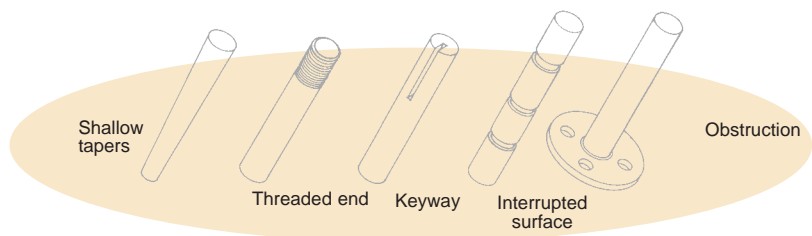


# External roller burnishing machines

*Cogsdill's CX machines roller burnish cylindrical diameters of any length in seconds. Parts are sized, finished and work hardened by highly polished, precision rollers in one quick pass. Fatigue life, corrosion resistance and appearance are enhanced as your parts are accurately sized and finished. Model options range from compact models designed for portability to rugged high production models. Equipment options are available to accommodate through-feed applications, parts with obstructions, and part-to-part size variations.*



Shown above are examples of various types of parts which are processed by CX external roller burnishing.

## Product features

### Versatility

All ductile or malleable metals with hardness up to R/C 40 can be roller burnished. Cylindrical parts of any length, bars, tubing, wire and stranded cable may all be processed with Cogsdill's self-contained, self-feeding roller burnishing machines. A continuously variable speed drive allows the operator to select the optimum production rate for obtaining the desired size and finish. An adjustable tilt base makes it possible to select the ideal feed angle for automatic or manual loading.

Several sub-assembly options are available to suit various application requirements (see page 41, "CX Sub-Assembly Options").

Coolant systems are designed and recommended to supply the necessary part lubrication for burnishing. Part supports, consisting of V-guides faced with teflon, are available for thru-feed applications where long parts require support, or as an aid in workpiece alignment during high production runs. Various power options are available to meet your electrical requirements. Two lightweight, compact models are available where portability is a major factor to consider; a pair of heavy duty, high production models round out a product line designed to meet your production needs.

These options, combined with the standard features, make the Cogsdill CX machine a useful and versatile machine tool. However, should the wide array of options available with our standard tooling and equipment fail to meet your particular requirements, a variety of special tooling is available on special order. Please submit a part print and request a quotation.

### Accurate sizing

Tolerances within .0025mm (.0001inch) are attainable, depending on variables such as material type, hardness, pre-machining method, and the finish on the part prior to burnishing. A prepared tolerance of .05mm (.002 in) can be reduced to .02mm (.001 in). In applications requiring closer tolerances, .02mm (.001inch) can be reduced to 7.5microns (.0003 inch).

### Low micro finishing

One pass through a Cogsdill CX machine can quickly reduce a 0.5 to 1.0 micrometer Ra (20-40 microinch) ground surface or a 2-3 micrometer Ra (80-120 microinch) turned surface to a mirrorlike .125 micrometer Ra (5 microinch) finish or lower. Parts varying in size as much as .127 mm (.005 inch) can be burnished to the same low microfinish with the use of an optional pressure control unit (see Versatility section). The roller burnishing process significantly improves bearing surface over other types of finishing processes and is ideal for shafts running in bushings or oil seals.

### Work hardening

Surface hardening of the workpiece is achieved simultaneously with sizing and finishing. With certain materials, increases in surface hardness of up to 3 points on the Rockwell "C" scale are attainable. The smooth, dense, hardened surface produced by the roller burnishing process extends wear life, improves resistance to corrosion and reduces fatigue failures. Friction is also reduced, resulting in noise reduction where shafts are running in bushings.

### Appearance improvement

Machined parts (turned or ground) can be roller burnished to lustrous, mirrorlike finishes. Subsequent plating applications will often be improved as roller burnishing removes surface patterns and blemishes resulting from prior machining operations.

### Fast processing

Cogsdill CX machines process parts in seconds. Parts are sized, finished and work hardened in one pass. Cylindrical parts of any length are processed at speeds up to 9.14 meters/minute (30 feet per minute).

Roller burnishing can often eliminate time consuming and expensive finishing operations such as grinding or lapping. The result is better quality parts, produced in less time, at a lower cost.

### Adjustability

Race assemblies, the working components of the CX machine, are designed to process specific nominal size workpieces. CX-1 race assemblies are adjustable in increments of .0025mm (.0001 inch) over a range of .53mm (.021 inch) for each nominal size. CX-2 race assemblies are adjustable in increments of .0051mm (.0002 inch) over a range of 1.04mm (.041 inch) for each nominal size (see page 40 for total range of adjustability for each CX model). Race assemblies are interchangeable within the limits of the operating range for a given model. Changing race assemblies is a 5 minute job requiring little more than the removal of four machine screws.

## Machine models

### CX-M

The Cogsdill CX-M External Roller Burnishing Machine sizes and finishes part diameters from 1.14 to 16.87mm (.045 to .625 inch) in seconds. This inexpensive machine is light and compact—a real space saver—and easily portable too—only 32 kg (70 lbs.).

Set-up is fast and simple, and the CX-M is easy and economical to operate. The machine is self-feeding, and can be adapted to automatic feeders. Operates on 120V single-phase power.



CX-M

### CX-1T

The CX-1T External Roller Burnishing Machine is a light, compact model designed specifically for portability or bench top operation at multiple work stations. Weighing less than 68 kg (150 lbs.) and occupying less than .099 cubic meters (3.5 cubic feet) of space, the CX-1T can easily be transported to any location in the shop. The machine operates with a continuously variable speed drive and can be bench mounted or placed on an optional mobile cabinet bench.

The CX-1T processes parts ranging from 1.143 to 25.502mm (.045 to 1.004 inches) in diameter.

### CX-1N

The CX-1N External Roller Burnishing Machine processes parts in the same size range as the portable CX-1T, but is designed for permanent installation on the production floor. The burnishing head is belt driven and has a continuously variable speed drive. A coolant system and drip pan are mounted on the same frame with the motor and burnishing head. The CX-1N is specifically designed for rugged high production use.

The CX-1N utilizes the same race assemblies as the CX-1T and processes parts ranging from 1.143 to 25.502mm (.045 to 1.004 inches) in diameter.



CX-1N



CX-1T

### CX-2N

The CX-2N External Roller Burnishing Machine, like the CX-1N is designed to be permanently installed on the production floor. Overall design is similar to the CX-1N; however, this model processes parts from 25.460 to 63.602mm (.963 to 2.504 inches) in diameter. The CX-2N can also be adapted to accept CX-1N race assemblies (to accommodate diameters as small as 1.143mm (.045 inch)). The CX-2N features a continuously variable speed drive and a frame designed for heavy duty use.

Machines to burnish parts larger than 63.5mm (2.500 inches) in diameter are built to special order; contact our Engineering Department for details.

## CX sub-assembly options

The CX machine is designed for versatility. Four CX sub-assembly options allow almost any part configuration to be burnished. The machine operates in one of two modes: interference or compensating.

In the interference mode, the working diameter is set slightly smaller (about .01mm or .0005 inch) than the diameter of the workpiece. The interference mode is used to accurately size and finish parts simultaneously in one fast pass.

The air pressure-controlled compensating unit allows the machine to automatically adjust to different part diameters, within a given range, in order to achieve a surface finish which is consistent regardless of variations in part size. The compensating mode is designed for applications where finish, rather than size, is the primary requirement. The compensating unit can accommodate a size variation of up to .13mm (.005 inch) in a single part, or from part to part. It also allows through-feed burnishing of parts with tapers or enlarged sections where the maximum diameter difference is no more than .76mm (.030 inch).

Each of the two modes is available for through-feed burnishing or with an adjustable stop-and-release mechanism for burnishing parts up to shoulders or obstructions.

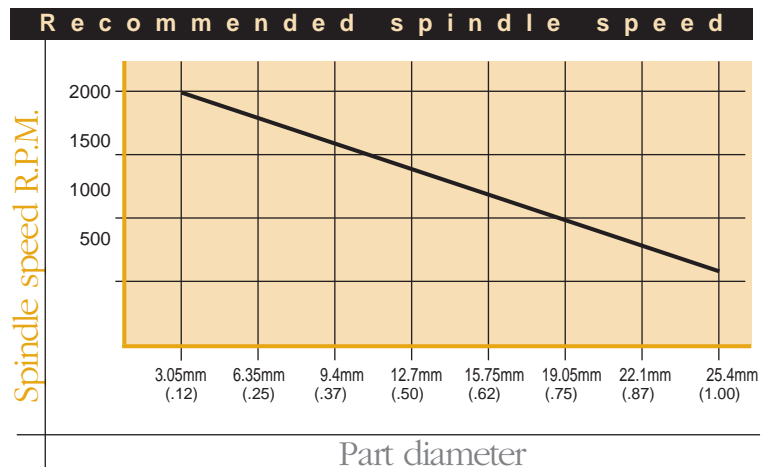
The four available CX sub-assemblies are as follows:

- Sub-assembly "A":  
Interference through-feed
- Sub-assembly "B":  
Interference to a stop
- Sub-assembly "C":  
Compensating through-feed
- Sub-assembly "E":  
Compensating to a stop

## CX speed recommendations

Spindle speed is not a critical factor in the successful operation of CX machines. Roller burnishing tools and machines are very tolerant in regard to the effect of spindle speed on resulting surface finishes.

For general speed guidelines, refer to the chart below.



**CX**  
external roller burnishing machines

# CX Interference-Style Feed Rates

The following chart depicts feed rates for selected nominal race assembly sizes. Contact our engineering department for cycle time calculations for your specific application.

Tool Size		FEED (Part Rotating)		FEED (Part Stationary)	
NOMINAL SIZE (in.)	MM	IPR	MM/REV	IPR	MM/REV
CX 062	1.57	0.063	1.60	0.009	0.23
CX 187	4.75	0.084	2.13	0.023	0.58
CX 250	6.35	0.094	2.39	0.029	0.74
CX 312	7.92	0.105	2.67	0.035	0.89
CX 375	9.52	0.115	2.92	0.040	1.01
CX 391	9.93	0.138	3.50	0.044	1.12
CX 438	11.12	0.145	3.68	0.048	1.22
CX 500	12.70	0.156	3.68	0.054	1.37
CX 562	14.27	0.166	4.21	0.060	1.52
CX 625	15.88	0.176	4.47	0.065	1.65
CX 750	19.05	0.197	5.00	0.076	1.93
CX 766	19.46	0.214	5.43	0.080	2.03
CX 875	22.22	0.232	5.89	0.089	2.26
CX 1000	25.40	0.253	6.42	0.100	2.54
CX 1031	26.19	0.129	3.27	0.051	1.29
CX 1125	28.57	0.137	3.48	0.055	1.40
CX 1250	31.75	0.147	3.73	0.061	1.55
CX 1281	32.54	0.173	4.39	0.066	1.67
CX 1375	34.92	0.181	4.60	0.070	1.78
CX 1500	38.10	0.191	4.85	0.075	1.90
CX 1625	41.27	0.201	5.10	0.080	2.03
CX 1750	44.45	0.211	5.36	0.086	2.18
CX 1875	47.62	0.222	5.64	0.091	2.31
CX 2000	50.80	0.232	5.89	0.096	2.44
CX 2125	53.97	0.242	6.14	0.102	2.59
CX 2250	57.15	0.252	6.40	0.107	2.72
CX 2375	60.32	0.263	6.68	0.112	2.84
CX 2500	63.50	0.273	6.93	0.117	2.97

# CX Air Compensating-Style Feed Rates

The following chart depicts feed rates for selected nominal race assembly sizes. Contact our engineering department for cycle time calculations for your specific application.

Tool Size		FEED (Part Rotating)		FEED (Part Stationary)	
NOMINAL SIZE (in.)	MM	IPR	MM/REV	IPR	MM/REV
CX 062	1.57	0.061	1.60	0.011	0.28
CX 187	4.75	0.081	2.06	0.024	0.61
CX 250	6.35	0.092	2.33	0.030	0.76
CX 312	7.92	0.102	2.59	0.035	0.89
CX 375	9.52	0.112	2.84	0.041	1.04
CX 391	9.93	0.132	3.35	0.045	1.14
CX 438	11.12	0.140	3.55	0.049	1.24
CX 500	12.70	0.150	3.81	0.054	1.37
CX 562	14.27	0.160	4.06	0.060	1.52
CX 625	15.88	0.171	4.34	0.065	1.65
CX 750	19.05	0.191	4.85	0.076	1.93
CX 766	19.46	0.207	5.26	0.079	2.00
CX 875	22.22	0.225	5.71	0.089	2.26
CX 1000	25.40	0.246	6.25	0.099	2.51
CX 1031	26.19	0.127	3.22	0.052	1.32
CX 1125	28.57	0.135	3.43	0.056	1.42
CX 1250	31.75	0.145	3.68	0.061	1.55
CX 1281	32.54	0.169	4.29	0.066	1.67
CX 1375	34.92	0.177	4.49	0.070	1.78
CX 1500	38.10	0.187	4.75	0.075	1.90
CX 1625	41.27	0.197	5.50	0.081	2.06
CX 1750	44.45	0.208	5.28	0.086	2.18
CX 1875	47.62	0.218	5.54	0.091	2.31
CX 2000	50.80	0.228	5.79	0.097	2.46
CX 2125	53.97	0.238	6.04	0.102	2.59
CX 2250	57.15	0.249	6.32	0.107	2.72
CX 2375	60.32	0.259	6.58	0.112	2.84
CX 2500	63.50	0.269	6.83	0.118	2.99



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