



yamasa

ROLLER

BURNISHING

TECHNOLOGY



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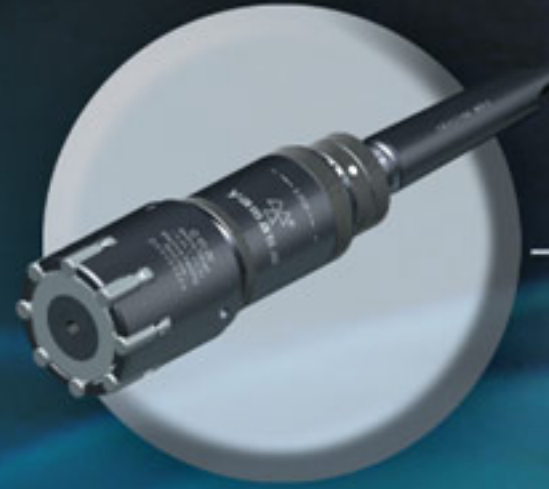
INDEX



Roller Burnishing Technology

- Roller Burnishing
- Advantages of roller burnishing
- Pre-machining of workpiece
- Available surfaces

Page 2-3



Internal Roller Burnishing Tools

- Type DX Ø005 - Ø350 mm explanations
- Type DX Ø005 - Ø350 mm order requirements
- Type DX Ø005 - Ø014 mm
- Type DX Ø015 - Ø021 mm
- Type DX Ø022 - Ø031 mm
- Type DX Ø032 - Ø034 mm
- Type DX Ø035 - Ø049 mm
- Type DX Ø050 - Ø080 mm
- Type DX Ø081 - Ø160 mm
- Type DX Ø161 - Ø350 mm

Page 4-14



External Roller Burnishing Tools

- Type MX Ø003 - Ø110 mm explanations
- Type MX Ø003 - Ø110 mm order requirements
- Type MX Ø003 - Ø014 mm
- Type MX Ø015 - Ø024 mm
- Type MX Ø025 - Ø049 mm
- Type MX Ø050 - Ø085 mm
- Type MX Ø086 - Ø110 mm

Page 15-22



Male-Female Taper and Flat Surface Burnishing Tools

- Type KI, KD, KA explanations
- Type KI, KD, KA order requirements

Page 23-24



Single Roller Burnishing Tools

- Type SX

Page 25



Roller Burnishing Machines

- Type MXM-1 between Ø03 - Ø20
- Type MXM-2 between Ø03 - Ø40

Page 26-27

ABOUT US

Our company which is founded in 1958 in Izmir produces full automatic roller burnishing machines and roller burnishing tools under the brand of YAMASA. Our enterprise is carrying on its growth within years. With the developed technology and specialized staff, it increases the variety of the products and grows day by day. As one of the biggest producers, YAMASA offers ideal solutions to the worldwide customers.

The properties which make YAMASA an ideal solution partner

- Qualified and fast production of standard and special tools
- A wide variety of products
- Economic prices
- High stock capacity
- Delivery on time

The roller burnishing machines and tools, that we produce are used in

- Automotive industry
- Aircraft industry
- Machine production
- Agricultural vehicles
- Ship building industry
- Railway industry
- Light motorized two wheeled vehicles industry
- Heavy work vehicles industry
- Heating and cooling industry
- Electronic household goods
- Defence industry etc.

We cope the demands and needs of our customers in these sectors with our high service and product quality on the one hand and with stable prices on the other hand.

Our Mission

- To answer the needs and surpass all expectations of the customers with a higher quality
- To invest continuously in expertness and technology
- To know the worth of natural sources, to care the environment and ensure our future

Our Vision

- The unconditional satisfaction of our customers
- To prove the trustworthiness to the persons or companies we work with and to be preferred everytime



Roller Burnishing Technology



Roller Burnishing

The roller burnishing is a method to make the workpiece, which has passed through the pre-machining, smooth and hard. It is possible to process any kind of metallic material by using this method. The roller burnishing is done by contacting of the rollers on the surface of the workpiece by the help of a precision mechanism. When such a contact is obtained, the workpiece or the tool turns at a specified speed, then the rollers go forward on the workpiece's surface by rotation. In addition, a pressure is applied on the surface of the workpiece with a certain force thus the process of roller burnishing is achieved. The effects that occur at the point where a single roller is contacted to the surface of the workpiece are as follows;

The contact of the roller to the workpiece is obtained by pressure. At this point, while the protrusions on the surface are being pressed, the gaps in bottom are filled up simultaneously. This process that we call as plastic deformation is repeated as long as the rotation, pressing and feeding continues (Fig.1). Therefore the smooth and bright surfaces are obtained.

The feeding speed of roller and the pressure applied on the workpiece is defined according to the surface roughness which is required to obtain. The roughness values decrease by slowing down the feeding speed and increasing the pressure. On the contrary, while the pressure decreases and the speed of feeding becomes faster, the surface roughness values will increase.

After the roller burnishing process, dimensional changes occur on the surface. Such a change is equal to the roughness value of the surface. So it is possible to say that such a change occurs in the shape and dimension of the workpiece remains inside the roughness limits.

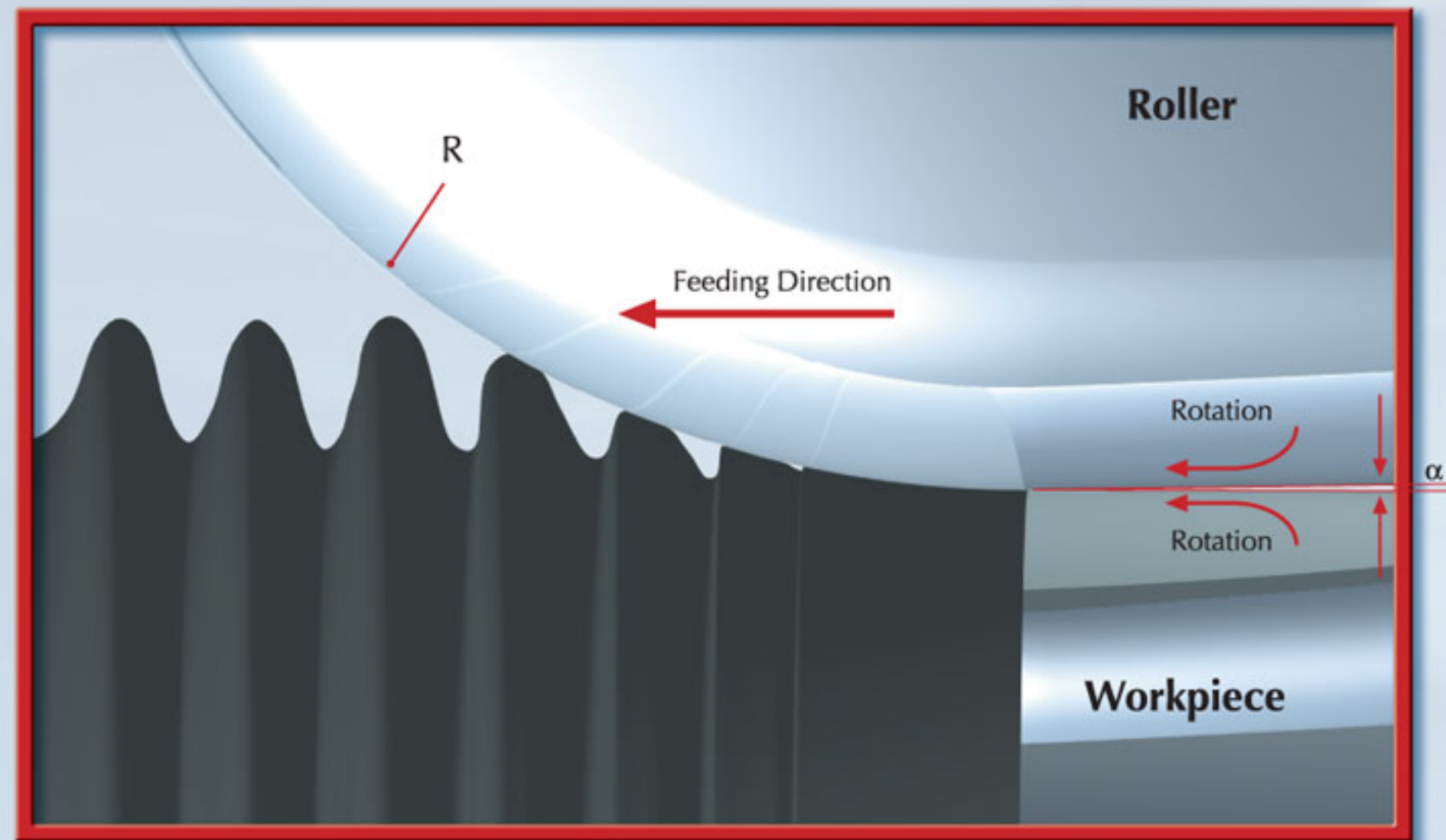


Fig.1 - Roller Burnishing Process

Advantages of roller burnishing

- The surfaces in quality of $R_z < 1\mu\text{m}$ can be obtained.
- It is possible to catch the desired size easily and rapidly.
- The process is completed by one pass. The process time is very short.
- The roller burnishing process hardens the surface in the same time. It ensures the processed surface to become stronger, more brilliant and slippery.
- Roller burnishing process makes the wear of the workpiece difficult and other components which work on the workpiece surface.
- It saves time, money and energy.
- No sawdust and residues occur. No noise and damage to the environment.
- It requires low lubrication and cooling.

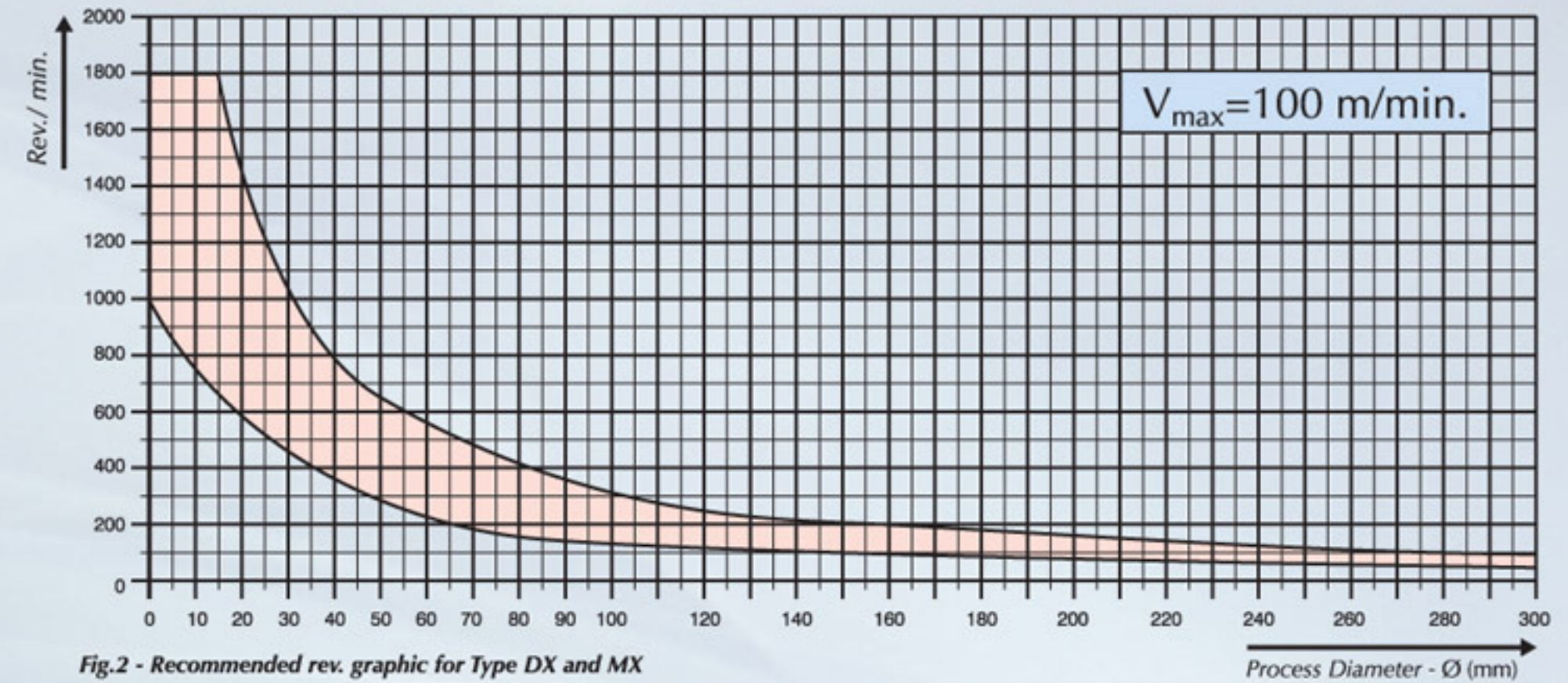


Fig.2 - Recommended rev. graphic for Type DX and MX

Pre-machining of workpiece

All kinds of metallic materials can be burnished up to hardness of 42-45 HRC. The burnishing rollers do not remove the sawdust from the surface. It only accumulates the roughness on the surface on to each other. Therefore the roller burnishing tolerance ϕ (mm) becomes equal to the roughness depth (R_z). The roughness depth in pre-machining can be selected between $R_z=5\mu\text{m}$ and $R_z=50\mu\text{m}$ depending on the material type.

The formula below is used to obtain the most appropriate pre-machined surface.

$$\text{Feed rate per revolution (mm/rev.)} = 0.5 \times \text{cutter edge radius (mm)}$$

The workpiece after pre-machining becomes ready for roller burnishing process. After the roller burnishing process, there is no roughness left on the surface (Fig.3).

Available Surfaces

This method can be used in cylindrical holes, cylindrical outer surfaces, interior-outer conic and flat surfaces.

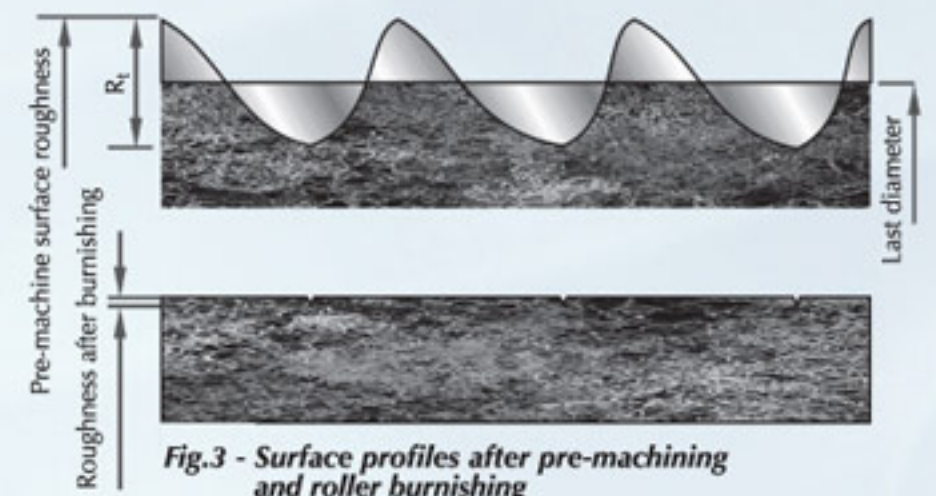


Fig.3 - Surface profiles after pre-machining and roller burnishing

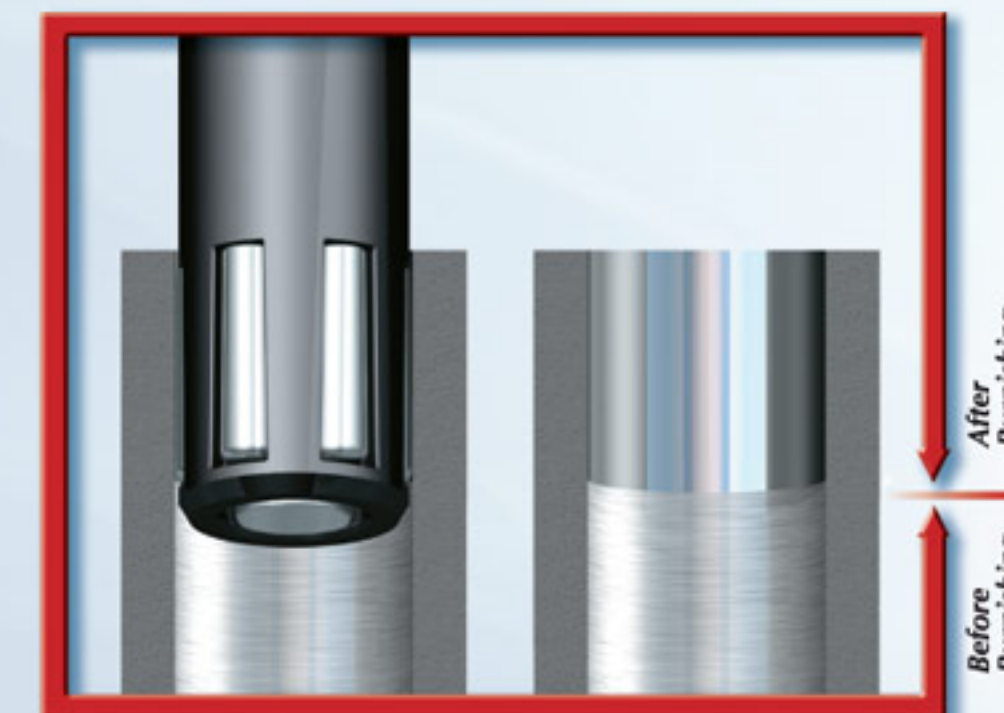


Fig.4 During the process After the process

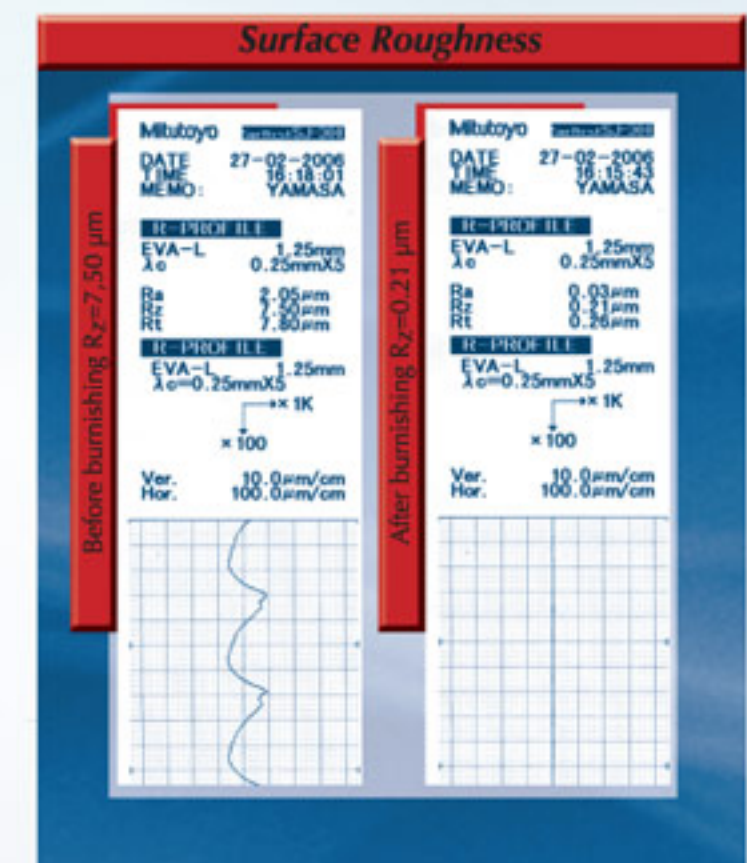


Fig.5



Through holes between $\varnothing 5 - \varnothing 350$ mm
Blind holes between $\varnothing 5 - \varnothing 350$ mm

Type DX For Cylindrical Holes

Through holes between $\varnothing 5 - \varnothing 350$ mm
Blind holes between $\varnothing 5 - \varnothing 350$ mm



EXPLANATIONS

Application

YAMASA DX type tools are used for the aim of burnishing the cylindrical holes that have an open and closed end. The tools provide as well as surface hardness and calibration (measurement accuracy) beside of burnishing. Because of the high processing power and speed ability it provides time saving. These are the preference causes for the serial production.

Technical Features

The tools are adjusted. The adjustment capacity is changing according to the diameter and types between 0,25 mm and 1 mm. The tools have an adjustment mechanism which gives the possibility to adjust very high precision measurements. For $\varnothing 5 - \varnothing 80$ mm tools, adjustment precision is 0,0025 mm and for bigger than $\varnothing 80$ mm tools, adjustment precision is 0,0050 mm. YAMASA DX type roller burnishing tools can process the cylindrical holes up to H8 tolerance with a single adjustment. These tools are capable to process all kinds of metallic materials with 1400 N/mm² tensile strength and hardness up to max. 42-45 HRC. Tools work by turning to right. Either tool or workpiece may turn. These tools can be used on universal or CNC lathes, machining centers, drilling machines, milling machines or other machines which process by turning. The tools can be fixed to all machines easily and practically. Tools have rather a long life. It is possible to use the tools for a long time without size change due to abrasion.

There are three types of YAMASA DX burnishing tools according to the process type :

1) Through Hole Self-feeding

These burnishing tools process the holes that have an open end. The tools provide own feeding speed which is needed while it is processing the workpiece. Feeding occurs free from the machine.

2) Through Hole Machine-feeding

These burnishing tools process the holes that have an open end. While the tools process the workpiece, the machine provides feeding speed which is needed.

3) Blind hole Machine-feeding

These burnishing tools process stepped or fully closed holes up to end. While the tools process the workpiece, the machine provides feeding speed which is needed.

The tool or the workpiece can be turned with the speed of max. 250 m/min. The machine feeding speed is possible from 0,05 mm/rev. to 0,3 mm/rev. for per roller.

Samples of application

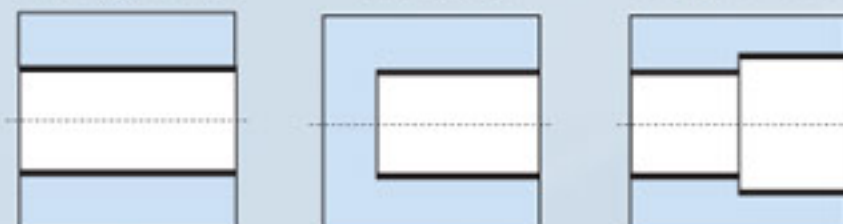
- Connecting rod • Brake cylinder • Valve body
- Joints • Pneumatic cylinder • Hole of piston housing
- Cardan shafts • Locker arms • Gas valve • Gears
- Air hammer parts • Solenoid valve • Shock absorber
- Carburetors • Ring bushings • Pipes • Pistons
- Master cylinders • Motor stators • Cylinders etc.



Through holes

Blind holes

Stepped holes



Tool Structure



YAMASA DX burnishing tools consist of a body and a roller head. The tool body has a precision adjustment mechanism. Cage, cone and rollers are the parts of the roller head. The roller heads fitting in to the same body can be changed. The tool shank may be morse taper or

cylindrical. The tools, which are bigger than $\varnothing 34$ have an unlimited rolling length, for the tools which are smaller than $\varnothing 35$ exist standard rolling lengths (see table below). For special orders, tools with longer rolling lengths can be produced.

Tool Body	Diameter Range $\varnothing D$	Tool Shank		a	b	c	g	Remarks
		Morse Taper	Cylindrical ($\varnothing i \times h$)					
DX1.1	005-014	MK2	$\varnothing 20 \text{ h}6 \times 50$	78,5	146	34	1,5	Standart rolling length 50 mm. Rolling length can be extended upon special order.
DX1.2	015-021				146		2	
	022-034				139		2,5	
DX1.3	035-049				142,5		3	
DX2	050-080	MK3	$\varnothing 25 \text{ h}6 \times 56$	98	177,5	48	3,5	Unlimited rolling length.
DX3	081-160	MK4	$\varnothing 32 \text{ h}6 \times 60$	123	195	62	4	
DX4	161-350	MK5	$\varnothing 40 \text{ h}6 \times 80$	155,5	272,5	89	4,5	

All Dimensions in mm.



Through holes between Ø5 - Ø350 mm
Blind holes between Ø5 - Ø350 mm

Type DX For Cylindrical Holes

Through holes between Ø5 - Ø14 mm
Blind holes between Ø5 - Ø14 mm



Order Requirements

YAMASA DX Type burnishing tools can process the various diameters in order to the adjustability specification. For example: DX1.2-025,00-1-50-MK2 type burnishing tool having a nominal size of Ø25,00 mm is capable to process all sizes between Ø24,90 mm and Ø25,90 mm.

YAMASA, DX type tools are produced in special diameters and sizes upon request. In addition, the tools with the special rolling length can also be produced.

You can use the information above to select the proper tool. If you want to take help for the tool selection, you can fill out the tool option form and send to us or to one of the related zone representation. So we can do the proper tool selection for you.

Tool Selection

1-Tool Body Selection

At sight to the table, select the body number proper to the tool diameter.

2-Diameter Selection

Define the diameter accurately which you will process (for example 25,40 ...).

3-Process Type Selection

Select the process type according to machine and workpiece.

- 1: Automatic feeding (self-feeding) for through holes
- 2: Machine feeding (not self-feeding) for through holes
- 3: Machine feeding (not self-feeding) for blind holes

4-Rolling Length Selection

Define the rolling length which is proper for the workpiece. It doesn't need to be stated for bigger than Ø34 mm diameter because they have an unlimited rolling length but it must be stated smaller than Ø35 mm diameter. Standard rolling length is 50 mm for smaller than Ø35. For these diameters other rolling length options are 100, 150, 200, 250, 300 mm. For the diameters of smaller than Ø35 more longer rolling length demands will be considered specifically.

5-Tool Shank Selection

Prefer proper shank to your machine.

- MK : Morse Taper Shank
- ZS : Cylindrical Shank

Order Sample

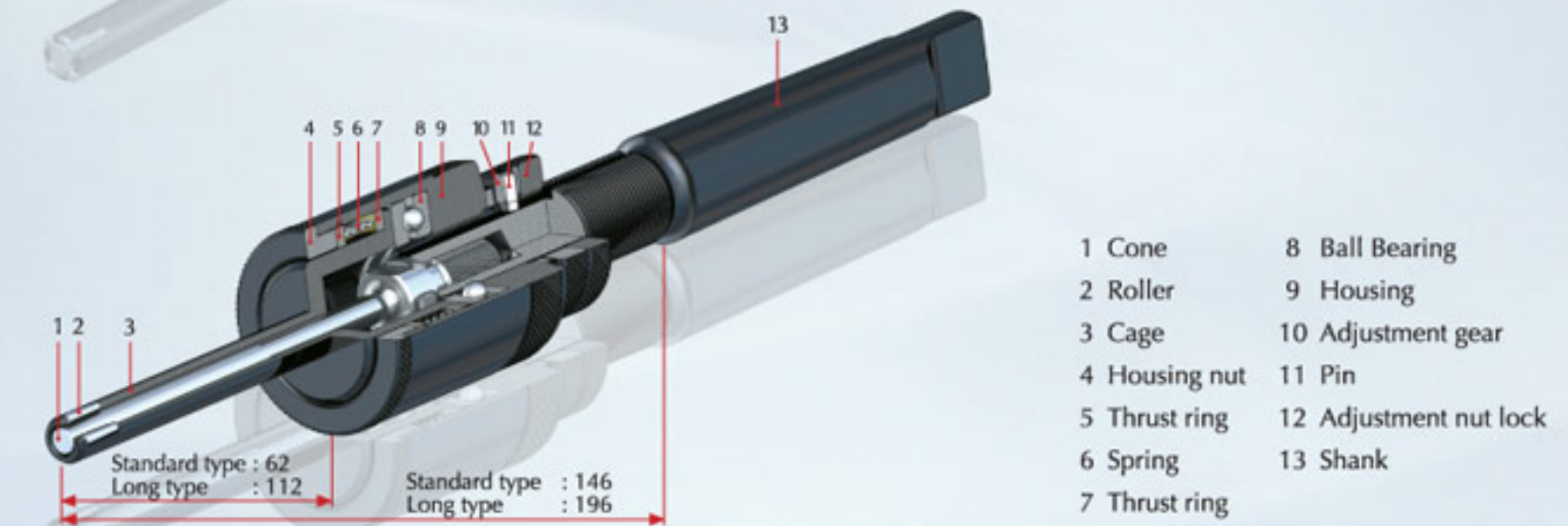
DX1.2-025,40-2-50-ZS20
DX1.2 : Tool body
025,40 : Diameter (Ø)
2 : Process type
50 : Rolling length
ZS20 : Shank

Technical Data

Revolution : approx. 800 to 1800 rpm (see Fig.2)
Feeding : per roller 0,10 to 0,15 mm/rev.
Burnishing allowance: + 0,005 to + 0,02 mm
Pre-machining : Reaming or lathening
Surface roughness $R_z = 5-15 \mu m$
Coolant : Oil emulsion or cutting oil



DX1.1-008,00-3-100-MK2
INTERNAL ROLLER BURNISHING TOOL



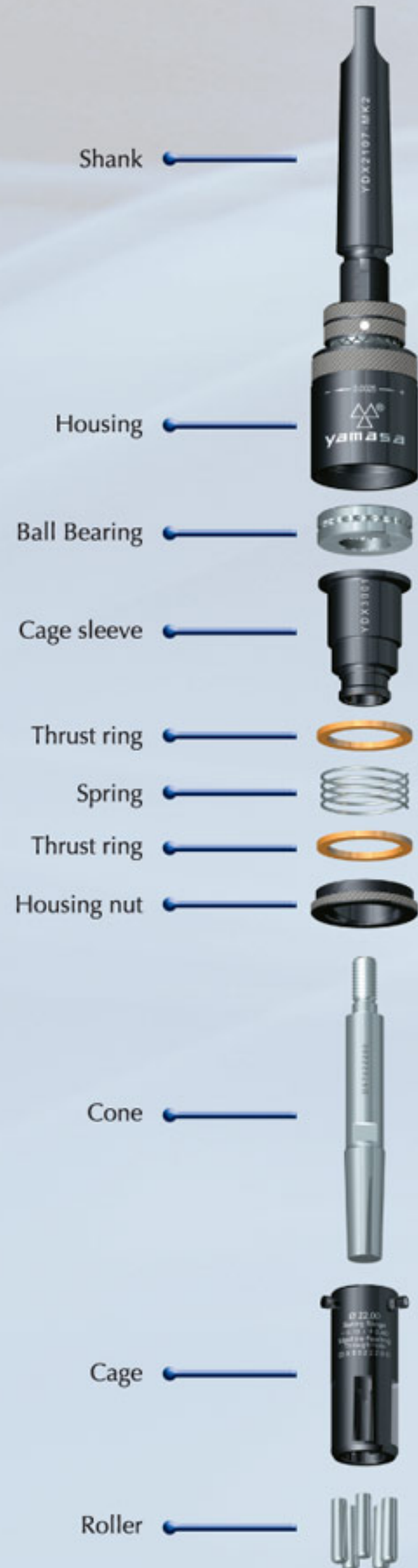
STANDARD TYPE

LONG TYPE

Tool Body	Diameter	Process Type			Rolling Length	Tool Shank		Setting Range			Roller		Quantity		
		Through				Morse Taper	Cylindrical	Through		Blind	Roller Number				
		AF	MF	MF				AF	MF		MF	Through		Blind	Piece
DX1.1	005,00				50	MK2	ZS 20 Ø20 h6 x 50	-0,05 +0,20	-0,05 +0,20	-0,05 +0,20	500115	-	3		
	006,00										500100	500308			
	007,00														
	008,00														
	009,00	1	2	3										4	
	010,00														
	011,00														
	012,00														
013,00															
014,00															

Tool Body	Diameter	Process Type			Rolling Length	Tool Shank		Setting Range			Roller		Quantity			
		Through				Morse Taper	Cylindrical	Through		Blind	Roller Number					
		AF	MF	MF				AF	MF		MF	Through		Blind	Piece	
DX1.1	006,00				100	MK2	ZS 20 Ø20 h6 x 50	-0,05 +0,20	-0,05 +0,20	-0,05 +0,20	500100	500308	3			
	007,00															
	008,00															
	009,00															
	010,00	1	2	3										4		
	011,00															
	012,00															
	013,00															
014,00																

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)





Technical Data

Revolution : approx. 800 to 1400 rpm (see Fig.2)
 Feeding : per roller 0,10 to 0,15 mm/rev.
 Burnishing allowance: + 0,01 to + 0,02 mm
 Pre-machining : Reaming or lathening
 Surface roughness $R_z = 5-15 \mu\text{m}$
 Coolant : Oil emulsion or cutting oil

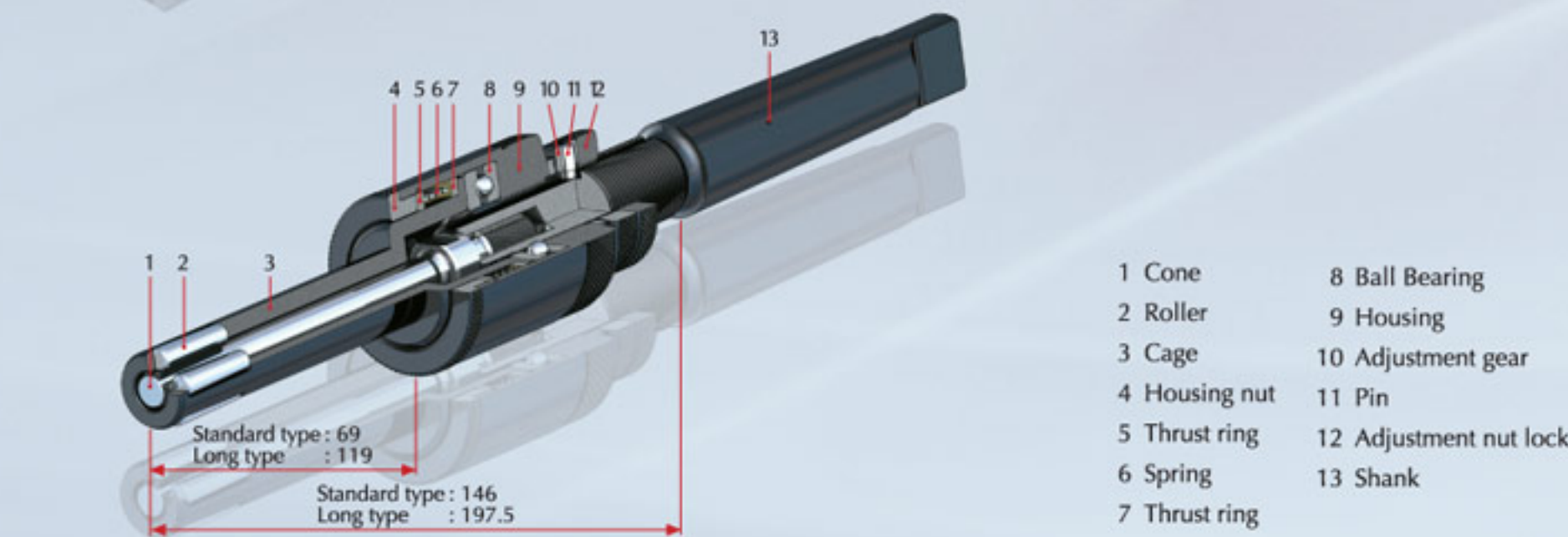
Through holes between $\varnothing 15 - \varnothing 21 \text{ mm}$
 Blind holes between $\varnothing 15 - \varnothing 21 \text{ mm}$

Type DX For Cylindrical Holes

Through holes between $\varnothing 22 - \varnothing 31 \text{ mm}$
 Blind holes between $\varnothing 22 - \varnothing 31 \text{ mm}$



DX1.2-015,00-3-100-MK2
INTERNAL ROLLER BURNISHING TOOL



- 1 Cone
- 2 Roller
- 3 Cage
- 4 Housing nut
- 5 Thrust ring
- 6 Spring
- 7 Thrust ring
- 8 Ball Bearing
- 9 Housing
- 10 Adjustment gear
- 11 Pin
- 12 Adjustment nut lock
- 13 Shank

Tool Body	Diameter	Process Type			Rolling Length	Tool Shank			Setting Range			Roller		
		Through		Blind		Morse Taper	Cylindrical	Through		Blind	Roller Number		Quantity	
		AF	MF	MF				AF	MF		MF	Through		Blind
DX1.2	015,00	1	2	3	50	MK2	ZS 20 Ø20 h6 x 50	-0,10 +0,90	-0,10 +0,40	-0,05 +0,40	500111	500310	5	
	016,00													
	017,00													
	018,00													
	019,00													
	020,00													
	021,00													

Tool Body	Diameter	Process Type			Rolling Length	Tool Shank			Setting Range			Roller		
		Through		Blind		Morse Taper	Cylindrical	Through		Blind	Roller Number		Quantity	
		AF	MF	MF				AF	MF		MF	Through		Blind
DX1.2	015,00	1	2	3	100	MK2	ZS 20 Ø20 h6 x 50	-0,10 +0,90	-0,10 +0,40	-0,05 +0,40	500111	500310	5	
	016,00													
	017,00													
	018,00													
	019,00													
	020,00													
	021,00													

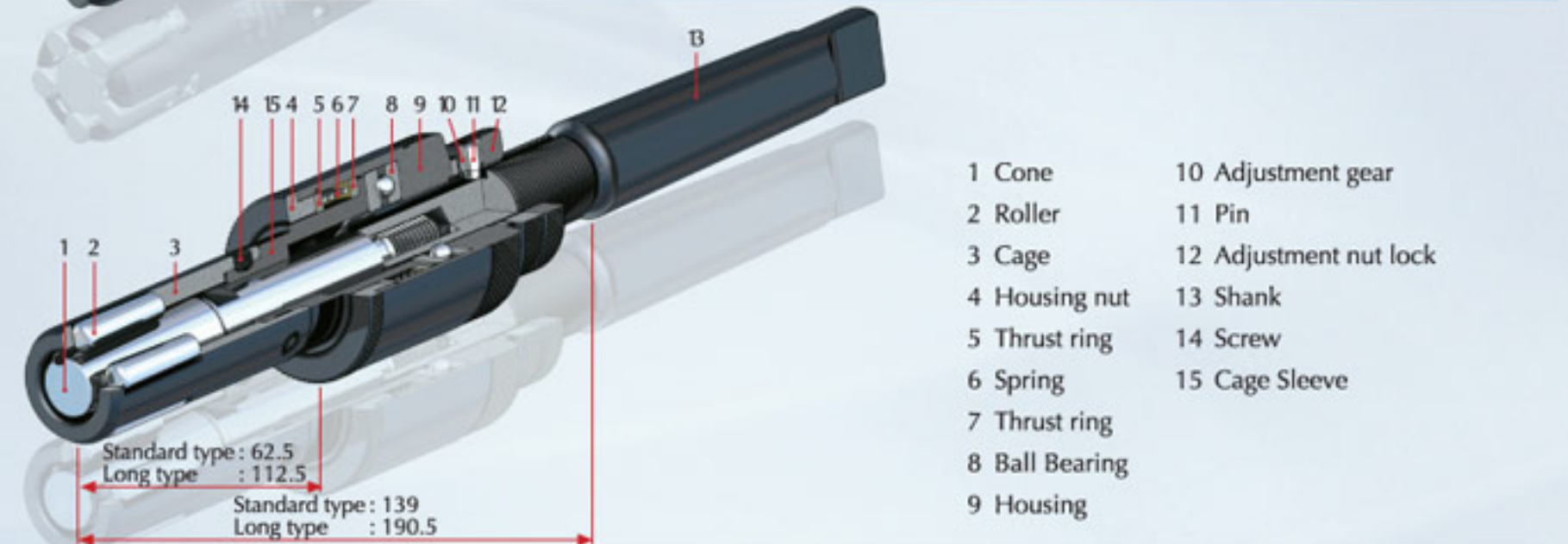
All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)

Technical Data

Revolution : approx. 700 to 1400 rpm (see Fig.2)
 Feeding : per roller 0,10 to 0,15 mm/rev.
 Burnishing allowance: + 0,02 to + 0,03 mm
 Pre-machining : Reaming or lathening
 Surface roughness $R_z = 5-20 \mu\text{m}$
 Coolant : Oil emulsion or cutting oil



DX1.2-022,00-3-100-MK2
INTERNAL ROLLER BURNISHING TOOL



- 1 Cone
- 2 Roller
- 3 Cage
- 4 Housing nut
- 5 Thrust ring
- 6 Spring
- 7 Thrust ring
- 8 Ball Bearing
- 9 Housing
- 10 Adjustment gear
- 11 Pin
- 12 Adjustment nut lock
- 13 Shank
- 14 Screw
- 15 Cage Sleeve

Tool Body	Diameter	Process Type			Rolling Length	Tool Shank			Setting Range			Roller		
		Through		Blind		Morse Taper	Cylindrical	Through		Blind	Roller Number		Quantity	
		AF	MF	MF				AF	MF		MF	Through		Blind
DX1.2	022,00	1	2	3	50	MK2	ZS 20 Ø20 h6 x 50	-0,10 +0,90	-0,10 +0,40	-0,05 +0,40	500112	500311	5	
	023,00													
	024,00													
	025,00													
	026,00													
	027,00													
	028,00													
	029,00													
	030,00													
	031,00													

Tool Body	Diameter	Process Type			Rolling Length	Tool Shank			Setting Range			Roller		
		Through		Blind		Morse Taper	Cylindrical	Through		Blind	Roller Number		Quantity	
		AF	MF	MF				AF	MF		MF	Through		Blind
DX1.2	022,00	1	2	3	100	MK2	ZS 20 Ø20 h6 x 50	-0,10 +0,90	-0,10 +0,40	-0,05 +0,40	500112	500311	5	
	023,00													
	024,00													
	025,00													
	026,00													
	027,00													
	028,00													
	029,00													
	030,00													
	031,00													

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)



Technical Data

Revolution : approx. 500 to 1000 rpm (see Fig.2)
 Feeding : per roller 0,10 to 0,15 mm/rev.
 Burnishing allowance: + 0,02 to + 0,03 mm
 Pre-machining : Reaming or lathening
 Surface roughness $R_z = 5-30 \mu\text{m}$
 Coolant : Oil emulsion or cutting oil

Through holes between $\varnothing 32 - \varnothing 34 \text{ mm}$
 Blind holes between $\varnothing 32 - \varnothing 34 \text{ mm}$

Type DX For Cylindrical Holes

Through holes between $\varnothing 35 - \varnothing 49 \text{ mm}$
 Blind holes between $\varnothing 35 - \varnothing 49 \text{ mm}$



Technical Data

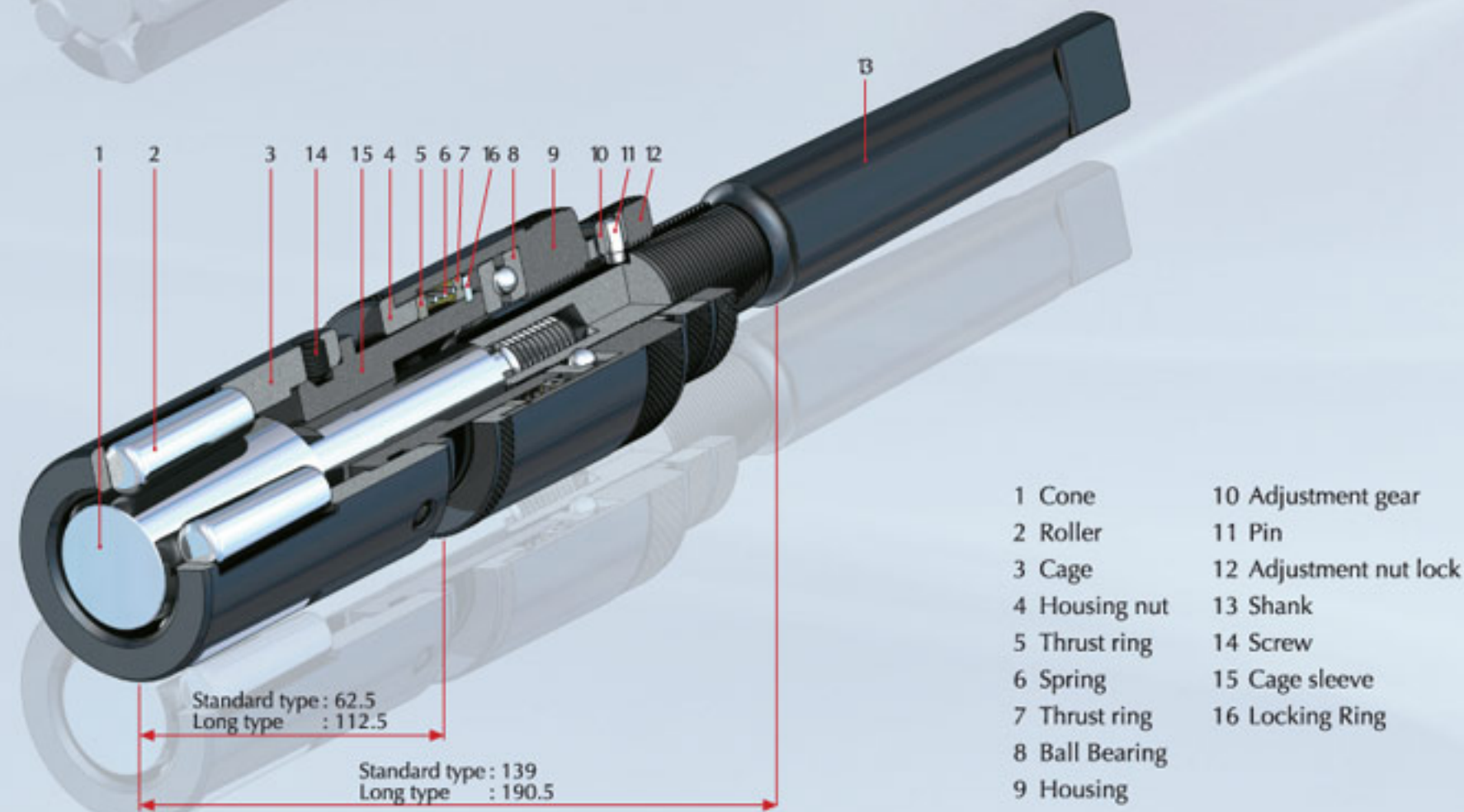
Revolution : approx. 450 to 900 rpm (see Fig.2)
 Feeding : per roller 0,10 to 0,15 mm/rev.
 Burnishing allowance: + 0,02 to + 0,03 mm
 Pre-machining : Reaming or lathening
 Surface roughness $R_z = 5-30 \mu\text{m}$
 Coolant : Oil emulsion or cutting oil



**DX1.3-032,00-3-100-MK2
INTERNAL ROLLER BURNISHING TOOL**



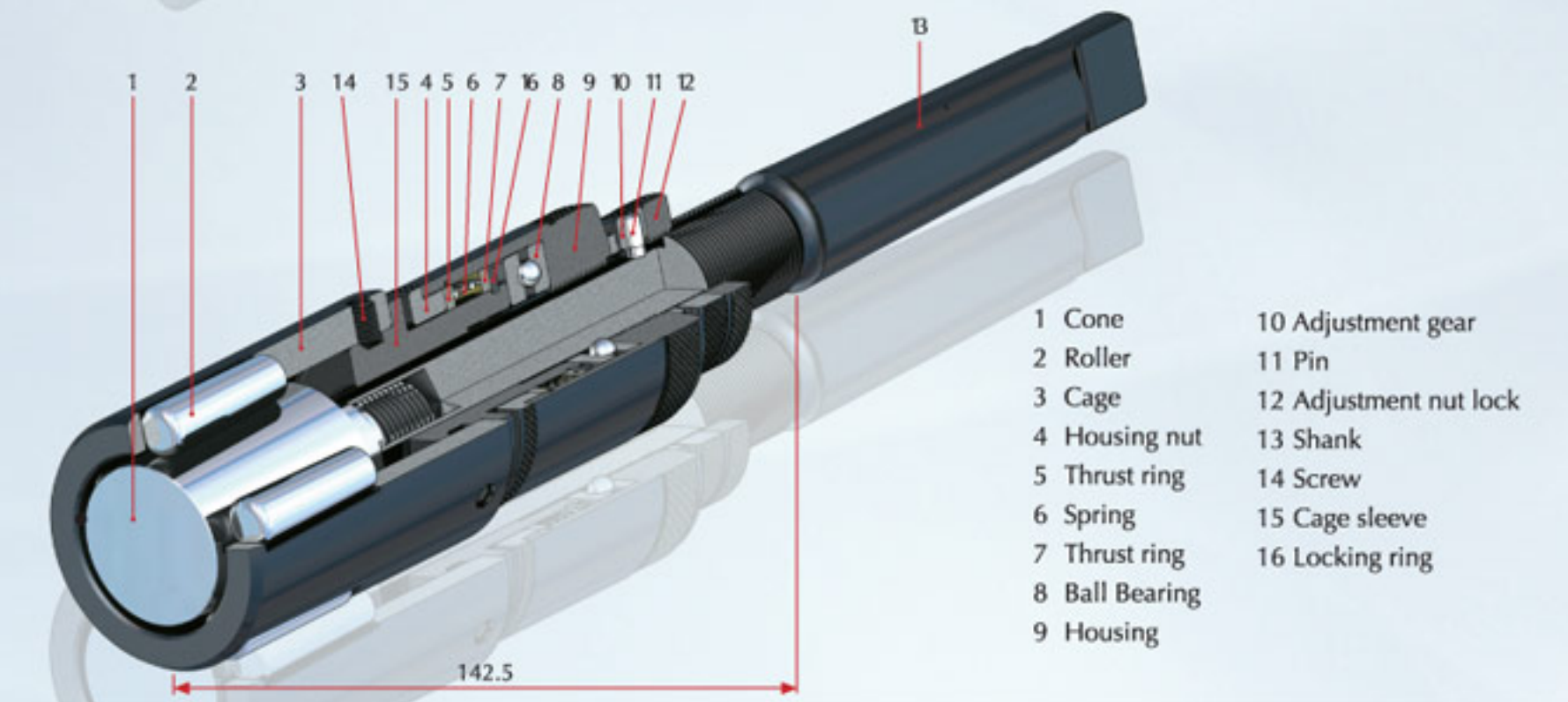
**DX1.3-040,00-3-U-MK2
INTERNAL ROLLER BURNISHING TOOL**



- 1 Cone
- 2 Roller
- 3 Cage
- 4 Housing nut
- 5 Thrust ring
- 6 Spring
- 7 Thrust ring
- 8 Ball Bearing
- 9 Housing
- 10 Adjustment gear
- 11 Pin
- 12 Adjustment nut lock
- 13 Shank
- 14 Screw
- 15 Cage sleeve
- 16 Locking Ring

Standard type : 62.5
 Long type : 112.5

Standard type : 139
 Long type : 190.5



- 1 Cone
- 2 Roller
- 3 Cage
- 4 Housing nut
- 5 Thrust ring
- 6 Spring
- 7 Thrust ring
- 8 Ball Bearing
- 9 Housing
- 10 Adjustment gear
- 11 Pin
- 12 Adjustment nut lock
- 13 Shank
- 14 Screw
- 15 Cage sleeve
- 16 Locking ring

142.5

STANDARD TYPE

Tool Body	Diameter	Process Type			Rolling Length	Tool Shank			Setting Range			Roller		Quantity
		Through		Blind		Morse Taper	Cylindrical	Through		Blind	Roller Number			
		AF	MF	MF				AF	MF	MF	Through	Blind	Piece	
DX1.3	032,00	1	2	3	50	MK2	ZS 20 $\varnothing 20 \text{ h6} \times 50$	-0,10	-0,10	-0,05	500109	500307	5	
	033,00							+0,90	+0,40	+0,40				
	034,00													

LONG TYPE

Tool Body	Diameter	Process Type			Rolling Length	Tool Shank			Setting Range			Roller		Quantity
		Through		Blind		Morse Taper	Cylindrical	Through		Blind	Roller Number			
		AF	MF	MF				AF	MF	MF	Through	Blind	Piece	
DX1.3	032,00	1	2	3	100	MK2	ZS 20 $\varnothing 20 \text{ h6} \times 50$	-0,10	-0,10	-0,05	500109	500307	5	
	033,00							+0,90	+0,40	+0,40				
	034,00													

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)

STANDARD TYPE

Tool Body	Diameter	Process Type			Rolling Length	Tool Shank			Setting Range			Roller		Quantity
		Through		Blind		Morse Taper	Cylindrical	Through		Blind	Roller Number			
		AF	MF	MF				AF	MF	MF	Through	Blind	Piece	
DX1.3	035,00	1	2	3	UNLIMITED	MK2	ZS 20 $\varnothing 20 \text{ h6} \times 50$	-0,10	-0,10	-0,05	500109	500307	6	
	036,00							+0,90	+0,40	+0,40				
	037,00													
	038,00													
	039,00													
	040,00													
	041,00													
	042,00													
	043,00													
	044,00													
	045,00													
	046,00													
	047,00													
	048,00													
	049,00													

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)



Through holes between $\varnothing 50 - \varnothing 80$ mm
Blind holes between $\varnothing 50 - \varnothing 80$ mm

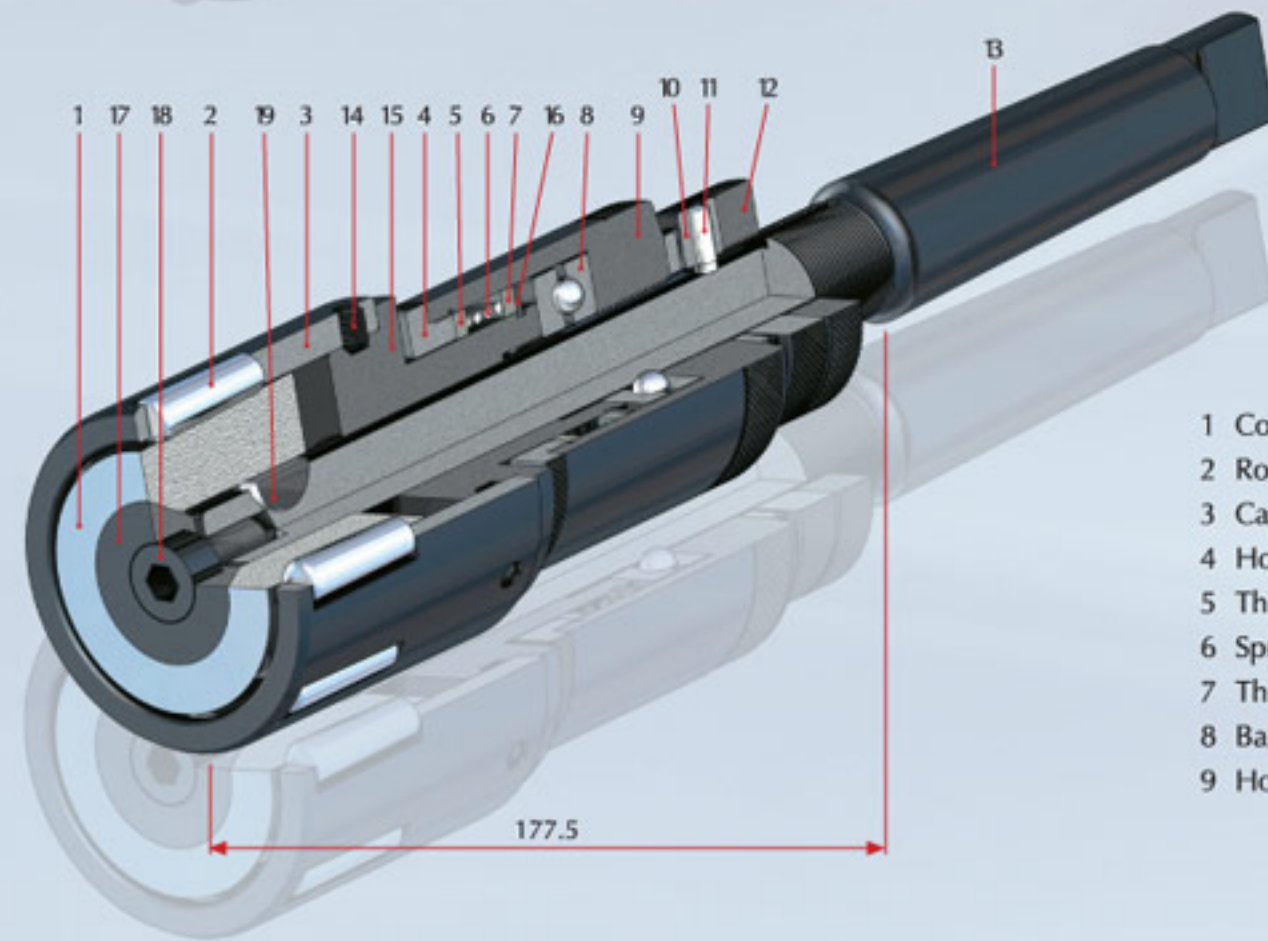
Technical Data

Revolution : approx. 300 to 650 rpm (see Fig.2)
Feeding : per roller 0,10 to 0,15 mm/rev.
Burnishing allowance : + 0,02 to + 0,03 mm
Pre-machining : Reaming or lathening
Surface roughness $R_z = 5-30 \mu\text{m}$
Coolant : Oil emulsion or cutting oil



DX2-060,00-3-U-MK3
INTERNAL ROLLER BURNISHING TOOL

TOOL BODY
ROLLER HEAD



- 1 Cone
- 2 Roller
- 3 Cage
- 4 Housing nut
- 5 Thrust ring
- 6 Spring
- 7 Thrust ring
- 8 Ball Bearing
- 9 Housing
- 10 Adjustment gear
- 11 Pin
- 12 Adjustment nut lock
- 13 Shank
- 14 Screw
- 15 Cage sleeve
- 16 Locking ring
- 17 Conical ring
- 18 Screw
- 19 Wedge

177.5

STANDARD TYPE

Tool Body	Diameter	Process Type			Rolling Length	Tool Shank			Setting Range			Roller		
		Through		Blind		Morse Taper		Cylindrical	Through		Blind	Roller Number		Quantity
		AF	MF	MF				AF	MF	MF	Through	Blind	Piece	
DX2	050,00				UNLIMITED	MK3	ZS 25 $\varnothing 25 \text{ h6} \times 56$	-0,10 +0,90	-0,10 +0,40	-0,05 +0,40	500109	500307	8	
	055,00													
	060,00													
	065,00													
	070,00													
	075,00													
	080,00													

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)

Type DX For Cylindrical Holes

Through holes between $\varnothing 81 - \varnothing 160$ mm
Blind holes between $\varnothing 81 - \varnothing 160$ mm



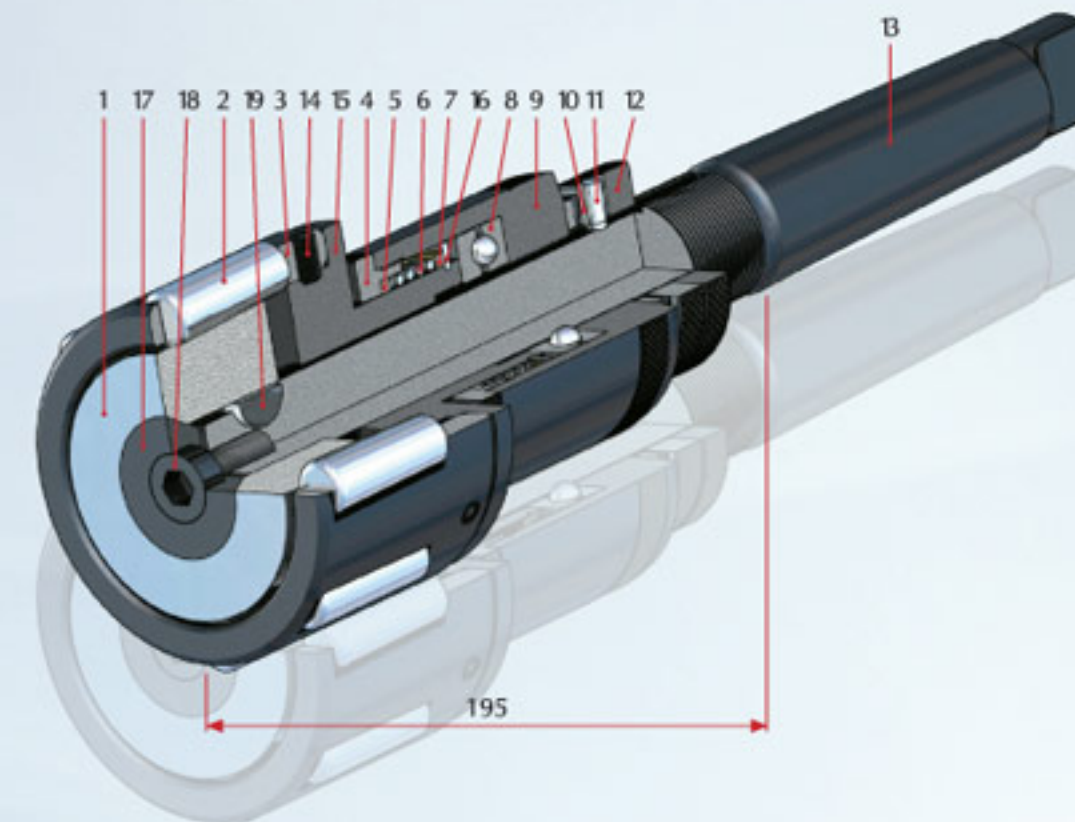
Technical Data

Revolution : approx. 190 to 400 rpm (see Fig.2)
Feeding : per roller 0,10 to 0,15 mm/rev.
Burnishing allowance : + 0,02 to + 0,03 mm
Pre-machining : Lathening
Surface roughness $R_z = 5-30 \mu\text{m}$
Coolant : Oil emulsion or cutting oil



DX3-090,00-3-U-MK4
INTERNAL ROLLER BURNISHING TOOL

TOOL BODY
ROLLER HEAD



- 1 Cone
- 2 Roller
- 3 Cage
- 4 Housing nut
- 5 Thrust ring
- 6 Spring
- 7 Thrust ring
- 8 Ball Bearing
- 9 Housing
- 10 Adjustment gear
- 11 Pin
- 12 Adjustment nut lock
- 13 Shank
- 14 Screw
- 15 Cage sleeve
- 16 Locking ring
- 17 Conical ring
- 18 Screw
- 19 Wedge

195

STANDARD TYPE

Tool Body	Diameter	Process Type			Rolling Length	Tool Shank		Setting Range			Roller		
		Through		Blind		Morse Taper	Cylindrical	Through		Blind	Roller Number		Quantity
		AF	MF	MF				AF	MF	MF	Through	Blind	Piece
DX3	081,00				UNLIMITED	MK4	ZS 32 $\varnothing 32 \text{ h6} \times 60$	-0,10 +0,90	-0,10 +0,40	-0,05 +0,40	500107	500306	8
	090,00												
	100,00												
	110,00												
	120,00												
	121,00												
	130,00												
	140,00												
	150,00												
	151,00												
160,00													

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)



Type DX

Through holes between
Blind holes between

For Cylindrical Holes

Ø161 - Ø350 mm
Ø161 - Ø350 mm

Type MX

Plain shafts between
Stepped shafts between

For Cylindrical Shafts

Ø3 - Ø110 mm
Ø3 - Ø110 mm

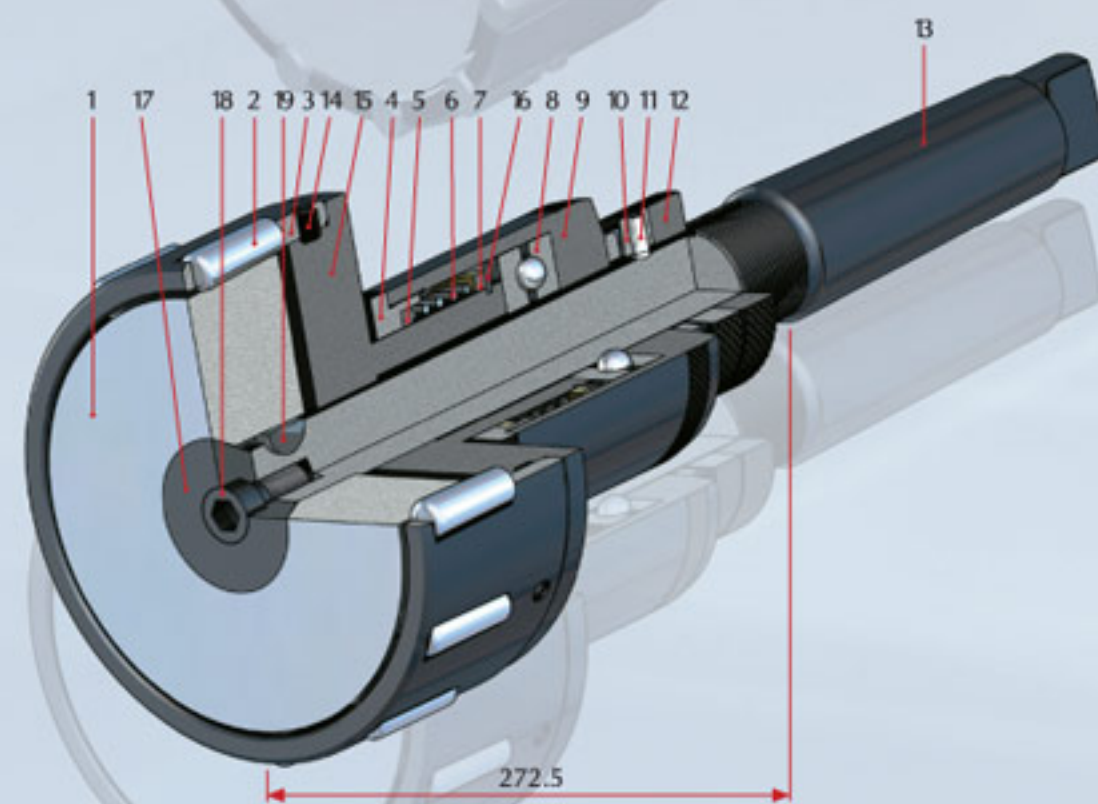


Technical Data

Revolution : approx. 100 to 200 rpm (see Fig.2)
Feeding : per roller 0,10 to 0,15 mm/rev.
Burnishing allowance: + 0,02 to + 0,03 mm
Pre-machining : Lathening
Surface roughness $R_z = 5-30 \mu\text{m}$
Coolant : Oil emulsion or cutting oil



DX4-170,00-3-U-MK5
INTERNAL ROLLER BURNISHING TOOL



- | | |
|--------------------|------------------------|
| 1 Cone | 11 Pin |
| 2 Roller | 12 Adjustment nut lock |
| 3 Cage | 13 Shank |
| 4 Housing nut | 14 Screw |
| 5 Thrust ring | 15 Cage sleeve |
| 6 Spring | 16 Locking ring |
| 7 Thrust ring | 17 Conical ring |
| 8 Ball Bearing | 18 Screw |
| 9 Housing | 19 Wedge |
| 10 Adjustment gear | |

EXPLANATIONS

Application

YAMASA MX type tools are used for the aim of the burnishing the cylindrical stepped and plain shafts. The tools provide as well as surface hardness and at low rate calibration (measurement accuracy) beside of the burnishing. The tools provide time saving through a high processing power and speed and this is preference cause for the serial production.

Technical Features

The tools are adjusted. The adjustment capacity for every diameter is 0,5 mm. The tools have an adjustment mechanism which gives the possibility to adjust very high precision measurements. This mechanism provides adjustment precision up to 0,0050 mm. YAMASA MX type roller burnishing tools for cylindrical shafts can work in H8 tolerances with a single adjustment. These tools are capable to process all kinds of metallic materials with 1400 N/mm² tensile strength and hardness up to max. 42-45 HRC. Tools work by turning to right. Either tool or workpiece may turn. These tools can be used on universal or CNC lathes, machining centers, drilling machines or other machines which process by turning. The tools can be tied to all machines easily and practically. Tools have rather a long life. It is possible to use the tools for a long time without size change due to abrasion.

There are three types according to the process type of YAMASA MX burnishing tools.

1) Plain Shaft Self-feeding

These burnishing tools process plain shafts. The tool provides own feeding speed which is needed while it is processing the workpiece. Feeding is occurred free from the machine.

2) Plain Shaft Machine-feeding

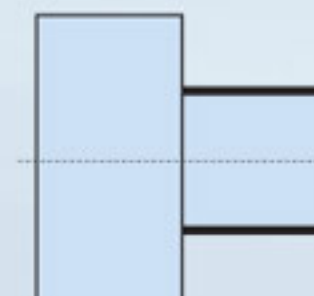
These burnishing tools process plain shafts. While the tool processes the workpiece, machine provides feeding speed which is needed.

3) Stepped Shaft Machine-feeding

These burnishing tools process stepped shafts and plain shafts up to the end. While the tool processes the workpiece, machine provides feeding speed which is needed.

The tool or the workpiece can be turned with a speed of max. 250 m/min. Machine feeding speed is possible from 0,05 mm/rev. to 0,3 mm/rev. for per roller.

Stepped Shafts



Plain Shafts



Samples of application

- Torque converters • Air hammer parts • Clutch parts
- Spline hubs • Pulleys • Rods • Pins • Shafts etc.

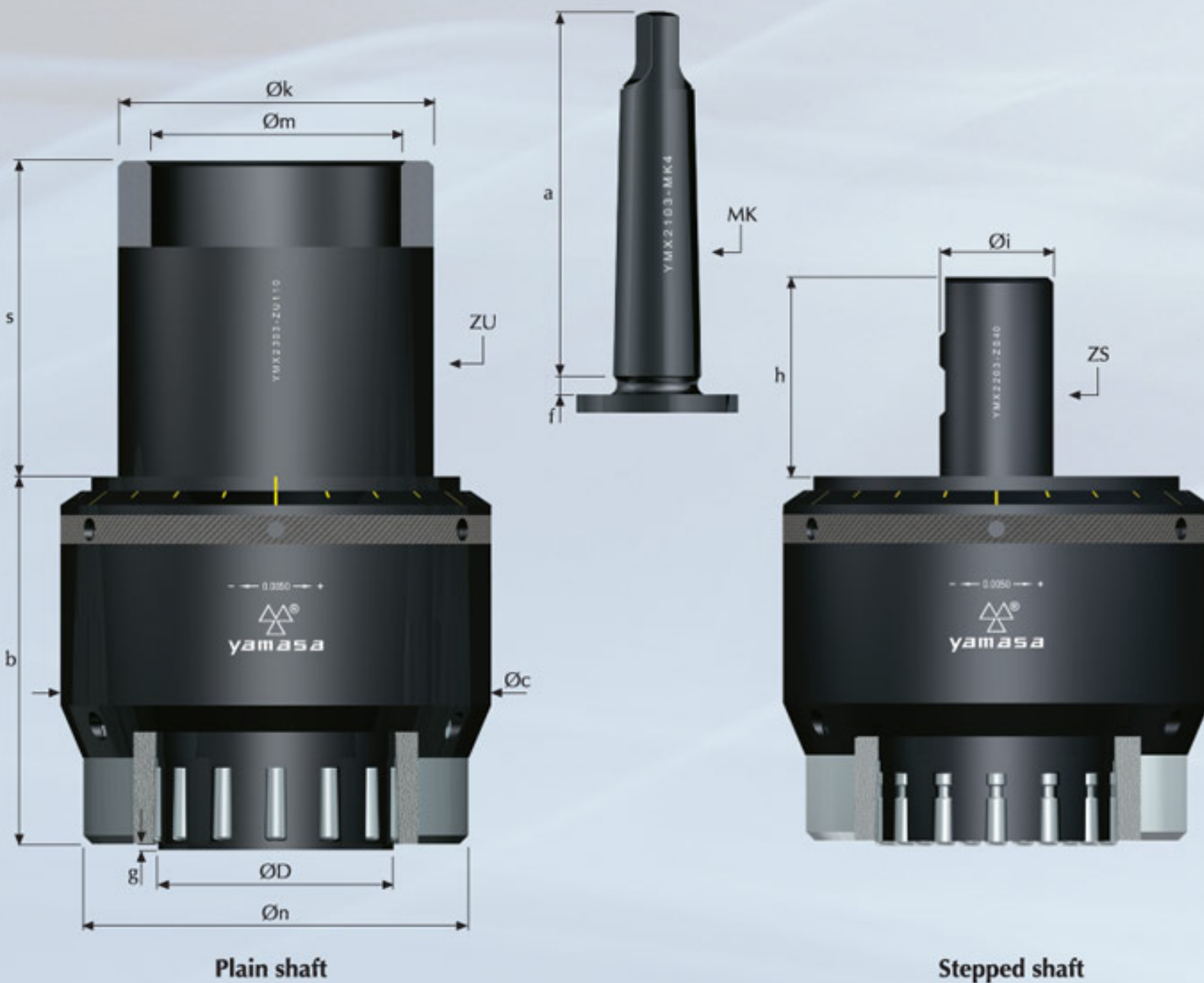


Tool Body	Diameter	Order Sample			Rolling Length	Tool Shank	Setting Range			Roller		Quantity Piece	
		Process Type		Through			Blind	Through	Blind	Blind	Through		Blind
		Through	Blind										
DX4	161	1	2	3	UNLIMITED	MK5	Z5 40 Ø40 h6 x 80	-0,10 +0,90	-0,10 +0,40	-0,05 +0,40	500107	500306	12
	170												14
	171												16
	200												18
	201												20
	230												22
	231												24
	260												26
	261												
	280												
	281												
	310												
	311												
	330												
	331												
	350												

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)



Plain shafts between $\text{Ø}3 - \text{Ø}110 \text{ mm}$
 Stepped shafts between $\text{Ø}3 - \text{Ø}110 \text{ mm}$



Tool Structure

YAMASA MX burnishing tools consist of a body and a roller head. The tool body has a precision adjustment mechanism. Cage, cone and rollers are the parts of the roller head. The roller heads fitting in to the same body

can be changed. The tool shank may be morse taper or cylindrical. Rolling lengths are related to shank selection. ZU shanks have unlimited rolling length, but ZS and MK shanks are limited (see table below).

Tool Body	Diameter Range Ø	Tool Shank - Morse Taper or Cylindrical Shank			b	c	g	n	a	f
		For Limited Rolling Length		For Unlimited Rolling Length						
		MK	ZS ($\text{Ø}l \times h$)	ZU ($\text{Ø}k \times s \times \text{Ø}m$)						
MX1	03-14	MK2	$\text{Ø} 20 \text{ h}6 \times 50$	$\text{Ø} 25 \text{ h}6 \times 60 \times \text{Ø} 15$	min 95 - max 105	54	2,0	44	78,5	s
MX2	15-24	MK3	$\text{Ø} 25 \text{ h}6 \times 56$	$\text{Ø} 40 \text{ h}6 \times 70 \times \text{Ø} 26$	min 100 - max 110	74	2,5	62	98	
MX3	25-49	MK4	$\text{Ø} 40 \text{ h}6 \times 70$	$\text{Ø} 80 \text{ h}6 \times 90 \times \text{Ø} 50$	min 119 - max 129	106	3,0	94	123	
MX4	50-85			$\text{Ø} 110 \text{ h}6 \times 110 \times \text{Ø} 87$	min 128 - max 138	149	3,5	138	123	
MX5	86-110	MK5	$\text{Ø} 50 \text{ h}6 \times 80$	$\text{Ø} 150 \text{ h}6 \times 120 \times \text{Ø} 112$	min 141 - max 151	193	3,5	177	155,5	

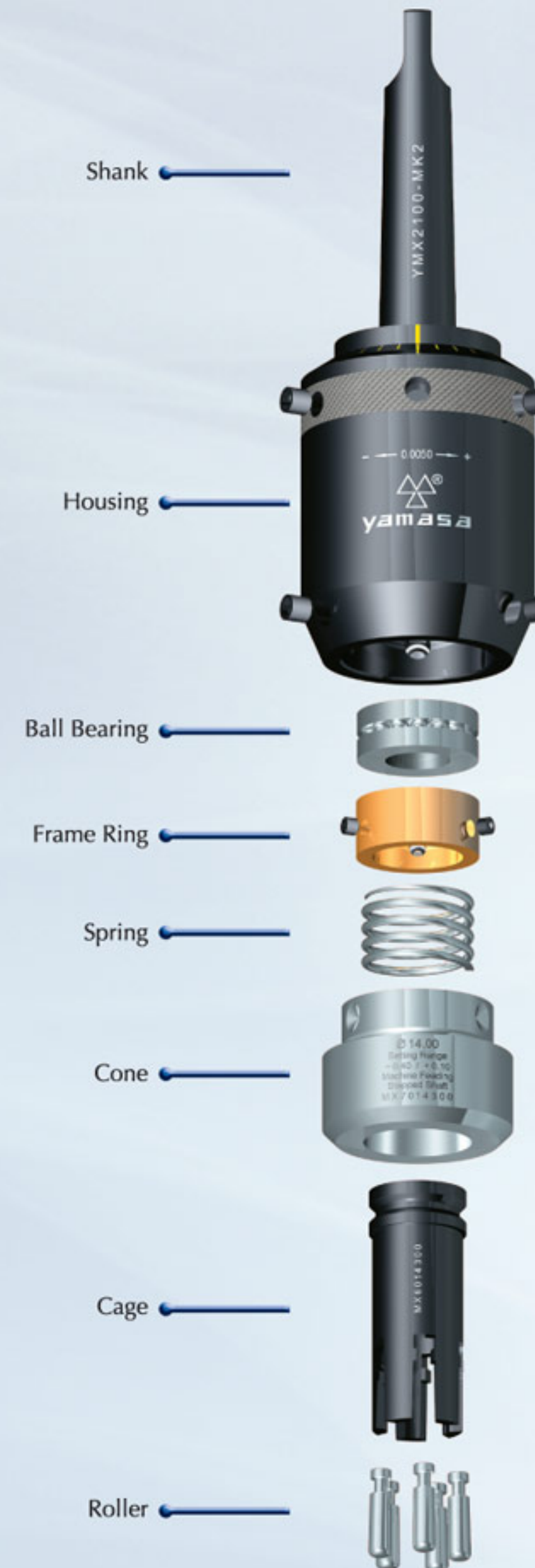
All Dimensions in mm.

Type MX

Plain shafts between $\text{Ø}3 - \text{Ø}110 \text{ mm}$
 Stepped shafts between $\text{Ø}3 - \text{Ø}110 \text{ mm}$

For Cylindrical Shafts

$\text{Ø}3 - \text{Ø}110 \text{ mm}$
 $\text{Ø}3 - \text{Ø}110 \text{ mm}$



Order Requirements

YAMASA MX Type burnishing tools can process the various diameters in order to the adjustment specification. As an example, MX3-030,00-1-100-MK3 model burnishing tool having a nominal size of $\text{Ø}30,00 \text{ mm}$ is capable to process all sizes between $\text{Ø}29,60 \text{ mm}$ and $\text{Ø}30,10 \text{ mm}$.

YAMASA MX type tools are produced in special diameters and sizes upon request. In addition, the tools with the special rolling length can also be produced.

You can use the information above to select the proper tool. If you want to take help for the tool selection, you can fill out the tool option form and send to us or to one of the related zone representation. So we can do the proper tool selection for you.

Tool Selection

1-Tool Body Selection

At sight to the table, select the body number proper to the tool diameter.

2-Diameter Selection

Define the diameter which process you will apply accurately (for example 15,87 ...).

3-Process Type Selection

It is selected according to the machine and workpiece.

- 1: Automatic feeding (self-feeding) for plain shafts
- 2: Machine feeding (not self-feeding) for plain shafts
- 3: Machine feeding (not self-feeding) for stepped shafts

4-Rolling Length Selection

Define the rolling length which is proper for the workpiece. Rolling length is related to the shank selection.

- For the tool diameter between 3-24 mm; by selection of ZS and MK shanks the rolling length is 75 mm.
- For the tool diameter between 25-85 mm; by selection of ZS and MK shanks the rolling length is 100 mm.
- For the tool diameter between 86-110 mm; by selection of ZS and MK shanks the rolling length is 115 mm.
- For the tool diameter between 3-110 mm; by selection of ZU shank rolling length is an unlimited (U).

5-Tool Shank Selection

Prefer the proper shank to your machine.

- ZU : Cylindrical Shank (unlimited rolling lengths)
- ZS : Cylindrical Shank (limited rolling lengths)
- MK : Morse Taper Shank (limited rolling lengths)

Order Sample

- MX2-015,87-3-75-MK3
- MX2 : Tool body
- 015,87 : Diameter (Ø)
- 3 : Process type
- 75 : Rolling length
- MK3 : Shank



Plain shafts between $\varnothing 3 - \varnothing 14$ mm
 Stepped shafts between $\varnothing 3 - \varnothing 14$ mm

Type MX For Cylindrical Shafts

Plain shafts between $\varnothing 15 - \varnothing 24$ mm
 Stepped shafts between $\varnothing 15 - \varnothing 24$ mm

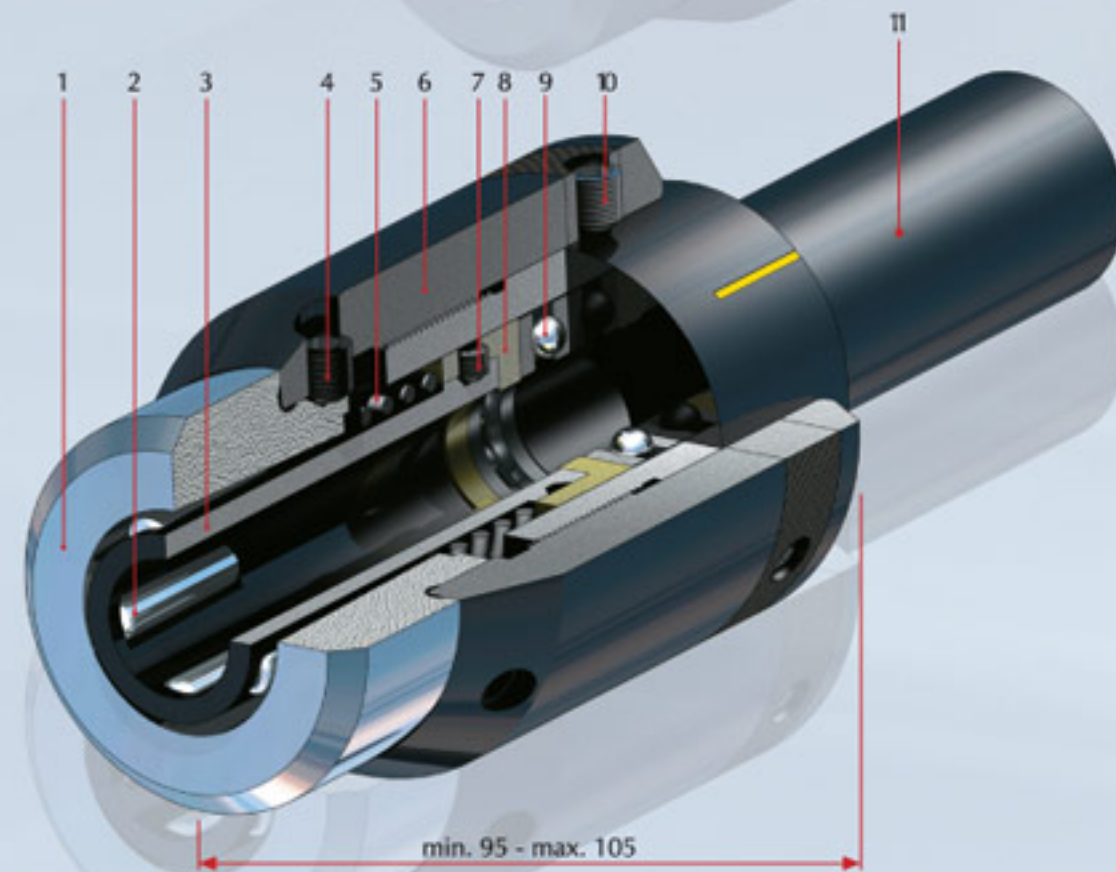


Technical Data

Revolution : approx. 800 to 1800 rpm (see Fig.2)
 Feeding : per roller 0,10 to 0,15 mm/rev.
 Burnishing allowance: + 0,005 to + 0,02 mm
 Pre-machining : precision lathening or grinding
 Surface roughness $R_z = 5-15 \mu\text{m}$
 Coolant : Oil emulsion or cutting oil



MX1-014,00-3-75-MK2
 EXTERNAL ROLLER BURNISHING TOOL
 ROLLER HEAD



- 1 Cone
- 2 Roller
- 3 Cage
- 4 Screw
- 5 Spring
- 6 Housing
- 7 Screw
- 8 Frame ring
- 9 Ball bearing
- 10 Screw
- 11 Shank

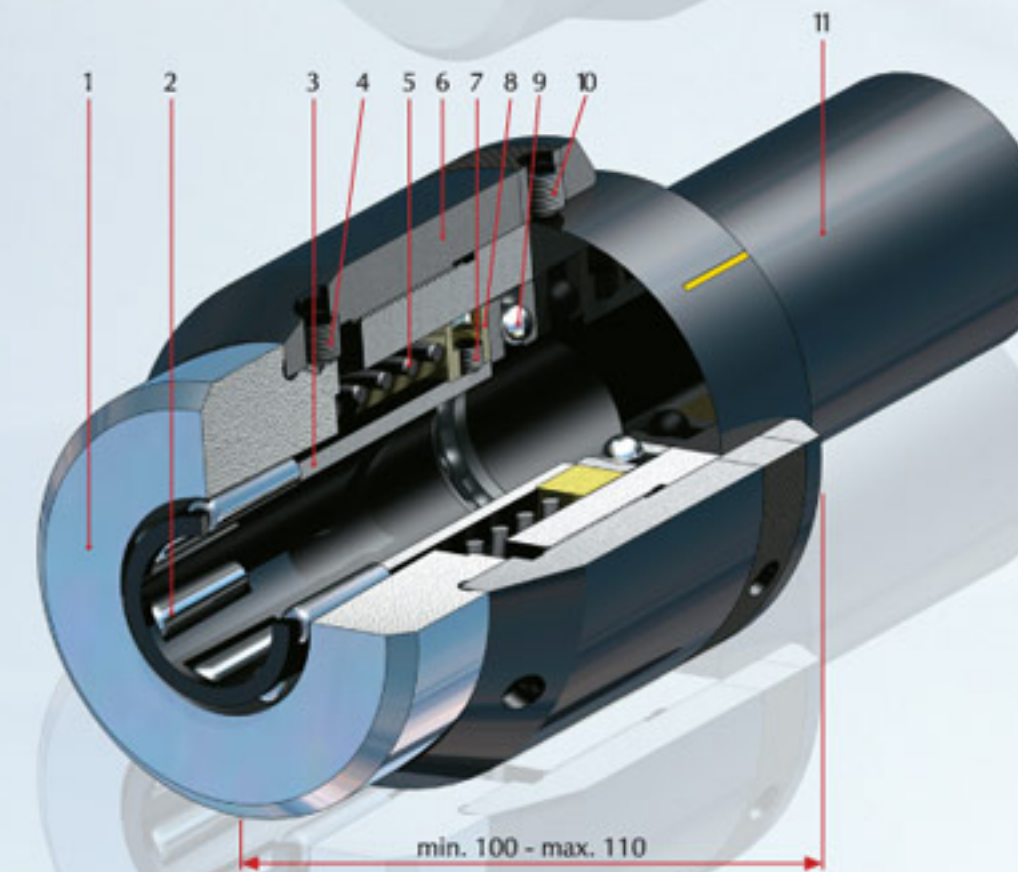
min. 95 - max. 105

Technical Data

Revolution : approx. 800 to 1400 rpm (see Fig.2)
 Feeding : per roller 0,10 to 0,15 mm/rev.
 Burnishing allowance: + 0,01 to + 0,02 mm
 Pre-machining : precision lathening or grinding
 Surface roughness $R_z = 5-15 \mu\text{m}$
 Coolant : Oil emulsion or cutting oil



MX2-020,00-3-75-MK3
 EXTERNAL ROLLER BURNISHING TOOL
 ROLLER HEAD



- 1 Cone
- 2 Roller
- 3 Cage
- 4 Screw
- 5 Spring
- 6 Housing
- 7 Screw
- 8 Frame ring
- 9 Ball bearing
- 10 Screw
- 11 Shank

min. 100 - max. 110

Tool Body	Diameter	Order Sample							Setting Range	Roller				
		Process Type			Rolling Length					Tool Shank				
		AF	MF	MF	MK	ZS	ZU	Morse Taper		Cylindrical				
MX1	003,00	1	2	3	75	75	UNLIMITED	MK2	ZS 20 $\varnothing 20 \text{ h6} \times 50$	ZU 25 $\varnothing 25 \text{ h6}$ $\times 60 \times \varnothing 15$	-0,40 +0,10	500112	500311	3
	004,00													
	005,00													
	006,00													
	007,00													
	008,00													
	009,00													
	010,00													
	011,00													
	012,00													
013,00														
014,00														

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)

Tool Body	Diameter	Order Sample							Setting Range	Roller				
		Process Type			Rolling Length					Tool Shank				
		AF	MF	MF	MK	ZS	ZU	Morse Taper		Cylindrical				
MX2	015,00	1	2	3	75	75	UNLIMITED	MK3	ZS 25 $\varnothing 25 \text{ h6} \times 56$	ZU 40 $\varnothing 40 \text{ h6}$ $\times 70 \times \varnothing 26$	-0,40 +0,10	500112	500311	5
	016,00													
	017,00													
	018,00													
	019,00													
	020,00													
	021,00													
	022,00													
	023,00													
	024,00													

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)

STANDARD TYPE

STANDARD TYPE



Plain shafts between $\varnothing 25 - \varnothing 49$ mm
 Stepped shafts between $\varnothing 25 - \varnothing 49$ mm

Type MX For Cylindrical Shafts

Plain shafts between $\varnothing 50 - \varnothing 85$ mm
 Stepped shafts between $\varnothing 50 - \varnothing 85$ mm



Technical Data

Revolution : approx. 600 to 1250 rpm (see Fig.2)
 Feeding : per roller 0,10 to 0,15 mm/rev.
 Burnishing allowance: + 0,01 to + 0,02 mm
 Pre-machining : precision lathening or grinding
 Surface roughness $R_z = 5-15 \mu\text{m}$
 Coolant : Oil emulsion or cutting oil



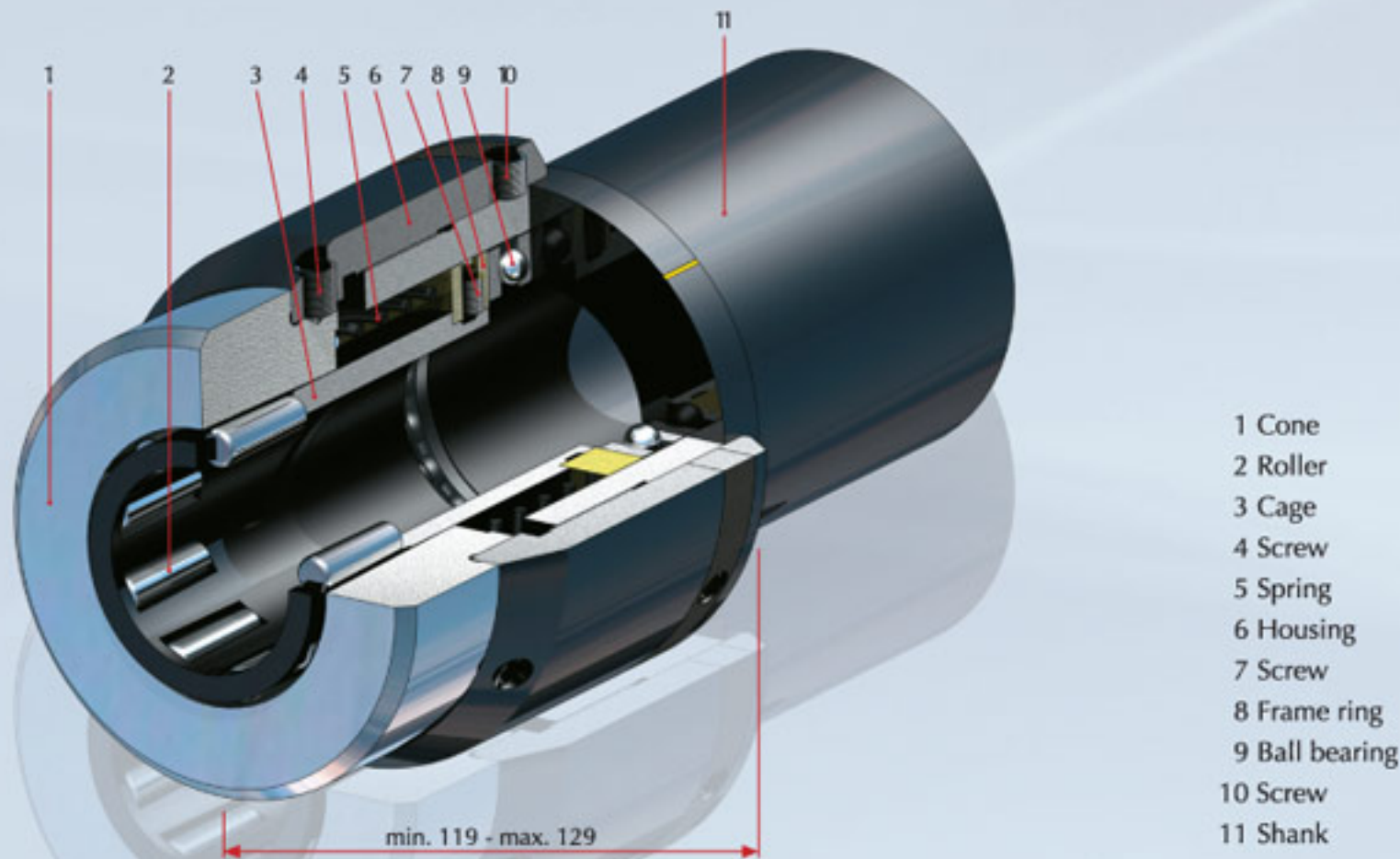
MX3-040,00-3-100-MK4
 EXTERNAL ROLLER BURNISHING TOOL
 ROLLER HEAD

Technical Data

Revolution : approx. 300 to 650 rpm (see Fig.2)
 Feeding : per roller 0,10 to 0,15 mm/rev.
 Burnishing allowance: + 0,01 to + 0,02 mm
 Pre-machining : precision lathening or grinding
 Surface roughness $R_z = 5-15 \mu\text{m}$
 Coolant : Oil emulsion or cutting oil

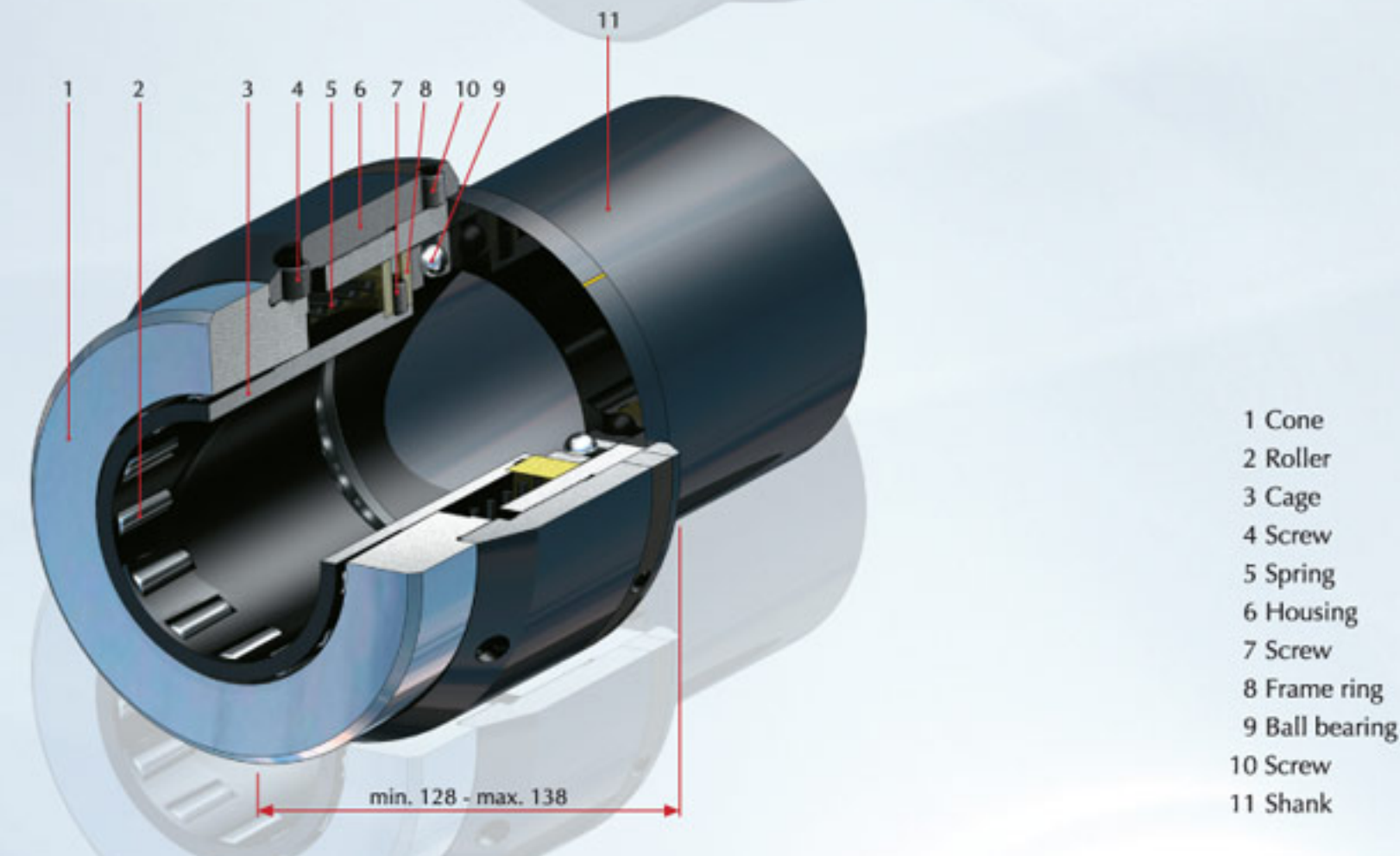


MX4-070,00-3-100-MK4
 EXTERNAL ROLLER BURNISHING TOOL
 ROLLER HEAD



- 1 Cone
- 2 Roller
- 3 Cage
- 4 Screw
- 5 Spring
- 6 Housing
- 7 Screw
- 8 Frame ring
- 9 Ball bearing
- 10 Screw
- 11 Shank

min. 119 - max. 129



- 1 Cone
- 2 Roller
- 3 Cage
- 4 Screw
- 5 Spring
- 6 Housing
- 7 Screw
- 8 Frame ring
- 9 Ball bearing
- 10 Screw
- 11 Shank

min. 128 - max. 138

STANDARD TYPE

Tool Body	Diameter	Order Sample						Setting Range	Roller					
		Process Type			Rolling Length				Tool Shank					
		Plain		Stepped	MK	ZS	ZU		Morse Taper		Quantity			
		AF	MF	MF					Morse Taper	Cylindrical				
MX3	025,00	1	2	3	100	100	UNLIMITED	MK4	ZS 40 $\varnothing 40$ h6 x 70	ZU 80 $\varnothing 80$ h6 x 90 x $\varnothing 50$	-0,40 +0,10	500109	500307	7
	038,00													9
	039,00													9
	049,00													9

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)

STANDARD TYPE

Tool Body	Diameter	Order Sample						Setting Range	Roller					
		Process Type			Rolling Length				Tool Shank					
		Plain		Stepped	MK	ZS	ZU		Morse Taper		Quantity			
		AF	MF	MF					Morse Taper	Cylindrical				
MX4	050,00	1	2	3	100	100	UNLIMITED	MK4	ZS 40 $\varnothing 40$ h6 x 70	ZU 110 $\varnothing 110$ h6 x 110 x $\varnothing 87$	-0,40 +0,10	500109	500307	9
	051,00													11
	052,00													11
	069,00													11
	070,00													13
085,00	13													

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)



Type MX For Cylindrical Shafts

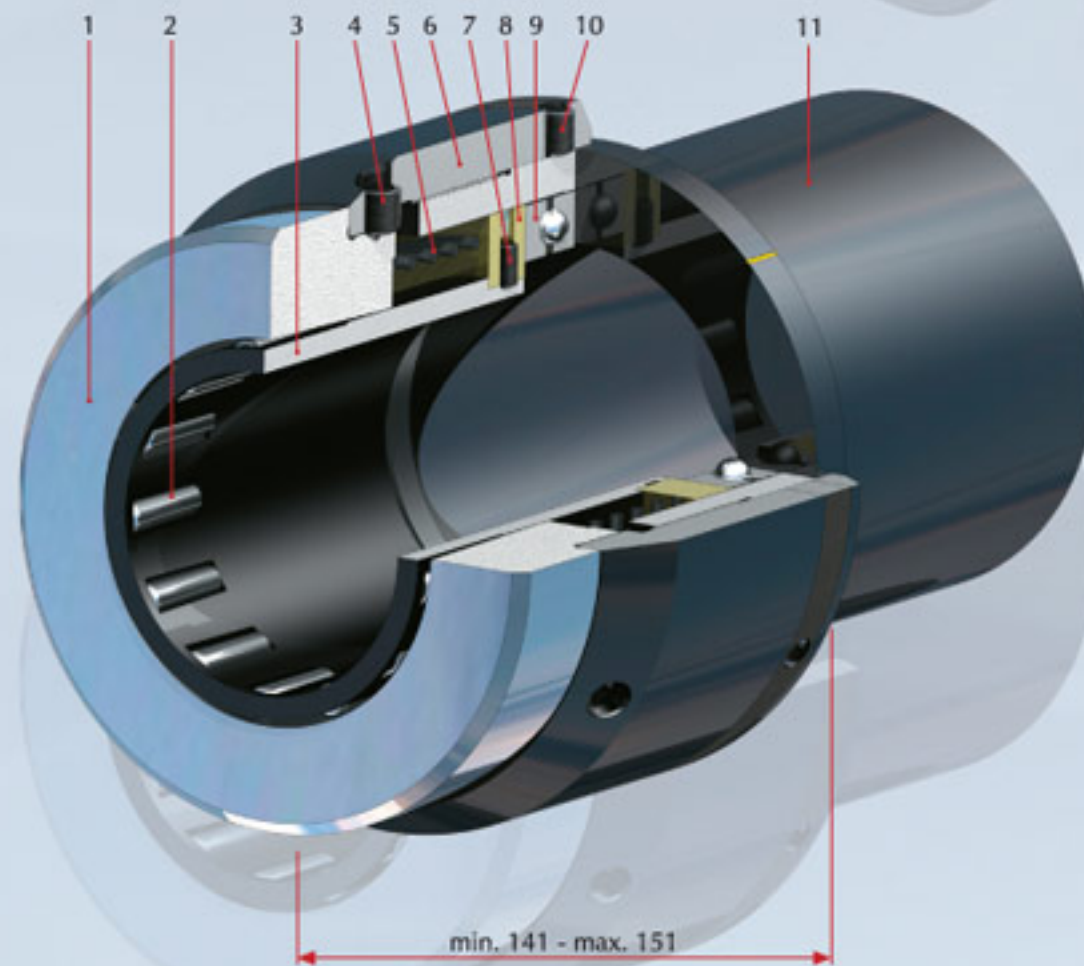
Plain shafts between Ø86 - Ø110 mm
Stepped shafts between Ø86 - Ø110 mm

Type KI, KD, KA For Male - Female Tapers and Flat Surfaces



Technical Data

Revolution : approx. 180 to 370 rpm (see Fig.2)
Feeding : per roller 0,10 to 0,15 mm/rev.
Burnishing allowance: + 0,01 to + 0,02 mm
Pre-machining : precision lathening or grinding
Surface roughness $R_z = 5-15 \mu\text{m}$
Coolant : Oil emulsion or cutting oil



- 1 Cone
- 2 Roller
- 3 Cage
- 4 Screw
- 5 Spring
- 6 Housing
- 7 Screw
- 8 Frame ring
- 9 Ball bearing
- 10 Screw
- 11 Shank

min. 141 - max. 151

EXPLANATIONS Application

These tools are used to process the interior-outer conics and flat surfaces. They are suitable to roller burnish for all workpieces requiring sensitivity. The tool body is equipped with a special spring system. This spring system enables the pressure, which is applied on the workpiece, adjusted specifically. At the same time, this spring system provides the tool a safety stroke (safety distance). The safety stroke prevents overload on the workpiece and the machine. Furthermore it helps to get a standard and perfect surface quality. The spring system which is designed specially for each tool, gives the opportunity to apply the same pressure everytime to the workpiece which is processed, thus a precision and standard size is obtained.

Type KI

For tapered internal surfaces



**KI - 45,30 - 30,50 - 30° - K2 - 1 - ZS25
ROLLER BURNISHING TOOL**

Technical Data

Revolution : approx. 200 to 700 rpm
Pre-machining : precision lathening
Roughness $R_z = 5-15 \mu\text{m}$
Coolant : Oil emulsion or cutting oil

Any adjustment mechanism is not mentioned in tools. The roller burnishing process occurs when the roller head, which is prepared specially due to the sizes of workpiece, is contacted to the workpiece with a certain force. During the process either the tool or the workpiece may turn. These tools are capable to process all kinds of metallic materials with 1400 N/mm² tensile strength and hardness up to max. 42-45 HRC. Tools work by Universal or CNC lathes, machining centers, drilling machines, milling machines or other machines which process by turning.

Type KD

For external tapered surfaces



**KD - 28,30 - 18,40 - 30° - K2 - 1 - ZS25
ROLLER BURNISHING TOOL**

Technical Data

Revolution : approx. 200 to 700 rpm
Pre-machining : precision lathening
Roughness $R_z = 5-15 \mu\text{m}$
Coolant : Oil emulsion or cutting oil

Tool Structure

KI, KD and KA type tools consist of a body and a roller head. The tool body consists of a shank and a very sensitive housing equipped with the pressurized spring system. The special spring system is designed due to the requirements of the work suitability. The tool is given with morse taper or cylindrical shank due to the preference. The roller head consists of cage, cone and rollers. These parts are designed and produced due to the dimensions of the workpiece. Later the roller heads are assembled to the proper body. As the roller heads are designed upon the specifications of the desired work, it is not possible to keep these parts in stock.

Type KA

For flat surfaces



**KA - 56,00 - 38,00 - K2 - 2 - ZS25
ROLLER BURNISHING TOOL**

Technical Data

Revolution : approx. 200 to 700 rpm
Pre-machining : precision lathening
Roughness $R_z = 5-15 \mu\text{m}$
Coolant : Oil emulsion or cutting oil

STANDARD
TYPE

Tool Body	Diameter	Process Type		Rolling Length			Tool Shank			Setting Range	Roller			
		AF	MF	MF	MK	ZS	ZU	Morse Taper			Roller Number	Quantity		
								ZS	ZU				Plain	Stepped
		AF	MF	MF	MK	ZS	ZU				Morse Taper	Cylindrical		
MX5	086,00	1	2	3	115	115	UNLIMITED	MK5	ZS 50 Ø50 h6 x 80	ZU 150 Ø150 h6 x 120 x Ø112	-0,40 +0,10	500107	500306	9
	095,00													
	096,00													
	110,00													

All Dimensions in mm. AF: Automatic Feeding (Self Feeding) MF: Machine Feeding (Not-self Feeding)



Type KI, KD, KA For Male - Female Tapers and Flat Surfaces

Samples of application

- Taper seat surfaces of valve bodies • Ball stud • Gas cock • Clutch parts
- Valve seat surface • Top end of sensor connector • Joint flange surface
- Plain surfaces of compressor parts • Mating surface of transmission parts
- Top end of sensor connector • Semiconductor valves • Joints etc.

Type SX For Shafts, Tapers and Flat Surfaces



Order Requirements

The tool bodies and roller heads are designed in according to the sizes of the workpieces and the material type. In order to produce the most proper tool, it is necessary to submit the technical drawing and the informations such as the material type and material hardness. If it is impossible to send the technical drawings, at least the surface sizes of the workpiece and the material type should be informed definitely.

Order sample :

- KI - 47,00 - 33,20 - 30° - MK3
- KI : Type
- 47,00 : Ø D
- 33,20 : Ø d
- 30° : Angle (only for KI and KD)
- MK3 : Shank

STANDARD TYPE	Tool Body	Diameter Range ØD	Tool Shank		a	b	c	e
			Morse Taper	Cylindrical (Øi x h)				
	K1	006,00 - 044,99	MK2	Ø20 h6 x 50	78,5	65	25	It can be changed according to the workpiece and surface dimensions which will be operated.
	K2	045,00 - 099,99	MK3	Ø25 h6 x 56	98	92	48	
	K3	100,00 - 149,99	MK4	Ø32 h6 x 60	123	107	63	

All Dimensions in mm.



Application

YAMASA SX type tools are used for the aim of burnishing stepped and plain shafts, female tapers and flat surfaces. The tools provide as well as surface hardness and low rate calibration (measurement accuracy) beside of burnishing. The tools provide time saving through a high processing power and speed. These are the preference causes for the serial production.

Technical Data

- Circumferential speed : max. 150 m/min.
- Feeding : max. 0,6 mm/rev.
- Burnishing allowance : + 0,005 to + 0,02 mm
- Pre-machining : precision lathening or grinding
- Surface roughness $R_z = 5-15 \mu m$
- Coolant : Oil emulsion or cutting oil

Samples of application

- Axle shafts • Clutch parts • Brake disks • Spline hubs
- Pulleys • Torque converters • Rods • Shafts etc.



Technical Features

- It can burnish the workpieces with various diameters.
- Tools can be used in two different ways by changing the shank. Shank of the tool can be disassemble and can be interchanged on the body. So with same tool either shafts or flat surfaces can be burnished. For this reason it does not require to have two other tools for two different surfaces.
- Tool shank and dial indicator have a special right and left interchange.
- Because of the modular structure it is suitable for the right and left hand operation.
- Used either with CNC or with universal lathes.
- Tools don't require settings and when the tool is fixed to the machine it is ready to use.
- During the operation the tool is fixed and the workpiece rotates. Rotation is possible in two directions.
- Roller burnishing force can be adjusted. So it is possible to achieve high quality and standard roughness values.
- Roller burnishing of shoulders and other edges is possible up to the end.
- It is capable to burnish all kinds of metallic materials up to the tensile strength of 1400N/mm² and to the hardness 42-45 HRC.
- Wear and damaged parts can be changed easily.
- According to the preference, shank is given as Square, Weldon or VDI. Whole shanks can be assembled, disassembled and can be interchanged.





Roller Burnishing Machines

Type MXM

For Cylindrical Shafts

For plain and stepped shafts between $\varnothing 3 - \varnothing 40$ mm



Technical Data

Burnishing allowance : + 0,005 to + 0,02 mm
 Pre-machining : precision lathening or grinding
 Surface roughness $R_z = 5-15 \mu\text{m}$



Application

YAMASA MXM type machines are used for the aim of burnishing the cylindrical stepped and plain shafts. The machine provides as well as surface hardness and low rate calibration (measurement accuracy) beside of burnishing. Because of the high processing power and speed ability, it provides time saving. These are the preference causes for the serial production.

Technical Features

YAMASA MXM roller burnishing machines can process the cylindrical shafts up to H8 tolerances with a single adjustment. These machines are capable to process all kinds of metallic materials with 1400 N/mm² tensile strength and hardness up to max. 42-45 HRC. Super finish surfaces up to $R_a = 0,02 \mu\text{m}$ can be obtained.

With MXM Type burnishing machines, part feeding and tolerance adjustment can be done automatically. The machine takes the workpiece and then removes out after the burnishing process is completed. The machine has full automatic specifications. It is capable to achieve a rapid production in order to the automatic feeding system. It can be integrated to each production line for every kind of serial production. As well as automatic loading system can be integrated.

Design and Function

MXM Roller Burnishing Machines are capable to process any kind of diameter between $\varnothing 3 - \varnothing 40$ mm by changing the roller heads. One roller head is used for each nominal diameter. Each roller head has an adjustment capacity of 0,5 mm. The nominal diameter of the roller head can be adjusted with the tolerance between -0,40 and +0,10.

Advantages

- It is capable to achieve a rapid and serial production.
- Saves time, money and energy.
- The roller heads can be replaced easily and rapidly.
- A precision and fast adjustment can be done through the adjustment mechanism.
- No sawdust and residues occur.

Samples of application

- Shock absorber shafts • Pneumatic cylinder shafts
- HDD shafts • Coil • Powered tooth brush drive shafts
- Printer guide shafts • Piston rods • Air hammer parts
- Air condition shafts • Pump shafts • Motor shafts
- Optical drum for copying machine • Wire etc.



PROCESSING PROPERTIES	MODELS					
	MXM-1 NC HORIZONTAL	MXM-1 DPH HORIZONTAL	MXM-1 DVH HORZ.-VERT	MXM-2 NC HORIZONTAL	MXM-2 DPH HORIZONTAL	MXM-2 DVH HORZ.-VERT
Diameter range (mm)	$\varnothing 3 - \varnothing 20$	$\varnothing 3 - \varnothing 20$	$\varnothing 3 - \varnothing 20$	$\varnothing 03 - \varnothing 40$	$\varnothing 03 - \varnothing 40$	$\varnothing 03 - \varnothing 40$
Workpiece processing length (mm)	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Max. feed rate (mm/rev.)	2	2	2	2	2	2
Achieved min. Roughness (R_a - μm)	0.02	0.02	0.02	0.02	0.02	0.02
Stepped workpiece processing possibility	x	x	x	x	x	x
POWER PROPERTIES						
Motor power	1.5 kW	1.5 kW	1.5 kW	2.2 kW	2.2 kW	2.2 kW
Electrical connection	380 V	380 V	380 V	380 V	380 V	380 V
Speed control	1.5 kW	1.5 kW	1.5 kW	2.2 kW	2.2 kW	2.2 kW
Oil pump	90 W	90 W	-	90 W	90 W	-
COMMAND - CONTROL						
Lighting	x	x	x	x	x	x
Discharging system for tightened piece	x	x	x	x	x	x
Emergency stop	x	x	x	x	x	x
Control panel	x	x	x	x	x	x
Speed control	x	x	x	x	x	x
Automatic Emergency stop	x	x	x	x	x	x
Electronic Revolution indicator	x	x	x	x	x	x
Lubrication	x	x	-	x	x	-
Oil lessen/out alarm	x	-	-	x	-	-
Colored LCD computerized control panel	x	-	-	x	-	-
Daily piece counter indicator	x	-	-	x	-	-
Total piece counter indicator	x	-	-	x	-	-
Processing period indicator (optional)	x	-	-	x	-	-
Memory by operation	x	-	-	x	-	-
Program and receipt print	x	-	-	x	-	-
Digital revolution setting system	x	-	-	x	-	-
Additional module possibility	x	-	-	x	-	-
Automatic loading system Integrated possibility	x	x	x	x	x	x
Commanding and programming piece loading system with the present computerized panel	x	-	-	x	-	-
CHANGEABLE PARTS						
Roller head	x	x	x	x	x	x
Input-middle-output centering apparatus	x	x	x	x	x	x
COOLING TANK						
Lubrication	x	x	-	x	x	-
Oil level indicator	x	x	-	x	x	-
Filtering	x	x	-	x	x	-
Capacity (Liter)	30	30	-	30	30	-
DIMENSIONS						
Width (mm)	780	780	500	780	780	500
Length (mm)	1400	1400	1000	1400	1400	1000
Height (mm)	1200	1200	550	1200	1200	550



Tool Option Form

This form may be reproduced with photocopy. Please fill up this form and send us if necessary. The information included in this form shall be useful for us to select the appropriate tool that you need.

1) Sender's information

Company name.....Date.....
 Address.....
 P.O. Box.....City.....Country.....
 Phone.....Fax.....E-mail.....
 Contact person.....Title.....

2) Workpiece

Name of workpiece.....Material.....
 Hardness (HRC,HRB,HB,Hs,Hv,Other:.....).....Tensile strength(N/mm²).....

3) Surface to be burnished: Tick the following

Through hole Blind hole Plain shaft Stepped Shaft
 Workpiece Diameter (∅).....Rolling Length.....
 Male taper Female taper
 Workpiece Diameter ∅D.....∅d.....Angle(α).....
 Flat surface
 Workpiece Diameter ∅D.....∅d.....
 Others
 Dimensions.....

4) Burnishing specification

Workpiece	Before process	After process
Surface roughness (R _z , R _a , R _{max} , Other:.....)		
Size Tolerance (mm)		
Roundness (mm)		
Hardness		
Others		

5) Purpose of burnishing: Tick the following

Improvement of surface roughness Improvement of accuracy Improvement of roundness
 Increase of surface hardness Others (.....)

6) Type of machine to be used

7) Tool shank MK ZS ZU Non-standard (please provide details).....

8) Sketch of workpiece Drawing no.....(please attach drawing and underline the burnishing points, if any.)



Brighten your future...

Your Representative