore. The stepped bush clamps the top face of the workpiece and positively locates it relative to the cutter tool.

Continuously adjustable









A three-point clamping system with fixed and adjustable clamping elements clamps the workpiece eccentrically and firmly by its bore.






Application of the centering set for tool bores

Tool kit, full equipment		WC 2	WC 3	WC 4	WC 7	WC 9c	WC 9	WC 10	WC 11
Cone	(mm)	10,5 - 13	14 - 20	21 - 40	41 - 85	80 - 230	85 - 260	-	-
Stepped bush	(mm)	-	14 - 20	25 - 40	45 - 85	80 - 230	90 - 200	-	-
Continuously adjustable centering	(mm)	-	-	40 - 160	60 - 200	100 - 300	130 - 400	200 - 500	200 - 500 230 - 750

	Table insert bush
	Cutter guide bar
	Cutter

	Clamping piece
	Cutter bar/holder
	Feed bar

	Cutter shaft
	Centerings
	Chip remover

Product range

Work piece:	Machine range																	
	Whirling								Rolling								Key-seating	
	LWN 65	LWN 90	LWN 120 HP	LWN 120 IW	LWN 160	LWN 190 HP	LWN 300 HP	LWN 300 PM	LWN 70 RT	LWN 120 RR	LWN 120 RT	LWN 170 RT	LWN 250 RT	LWN 400 RT	LWN 630 RT	LWN 800 RT	Polyimat	Polyjet
Small gear worms	●								●	●	●	●						
Gear worms		●	●		●	●	●						●	●	●			
Steering worms		●	●		●													
Ball screws			●		●	●	●				●	●	●	●	●			
EPS worms		●	●						●	●	●							
Rack-and-pinion spindles			●		●								●					
Eccentric worms		●	●		●													
Pump spindles			●		●	●	●											
Charging worms			●		●	●	●											
Rotors								●										
Stators																		●
Threaded nuts				●														
Bone screws	●																	
Splines									●	●	●				●			
Knurls									●	●	●				●	●		
Special/trapezoid threads												●	●	●	●			
Key ways																	●	●
Helical key ways																	●	●
Internal profiles																	●	●
External profiles																	●	●
Keys in conical holes																	●	●
Profile variants																	●	●

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