



Roller burnishing

External Roll-a-Finish™ XBB series

Standard tool specifications

For burnishing the outside diameter of cylindrical parts such as shafts rotating in bushings or bearings. Provides an ideal surface for grease and oil seals.



XBB tools are available for nominal sizes from 1.5mm to 65mm

All XBB tools are 'Bottoming style' and require machine feeding.
The tools are adjustable in increments of 0.002mm and 0.005mm on larger sizes.





Roller burnishing

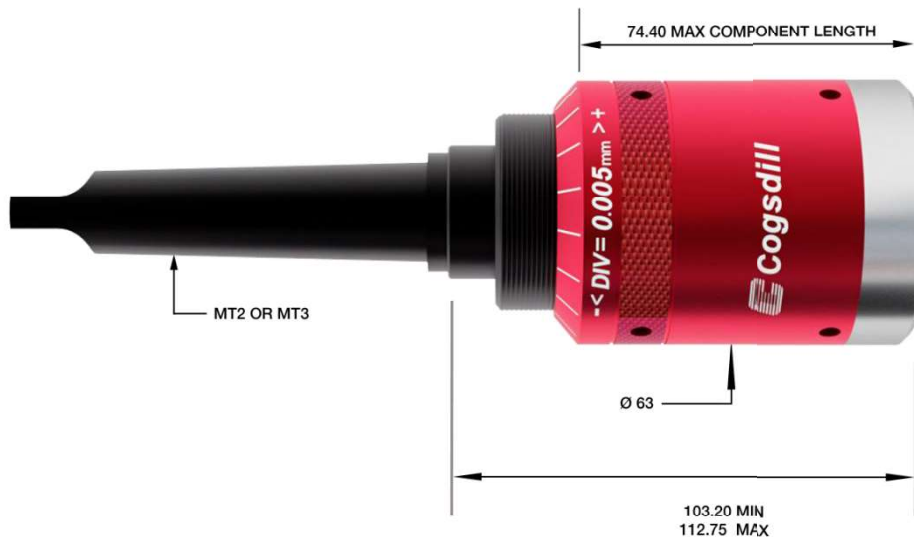
External Roll-a-Finish™ XBB series

Standard tool specifications

XBB SERIES ROLL-A-FINISH™ TOOLS 1.50mm to 20.00mm (.059" to .787")



STANDARD HOLLOW SHANK DESIGN



OPTIONAL SCREW-IN SHANK DESIGN



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DIAMETER RANGE				TOOL NUMBER
MIN Ø		MAX Ø		Bottoming
mm	Inches	mm	Inches	(No Helix)
1.00	0.039	1.60	0.063	XBB 1.50
1.50	0.059	2.10	0.083	XBB 2.00
2.00	0.078	2.60	0.102	XBB 2.50
2.50	0.098	3.10	0.122	XBB 3.00
3.00	0.118	3.60	0.142	XBB 3.50
3.50	0.138	4.10	0.161	XBB 4.00
4.00	0.157	4.60	0.181	XBB 4.50
4.50	0.177	5.10	0.201	XBB 5.00
5.00	0.197	5.60	0.220	XBB 5.50
5.50	0.217	6.10	0.240	XBB 6.00
6.00	0.236	6.60	0.260	XBB 6.50
6.50	0.256	7.10	0.280	XBB 7.00
7.00	0.276	7.60	0.299	XBB 7.50
7.50	0.295	8.10	0.319	XBB 8.00
8.00	0.315	8.60	0.339	XBB 8.50
8.50	0.335	9.10	0.358	XBB 9.00
9.00	0.354	9.60	0.378	XBB 9.50
9.50	0.374	10.10	0.398	XBB 10.00
10.00	0.39	10.60	0.417	XBB 10.50
10.50	0.41	11.10	0.437	XBB 11.00
11.00	0.43	11.60	0.457	XBB 11.50
11.50	0.45	12.10	0.476	XBB 12.00
12.00	0.47	12.60	0.496	XBB 12.50
12.50	0.49	13.10	0.516	XBB 13.00
13.00	0.51	13.60	0.535	XBB 13.50
13.50	0.53	14.10	0.555	XBB 14.00
14.00	0.55	14.60	0.575	XBB 14.50
14.50	0.57	15.10	0.594	XBB 15.00
15.00	0.59	15.60	0.614	XBB 15.50
15.50	0.61	16.10	0.634	XBB 16.00
16.00	0.63	16.60	0.654	XBB 16.50
16.50	0.65	17.10	0.673	XBB 17.00
17.00	0.66	17.60	0.693	XBB 17.50
17.50	0.68	18.10	0.713	XBB 18.00
18.00	0.70	18.60	0.732	XBB 18.50
18.50	0.72	19.10	0.752	XBB 19.00
19.00	0.74	19.60	0.772	XBB 19.50
19.50	0.76	20.10	0.791	XBB 20.00

Optional Self-Feeding 1½° Helix style tools are available from XBB 6.5 onwards.



Roller burnishing

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XBB SERIES ROLL-A-FINISH™ TOOLS 21.00mm to 40.00mm (.827" to 1.575")



STANDARD HOLLOW SHANK DESIGN



OPTIONAL SCREW-IN SHANK DESIGN



Roller burnishing

External Roll-a-Finish™ XBB series

Standard tool specifications

XBB SERIES ROLL-A-FINISH™ TOOLS 21.00mm to 40.00mm (.827" to 1.575")

DIAMETER RANGE				TOOL NUMBER
MIN Ø		MAX Ø		Bottoming
mm	Inches	mm	Inches	(No Helix)
20.00	0.787	21.10	0.831	XBB 21
21.00	0.827	22.10	0.870	XBB 22
22.00	0.866	23.10	0.909	XBB 23
23.00	0.906	24.10	0.949	XBB 24
24.00	0.945	25.10	0.988	XBB 25
25.00	0.984	26.10	1.028	XBB 26
26.00	1.024	27.10	1.067	XBB 27
27.00	1.063	28.10	1.106	XBB 28
28.00	1.102	29.10	1.146	XBB 29
29.00	1.142	30.10	1.185	XBB 30
30.00	1.181	31.10	1.224	XBB 31
31.00	1.22	32.10	1.264	XBB 32
32.00	1.26	33.10	1.303	XBB 33
33.00	1.299	34.10	1.343	XBB 34
34.00	1.339	35.10	1.382	XBB 35
35.00	1.378	36.10	1.421	XBB 36
36.00	1.417	37.10	1.461	XBB 37
37.00	1.457	38.10	1.500	XBB 38
38.00	1.496	39.10	1.539	XBB 39
39.00	1.535	40.10	1.579	XBB 40

Optional Self-Feeding 1½° Helix style tools are available for all sizes in this range.

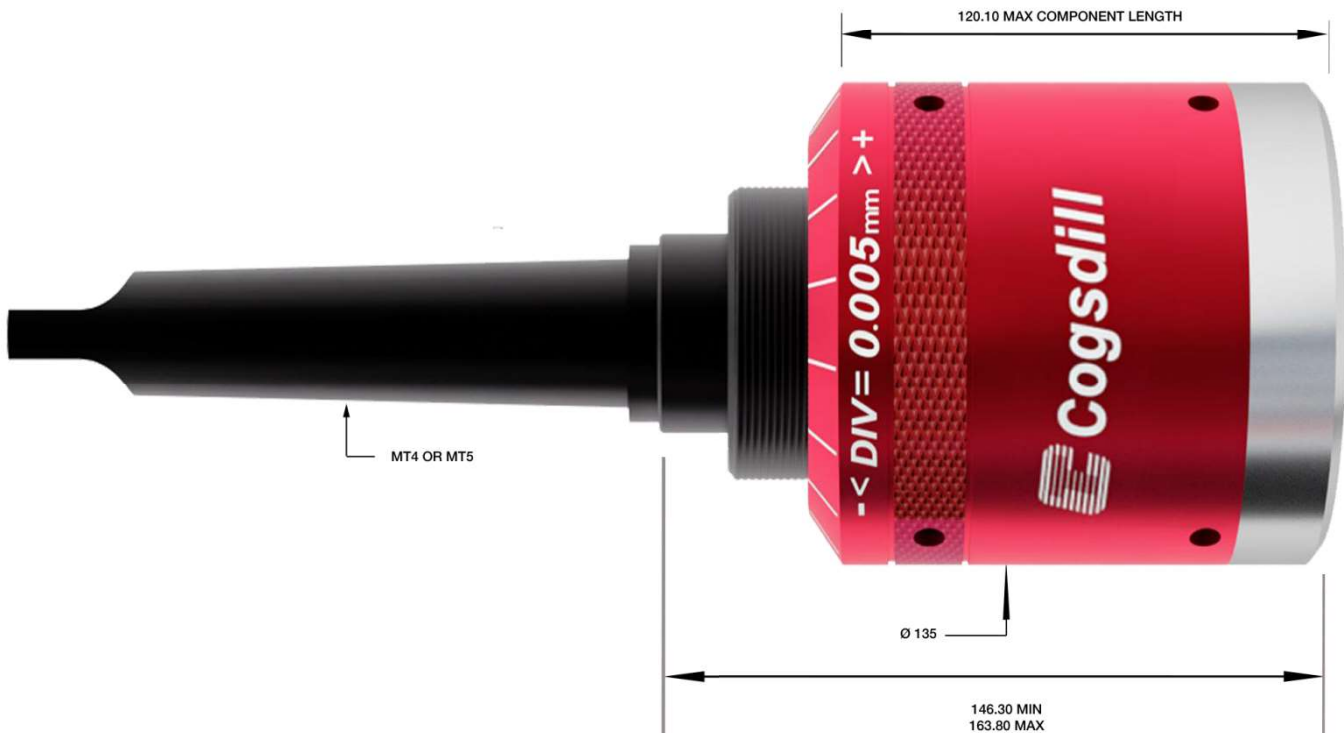


Roller burnishing

External Roll-a-Finish™ XBB series

Standard tool specifications

XBB SERIES ROLL-A-FINISH™ TOOLS 41.00mm to 65.00mm (1.614" to 2.559")





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Standard tool specifications

XBB SERIES ROLL-A-FINISH™ TOOLS 41.00mm to 65.00mm (1.614” to 2.559”)

DIAMETER RANGE				TOOL NUMBER
MIN Ø		MAX Ø		Bottoming
mm	Inches	mm	Inches	(No Helix)
40.00	1.575	41.10	1.618	XBB 41
41.00	1.614	42.10	1.657	XBB 42
42.00	1.654	43.10	1.697	XBB 43
43.00	1.693	44.10	1.736	XBB 44
44.00	1.732	45.10	1.776	XBB 45
45.00	1.772	46.10	1.815	XBB 46
46.00	1.811	47.10	1.854	XBB 47
47.00	1.850	48.10	1.894	XBB 48
48.00	1.890	49.10	1.933	XBB 49
49.00	1.929	50.10	1.972	XBB 50
50.00	1.969	51.10	2.012	XBB 51
51.00	2.008	52.10	2.051	XBB 52
52.00	2.047	53.10	2.091	XBB 53
53.00	2.087	54.10	2.13	XBB 54
54.00	2.126	55.10	2.169	XBB 55
55.00	2.165	56.10	2.209	XBB 56
56.00	2.205	57.10	2.248	XBB 57
57.00	2.244	58.10	2.287	XBB 58
58.00	2.283	59.10	2.327	XBB 59
59.00	2.323	60.10	2.366	XBB 60
60.00	2.362	61.10	2.406	XBB 61
61.00	2.402	62.10	2.445	XBB 62
62.00	2.441	63.10	2.484	XBB 63
63.00	2.480	64.10	2.524	XBB 64
64.00	2.520	65.10	2.563	XBB 65

Optional Self-Feeding 1½° Helix style tools are available for all sizes in this range.



Roller burnishing

Roll-a-Finish™ SRMR/SRMB and XBB series

Spare Roll part numbers

SRMR/SRMB INTERNAL ROLLER BURNISHING ROLL CHART

TOOL NUMBER (From - To)	ROLL NUMBER		QTY/TOOL
	Through hole	Bottoming	
SRM 4.00 - SRM 4.75	RR137	-	3
SRM 5.00 - SRM 5.75	SR187	-	3
SRMR 6.00 - SRMR 7.50	R250	B250	5
SRMR 8.00 - SRM 9.00	R312	B312	5
SRMR 9.50 - SRMR 10.50	R375	B375	5
SRMR 11.00 - SRMR 12	R437	B437	5
SRMR 13 - SRMR 17	R500	B500	5
SRMR 18 - SRMR 24	R750	B750	5
SRMR 25 - SRMR 29	R750	B750	7
SRMR 30 - SRMR 35	R875	B875	7
SRMR 36 - SRMR 41	R1125	B1125	7
SRMR 42 - SRMR 50	R1625	B1625	7
SRMR 51 - SRMR 69	R1625	B1625	9
SRMR 70 - SRMR 89	R1625	B1625	11
SRMR 90 - SRMR 110	R1625	B1625	13
SRMR 111 - SRMR 135	R1625	B1625	15
SRMR 136 - SRMR 155	R1625	B1625	17
SRMR 156 - SRMR 177	R1625	B1625	19

XBB EXTERNAL ROLLER BURNISHING ROLL CHART

TOOL NUMBER (From - To)	ROLL NUMBER	
	Bottoming	QTY/TOOL
XBB 1.50 - XBB 5.50	B312	3
XBB 6.00 - XBB 20.00	B438	5
XBB 21 - XBB 40	B875	7
XBB 41 - XBB 65	B1125	9

Tool adjustment procedure

Cogsdill manufactures a variety of standard Roll-a-Finish Tools. Although the detail numbers and nomenclature for the adjustment components differ somewhat for the various tool series, the adjustment procedure for all Roll-a-Finish tools is basically the same.

For all SRMR and SRMB tools, a rear castellated adjusting collar interlocks with a threaded and castellated bearing collar to keep the tool in adjustment. In order to adjust the tool, retract the spring-loaded adjusting collar and rotate the threaded bearing collar. This will alter the position of the tapered mandrel or race in relation to the tapered rolls, thereby changing the

effective tool diameter within the specified diameter range. XBB tools are adjusted by rotating the housing on the threaded mandrel shank. Tool adjustment requires the use of an Allen wrench. SRMR, SRMB and XBB series tools adjust in increments of .0025mm (.0001 inch), and in increments of .005mm (.0002 inch) for tools over 50mm in diameter.



tool adjustment procedure

- 1 The first step is to rotate the adjustment collar assembly in a plus or minus direction as marked on the tool until the workpiece will just slip over the rolls. This procedure is similar to plug or ring gaging a part. This will set tool working diameter the same as prepared part diameter.
- 2 Retract the tool from the part and increase tool working diameter by approximately .01mm to .02mm (.0005 to .001 inch) over the prepared part diameter. On SRMR and SRMB tools, a one notch change equals .002mm (.0001 inch) diameter change. On tools over 50.0mm in diameter, calibrations are in .005mm (.0002 inch) increments.
- 3 Now, run the first part and check for finish. Readjust tool diameter as necessary to obtain desired surface finish. Several trial runs may be necessary; however, once properly adjusted, only one pass of the tool is required for roller burnishing.
- 4 Measure finished parts for size. The difference between the prefinished and roller burnished sizes represents actual stock displacement. If necessary, modify the prefinished size to allow for more or less stock displacement.
- 5 If the prefinished size is changed, the burnishing tool must be adjusted by the same amount as the cutting tool to produce the desired finish.

Stock displacement

Approximate pre-finishes resulting from common machining operations and the probable displacements produced by the roller burnishing process are listed below

PREFINISH OPERATION	Prefinish surface	
	Micrometers	Microinches
Hone	.25-.50	10-20
Grind	.50-1.00	20-40
Ream	1.00-1.50	40-60
Bore, Turn (Medium)	2.00-3.00	80-100
Bore, Turn (Rough)	3.75-5.00	150-200

PREFINISH OPERATION	Expected displacement by burnishing	
	Millimeters	Inches
Hone	.002-.005	.0001-.0002
Grind	.005-.010	.0002-.0004
Ream	.010-.015	.0004-.0006
Bore, Turn (Medium)	.020-.030	.0008-.0012
Bore, Turn (Rough)	.038-.050	.0015-.0020

Surface finishes of .25micrometers (10 microinches) Ra and below are obtainable provided that the prepared surface is uniform and tearfree.

Tool operation

Standard Roll-a-Finish tools are designed for right-hand rotation. When the Roll-a-Finish tool reaches the end of the desired roller burnishing length, pull the tool from the bore.

This reverse action causes the rolls to collapse slightly in the cage to make withdrawal easy.



Coolant

For most metals use any standard grade, light-weight, low-viscosity lubricating oil, or any mineral, sulphur, or soluble oil compatible with the metal or alloy to be burnished and recommended for fine surface finishing.

For aluminum or magnesium alloys use a highly refined oil-based coolant with low viscosity. For cast iron a mineral seal oil is ideal. Flooding the part is recommended.

Filtration of the coolant is highly recommended to remove metal particles and grit.

Maintenance & repair

The Roll-a-Finish tool requires only routine maintenance. For long tool life and optimum performance, tool should be kept free of grit and other foreign matter. Rolls, cage, and mandrel should be examined at regular intervals and replaced when the desired size and finish are no longer obtainable. It is always advisable to replace a complete set of rolls, as there will be some sacrifice of tolerance and finish quality if new and used rolls are mixed.

Tools may be returned to Cogsdill for inspection and reconditioning to return them to original operating performance. Contact Cogsdill's Returns Department for a Return Material Authorization Number to assist us in processing your repair order. We will advise price and delivery before proceeding with the repair.

Interchangeability

Mandrel and race assemblies are interchangeable with tool adjustment assemblies within specified ranges. For example, the SRMR and SRMB tools from 12,0 to 25,0mm have a common adjustment assembly. All standard Roll-a-Finish tools 6,0mm and above can be changed from through-hole to bottoming by changing cage and rolls.

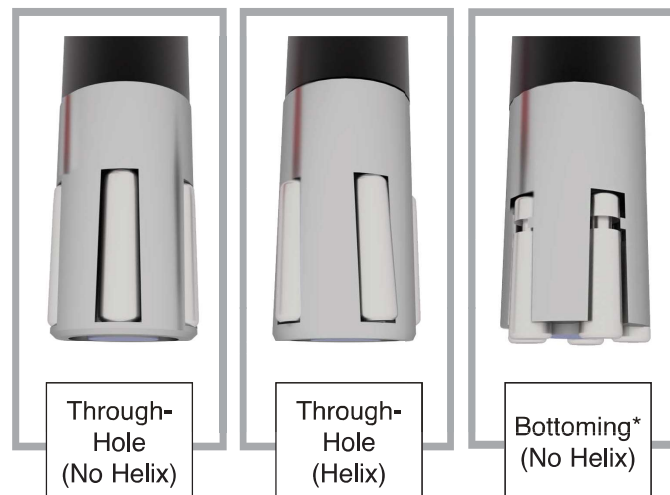
Speed and feed recommendations for internal Roll-a-Finish tools with self-feeding cages ⁽¹⁾

DIAMETER		RPM	FEED PER REVOLUTION	
MM	INCHES		MM	INCHES
4.76	.187	1500-4300	.2540-.3048	.010-.012
6.35	.250	1500-4300	.2540-.3048	.010-.012
7.94	.312	1300-3700	.3048-.3556	.012-.014
9.52	.375	1020-3100	.4064-.5080	.016-.020
11.11	.437	875-2600	.4572-.5842	.018-.023
12.70	.500	765-2300	.4572-.5842	.018-.023
14.28	.562	675-2000	.4572-.5842	.018-.023
15.87	.625	610-1800	.7620-.9144	.030-.036
19.05	.750	505-1500	.7620-.9144	.030-.036
22.22	.875	335-1300	.8636-.9906	.034-.039
25.40	1.000	380-1100	1.219-1.321	.048-.052
28.57	1.125	340-1000	1.295-1.422	.051-.056
31.75	1.250	305-900	1.625-1.752	.064-.069
34.92	1.375	275-825	1.956-2.083	.077-.082
38.10	1.500	255-750	2.286-2.413	.090-.095
41.27	1.625	235-700	2.133-2.235	.084-.088
44.45	1.750	215-650	2.464-2.565	.097-.101
47.62	1.875	205-610	2.794-2.895	.110-.114
50.80	2.000	190-575	3.124-3.226	.123-.127
53.97	2.125	180-540	3.454-3.581	.136-.141
57.15	2.250	170-510	3.785-3.912	.149-.154
60.32	2.375	160-485	4.115-4.242	.162-.167
63.50	2.500	150-460	4.445-4.572	.175-.180
66.67	2.625	145-435	2.235-2.286	.088-.090
69.85	2.750	140-415	2.413-2.464	.095-.097
73.02	2.875	130-400	2.565-2.591	.101-.102
76.20	3.000	125-380	2.565-2.616	.101-.103
88.90	3.500	110-325	3.251-3.302	.128-.130
101.60	4.000	95-285	3.912-3.962	.154-.156

(1) When the self-feeding tool is used with power feed, the feed rate MUST exceed the maximum feed rate (shown at left) for a given size. This prevents the rolls from collapsing in the cage and eliminating the burnishing action.

POWER FEEDING CAGES:

The feed rate for SRMR and SRMB tools and bottoming style tools with power-feeding cages must be from .25mm/rev. (.010 IPR) up to the maximum rate (shown at left) for the self-feeding tools for the same diameter.



*Mandrel may be cut off if it does not allow full bottoming.