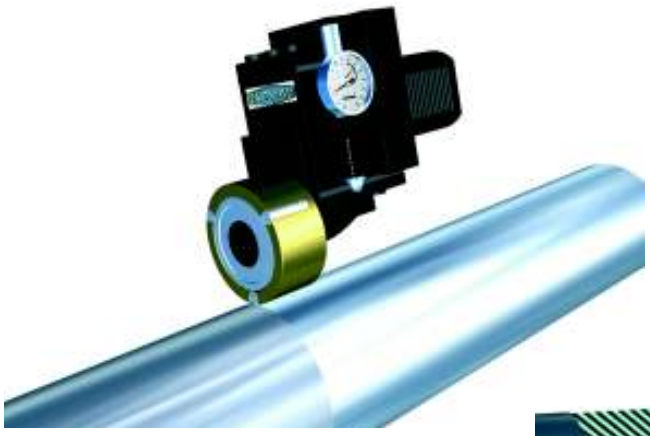
Mechanical Single Roller Tools

ECOROLL's mechanical single roller tools are designed to machine a wide variety of irregular surfaces, including specific contours, fillets, and grooves as well as cylindrical and tapered external surfaces and bores.

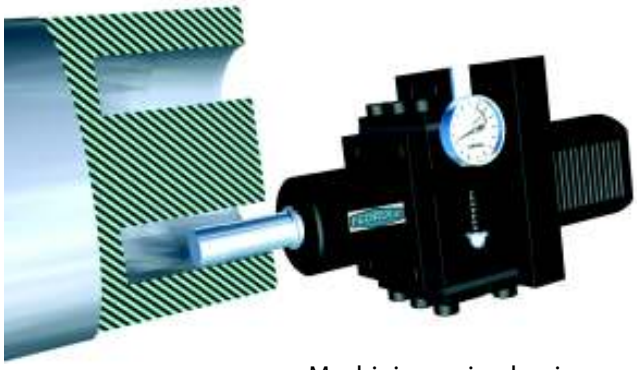
This group of tools includes types EG5, EG14 and EG45.

EG5

The EG tools consist of a tool body equipped with a tool shank, a spring assembly that allows the head to move with no play and very little friction, and an indicator that indirectly measures the burnishing force.

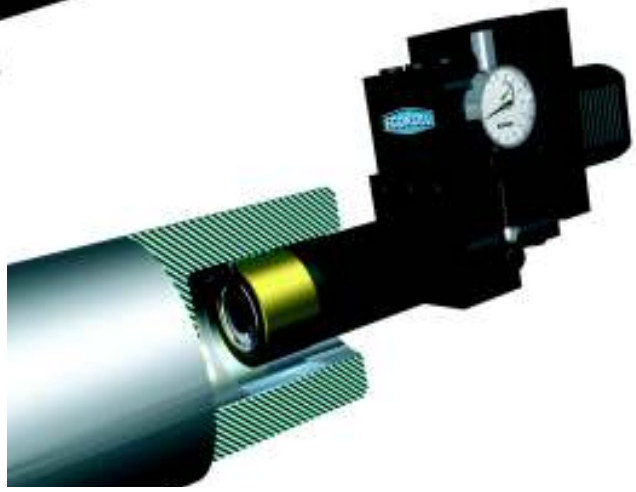


Machining a cylinder rod with a Type EG5 tool.



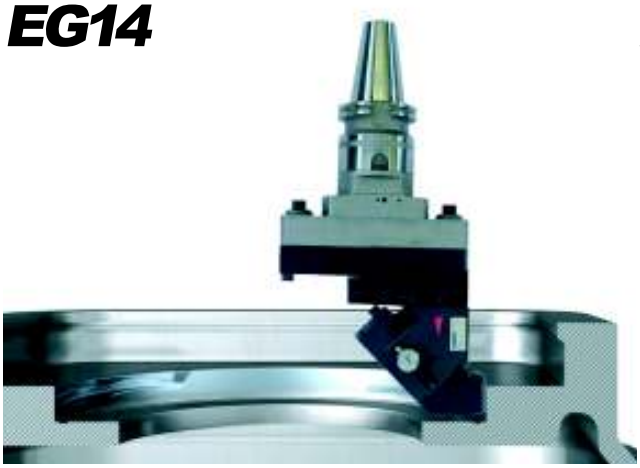
Machining a circular ring area with an EG5-xxF tool.

Machining a spherical surface with an EG5-08 tool.

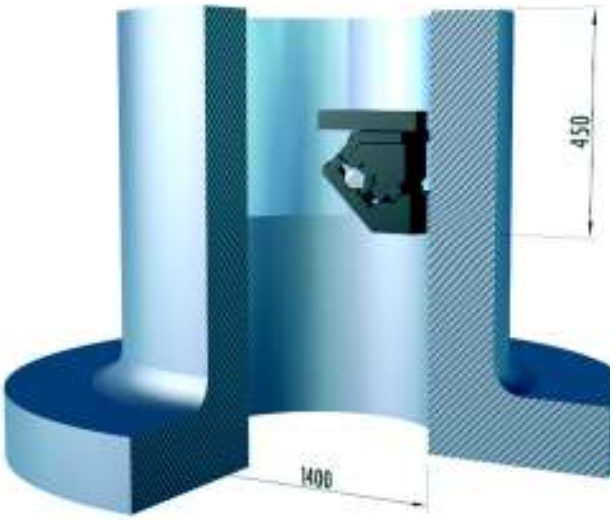


Machining a bore with an EGI-32 tool.

EG14



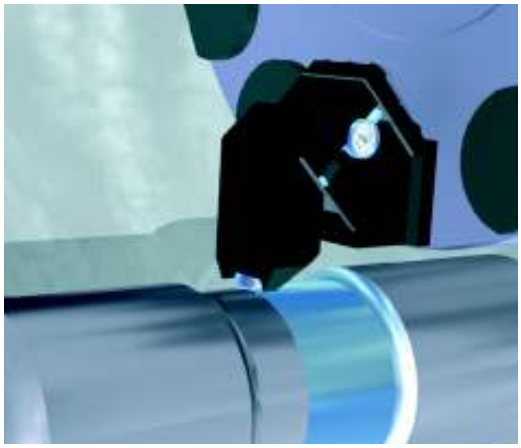
Machining a housing



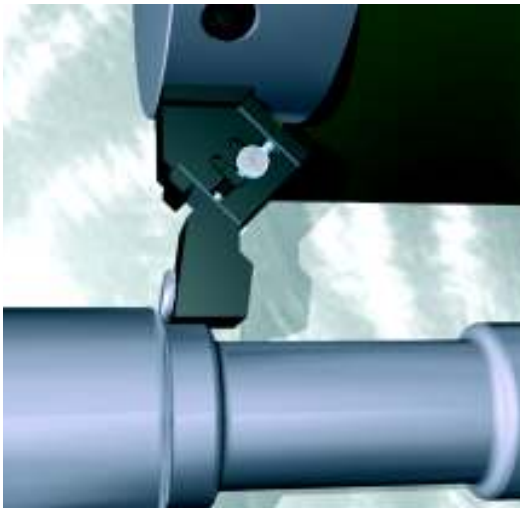
Machining a bearing housing

Machining a cylinder rod

EG45



Machining a train axle with an EG45-40M tool.



Machining a train axle with an EG45-45T tool.

Machining a flywheel with an EG45-40M tool.

Type EG5 Tool Applications: Cylinders, faces, tapers and bores

Diameters 55 mm and larger

Features

- *Roller burnishing of cylindrical and tapered external surfaces, external or internal faces, and cylindrical and tapered bores (specially designed models available for tapers)*
- *For use with either CNC-controlled or conventional lathes*
- *Complete processing in one setting*
- *Achievable surface quality: R_z < 1 µm (R_a = 0.2 µm)*
- *Suitable for metals with tensile strength up to 1400 N/mm² and maximum hardness HRC ≤ 45*
- *Symmetrical construction allows either right or left hand operation*
- *Feed in the direction of the arrow label on the tool*
- *Roller can rotate in either direction*

Advantages

- *Short cycle time*
- *Eliminates set-up and auxiliary processing time*
- *For use with either CNC-controlled or conventional lathes*
- *No dust or grinding residue*
- *Minimal lubrication required (oil or emulsion)*
- *Variable burnishing force dependent on spring deflection*
- *Accurately measured burnishing force ensures consistent, high quality results*
- *Unrestricted roller face makes roller burnishing of shoulders and other edges possible*
- *Spring assembly allows roller head to move with no play and very low friction*
- *Modular construction allows these tools to be used in several configurations*
- *Easy to change wear parts*
- *Tool design includes fixed roller clearance angle **α***

Parameters

- *Maximum circumferential speed: 150 m/min.*
- *Maximum feed rate: 0.6 mm/rev.*
- *Maximum burnishing force: 3000 N*

Bore Application

with Design Version 1 (see illustrations, following page)

Bore depth (mm)	≤ 16	> 66
Smallest bore diameter (mm)	55	140

Tool Design and Specifications

Basic tool design

Type EG5 single roller burnishing tools consist of a tool body equipped with a tool shank, a spring assembly that allows the roller head to move with no play and very low friction, and a dial indicator that indirectly measures the burnishing force. An optional inductive measuring system externally displays the rolling force.

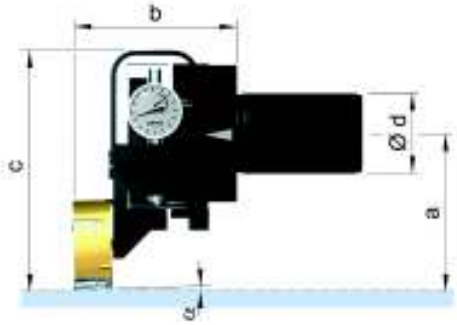
The roller head is attached to the flexible, spring-loaded section of the tool body. The roller head consists of a cage, which contains and guides the burnishing roller, and a support roller with a large-scale needle bearing. The cage contains two spare rollers as well.

How to order:

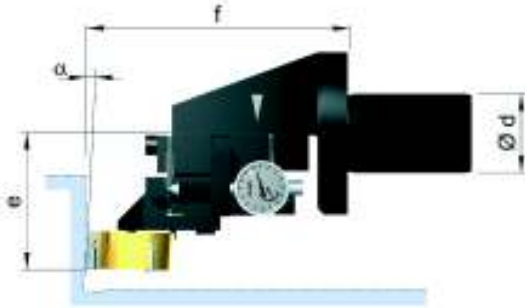
Four versions of this tool are available.
Please refer to the following illustrations and table.

Tool type — **EG5–3–VDI30** — *Shank: VDI = DIN 69880 SL = square shank*

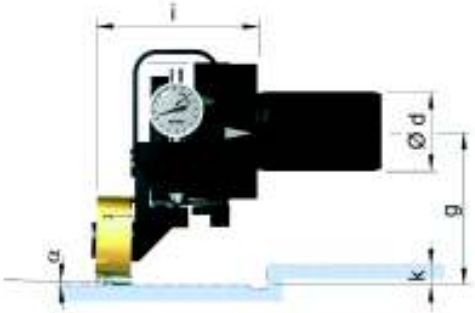
Design version: See illustrations. Specially designed tools for machining tapers by request.



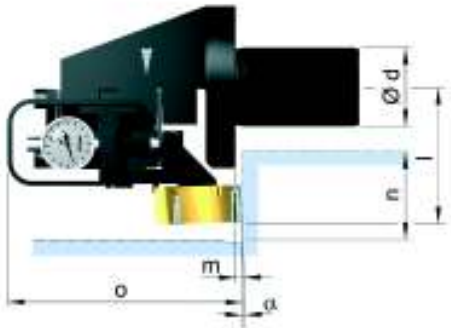
EG5, Design 1
Cylindrical surfaces



EG5, Design 2
Faces on the chuck side



EG5, Design 3
Cylindrical surfaces
Feed direction: toward tailstock



EG5, Design 4
Faces on the tailstock side

Tool type	VDI shank Ø d[1] (mm)	Height (mm)		Square shank (mm)	Variable dimensions per design version (mm)											
					1			2		3			4			
		h_1	h_2	p[1]	a	b	c	e	f	g	i	k	l	m	n	o
EG5	20	45	67	16	78	82	120	64	111	78	84	10	84	3	44	120
	30		77	20				69								
	40		82	25					112							

NOTE: 1) *Optional sizes*

Type EG5 Tool Applications: Contours, fillets, groove flanks, short bores

Diameters 8.5 mm and larger

Features

- *For use with either CNC-controlled or conventional lathes*
- *Complete processing in one setting*
- *Achievable surface quality:*
  R_z < 1 µm (R_a = 0.2 µm)
- *Suitable for metals with tensile strength up to 1400 N/mm² and maximum hardness HRC ≤ 45*
- *Modular construction allows these tools to be used in several configurations*
- *Symmetrical construction allows either right- or left-hand operation*
- *Rotates in either direction*

Advantages

- *Short cycle time*
- *Eliminates set-up and auxiliary processing time*
- *No dust or grinding residue*
- *Minimal lubrication required (oil or emulsion)*
- *Accurately measured burnishing force ensures consistent, high quality results*
- *Unrestricted roller face makes roller burnishing of shoulders and other edges possible*
- *Easy to change wear parts*

Basic tool design

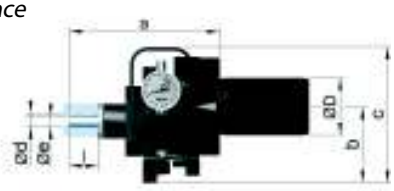
- *Tool body equipped with a tool shank, a spring assembly that allows the roller head to move with no play and very low friction*
- *Dial indicator that indirectly measures the burnishing force*
- *Variable burnishing force dependent on spring deflection*
- *Feed in the direction of the arrow label on the tool*
- *Tool design includes fixed roller clearance angle* ***α***

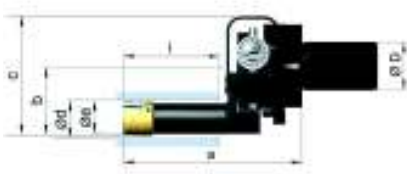
Parameters

Tool	Circumferential speed	Feed rate
EG5-08F	80-100 m/min.	0.1-0.4 mm/ rev.
EGI5-32	80-150 m/min.	0.1-0.6 mm/rev.
EGI5		
EG5-40M	100-200 m/min.	0.1-0.8 mm/rev.
EG5-40M-45°		

EG5-08F

- *Roller burnishes groove flanks on the face or on the peripheral side and bores with diameters of 8.5 mm and larger*
- *Maximum rolling depth: 20 mm for diameters of 11.5 mm and larger*
- *Maximum rolling depth: 30 mm with EG5-11F*
- *Tool body's spring assembly positioned parallel to workpiece surface*
- *Floating roller head attached to the tool body's flexible, spring-loaded section*





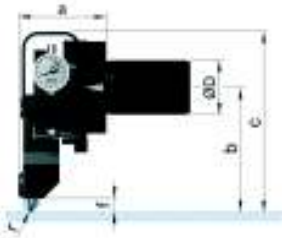
EGI5-32

- *Roller burnishes bores with diameters of 32 mm and larger*
- *Maximum rolling length: 80 mm*
- *Tool body's spring assembly positioned parallel to workpiece surface*
- *Roller head attached to the tool body's flexible, spring-loaded section*
- *Roller head consists of a cage that guides the burnishing roller and a support roller with a large-scale needle bearing*

Tool Design and Specifications

EGI5

- *Roller burnishes bores with diameters of 55 mm and larger*
- *Maximum rolling length: 140 mm*
- *Tool body's spring assembly positioned at a 45° angle to workpiece surface*
- *Roller head attached to the tool body's flexible, spring-loaded section*
- *Roller head consists of a cage that guides the burnishing roller and a support roller with a large-scale needle bearing*
- *Cage also contains two spare rollers*



EG5-40M

- *Roller burnishes contoured external surfaces*
- *For materials with low and mid-level strength*
- *Tool body's spring assembly positioned parallel to workpiece surface*
- *Roller head attached to the tool body's flexible, spring-loaded section*
- *Extremely narrow roller with an integrated four-point bearing*

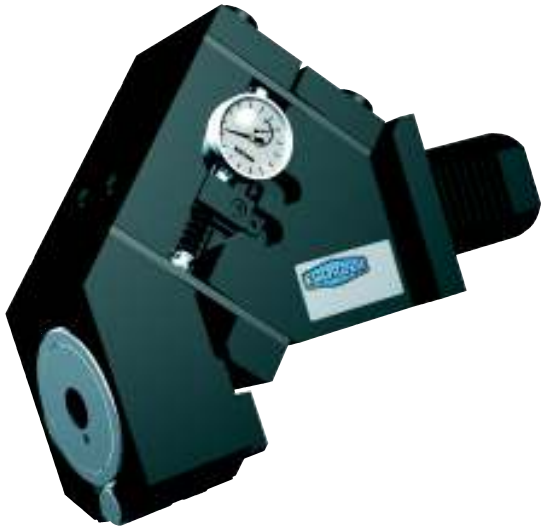
EG5-40M-45°

- *Roller burnishes cylindrical surfaces with connecting fillet radii up to the workpiece face*
- *For materials with low and mid-level strength*
- *Tool body's spring assembly positioned at a 45° angle to workpiece surface*
- *Roller head attached to the tool body's flexible, spring-loaded section*
- *Extremely narrow roller with an integrated four-point bearing*

Tool type	VDI shank Ø D (mm)	Height (mm)		Square shank (mm)	Basic dimensions (mm)					
		h_1	h_2		a	b	c	d	e	l
EG5-08F	20,30,40	40	67-91	20 25 32	106	53	95	8.5 / 11.5	8 / 11	20/30
	50				117					
EGI5-32	20,30,40				150	58	99	32	24	80
	50				161					
EGI5	30, 40	63	81-90		252	41	122	55	44	100
	50									
										f
EG5-40M	20,30,40	50	67-91		136	65	115			30
	50				147					
EG5-40M-45°	20,30,40				66	92	134			10
	50				77					

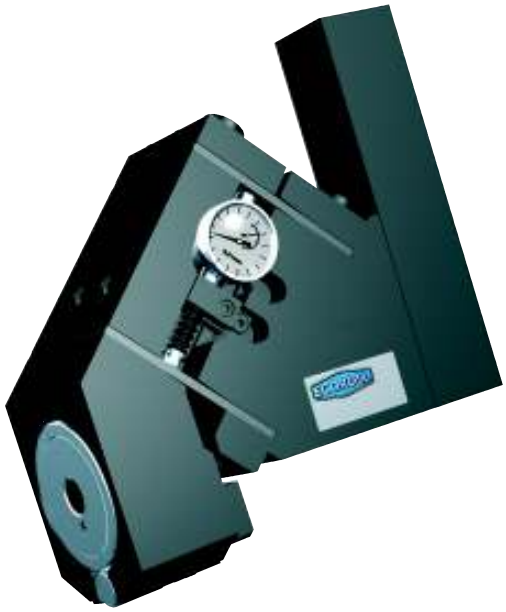
Type EG14 Tool Applications: External surfaces and bores, cylindrical and tapered

Diameters 120 mm and larger



Features

- *Machines cylindrical and tapered external surfaces, external or internal faces, and cylindrical and tapered bores (specially designed models available for tapers)*
- *For use with either CNC-controlled or conventional lathes*
- *Complete processing in one setting*
- *Achievable surface quality: R_z < 1 µm (R_a = 0.2 µm)*
- *Suitable for metals with tensile strength up to 1400 N/mm² and maximum hardness HRC ≤ 45*
- *Modular construction allows these tools to be used in several configurations*
- *Symmetrical construction allows either right- or left-hand operation*
- *Rotates in either direction*
- *Tool design includes fixed roller clearance angle* ***α***



Advantages

- *Short cycle time*
- *No auxiliary processing time necessary*
- *No dust or grinding residue*
- *Minimal lubrication required (oil or emulsion)*
- *Infinitely variable burnishing force*
- *Accurately measured burnishing force ensures consistent, high quality results*
- *Unrestricted roller face makes roller burnishing of shoulders and other edges possible*
- *Easy to change wear parts*

Parameters

- *Maximum circumferential speed: 200 m/min.*
- *Maximum feed rate: 1 mm/rev.*
  ***NOTE**: Feed in the direction of the arrow label on the tool (see tools, following page)*
- *Maximum burnishing force: 10,000 N*

Bore Application

with Design Version 1 (see illustrations, following page)

Bore depth (mm)	≤ 25	≤ 50	> 50
Smallest bore diameter (mm)	120	150	180

Tool Design and Specifications

Basic tool design

Type EG14 single roller burnishing tools consist of a tool body equipped with a tool shank, a spring assembly that allows the roller head to move with no play and very low friction, and a dial indicator that indirectly measures the burnishing force. An optional inductive measuring system externally displays the rolling force.

The roller head is attached to the flexible, spring-loaded section of the tool body. The roller head consists of a cage, which contains and guides the burnishing roller, and a support roller with a large-scale needle bearing.

How to order:

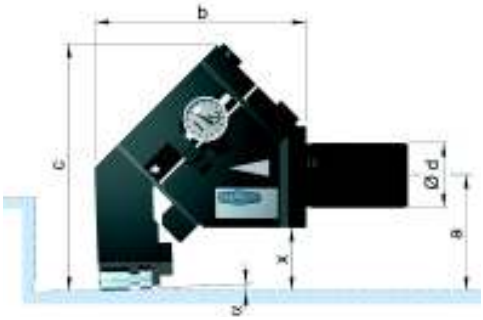
Four versions of this tool are available. Please refer to the following illustrations and table.

Tool type — **EG14–1–VDI50**

Design version: see illustrations. Specially designed tools for machining tapers by request.

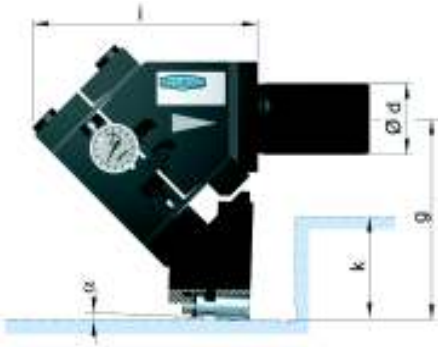
Shank:
VDI = DIN 69880, double toothed
SL = square shank

Specially designed shanks by request

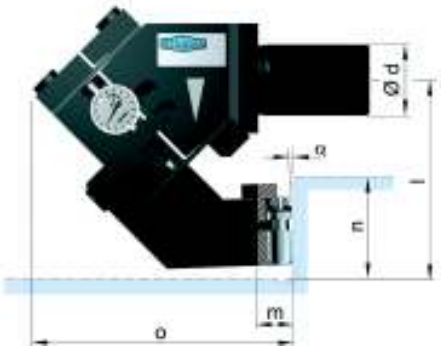


EG14, Design 1
Cylindrical surfaces

EG14, Design 2
Faces on the chuck side



EG14, Design 3
Cylindrical surfaces
Feed direction: toward tailstock



EG14, Design 4
Faces on the tailstock side

Tool type	VDI shank Ø d[1] (mm)	Height (mm)		Square shank (mm)	Variable dimensions per design version (mm)												
					1				2		3			4			
		h_1	h_2	p[1]	a	b	c	x	e	f	g	i	k	l	m	n	o
EG14	40	63	81	25 or 32	71	131	152	43	40	159	113	127	50	106	20	50	147
	50		90						45								
	60		110			150			50	166		124			13		

NOTE: 1) *Optional sizes*

Type EG45 Tool Applications: Fillets and contours

Features

- *For use with either CNC-controlled or conventional lathes that can copy contours*
- *Complete processing in one setting*
- *Achievable surface quality: R_z < 1 µm (R_a = 0.2 µm)*

EG45-40M

EG45-40M

- *Roller burnishes cylindrical surfaces with connecting fillet radii up to the workpiece face*
- *For materials with low to mid-level strength*

EG45-45T

EG45-45T

- *Roller burnishes cylinders and faces in addition to connecting fillets up to a 75° inclination*
- *High burnishing force can machine high-strength materials*

EG45-45F

- *Roller burnishes convex and concave forms with a floating roller head specially adapted to the workpiece*
- *Operates in plunge-in or feed mode*

Advantages

- *Simultaneously eliminates micro-notches and induces residual compressive stresses*
- *Short cycle time*
- *Eliminates set-up and auxiliary processing time*
- *No dust or grinding residue*
- *Minimal lubrication required (oil or emulsion)*
- *Infinitely variable burnishing force*
- *Accurately measured burnishing force ensures consistent, high quality results*
- *Easy to change wear parts*

Parameters

- *Maximum circumferential speed: 300 m/min.*
- *Maximum feed rate: 1 mm/rev.*

Radius Application

Tool type	Workpiece radius R to be burnished with roller radius r (mm)					
	0.6	**1**	**1.6**	**2.5**	**4**	**6.3**
EG45-40M	0.6-3	1-5	2.5-8	4-12	6-40	
EG45-45T	0.6-3	1-5	2-8	3-12	5-20	8-63
EG45-45F	Rollers specially designed according to workpiece shape.					

Tool Application Ranges

Yield strength R_p0.2 N/mm²	≤ 160	≤ 250	≤ 400	≤ 630	≤ 1000
Workpiece Ø ≤ 25 mm	EG45-45T EG45-45F EG45-40M				EG45-45T EG45-45F
Workpiece Ø ≤ 100 mm	EG45-45T EG45-45F EG45-40M			EG45-45T EG45-45F	
Workpiece Ø ≤ 160 mm	EG45-45T EG45-45F EG45-40M		EG45-45T EG45-45F		
Workpiece Ø ≤ 250 mm	EG45-45T EG45-45F EG45-40M	EG45-45T EG45-45F			

Tool Design and Specifications

Basic tool design

Type EG45 single roller burnishing tools consist of a tool body equipped with a tool shank, a spring assembly that allows the roller head to move with no play and very low friction, and a dial indicator that indirectly measures the burnishing force.

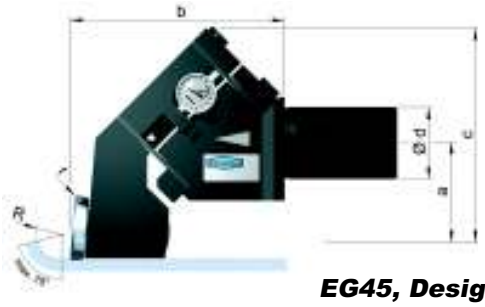
The roller head is attached to the flexible, spring-loaded section of the tool body. EG45-45T and -45F are equipped with floating rollers, and EG45-40M comes with a smaller roller. Because of its structure, EG45-40M has a lower load capacity.

How to order:

Four versions of this tool are available. Please refer to the following illustrations and table.

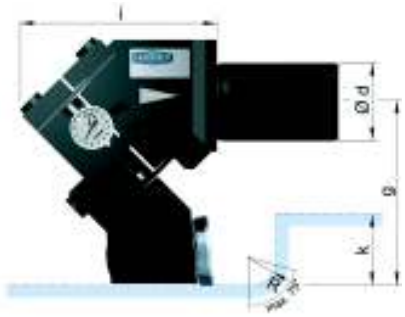
EG45–1–40M–R2.5–VDI50

- EG45: *Tool type: Single roller burnishing tool with a spring system loaded at a 45° angle*
- 1: *Design version: see illustrations*
- 40M: *Roller diameter and design*
- R2.5: *Roller with radius of 2.5 mm*
- VDI50: *Shank VDI 50, SL=square shank*

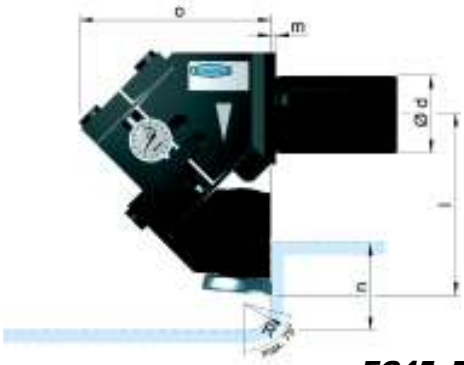


EG45, Design 1
Cylindrical surfaces,
including adjacent fillets

EG45, Design 2
Faces on the chuck side,
including adjacent fillets



EG45, Design 3
Cylindrical surfaces, including adjacent fillets
Feed direction: toward tailstock



EG45, Design 4
Faces on the tailstock side,
including adjacent fillets

Tool type	VDI shank Ø d (mm)	Height (mm)		Square shank (mm)	Variable dimensions per design version (mm)											
					1			2		3			4			
		h_1	h_2	p	a	b	c	e	f	g	i	k	l	m	n	o
EG45-45T	40,50	63	81-110	25 or 32	81	149	162	52	163	118	127	48	116	3	72	124
	60					156			170		134					
EG45-40M	40,50				69	129	150			108	126					
	60					136					134					