fives

Ultimate grinding solutions

Serving the global manufacturing industry

Orbital, cylindrical, centerless, surface & ultra-precision technologies

— Over 200 years of grinding and ultra precision experience
— Renowned legacy names — Landis, Giustina, Cranfield Precision & Landis-Bryant
— Wide range of products
— Global support network

Fives designs and supplies ultimate grinding solutions for precision component manufacturers in a broad range of industries

Automotive — Aerospace — Bearing — Fuel systems — Fluid power — Off-road — Textile — Renewable Energy — Precision Components, and more.

Fives and its dedicated Grinding | Ultra Precision teams - over 650 people globally - offer a complete range of grinding and specialist high-precision machines, plus a comprehensive range of systems, grinding accessories and service/support programs.

Fives is a leader in centerless and disc grinding processes, orbital crankshaft and cam profile grinding as well as lean and flexible peel and cylindrical (OD/ID) grinders for a wide range of components for various industries. Furthermore Fives provides bespoke solutions for unique, ultra-precise machining requirements.

Fives proposes the best solution to the customer and executes projects as a true partner

With a strong legacy based on 4 major names - Landis, Giustina, Landis-Bryant and Cranfield Precision, and more than 200 years of expertise developing pioneering solutions in close partnership with customers, Fives is recognized as the leading provider of grinding and ultra precision solutions – a partner that helps customers maximize operational performance.

From system design to installation and throughout the product's lifecycle, Fives proposes the best solution to the customer and executes projects as a true partner. It is a value-added resource, with a global presence, an unrivalled expertise, and decades of experience of understanding and adapting to customers' needs.

Landis-Bryant ID/OD grinders RU1 & RU2

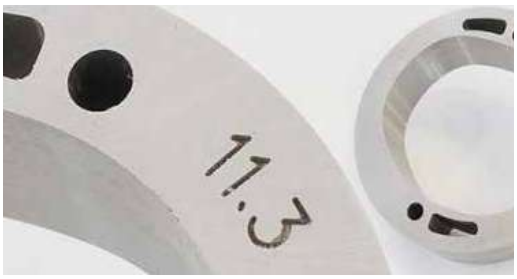
High precision universal grinding systems that provide multi-surface grinding capability and ultimate flexibility with our patented REVELATIONS® operating system software. Machines can be configured as chucker, shoe centerless and center-type systems.

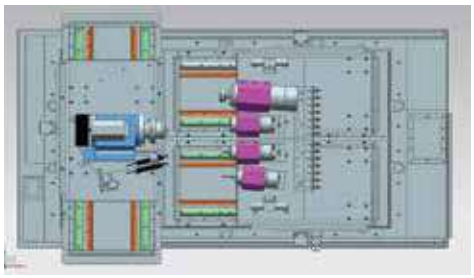
The machines in this series are designed for bearings, automotive, fuel management, medical and optical applications.

— Hydra-Truc™ round bar hydrostatic way system
— Fanuc i Series control
— High acceleration linear motors
— Thermally stable base and adaptive thermal compensation

Landis-Bryant RU2


Multi-spindle configuration


Out of round grinding


Dual slide setup

Model	RU1	RU2 Chucker	RU2 Center type	RU2 Fuel MGMT
Grinding Capacity				
Max. work OD (Chucker)	76 mm	203 mm	101 mm	203 mm
Max. grinding length	63 mm	177	203	177
Internal grinding diameter	38 mm	228	n/a	228
Internal grinding depth	31 mm	88	n/a	88
Spindles & workhead				
Max. number spindles	1	3	1	6 (2x3)
Max. number workheads	1	1	1	2
Conventional wheels	✓	✓	✓	✓
Super Abrasives	✓	✓	✓	✓
Max. ID spindle speed	120,000 rpm	120,000 rpm	120,000 rpm	120,000 rpm
Max. workhead speed	3,000 rpm	3,000 rpm	3,000 rpm	3,000 rpm
Axes and control				
Axis travel (X & Z)	101 mm	254 mm	254 mm	254 (2) mm
Axis speed (X & Z)	750 mm/min	750 mm/min	750 mm/min	750 mm/min
Dimensions				
Dimensions (W x L)	1220 x 760 mm	2440 x 1520 mm	2440 x 1520 mm	2440 x 1520 mm
Machine weight	3940 kg	5900 kg	5900 kg	6300 kg

High production grinders Landis-Bryant UL2 & UF2

Landis-Bryant ULTRAFORM and ULTRALINE are engineered for high volume productivity and exceptional accuracy. Typical a pplications include bores, faces and contours of precision bearing components, gears, constant velocity joint components as well as drive and transmission components. Quick changeover features support efficient production of part families.

- Round Bar Hydrostatic slides
- "Flow-Thru" concept for ultimate thermal stability
- Pre-programmed custom grinding cycles
- Designed for optimum CBN performance
- Quick changeover tooling options
- Automation for high-volume production
- Various gauging options

Landis-Bryant UL2

Model	UL2
Grinding capacity	
Max. workpiece diameter	177 mm
Max. internal grinding diameter	100 (140) mm
Max. Internal grinding depth	75 mm
Spindles & workhead	
ID spindle speed	up to 120000 rpm
Max. workhead speed	4000 rpm
Axes	
X-Axis travel	50 mm
X-Axis speed	13 m/min
Z-Axis travel	254 mm
Z-Axis speed	46 m/min
Dimensions	
Dimensions (W x L)	2555 x 1825 mm
Machine weight	4750 kg

Model	UF2
Grinding capacity	
Max. work OD (Chucker)	203 mm
Max. work OD (Shœ)	152 (254) mm
Max. grinding length	101 mm
Spindles & workhead	
Wheel type	Conventional / CBN
OD grinding wheel diameter	610 mm
Max. workhead speed	1000 (2000) rpm
Workhead angle	0 - 30 deg
Axis	
X-Axis travel	508 mm
X-Axis speed	20 m/min
Dimensions	
Dimensions (W x L)	Approx. 3400 x 2100 mm
Machine weight	9500 kg

Centerless product range

For nearly a century, Fives has been a pioneer in the field of Centerless grinding. So whether using aluminum oxide, harder synthetics or super abrasives such as CBN and diamond wheels, Fives centerless grinders are ready to optimize grinding on conventional ferrous metals or exotic ceramic components.

Fives offers both conventional slide design as well as fixed-center machines to accommodate a variety of different applications and requested material handling systems.

— Centerless ranges from the simple PLC machine all the way up to a 10-axes CNC turn-key solution

Giustina R125

Viking

Model	Viking 200 (250)	RK 350-20	Giustina R125-350	Giustina R125-500	Giustina R125-660
Type	Twin Grip	Twin Grip	Twin Grip Fixed Center	Twin Grip Fixed Center	Twin Grip Fixed Center
Working Capacity					
Min/max outer diameter	1.2 - 60 (100) mm	12.7 - 152 mm	2 - 150 mm	2 - 250 mm	2 - 300 mm
Grinding wheel					
Sizes / width	200 (250) mm	508 mm	350 mm	508 mm	650 mm
Max/min OD	400 (450)/250 (300) mm	610/431 mm	610/410 mm	610/410 mm	610/410 mm
Motor power	15 (30) kW	237(55) kW	50 kW	110 kW	110 kW
Peripheral speed	45 *(137) m/s	45 m/s	45 (60) m/s	45 (60) m/s	45 (60) m/s
Regulating wheel					
Sizes / width	200 (250) mm	508 mm	350 mm	508 mm	650 mm
Max/min OD	300 (355)/255 mm	355/279 mm	355/250 mm	355/250 mm	355/250 mm
Motor power	3.3 kW	3.3 kW	3.3 kW	3.3 kW	3.3 kW
Operating speed	10 - 70 rpm	10 - 70 rpm	10 - 70 rpm	10 - 70 rpm	10 - 70 rpm
Dressing speed	600 rpm	300 rpm	300 rpm	300 rpm	300 rpm
Infeeds					
Max. plunge infeed	1500 mm/min	1500 mm/min	1500 mm/min	1500 mm/min	1500 mm/min
Min. plunge infeed	0.1 mm/min	0.1 mm/min	0.1 mm/min	0.1 mm/min	0.1 mm/min
Dimensions					
Dimensions (WxDxH)	3.1 x 2.7 x 2.3 m	3.3 x 2.8 x 2.7 m	3.4 x 1.8 x 1.5 m	3.4 x 1.8 x 1.9 m	3.4 x 2.0 x 1.9 m
Weight	9,072 kg	11,794 kg	16,000 kg	18,000 kg	20,000 kg

Landis LTT

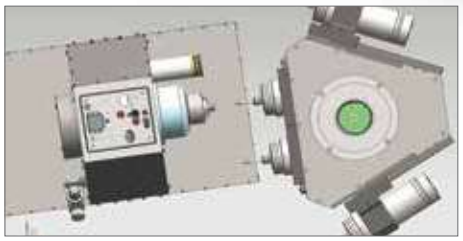
Twin-turret, multi-spindle grinding

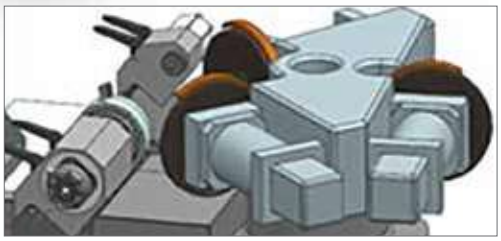
Twin-turret, multi spindle solution to grind ODs, IDs, faces, tapers, concentric and eccentric diameters to sub-micron tolerances in a single clamping.

- Unlimited flexibility in workpiece grinding operations
- Various spindle configurations available
- Hard turning and polishing capabilities
- Reduced work piece changeover time
- Constant wheel surface speed
- Superior surface finishes
- Easy automation integration
- High performance control with open architecture

Landis LTT


Grinding / hard turning setup


Bore, seat & face configuration


Between center

Model	Landis LTT 100	Landis LTT 400	
	Chucker	Between centers	Chucker
Grinding capacity			
Max. grinding diameter (OD)	100 mm	180 mm	400 mm
Max. external grinding length	100 mm	400 mm	150 mm
Max. internal grinding length	up to 100 mm		up to 150 mm
Grinding spindle turret			
Swivel range	+/- 135 deg	360 deg	+/- 135 deg
Turret bearing	hydrostatic	hydrostatic	
Max. number of spindles	4	3	4
Conventional wheels	✓		✓
Super abrasives	✓	✓	✓
Max. wheel Ø	140 mm	350 mm	160 mm
Wheel surface speed	85 m/s	120 m/s	100 m/s
Max. ID spindle speed	120,000 rpm	n/a	120,000 rpm
Work spindle turret			
Swivel range	+/- 135 deg	300 deg	+/- 135 deg
Turret bearing	hydrostatic	hydrostatic	
Workhead speed	1 - 3,000 rpm	1-1,000 rpm	1-1,000 (3,000) rpm
Linear axes travel (infeed)	150 mm	150 mm	300 mm
Dimensions			
Machine Dimensions (W x L)	1.6m x 1.9 m	2,6m x 2,3 m	
Machine weight	2,000 kg	3,500 kg	

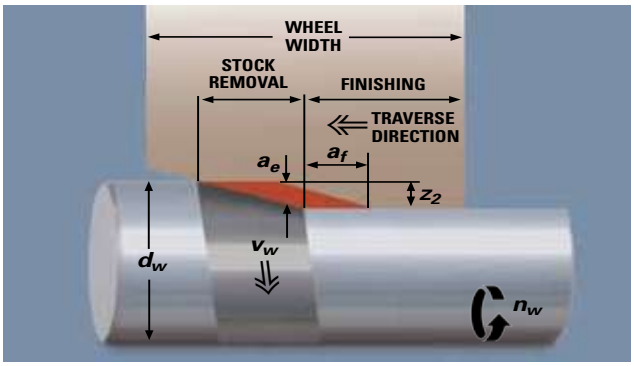
*Grinding spindle configuration, speeds, bearing type and powers can be changed to suit specific customer requirements. In-process gauging available.

Giustina Evolution peel grinder product range

The Giustina Evolution is an OD high-speed grinder offering maximum flexibility with sophisticated CBN / Diamond wheel technology. The work piece is driven between centers at speeds as high as 7,500rpm; the driving takes place due to center's friction. This avoids geometrical errors of the traditional driving mechanism.

- The high speed grinding wheel (120m/s) contours and finishes the workpiece
- With Numerical Control of all machine axes, different part programs can be stored and recalled within seconds for changeovers <1 minute
- Through the use of CBN abrasives, total cost per piece has become a fraction of that of conventional hard turning, grinding and polishing methods

Giustina Evolution



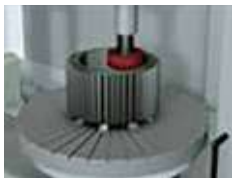
Model	365	368
Working capacity		
Center height	180 mm	180 mm
Center distance (min/max)	0/500 mm	0/1,000 mm
CBN Grinding wheel		
Diameter new wheel	400 mm	400 mm
Thickness	5 mm	5 mm
Surface speed	120 - 200 m/s	120 - 200 m/s
Wheel spindle & workhead		
G.W. spindle motor	22 kW	22 kW
Max. G.W. speed	12,000 rpm	12,000 rpm
Workhead spindle motor	9.5 kW	9.5 kW
Max. workhead speed	7,500 rpm	7,500 rpm
Axes & Control		
Max. wheel slide speed	30 m/min	30 m/min
Max. Z-axis speed (workpiece slide)	10 m/min	10 m/min
Positioning resolution	0.1 µm	0.1 µm
Dimensions		
Machine weight	10,000 kg	12,000 kg

Giustina RV product range

The Giustina Rotary Vertical (RV) series grinders with vertical or universal spindle are designed for the finishing of inner, outer diameters and faces, especially of large gears, bearings, turbines along with components for the Naval, Power Generation, Wind Energy and Mining industries.

- Rotary tables (standard or hydrostatic) ranging in diameter from 800mm up to 2000mm
- Variety of wheel diameters from 300mm up to 500mm
- Equipped with an automatic tool changer, automatic probe, wheel balancing, and a table mounted rotary dressing attachment, all powered by a Siemens 840D

Giustina RV



Model	RV / RVU 80	RV / RVU 120	RV / RVU 160	RV / RVU 200
Working Capacity				
OD x height *standard wheel	850 X 500 mm	1300 X 500 mm	1700 X 500 mm	2100 X 500 mm
Min. ID x depth *standard wheel	500 x 500 mm	500 X 500 mm	600 X 500 mm	700 X 500 mm
Min. ID x depth *w/extension	200 x 250 mm	200 X 250 mm	200 X 300 mm	300 X 300 mm
Wheel dimensions				
Standard wheel OD x W	300 X 75 mm	300 X 75 mm	400 X 100 mm	500 X 100 mm
Wheel diameter w/extension	140 mm	140 mm	140 mm	200 mm
Universal spindle				
Power	15 kW	15 kW	25 kW	40 kW
Speed min. / max	2000-6000 rpm	2000-6000 rpm	1400-6000 rpm	1150-4000 rpm
Angle swiveling *RV/U	+/-110 deg	+/-110 deg	+/-110 deg	+/-110 deg
Standard rotary table				
Diameter	800 mm	1200 mm	1600 mm	2000 mm
Speed min. / max	10-220 rpm	5-150 rpm	5-100 rpm	1-50 rpm
Hydrostatic rotary table				
Diameter	800 mm	1200 mm	1600 mm	2000 mm
Speed min. / max	5-320 rpm	5-240 rpm	5-160 rpm	1-80 rpm
Load capacity w/o magnetic chuck	2000 kg	3500 kg	5000 kg	1300 kg
Vertical-transversal Axis				
Speed	15 m/min	15 m/min	15 m/min	15 m/min
Increment min. setting	0.001 mm	0.001 mm	0.001 mm	0.001 mm

Giustina double disc product range

A large range of CNC machines built for high production and quality standards, to process flat and parallel surfaces in various working modes.

— Rotary carrier, through-feed, reciprocating, continuous or plunge grinding method according to process requirements
— Our double disc grinding technology is second to none, and machines range in size from 305mm wheel diameter up to 1067mm wheel diameter with spindle power as high as 100kW

Giustina RVD23

Giustina R242

Vertical models	RVD – 20			RVD – 23		RVD - 30
Weight		5,550 kg		5,550 kg	12,000 kg	15,000 kg
OD grinding wheel	305 mm	355 mm	455 mm	510 mm	585 mm	760 mm
Max. power grinding wheel	5.5-7.5 kW	7.5-11 kW	11 - 15 kW	11 - 15 kW	22 - 30 kW	30 kW
Positioning precision	1 µm	1 µm	1 µm	1µm	1µm	1µm
Max. workpiece - OD	5 - 50 mm	5 - 60 mm	15 - 75 mm	15 - 75 mm	20 - 100 mm	25 - 180 mm
Max. workpiece - width	0.5 - 15 mm	0.5 - 15 mm	0.7 - 25 mm	0.7 - 25 mm	1 - 50 mm	1 - 75 mm
Horizontal models	**R220**		**R224**	**R242**		
Weight	6,000 kg	6,000 kg	8,000 kg	14,000 kg	14,000 kg	14,500 kg
OD grinding wheel	508 mm	610 mm	660 mm	760 mm	915 mm	1067 mm
Max. power grinding wheel	22 kW	22 kW	37 kW	75 kW	75 kW	75 kW
Positioning precision	1 µm	1 µm	1 µm	1 µm	1 µm	1 µm
Max. workpiece - OD	90 mm	90 mm	200 mm	370 mm	800 mm	900 mm
Max. workpiece - width	1 - 40 mm	1 - 50 mm	1 - 75 mm	1 - 110 mm	1 - 110 mm	1 - 110 mm

Giustina RP

Vertical single disc grinder

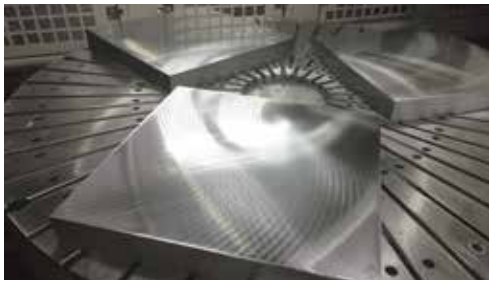
The Giustina RP is a vertical single disc grinder with magnetic rotary table and specially developed for the processing of big workpieces like large bearings, plates and pump covers. The machine's multiple workpiece clamping feature helps to reduce cycle time and enhance productivity.

— Monoblock wheelhead for highest rigidity & fast stock removal
— Rough and finish grind in one clamping
— Segmented grinding wheel

AVAILABLE OPTIONS:

— In-process measuring system
— Robot or gantry loading systems
— Magnetic rotary table in several sizes

Giustina RP



Model	RP 1000	RP 2000
Machining capacity		
Max. workpiece diameter	1,200 mm	2,100 mm
Max. workpiece thickness	400 mm	400 mm
Wheelhead		
Outer diameter	660 mm	660 mm
Surface speed	30 m/s	30 m/s
Max. power	75 kW	75 kW
Plunge infeed speed	0.1 - 1,000 mm/min	
Spindle type	Monoblock design, mounted on profiled guide ways	
Bearings	Pre-loaded angular contact ball bearings	
Linear axes		
Positioning resolution	0.0001 mm	0.0001 mm
Coolant		
Coolant delivery	350 l/min	350 l/min
Dimensions		
Machine weight	16,000 kg	24,000 kg

Landis Flex

Traverse / plunge / contour grinding

The Landis Flex is designed for grinding shaft-type parts. Sustainable productivity, precision and flexibility in a package with a small carbon footprint.

- Linear motors on all feed and traverse mechanisms
- Hydrostatic wheel spindles
- Meets micron level dimensional & geometric part tolerances
- CBN, diamond or conventional wheels
- Reduced power consumption

Landis Flex

30 degree plunge machine

Dedicated straight machine

Swivel machine

Twin wheel head machine

Model	Landis Flex			
Grinding capacity	**Straight**	**30 deg angle head**	**Swivel head**	**Twin wheel head**
Max. component swing	400 (750) mm	400 (750) mm	400 (750) mm	400 (750) mm
Max. grinding length	1500 / 2500 / 3500 / 4000 mm			
Max. workpiece weight	1350 kg	1350 kg	1350 kg	1350 kg
Wheelhead				
Max. number of wheels	1	1	3	2
Wheel type	Conventional or CBN			
Max. wheel Ø	760 mm	760 mm	600 mm	760 mm
Max. wheel width	100 (75) mm	100 (75) mm	100 (75) mm	100 (75) mm
Wheel surface speed	45 (80) m/s	45 (80) m/s	45 (80) m/s	45 (80) m/s
Spindle power	50 kW	50 kW	50 kW	50 kW
Workhead & Footstock				
Workhead speed	300 rpm			
Footstock stroke	70 mm			
Axes				
Guideways / bearings (linear axes)	Anti friction bearing			
Grinding spindle	Hydrostatic			
Drive	Linear motors			
Dimensions				
Machine weight	15,000 to 19,500 kg (dependent on length)			

Landis LT1Se & LT1Se-DH

Cam segment grinding

Designed as compact cam-segment grinders the Landis LT1Se models can grind cylindrical and non-cylindrical shapes on small to mid-sized components.

- Dual headstock (LT1Se-DH)
- Virtually zero parasitic time for high production requirements
- Integrated loader mechanism to load/unload whilst machining (LT1Se-DH)
- Linear motors on all slide ways
- In process gauging

LT1Se-DH

Landis LT1Se

Model	LT1Se	LT1Se-DH
Grinding capacity		
Max. component swing	200 mm*	75 mm*
Max. grinding length	250 mm*	150 mm*
Max. workpiece weight	100 kg	30 kg
CBN Grinding wheel		
Max. number of spindles	2	
Wheel type	CBN	
Max. wheel Ø	200 mm*	120 mm*
Max. wheel width	50 mm*	80 mm*
Wheel surface speed	120 m/s	120 m/s
Spindle power	20 kW	26 kW
Workhead & footstock		
Quantity	1	2
Workhead speed range	0 - 600 rpm	
Workhead drive power	5.5 kW	
Max. workhead motor torque	260 Nm	
Footstock stroke	150 mm	
Type	Live spindle	
Axes & Control		
Guideways / bearings (X)	Precision linear ways	Hydrostatic
Guideways / bearings (Z)	Precision linear ways	Precision linear ways
Drive	Linear motor	Linear motor
Grinding spindle	Ball bearings	Hydrostatic
Dimensions		
Machine bed	Composite	Cast Iron
Dimensions	2600 x 2150 mm	2205 x 2705 mm
Machine weight	12,500 kg	12,000 kg

Landis LT1e and Landis LT1Ve

Adaptable component grinding

The compact machine design is ideal for high volume production of camshafts and multi diameter shaft-type components. The Landis LT1 series is also suitable for grinding of concentric diameters, eccentrics, profiles, tapers, chamfers and faces.

- Available for different length capacity
- Optional swiveling wheelhead with an infinitely variable swiveling wheelhead
- Available with hydrostatic or precision roller bearings

Landis LT1e

Model	Landis LT1e 500	Landis LT1e 1200	Landis LT1Ve
Grinding capacity			
Max. component swing	150 mm		80 mm
Max. grinding length	500 mm	1,200 mm	500 mm
Center height	220 mm		220 mm
Max. workpiece weight	250 kg		100 kg
Wheelhead			
Wheel type	CBN		
Max. Wheel Ø	350 mm		
Max. wheel width	65 mm		
Wheel surface speed	200 m/s		120 m/s
Spindle power	40 kW		19 kW
Swivel wheelhead (B-axis)	n/a	optional	n/a
B-axis swivel range	n/a	230 deg	n/a
Workhead & footstock			
Type	live spindle		
Workhead speed range	0 - 600 rpm		
Workhead drive power	5.5 kW		
Max. workhead motor torque	230 Nm		260 Nm
Type	Hydraulic operated		
Footstock stroke	50 / 80 / 160 mm		up to 180 mm
Axes			
Linear guide ways	Hydrostatic		Linear rails
Grinding spindle	Hydrostatic		Ball bearings
Drive	Linear motor		Linear motor
Dimensions			
Dimensions [mm]	4330 x 5650 x 2385	5530 x 5650 x 2465	4030 x 3050 x 2338
Machine weight	9,800 kg	12,000 kg	10,000 kg

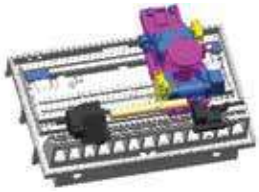
Landis LT2e

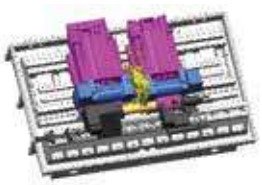
The benchmark for processing concentric and non-concentric workpieces

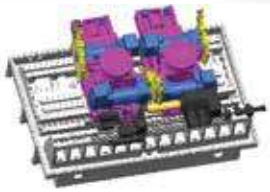
The built-in flexibility of the Landis LT2e allows the processing of a variety of parts within the size envelope with the same efficiency it handles crankshafts and camshafts. It offers a customizable solution that is tailored to the exact needs of the customer and the workpiece.

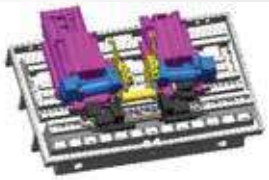
- Compact footprint
- Angle-mounted wheelhead option
- Optional swivel wheelheads for up to four spindles
- Simultaneous grinding with wheels spaced as close as 20mm
- ID attachment available for simultaneous ID/OD grinding

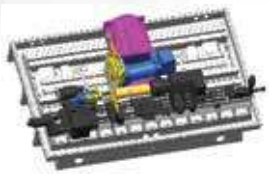
Landis LT2e


Single Swivel


Twin Standard


4 Spindle


Twin Opposed 5°


Flange & Bore

Model	Single Swivel	Twin Standard	4 Spindle *3 Spindle Option	Twin Opposed 5°	Flange & Bore
Grinding capacity					
Max. component swing	210 mm	210 mm	210 mm	210 mm (*170 mm)	210 mm
Max. grinding length	1500 mm	750 mm	750 mm	550 mm	750 mm
Max. workpiece weight	250 kg	250 kg	250 kg	250 kg	250 kg
Wheelhead					
Wheel type	CBN	CBN	CBN	CBN	CBN
Max. wheel Ø	520 mm	520 mm	520 mm	520 mm	520 mm
Max. wheel width	30 mm / 40 mm / 60 mm options			20 mm	120 mm 60 mm bore
Max. wheel surface speed	180 m/sec	180 m/sec	180 m/sec	180 m/sec	180 m/sec
Max. spindle power	70 kW	70 kW	70 kW	70 kW	70 kW
B-axis swivel range	230° infinitely	N/A	230° infinitely	Optional	Optional
Workhead & footstock					
Type	Headstock drive between centres			Dual footstock	Headstock drive centreless
Workhead drive power	13 kW	13 kW	13 kW	3.7 kW	13 kW
Max. motor torque	250 Nm	250 Nm	250 Nm	210 Nm	250 Nm
Footstock stroke	160 mm	160 mm	160 mm	160 mm	160 mm
Axes					
Linear guide ways	Hydrostatics	Hydrostatics	Hydrostatics	Hydrostatics	Hydrost./Linear elem.
Grinding spindle	Hydrostatics	Hydrostatics	Hydrostatics	Hydrostatics	Hydrost./Rolling elem.
Drive	Linear Motors	Linear Motors	Linear Motors	Linear Motors	Linear Motors / Ballscrew
Dimensions					
Dimensions	4965 mm x 5429 mm x 2300 mm				
Machine weight	21,500 kg	17,500 kg	24,000 kg	17,500 kg	17,500 kg

Landis LT2He and LT2HHe

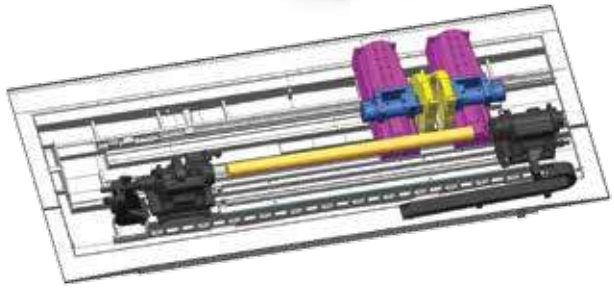
Crank shaft and cam shaft grinding machines

The Landis LT2He and LT2HHe models offer an extended component capacity. The machines are designed to grind crankpins and journals on large crankshafts, or lobes and journals on large camshafts, using single or twin wheelheads.

— Capacity up to 4,500mm part length
— Linear Motor Technology
— Hydrostatic wheelhead feed & cross slides
— Hydrostatic wheel spindles
— Variable speed work drive
— Automatic in-process gauging
— Flexible table tooling with rack & pinion adjustment

Landis LT2He

Finish grinding intake, exhaust cam lobes and injectors



LT2HHe configuration

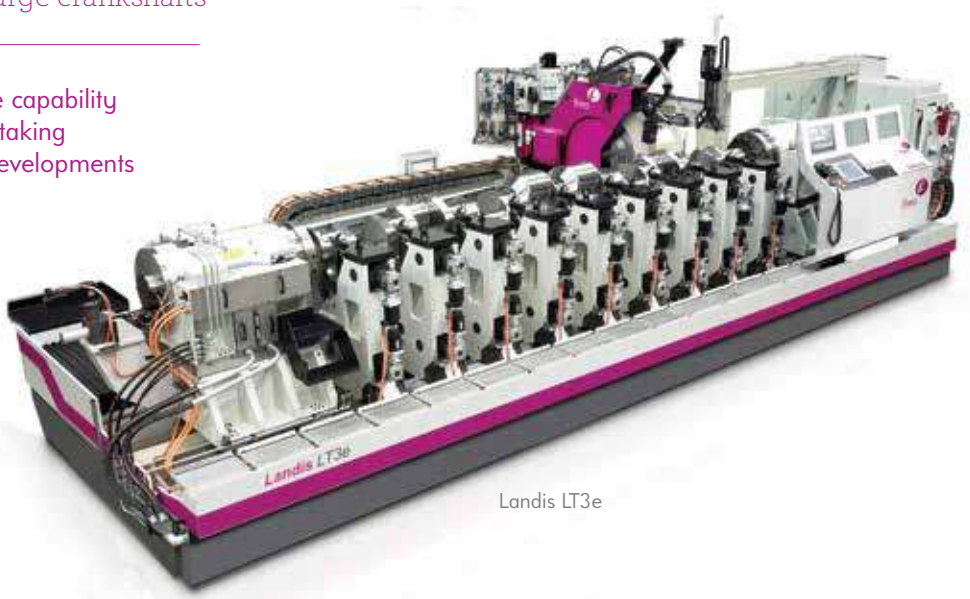
Model	LT2He Single Wheelhead *2 Spindle Swivel Optional	LT2He Twin Wheelhead	LT2HHe Twin Wheelhead
Grinding capacity			
Max. component swing	550 mm	550 mm	600 mm
Max. grinding length	3000 mm	1400 mm	4500 mm
Max. workpiece weight	500 kg	500 kg	4500 kg
Wheelhead			
Wheel type	CBN		
Max. wheel Ø	120/400/675mm options	675 mm	1000 mm
Max. wheel Width	80 mm	80 mm	150 mm
Max. wheel surface speed	150 m/sec	150 m/sec	120 m/sec
Max. spindle power	25/65/95 kW options	95 kW	124 kW
B-axis swivel range	*Optional 230° infinitely	N/A	± 3° for tapers
Workhead & footstock			
Max workhead speed	600 rpm	300 rpm	50 rpm
Workhead drive power	13 kW	20 kW	65 kW
Max. workhead motor torque	160 Nm	280 Nm	1250 Nm
Footstock stroke	160 mm	160 mm	150 mm
Axes			
Linear guide ways	Hydrostatics	Hydrostatics	Hydrostatics / Linear Rail
Grinding spindle	Hydrostatics		
Drive	Linear Motors		
Dimensions			
Dimensions	7552 x 5464 x 2800 mm		10,000 x 4,400 mm
Machine weight	26,000 kg	29,000 kg	70,000 kg

Landis LT3e

Specifically designed for grinding of large crankshafts

The Landis LT3e machine design provides the capability of grinding workpieces up to 8.5m in length, taking advantage of state-of-the-art technological developments and providing outstanding features.

- CNC Hydrostatic wheelhead and workhead bearings
- Up to 40 servo axes supported
- Servo workrests
- Electronically synchronized crankheads
- In-process gauging



Landis LT3e

Grinding of pins on 6500mm crankshaft

Model	Landis 4500	Landis 6500	Landis 8500
Grinding capacity			
Max. component swing	850 mm	850 mm	850 mm
Max. pin diameter	350 mm	350 mm	350 mm
Max. journal diameter	350 mm	350 mm	350 mm
Max. throw	250 mm	250 mm	250 mm
Max. part length	4,500 mm	6,500 mm	8,500 mm
Max. grinding length	4,500 mm	6,500 mm	8,500 mm
Max. workpiece weight	4,500 kg	6,500 kg	8,500 kg
Wheelhead			
Wheel type	Aluminium Oxide	Aluminium Oxide	Aluminium Oxide
Wheel heads	Single Wheel Head	Single Wheel Head	Single Wheel Head
Max. wheel Ø	1,400 mm	1,600 mm	1,600 mm
Max. wheel width	250 mm	250 mm	250 mm
Wheel surface speed	35 m/sec	35 m/sec	35 m/sec
Spindle power	60 kW	60 kW	60 kW
Bearings	Hydrostatics	Hydrostatics	Hydrostatics
Workhead & footstock			
Workhead speed range	0-12 rpm	0-12 rpm	0-12 rpm
Max. workhead motor torque	8000 nm	8000 nm	8000 nm
Workhead bearings	Hydrostatics	Hydrostatics	Hydrostatics
Footstock stroke	150 mm	150 mm	150 mm
Axes			
Linear guide ways	Hydrostatics / Linear Rails	Hydrostatics / Linear Rails	Hydrostatics / Linear Rails
Grinding spindle	Hydrostatics	Hydrostatics	Hydrostatics
Drive	Linear Motors	Linear Motors	Linear Motors
Dimensions			
Dimensions (mm)	10,225 mm x 5,500 mm	12,400 mm x 5,500 mm	14,57 5mm x 5,500 mm
Machine weight	80,000 kg	90,000 kg	100,000 kg

Cranfield Precision Twin Turret Generator

High-precision free form machining on a compact footprint

The Cranfield Precision TTG series is a twin-turret, multi spindle solution to grind OD's, ID's, faces, tapers, concentric and eccentric diameters to sub-micron tolerances in a single clamping. It offers unlimited flexibility in workpiece grinding operations.

- Various spindle configurations available
- Reduced work piece changeover time
- Constant wheel surface speed
- Superior surface finishes
- Easy automation integration
- High performance control with open architecture
- High stiffness and damping for high quality, low sub-surface damage optical surfaces
- Machine bed thermally isolated from machining process by patented machine axes configuration
- Multi-process platform: grinding, diamond turning, milling, polishing
- In-situ metrology

Cranfield Precision TTG 100

Optics grinding setup

Model	TTG100	TTG400
Machine capacity		
Max. grinding diameter (OD): Full form profile	100 mm	400 mm
Nominal external grinding length	100 mm	150 mm
Max. internal grinding length	100 mm	150 mm
Max. workpiece weight (for air bearing)	1.5 kg	8 kg
Tool spindle turret		
Swivel range	+/- 135 deg	+/- 135 deg
Turret bearing	Hydrostatic	
Max. number of spindles	4	4
Metal bond wheels	✓	✓
Resin bond wheels	✓	✓
Grinding spindle bearings	Air	Air
Max. wheel Ø	140 mm	160 mm
Max. wheel width	12 mm	12 mm
Wheel surface speed (wheel type dependent)	125 m/s	100 m/s
Max OD spindle power	2.4 kW	3.5 kW
Max. ID spindle speed	120,000 rpm	120,000 rpm
Work spindle turret		
Swivel range	+/- 135 deg	+/- 135 deg
Turret bearing	Hydrostatic	
C-axis	Air (hydrostatic option)	
Workhead speed	1 - 3,000 rpm	1 - 3,000 rpm
Linear axes travel (infeed)	150 mm	300 mm
Dimensions		
Machine dimensions (W x L)	1.6 m x 1.9 m	2.6 x 2.3 m
Machine weight	2,800 kg	3,500 kg

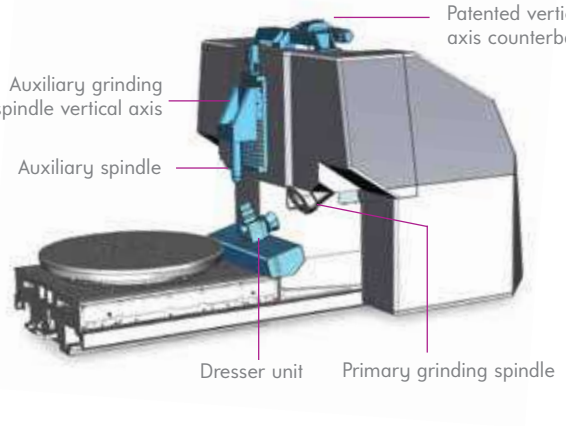
Cranfield Precision OGM

High precision glass grinding machine

The Cranfield Precision OGM range of high precision glass grinding machines has the capacity to produce components up to Ø1600mm x 600mm, with options for up to 2000mm diameter components. It features hydrostatic bearings, linear motors, FEA optimised base and bridge assembly.

- 1µm RMS form accuracy
- 100nm linear resolution encoder system
- Optional in-situ metrology
- Auxiliary ID/OD grinding spindle

Cranfield Precision OGM



In-situ metrology of 1200 mm optic

Model	OGM 1200	OGM 1600
Machining capacity		
Max. diameter	1200 mm	1600 mm
Max. workpiece height capacity (incl. tooling)	200 mm	600 mm
Max. workpiece mass (including tooling)	1200 kg	1600 kg
Y axis (horizontal workpiece travel)		
Axis stroke	1430 mm	2000 mm
Min. command resolution	0.05 µm	0.05 µm
Max. linear motor force (continuous)	1640 N	1640 N
Max. working feed rate velocity	3000 mm/min	3000 mm/min
Z axis (vertical grinding wheel infeed)		
Axis stroke	275 mm	455 mm
Min. command resolution	0.05 µm	0.05 µm
Max. working feed rate velocity	3000 mm/min	3000 mm/min
C Axis (component work table)		
Axis rotation (continuous)	+/- 360°	+/- 360°
Max. axis velocity	60 rpm	60 rpm
Encoder resolution	0.0001°	0.0001°
S1 grinding spindle		
Spindle speed (standard spindle)	100 - 3055 rpm	100 - 3055 rpm
Theoretical stiffness (radius and axial)	950 N/µm	950 N/µm
Rated spindle power (continuous)	20 kW	20 kW
Dimensions		
Dimensions (W x D x H)	2.18 x 6 x 3.05 m	2.6 x 7.55 x 3.85 m
Mass	30,000 kg	40,000 kg

Cranfield Precision EcoR1664

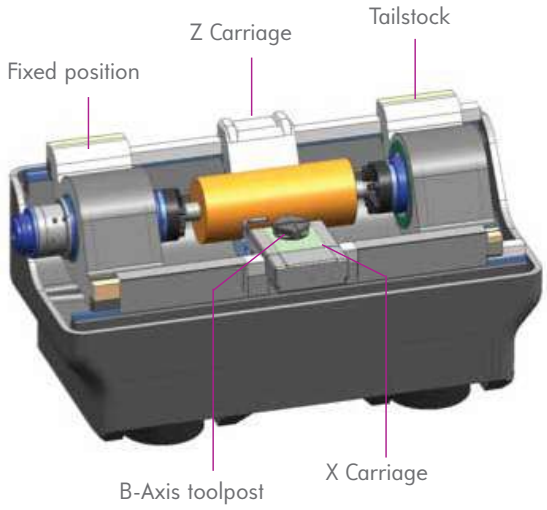
Ultra precision diamond turning machine

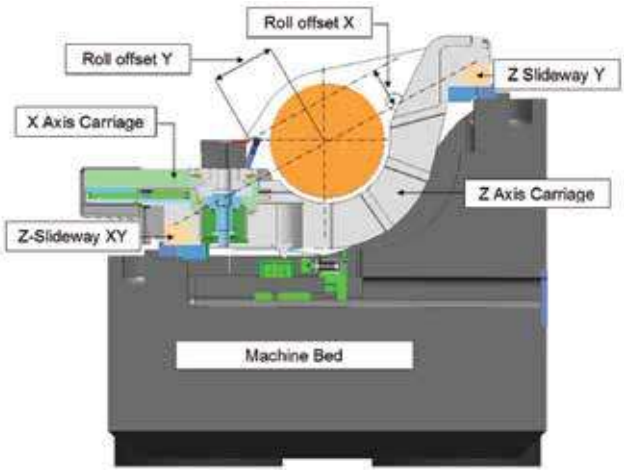
The Cranfield Precision EcoR1664 Roll Turning Machine is specially designed for production level machining of optical quality components.

The main axis of the machine uses a stepped hydrostatic design with rail positioning that provides virtually zero roll errors in the tool infeed direction drastically reducing the majority of errors experienced on conventional lathes.

- Outstanding thermal stability
- High system stiffness
- Very good damping

Cranfield Precision EcoR1664





Machining capacity	
Maximum roll diameter (OD)	410 mm (16")
Maximum roll length	1625 mm (64")
Maximum roll mass	680 kg (1500 lb)
X axis (tool Infeed)	
Axis stroke	205 mm
Compensated accuracy	<0.5 µm
Feedback resolution	1 nm
Maximum linear motor force	1385 N
Maximum axis velocity	50 mm/s
Maximum axis acceleration	50 mm/s^2
Z axis (tool traverse)	
Axis stroke	1630 mm
Compensated accuracy	<2 µm
Feedback resolution	1 nm
Maximum linear motor force	1748 N
Maximum axis velocity	50 mm/s
C Axis (headstock spindle)	
Load capacity	300 kg
Max speed	1200 rpm
Axis resolution	<0.05 arc sec
A Axis (tailstock spindle)	
Load capacity	300 kg
Max speed	1200 rpm
Axis resolution	<0.05 arc sec
B Axis (tool spindle)	
Load capacity	100 kg
Feed back resolution	0.05 arc se
Maximum torque	40 Nm
Environmental control	
Microclimate (oil shower temp. control)	0.01°C

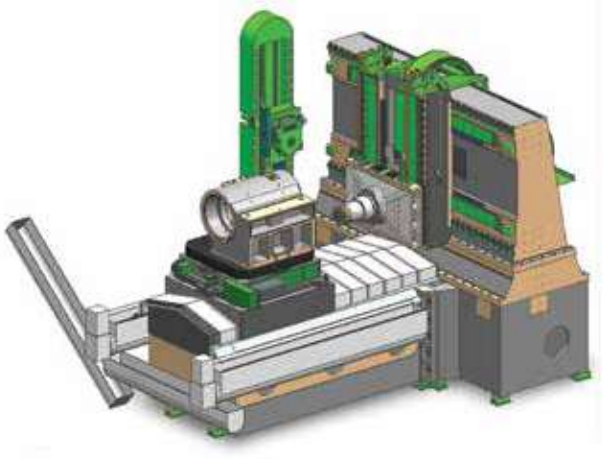
Cranfield Precision HPB4^3

High precision jig boring machine

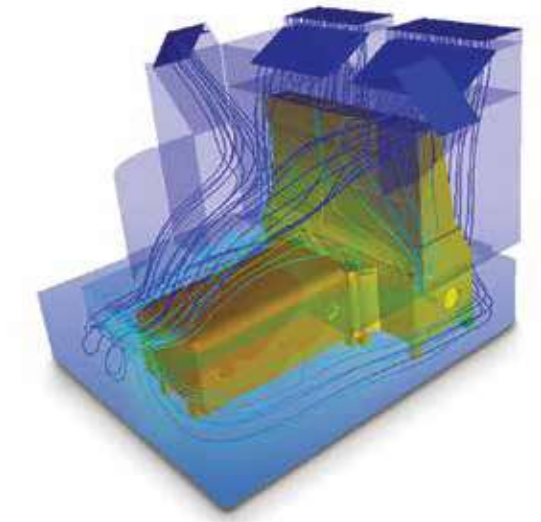
The Cranfield Precision HPB4^3 is a high performance horizontal jig boring machine with the capacity to machine large precision bores that are round, parallel and in-line. Designed as a multi-purpose machining center it allows to mill, drill, ream, face and bore in one set-up.

- Kinematically supported machine base
- High-precision hydrostatic tool spindle
- Temperature controlled motors, hydrostatic oil, coolant and environment for supreme machining accuracy
- Recirculating ball bearing guides (linear axes)

Cranfield Precision HPB4^3



Machine with component and auto tool changer



Flow analysis of machine's temperature controlled environment

Machining capacity	
Component work volume	4000 mm^3
X axis (spindle cross feed)	
Axis stroke	2000 mm
Feedback resolution	0.005 µm
Maximum linear motor force	1500 N
Machining feed rate	0-10 m/min
Maximum axis acceleration	2 m/s^2
Y axis (spindle vertical)	
Axis stroke	1125 mm
Feedback resolution	0.005 µm
Maximum linear motor force	1500 N
Machining feed rate	0-10 m/min
Maximum axis acceleration	2 m/s^2
Z Axis (component infeed)	
Axis stroke	1250 mm
Feedback resolution	0.005 µm
Maximum linear motor force	1500 N
Machining feed rate	0-10 m/min
Maximum axis acceleration	2 m/s^2
Rotary tool spindle	
Radial and axial stiffness	950 N/µm
Spindle speed	10-1500 rpm
Through spindle coolant	✓
Hydrostatic bearings	✓
B Axis (component rotary axis)	
Table size	1250 x 1250 mm
Load capacity	4000 kg
Maximum axial machining force	25 kN
Maximum radial error motion	10 µm
Position resolution	0.0001°

Automation & Turnkey solutions

Years of experience providing automation & turnkey solutions that are specifically tailored to the needs of the customer and today's production requirements.

— Market specific solutions
— Engineered in house
— Easy implementation into your current production processes
— Eliminate all possible project management headaches

AUTOMATION – MAXIMUM FLEXIBILITY

— Loading/unloading: manual, conveyors, pushing devices, robots, portals
— Machine integration in new and existing production lines
— Automatic parts detection and adaptation to mixed part types

Aftermarket

Our services include:

— Machine assembly- In the field as required
— Machine Set-up
— Machine demonstration
— Customer training
— Spare parts
— Replacement parts
— Technical support
— Retools / Remanufactures
— Warranty period
  • Parts
  • Service

GrinderCare℠

By taking advantage of our GrinderCare℠ service you can focus on your core competencies. Our technical support and field team keep your machines running efficiently and reduce the overall cost of machine ownership.

CHOOSE YOUR CARE COMPONENTS:

— On-site service
— Technical Support
— Training
— Process development
— Unit repairs
— Machine certification
— Preventive maintenance programs

SOFTWARE UPGRADES

— Controls
— PLC
— Computer

ADVANTAGES

— Faster computation
— Greater grind control
— Up to date technology

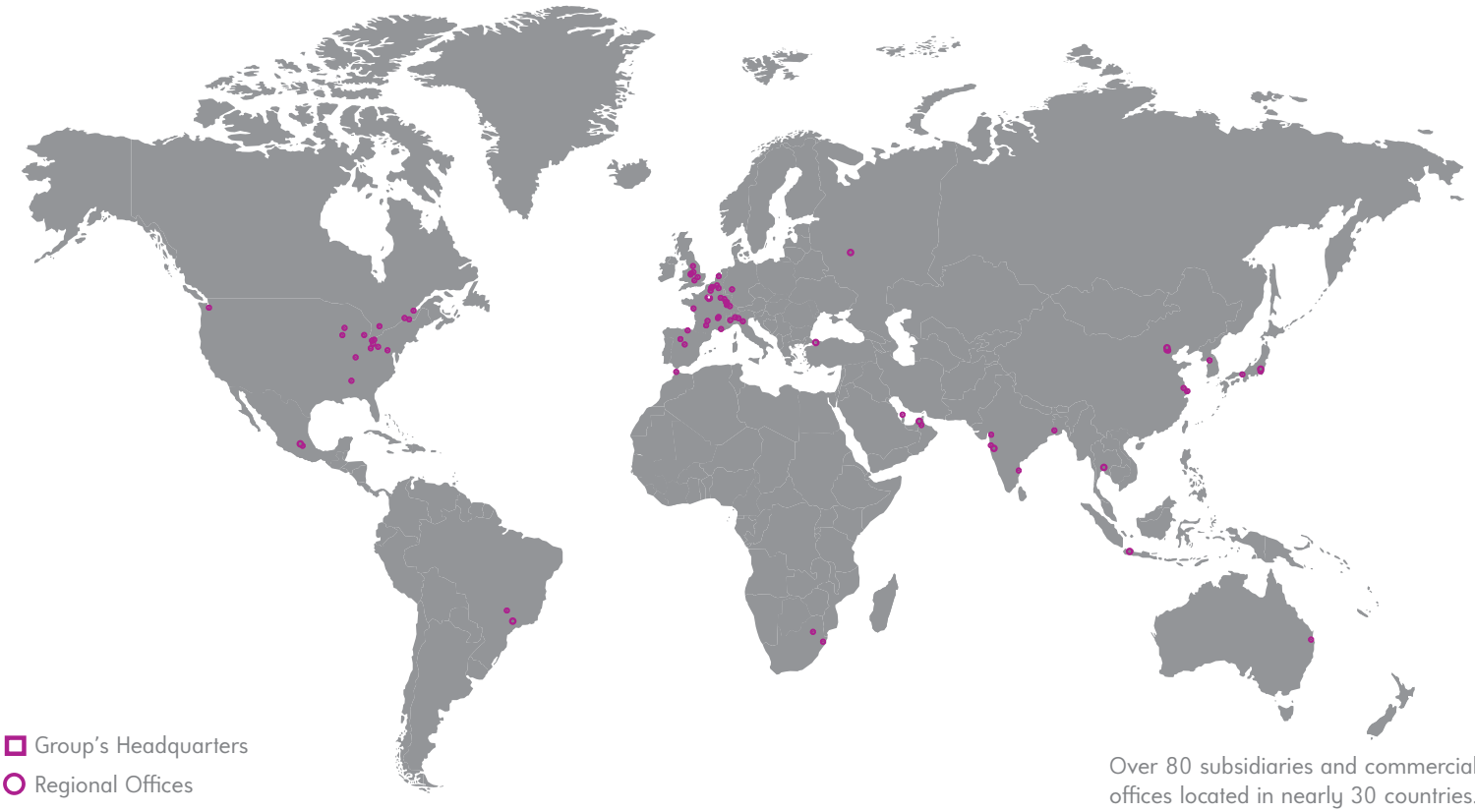
Our GrinderCare℠ program supports the following brands:

Landis - Landis-Bryant - Gardner - Giustina - Cincinnati - Besly - Warner Swasey - Pratt & Whitney - Norton - Gold Crown - Cranfield Precision

Providing parts and service all around the world

Fives GrinderCare℠ solutions aim to:

— Extend product life
— Maintain peak efficiencies
— Reduce the cost of machine ownership
— Maximize performance through a full range of services



- Group's Headquarters
- Regional Offices
- Subsidiaries

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