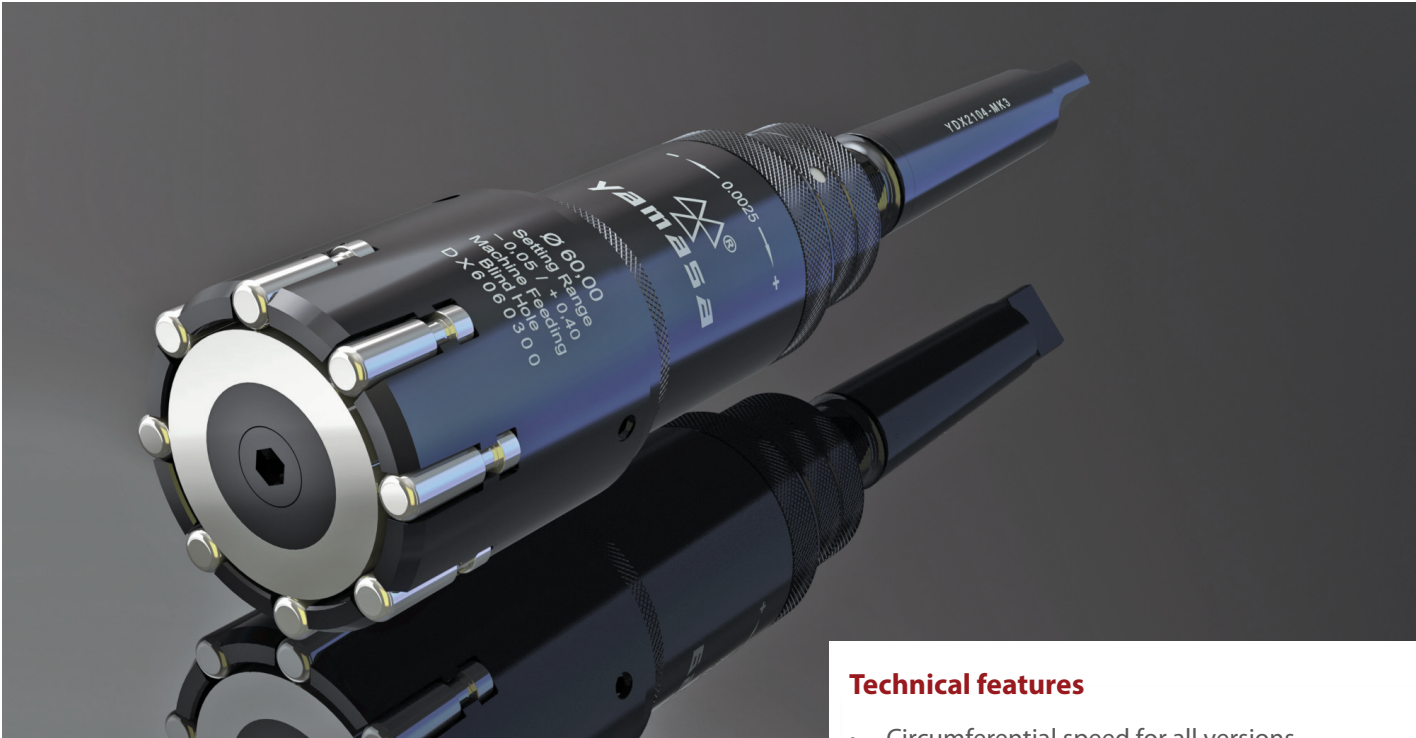


**Internal Roller Burnishing Tools**



**DX Series**  
Developed System



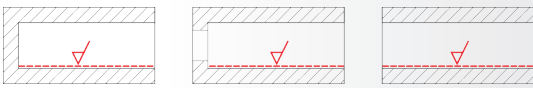
**Technical features**

- Circumferential speed for all versions maximum 250 m/min.
- Tools can be adjustable 0,15 - 1 mm according to type.
- Has a 0,0025 mm precise adjustment mechanism.
- Can burnish the holes up to H8-H9 tolerance with one adjustment.
- Burnishing all kinds of metallic materials up to the tensile strength of 1400N/mm<sup>2</sup> and to the hardness 42-45 HRC.
- Easy setting, long using life, low spare parts consumption. Every kind of spare part can be provided by YAMASA.

**Tool structure**

- Tool consists of a burnishing head and a body which has a precision adjustment mechanism.
- Burnishing head consists of a cage, cone and rollers. In the same time, these are consumables.
- It is possible to mount on the same type body the roller heads in different diameter.
- There are cylindrical and morse taper shank choices are available for machine connection (see table).

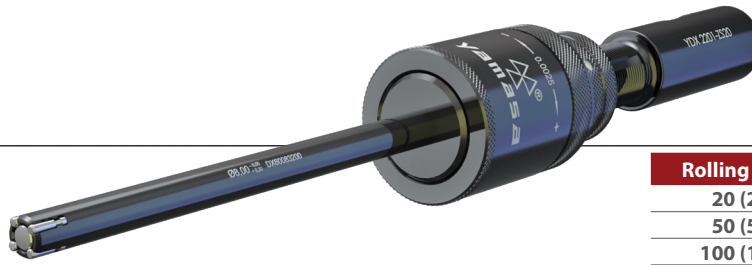




✓ Achievable surface roughness  $Rz < 1 \mu m / Ra < 0,16 \mu m$

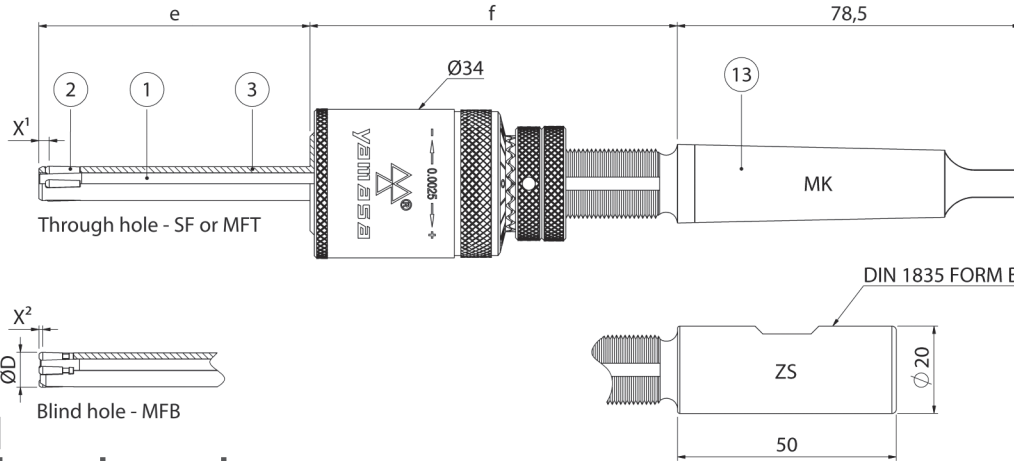
**DX Type** | Between  $\varnothing 5 - 14 \text{ mm}$

**Internal Roller Burnishing Tools**



Rolling length	e	f
20 (23*)	27	74,5
50 (58*)	62	84
100 (108*)	112	84
150 (158*)	162	84

\*max. rolling length for blind hole tool



**Minimum edge**

Diameter range	X <sup>1</sup> / SF	X <sup>1</sup> / MFT	X <sup>2</sup> / MFB
05,00	2,4	2,4	-
06,00 - 14,00	2,6	2,6	0,8

X<sup>2</sup>: It is possible to come to near the edge more. Please ask for special situations.

- 1- Cone
- 2- Roller
- 3- Cage
- 13- Shank

**Recommended machining parameters**

Diameter range (mm)	Revolution (rev/min)	Feed rate (mm/rev)	Feeding (mm/min)	Rotation direc.	Rolling share	Pre-machining roughness	Pre-machining	Coolant
				Retreat	Tool preload			
05,00	1000	0,30	300	CCW (M3)	up to 0,02 mm	Rz = 5 - 15 $\mu m$	Reaming or lathe	Oil or emulsion
06,00 - 07,00	1000	0,45	450	Rapidly (G0)	up to 0,05 mm			
08,00 - 14,00	1000	0,60	600					

**Product selection**

DX Tool selection (complete)							Spare part selection																	
Tool body	Dia. $\varnothing$ -mm	Version			Rolling length	Shank		DX Cage				DX Cone			Roller			Qua.						
		SF	MFT	MFB				Dia. $\varnothing$ -mm	Version	Rolling length	Dia. $\varnothing$ -mm	Version	Rolling length	SF	MFT	MFB								
DX1.1	5,00	1	2	3	20	MK2 or MK1 (opt.)	ZS20 or ZA20 (opt.)	1	2	3	20	1	2	3	20	500115	500115	-	3					
	50				50						50													
	6,00				20						6,00				20					6,00	20	500100	500100	500308
	50				100						100				100					100				
	7,00				20						7,00				20					7,00	20	500108	50108	500300
	50				8,00						8,00				8,00					8,00				
	100				9,00						9,00				9,00					9,00				
	20				10,00						10,00				10,00					10,00				
	50				11,00						11,00				11,00					11,00				
100	12,00	12,00	12,00	12,00																				
150	13,00	13,00	13,00	13,00																				
500102	500102	500301																						
14,00	14,00	14,00	14,00	14,00																				

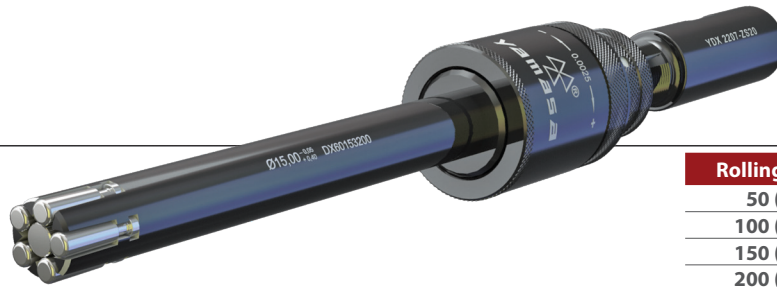
**How to order | Order samples**

DX1.1-12,00-1-50-MK2 Roller burnishing tool	12,00-1-50 DX Cage	12,00-1-50 DX Cone	500102 Roller
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You can create order codes of the tool and spare parts by looking at the product selection table. For this, please rank the requested product features side by side.

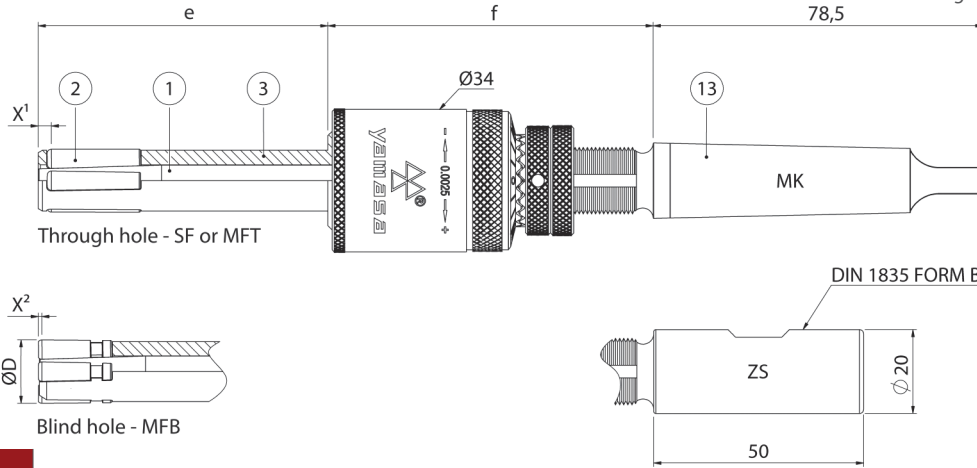
All dimensions in mm. **SF(1)**: Self feeding - through hole **MFT(2)**: Machine feeding - through hole **MFB(3)**: Machine feeding - blind hole

**Internal Roller Burnishing Tools**



Rolling length	e	f
50 (64*)	69	77
100 (114*)	119	78,5
150 (164*)	169	78,5
200 (214*)	219	78,5
250 (264*)	269	78,5

\*max. rolling length for blind hole tool



- 1- Cone
- 2- Roller
- 3- Cage
- 13- Shank

**Minimum edge**

Diameter range	X <sup>1</sup> / SF	X <sup>1</sup> / MFT	X <sup>2</sup> / MFB
15,00 - 21,00	6,2	3,5	0,8

X<sup>2</sup>: It is possible to come to near the edge more. Please ask for special situations.

**Recommended machining parameters**

Diameter range (mm)	Revolution (rev/min)	Feed rate (mm/rev)	Feeding (mm/min)	Rotation direc.	Rolling share	Pre-machining roughness	Pre-machining	Coolant
				Retreat	Tool preload			
015,00 - 021,00	1000	0,75	750	CCW (M3)	up to 0,02 mm	Rz = 5 - 15 µm	Reaming or lathe	Oil or emulsion
				Rapidly (G0)	up to 0,05 mm			

**Product selection**

DX Tool selection (complete)							Spare part selection														
Tool body	Dia. Ø-mm	Version			Rolling length	Shank		DX Cage				DX Cone				Roller			Qua.		
		SF	MFT	MFB				Dia. Ø-mm	Version	Rolling length	Dia. Ø-mm	Version	Rolling length	Code							
								SF	MFT	MFB	Rolling length	Ø-mm	SF	MFT	MFB	Rolling length	SF	MFT	MFB		
DX1.2	15,00	1	2	3	50 • 100 • 150 • 200 • 250	MK2 or MK1 (opt.)	ZS20 or ZA20 (opt.)	15,00	1	2	3	50 • 100 • 150 • 200 • 250	15,00	1	2	3	-	500129	500111	500310	5
	16,00							16,00													
	17,00							17,00													
	18,00							18,00													
	19,00							19,00													
	20,00							20,00													
	21,00							21,00													
								21,00					500130								

**How to order | Order samples**

DX1.2-15,00-2-50-ZS20 Roller burnishing tool	15,00-2-50 DX Cage	15,00-2 DX Cone	500111 Roller
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You can create order codes of the tool and spare parts by looking at the product selection table. For this, please rank the requested product features side by side. All dimensions in mm. **SF(1)**: Self feeding - through hole **MFT(2)**: Machine feeding - through hole **MFB(3)**: Machine feeding - blind hole



✓ Achievable surface roughness  $Rz < 1 \mu\text{m}$  /  $Ra < 0,16 \mu\text{m}$

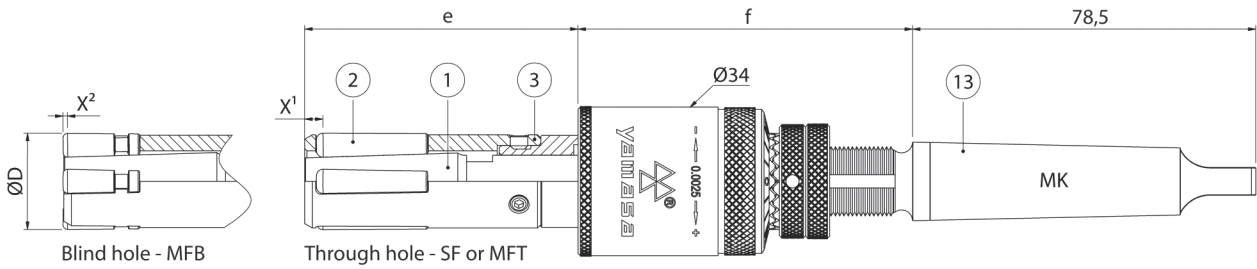
**DX Type** | Between  $\varnothing 22 - 31 \text{ mm}$

**Internal Roller Burnishing Tools**



Rolling length	e	f
50 (59*)	63,5	76,5
100 (109*)	113,5	78
150 (159*)	163,5	78
200 (209*)	213,5	78
250 (259*)	263,5	78
300 (309*)	313,5	78

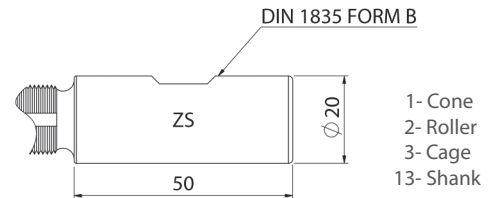
\*max. rolling length for blind hole tool



**Minimum edge**

Diameter range	X <sup>1</sup> / SF	X <sup>1</sup> / MFT	X <sup>2</sup> / MFB
22,00 - 27,00	7,7	5,5	0,8
28,00 - 31,00	9,3	5,5	0,8

X<sup>2</sup>: It is possible to come to near the edge more. Please ask for special situations.



**Recommended machining parameters**

Diameter range (mm)	Revolution (rev/min)	Feed rate (mm/rev)	Feeding (mm/min)	Rotation direc.	Rolling share	Pre-machining roughness	Pre-machining	Coolant
				Retreat	Tool preload			
022,00 - 031,00	1000	0,75	750	CCW (M3)	up to 0,03 mm	$Rz = 5 - 20 \mu\text{m}$	Reaming or lathe	Oil or emulsion
				Rapidly (G0)	up to 0,06 mm			

**Product selection**

DX Tool selection (complete)							Spare part selection													
Tool body	Dia. $\varnothing$ -mm	Version			Rolling length	Shank		DX Cage				DX Cone				Roller			Qua.	
		SF	MFT	MFB				Dia. $\varnothing$ -mm	Version	Rolling length	Dia. $\varnothing$ -mm	Version	Rolling length	Code						
DX1.2	22,00	1	2	3	50 100 150 200 250 300	MK2 or MK1 (opt.)	ZS20 or ZA20 (opt.)	1	2	3	-	22,00	1	2	3	-	500130	500112	500311	5
	23,00																			
	24,00																			
	25,00																			
	26,00																			
	27,00																			
	28,00																			
	29,00																			
	30,00																			
	31,00																			

**How to order | Order samples**

DX1.2-22,00-3-50-ZS20 Roller burnishing tool	22,00-3 DX Cage	22,00-3 DX Cone	500311 Roller
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You can create order codes of the tool and spare parts by looking at the product selection table. For this, please rank the requested product features side by side. All dimensions in mm. **SF(1)**: Self feeding - through hole **MFT(2)**: Machine feeding - through hole **MFB(3)**: Machine feeding - blind hole

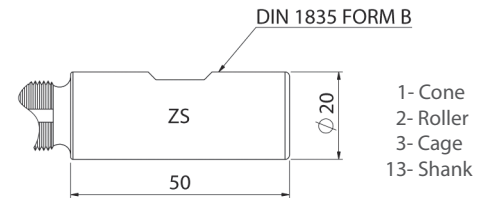
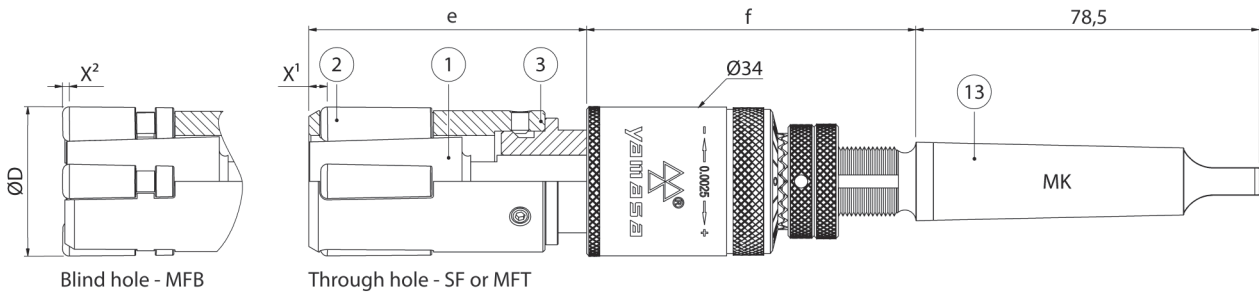


**Internal Roller Burnishing Tools**



Rolling length	e	f
50 (59*)	63,5	76,5
100 (109*)	113,5	78
150 (159*)	163,5	78
200 (209*)	213,5	78
250 (259*)	263,5	78
300 (309*)	313,5	78

\*max. rolling length for blind hole tool



**Minimum edge**

Diameter range	X <sup>1</sup> / SF	X <sup>1</sup> / MFT	X <sup>2</sup> / MFB
32,00 - 34,00	9,3	5,5	0,8

X<sup>2</sup>: It is possible to come to near the edge more. Please ask for special situations.

**Recommended machining parameters**

Diameter range (mm)	Revolution (rev/min)	Feed rate (mm/rev)	Feeding (mm/min)	Rotation direc.	Rolling share	Pre-machining roughness	Pre-machining	Coolant
				Retreat	Tool preload			
032,00 - 034,00	950	0,75	710	CCW (M3)	up to 0,03 mm	Rz = 5 - 20 µm	Reaming or lathe	Oil or emulsion
				Rapidly (G0)	up to 0,06 mm			

**Product selection**

DX Tool selection (complete)							Spare part selection														
Tool body	Dia. Ø-mm	Version			Rolling length	Shank		DX Cage				DX Cone				Roller					
		SF	MFT	MFB				Dia. Ø-mm	Version	Rolling length	Dia. Ø-mm	Version	Rolling length	Code			Qua.				
								SF	MFT	MFB		SF	MFT	MFB		SF		MFT	MFB		
DX1.3	32,00	1	2	3	50 • 100 • 150 • 200 • 250 • 300	MK2 or MK1 (opt.)	ZS20 or ZA20 (opt.)	32,00	1	2	3	-	32,00	1	2	3	-	500128	500109	500307	5
	33,00							33,00					33,00								
	34,00							34,00					34,00								

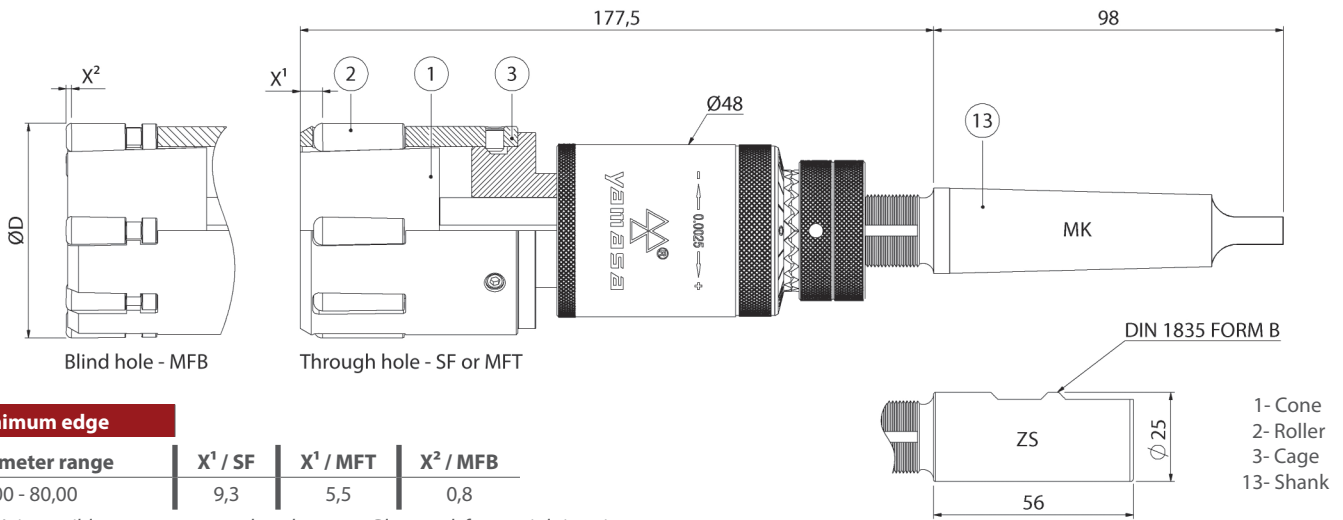
**How to order | Order samples**

DX1.3-32,00-1-100-MK2 Roller burnishing tool	32,00-1 DX Cage	32,00-1 DX Cone	500128 Roller
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You can create order codes of the tool and spare parts by looking at the product selection table. For this, please rank the requested product features side by side. All dimensions in mm. **SF(1)**: Self feeding - through hole **MFT(2)**: Machine feeding - through hole **MFB(3)**: Machine feeding - blind hole



**Internal Roller Burnishing Tools**



**Minimum edge**

Diameter range	X <sup>1</sup> / SF	X <sup>1</sup> / MFT	X <sup>2</sup> / MFB
50,00 - 80,00	9,3	5,5	0,8

X<sup>2</sup>: It is possible to come to near the edge more. Please ask for special situations.

**Recommended machining parameters**

Diameter range (mm)	Revolution (rev/min)	Feed rate (mm/rev)	Feeding (mm/min)	Rotation direc.	Rolling share	Pre-machining roughness	Pre-machining	Coolant
				Retreat	Tool preload			
050,00 - 060,00	530	1,20	630	CCW (M3)	up to 0,04 mm	Rz = 5 - 30 µm	Reaming or lathe	Oil or emulsion
061,00 - 070,00	450	1,20	540					
071,00 - 080,00	400	1,20	480	Rapidly (G0)	up to 0,07 mm			

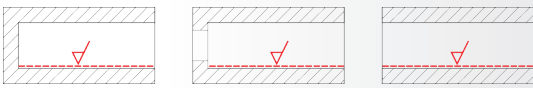
**Product selection**

DX Tool selection (complete)									Spare part selection												
Tool body	Dia. Ø-mm	Version			Rolling length			Shank	DX Cage			DX Cone			Roller			Qua.			
		SF	MFT	MFB	SF	MFT	MFB		Dia. Ø-mm	SF	MFT	MFB	Dia. Ø-mm	SF	MFT	MFB	SF		MFT	MFB	
DX2	50,00	1	2	3	stand.	stand.	stand.	MK3	ZS25 or ZA25 (opt.)	50,00	1	2	3	50,00	1	2	3	500128	500109	500307	8
	55,00				U=163	U=167	U=173			55,00				55,00							
	60,00				long	long	long			60,00				60,00							
	65,00				210	210	210			65,00				65,00							
	70,00				250	250	250			70,00				70,00							
	75,00				300	300	300			75,00				75,00							
	80,00				350	350	350			80,00				80,00							
					400	400	400														
	450	450	450																		
	500	500	500																		
	550	550	550																		

**How to order | Order samples**

DX2-52,00-3-U-ZS25 Roller burnishing tool	52,00-3 DX Cage	52,00-3 DX Cone	500307 Roller
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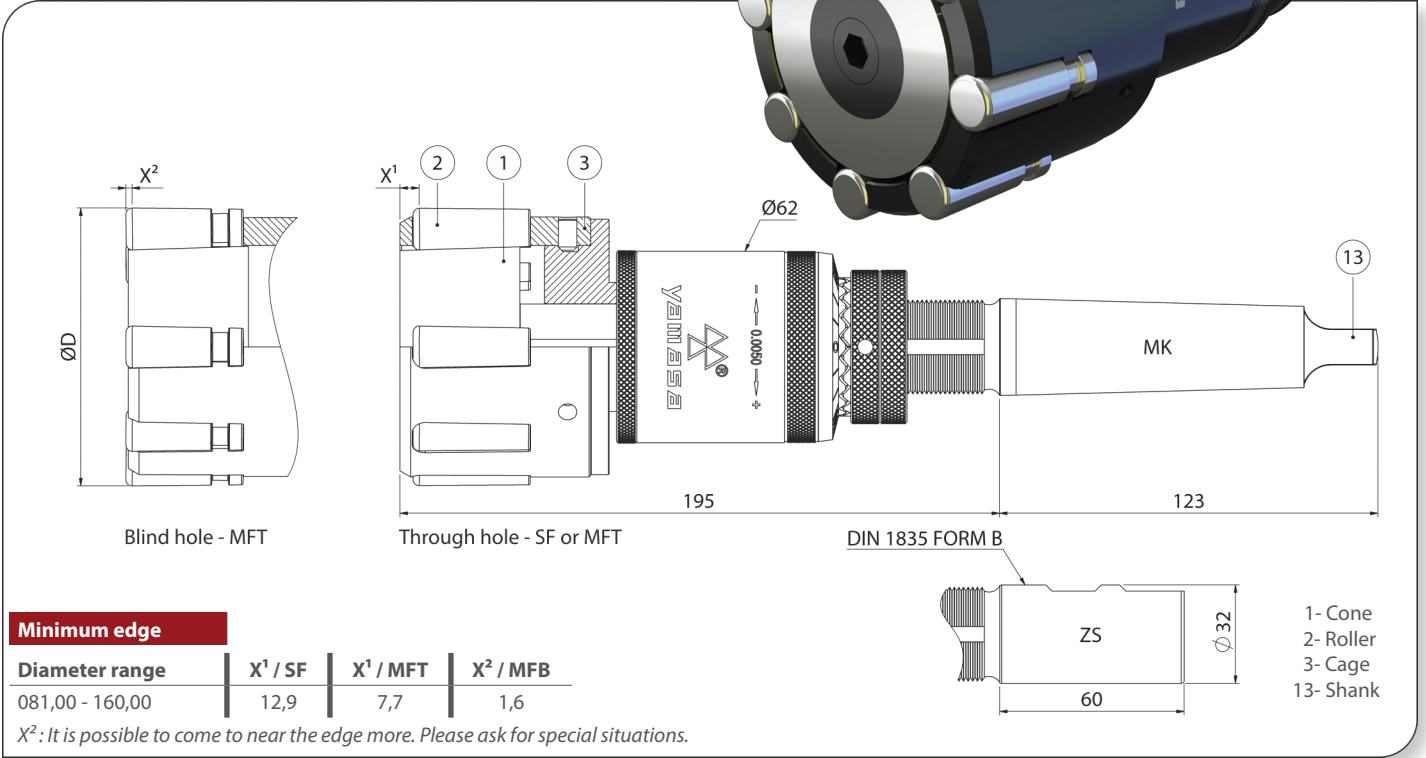
You can create order codes of the tool and spare parts by looking at the product selection table. For this, please rank the requested product features side by side. All dimensions in mm. **SF(1)**: Self feeding - through hole **MFT(2)**: Machine feeding - through hole **MFB(3)**: Machine feeding - blind hole



✓ Achievable surface roughness  $Rz < 1 \mu\text{m}$  /  $Ra < 0,16 \mu\text{m}$

**DX Type** | Between  $\varnothing 81 - 160 \text{ mm}$

**Internal Roller Burnishing Tools**



**Minimum edge**

Diameter range	X¹ / SF	X¹ / MFT	X² / MFB
081,00 - 160,00	12,9	7,7	1,6

X²: It is possible to come to near the edge more. Please ask for special situations.

**Recommended machining parameters**

Diameter range (mm)	Revolution (rev/min)	Feed rate (mm/rev)	Feeding (mm/min)
081,00 - 090,00	350	1,20	420
091,00 - 100,00	320	1,20	380
101,00 - 120,00	260	1,20	310

Diameter range (mm)	Revolution (rev/min)	Feed rate (mm/rev)	Feeding (mm/min)
121,00 - 140,00	230	1,50	340
141,00 - 150,00	210	1,50	310
151,00 - 160,00	200	1,80	360

<b>Rotation direction</b>	CCW (M3)
<b>Retreat</b>	Rapidly (G0)
<b>Rolling share</b>	up to 0,05 mm
<b>Tool preload</b>	up to 0,10 mm
<b>Pre-machining rough.</b>	$Rz = 5 - 30 \mu\text{m}$
<b>Pre-machining</b>	Reaming or lathe
<b>Coolant</b>	Oil or emulsion

**Product selection**

DX Tool selection (complete)								Spare part selection													
Tool body	Dia. $\varnothing$ -mm	Version			Rolling length			Shank	DX Cage			DX Cone			Roller			Qua.			
		SF	MFT	MFB	SF	MFT	MFB		Dia. $\varnothing$ -mm	Version	Dia. $\varnothing$ -mm	Version	Code	SF	MFT	MFB					
DX3	081,00	1	2	3	stand. U=177	stand. U=182	stand. U=190	MK4	ZS32 or ZA32 (opt.)	81,00	1	2	3	81,00	1	2	3	500132	500107	500306	8
	090,00									90,00											
	100,00									100,00											
	110,00									110,00											
	120,00									120,00											
	121,00									121,00											
	130,00									130,00											
	140,00									140,00											
	150,00									150,00											
	151,00									151,00											
	160,00									160,00				10							
	160,00									160,00											12

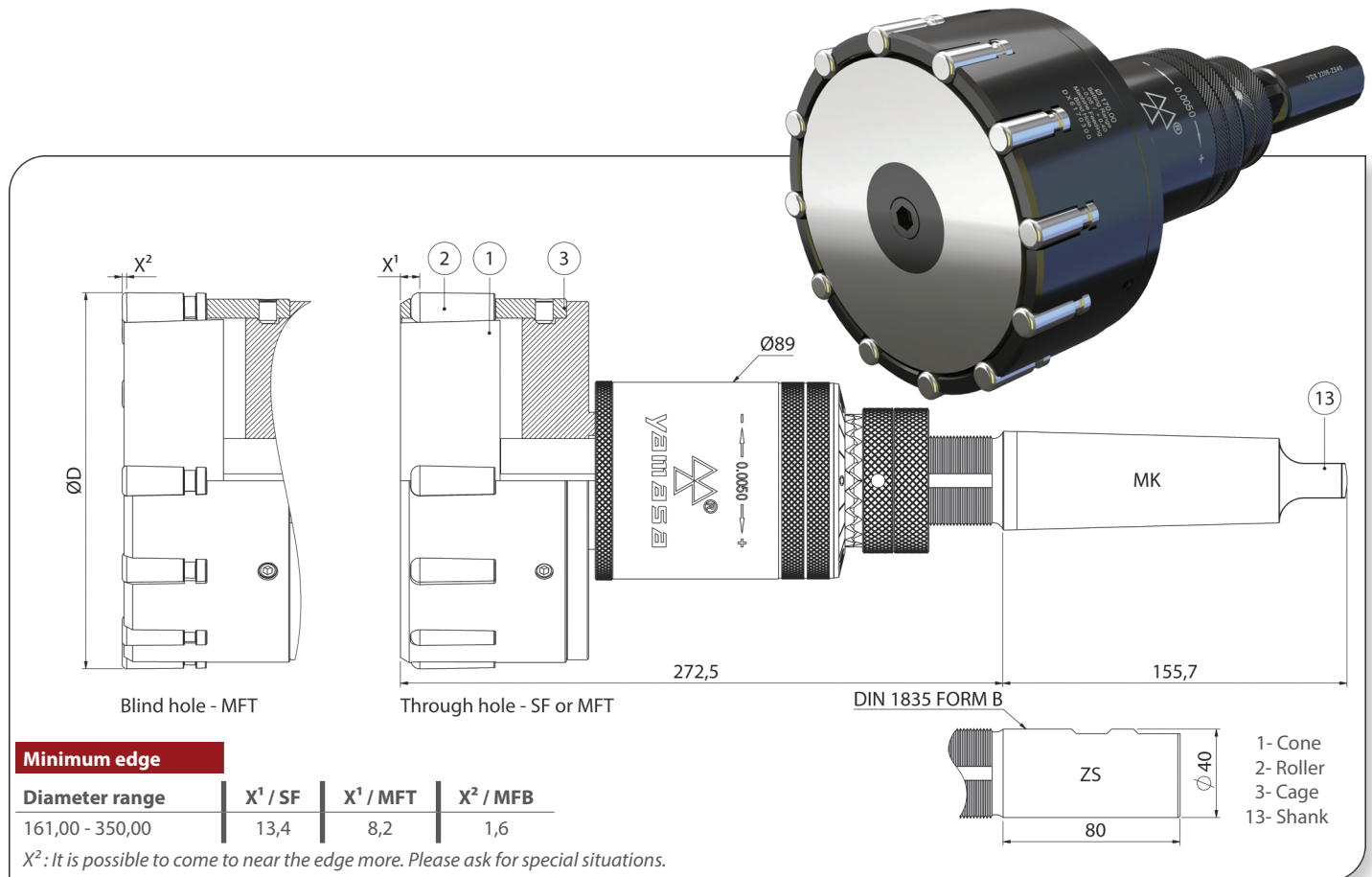
**How to order | Order samples**

DX3-85,00-3-U-ZS32 Roller burnishing tool	85,00-3 DX Cage	85,00-3 DX Cone	500306 Roller
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You can create order codes of the tool and spare parts by looking at the product selection table. For this, please rank the requested product features side by side. All dimensions in mm. **SF(1):** Self feeding - through hole **MFT(2):** Machine feeding - through hole **MFB(3):** Machine feeding - blind hole



**Internal Roller Burnishing Tools**



**Minimum edge**

Diameter range	X <sup>1</sup> / SF	X <sup>1</sup> / MFT	X <sup>2</sup> / MFB
161,00 - 350,00	13,4	8,2	1,6

X<sup>2</sup>: It is possible to come to near the edge more. Please ask for special situations.

**Recommended machining parameters**

Diameter range (mm)	Revolution (rev/min)	Feed rate (mm/rev)	Feeding (mm/min)	Diameter range (mm)	Revolution (rev/min)	Feed rate (mm/rev)	Feeding (mm/min)	Rotation direction	CCW (M3)
161,00 - 170,00	190	1,80	340	261,00 - 280,00	110	3,00	330	Retreat	Rapidly (G0)
171,00 - 200,00	160	2,10	330	281,00 - 310,00	100	3,30	330	Rolling share	up to 0,06 mm
201,00 - 260,00	140	2,40	330	311,00 - 350,00	95	3,60	340	Tool preload	up to 0,10 mm
								Pre-machining rough.	Rz = 5 - 30 µm
								Pre-machining	Reaming or lathe
								Coolant	Oil or emulsion

**Product selection**

DX Tool selection (complete)									Spare part selection												
Tool body	Dia. Ø-mm	Version			Rolling length			Shank	DX Cage			DX Cone			Roller			Qua.			
		SF	MFT	MFB	SF	MFT	MFB		Dia. Ø-mm	Version	Dia. Ø-mm	Version	Code	SF	MFT	MFB					
DX4	161,00	1	2	3	stand. U=254	stand. U=259	stand. U=266	MK5	ZS40 or ZA40 (opt.)	161,00	1	2	3	161,00	1	2	3	500132	500107	500306	12
	170,00									170,00				14							
	171,00									171,00				14							
	200,00									200,00				16							
	201,00									201,00				16							
	230,00									230,00				16							
	231,00									231,00				18							
	260,00									260,00				18							
	261,00									261,00				20							
	280,00									280,00				20							
	281,00									281,00				22							
	310,00									310,00				22							
	311,00									311,00				24							
	330,00									330,00				24							
	331,00									331,00				26							
	350,00									350,00				26							

**How to order | Order samples**

DX4-161,00-3-U-ZS40 Roller burnishing tool	161,00-3 DX Cage	161,00-3 DX Cone	500306 Roller
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You can create order codes of the tool and spare parts by looking at the product selection table. For this, please rank the requested product features side by side. All dimensions in mm. **SF(1)**: Self feeding - through hole **MFT(2)**: Machine feeding - through hole **MFB(3)**: Machine feeding - blind hole