

CASWELL
electroplating in miniature

The Complete Buffing & Polishing Booklet

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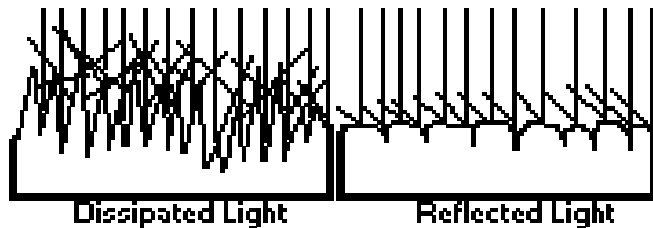
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An Introduction to Buffing & Polishing

Buffing and polishing using wheels and 'compounds' is somewhat like using wet and dry sanding paper, only much faster. Instead of using 'elbow grease' you will be using the power and speed of an electric motor.

The edge, or face, of the wheel is the 'sanding block', which carries a thin layer of 'compound' which is the sandpaper. Varying types of wheel are available, and the different grades of compound are scaled similar to sandpaper. The compounds are made from a wax substance which has the different abrasive powders added to it. When this hard block is applied to the edge of a spinning buffing wheel, the heat from the friction melts the wax, and both wax and abrasive are applied in a thin slick to the face of the wheel.

The objective of buffing and polishing is to make a rough surface into a smooth one and, of course, each work piece will be in a different condition, so will need different procedures. Imagine the surface magnified thousands of times, it will look like jagged mountains and valleys. By repeated abrasion, you are going to wear down those mountains until they are old, soft, rolling hills! Then they will not *dissipate* the light, but *reflect* it. It is the reflection that makes the buffed part appear shiny.



Tricks of the Trade

Repairing small dents.

Sand the inside of the part with emery paper. This will show you exactly where the dent is.

Using a piece of end grain wood as a block, gently beat out the dent with a hammer.

Cleaning your buffing wheels.

Take the blade from an old rough cut log saw, or large hacksaw, and cut it about one foot long.

Wrap several layers of duct tape around each end to make a handle similar to a bicycle handlebar grip.

Offer the jagged blade to the edge of the spinning wheel, and work it across the face until the wheel looks bright and fluffy once more. This action, done periodically, will remove entrapped metal particles, which could scratch a more delicate part.

Eliminating 'Swirl' Marks

Swirl marks caused by buffing in the final stages can easily be removed by wetting the part with a damp cloth, then dusting with a powder such as:- Whiting, Talcum Powder or Corn Starch, then buff on your wheel again until the swirls disappear.

One Wheel for one compound

Applying different compounds to the same wheel only causes problems, because you end up with a mixture of abrasive surfaces, and metal deposits left over from the more abrasive operation. These microscopic particles only scratch the surface, destroying any benefit gained by the finer compound.

THE BRIGHTEX WHEEL



Brightex wheels are constructed from a type of material, impregnated with a fine abrasive powder. The resulting combination being very flexible, yet very aggressive.

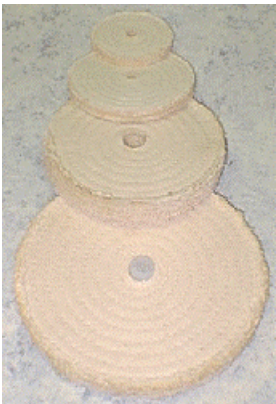
Brightex wheels remove rust, paint, scratches, minor blemishes and old paint.

A 'featherlite' touch is required with these wheels, unlike an ordinary buffing wheel.

Heavy pressure will result in premature wear of the wheel.

The blisters found in chrome plate, particularly on pot metal, can be flattened with this wheel. Substrates take on a satin or flat finish, which should then be buffed with Emery and a Sisal wheel, followed by White or Tripoli on a cotton wheel.

THE SISAL BUFFING WHEEL



Sisal is a slender, hard, cellular strand of fiber that has demonstrated its great strength and tough resiliency in the form of binder twine, cord & rope for many years. These qualities, along with its natural abrading and grease absorbing characteristics, provide an ideal buffing wheel fabric.

Sisal buffing wheels will provide both polishing and cutting action. They will remove stretcher strains, orange peel, polishing wheel grit lines, light die marks, etc.

To effect a fast cut, use a sisal wheel with the Black Emery compound.

APPLICATION OF THE BUFFING COMPOUNDS

The actual compound does the work, not the buffing wheel. Compounds are made from a mixture of fine abrasive fillers and a sort of greasy wax. The compound is melted, by friction heat, as the bar is pressed to the revolving wheel. This applies a thin layer of abrasive, 'glued' onto the cloth wheel, making it similar to an emery paper, only much faster!

Do not apply the compound (see below) after the workpiece, or on its own. This wastes material and is much less efficient.



By applying the material before the workpiece, you actually use the workpiece to force the compound into the buff. This is much less wasteful, more efficient and will actually speed up your buffing times.

Apply small quantities of compound, by approx. 1/2 - 1 second applications to the wheel.



The **TRADESMAN®** Buffing & Polishing Machine



TRADESMAN® buffing and polishing machines come as either bench mounted or with a pedestal.

These 3/4 hp motors are especially made for buffing, grinding and polishing. They operate at 3450 rpm. on 110 volts @ 5 amps

An extension piece is supplied for the right hand shaft to allow larger objects to be worked around the buffing wheel. Shafts are 1/2" diameter.

CUT AND POLISH MOTIONS

There are two basic buffing motions you should use.

1. **CUT MOTION** gives you:-

SMOOTH SURFACE, SEMI-BRIGHT & UNIFORM

The workpiece should be moved **AGAINST** the direction of the wheel, using a **MEDIUM** to **HARD** pressure.



2. **COLOR MOTION** gives you:-

BRIGHT, SHINY & CLEAN SURFACE

The workpiece should be moved **TOWARD** the direction of the wheel, using a **MEDIUM** to **LIGHT** pressure.



BUFFING SPEED AND PRESSURE

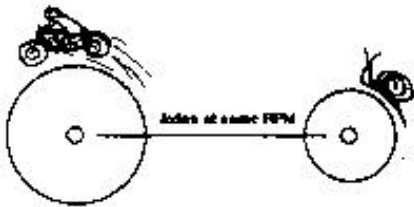
The correct pressure must be applied to the workpiece to provide the best finish economically and safely.

Inadequate pressure will give NO buffing action

Excessive pressure will cause the buffing wheel to slow down or actually collapse. This can also result in burn marks on the workpiece.

BUFF RUNNING SPEEDS

For best results your wheel should maintain a surface speed of between 3600 & 7500 Surface Feet Per Minute. (SFPM). The higher your speed, the better and quicker your results.



Formula for calculating surface speed of wheel in SFPM.

SFPM = $\frac{1}{4}$ x diameter of Wheel x RPM (revs of spindle per min.)

Therefore an 8" wheel @ 3600 RPM = $2 \times 3600 = 7200$ SFPM.

Spindle speeds can be increased by a step pulley on a motor shaft.

For the workshop where only the occasional piece of work needs to be buffed, an economic alternative to purchasing a special machine is to simply adapt a bench grinder. Whilst this does not have the extended shaft, it can still do a formidable job.

All the guards need to be taken off and the grinder mounted on the edge of a workbench. This will allow access to the wheel from many angles.

DISCLAIMER - Buffing machines can be dangerous. We accept no liability for their use/misuse or for accidents caused by the removal of guards.

Alternatively, a small used washing machine motor can be used. With access to a lathe, a simple pointed taper can be made to fit over the shaft. Then the buffing wheels can be rammed on to the point. On smaller pieces, an electric drill with one of our shank mounted buffs will do an excellent job.

Some of our customers have even placed a large hand grinder in a vice, then changed the grinding wheel for a buff. These machines usually have very high speeds with good power, so they should be considered as another option.

Whenever you are making up something to do a buffing job, your prime consideration should be your safety.

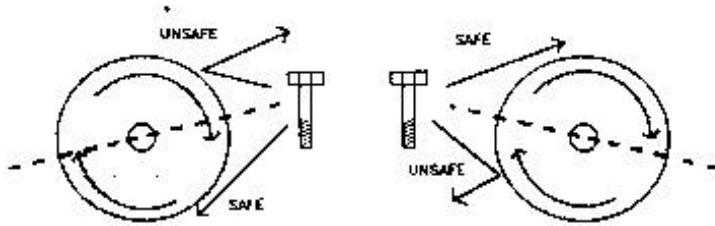
If the buff pulls the piece from your hands, you should consider where it is likely to go. Remember it will be traveling at a fair speed, so no one should be in its way!

Is the machine mounted safely? It will have to stand a fair amount of abuse, so make sure it is WELL fastened down.

SAFETY FIRST

There are two distinct areas on a buffing wheel -
THE UNSAFE AREA which is rotating towards the workpiece.

THE SAFE AREA which is rotating away from the workpiece.



The division of these two areas is marked with the dotted line on the above drawings.

The workpiece must only be applied to the area of the buff that is rotating AWAY from the workpiece.

You should ensure that you are completely aware which area is which, otherwise you could have a serious accident. Objects being thrown away from a buffing wheel can be traveling at very high speeds, which can result in some very unpleasant and potentially deadly accidents!

When buffing parts have sharp corners, edges or hooks, they should be offered to the wheel with the edge flowing away from the buff, so the part does not catch.

Operators should ALWAYS wear SAFETY GOGGLES, APRON and GLOVES.

THE SPIRAL SEWN WHEEL

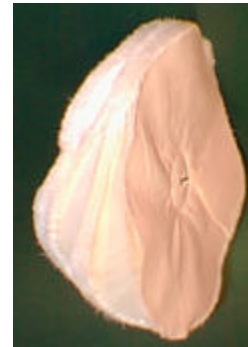


Spiral sewn wheels are the workhorse of most buffing and polishing jobs. Because the ply's of cotton cloth are sewn together spirally, the wheel becomes much harder and more pressure can be exerted on it. This is especially useful when 'cutting' the metal.

The faces of these wheels are pre-raked to accept compound immediately.

These wheels are dependable and long wearing.

THE LOOSE COTTON WHEEL



The main purpose of a loose cotton wheel is to polish and cut in a similar manner to the Spiral sewn wheel, except that this wheel, not being tightly stitched together, will 'mush' or collapse, allowing the cotton to get into awkward places more easily. If you have an object with fine details and awkward crevices, then this is the wheel to use.

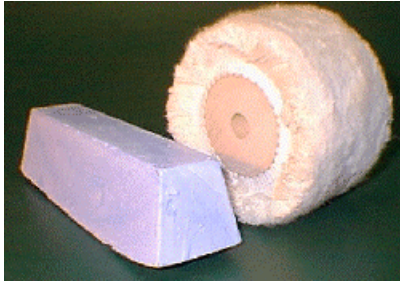
THE CANTON FLANNEL WHEEL



Canton flannel is very soft, and this wheel is loosely stitched, so the layers of cloth flare out to give a wide angle ultra smooth polishing surface.

Generally used with the BLUE compound, this wheel can be used on the most delicate items such as silver and gold plate. This wheel should not be contaminated with any other compound.

THE STRING BUFF



This buffing wheel is designed specially for buffing plastic. Its unique texture is designed to polish the plastic without melting it. By using it with our special blue compound, plastic can easily be brought to a high shine.

NYALOX WHEELS



Come in different shapes to access awkward areas. Strands of nylon impregnated with a tough aluminum oxide abrasive. Removes old paint, rust, weld scale and burns. Cleans and polishes. Is ideal for wood because it cleans without gouging. It never loses its

abrasive power, or its shape. Safe on skin! Max 2500 rpm

FRAY-RYTE BUFFS



buff for any cutting work.

Fray-Ryte is made from 15 compressed layers of biased cloth, so is extremely sturdy. With a closed face, its narrow profile makes work faster and easier in tight places. The pleating creates pockets for holding compounds more efficiently. Use a Fray-Ryte

ELECTRIC MOTOR & BUFFING WHEEL SIZES

Motor Size	4"	6"	8"	10"
1/6 hp	1"	.5"	-	-
1/4 hp	1.5"	1"	.5"	-
1/3 hp	2.5"	2"	1"	-
1/2 hp	3"	2.5"	2"	1"
3/4 hp	4.5"	3.5"	2.5"	2"

Generally speaking, you will start off with a course abrasive compound, then change to a medium compound and finally a fine compound, just as you would using sandpaper.

There are different types of wheels and these have different effects on the compound they are used with. For example, the SISAL wheel is a course 'rope like' fiber, which frays out to make a sort of brush. These fibers have a very beneficial effect on scratched and rougher surfaces, almost stroking them smooth. When used with a course 'EMERY' compound, they 'cut' the metal down very rapidly. You could use this compound on a SPIRAL SEWN wheel and it would work, but the job would take much longer because the softer SPIRAL SEWN wheel is not going to thrash the metal so aggressively.

As you progress through the buffing compounds, you will change your buffing wheel, ending up using the softest polishing wheel, the CANTON FLANNEL with the least abrasive BLUE or RED compound which only polishes, it has no cutting action.

So, depending on the job in hand, you will determine which abrasive compound and wheel you are going to use first, then step down through the stages until YOU are satisfied with the results.

Refer to the Buffing Wheel & Compound Recommendations chart -center pages.

Buffing Wheel And Compound Recommendations

Buff Type	Plastics			Silver, Gold (plated and solid) and very thin plates			Nickel and Chrome Plate			Copper, Brass, Aluminum, Pot Metal and Other Soft Metals			Steel and Iron			Stainless Steel		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Sisal										X			X			X		
Spiral Sewn								X			X			X			X	
Loose												X			X			X
Canton Flannel						X			X									
String	X	X	X															
Compound																		
Black										X			X			X		
Brown											X							
White								X				X		X				
Blue	X	X	X			X			X						X			
Green																	X	X
Red						X			X						X			

BLACK = Emery Compound, a course abrasive material for removal of scratches, pits, paint, rust etc.

BROWN = Tripoli compound used for general purpose cut and color on most soft metals.

WHITE = Blizzard compound, used for color and final finish of harder metals, has a cutting action.

RED = Jeweller's Rouge, designed to polish without any cutting action. Safe on thin plates. Use on its own wheel.

BLUE = A dryer, almost greaseless wheel - designed to polish without any cutting action. Safe on thin plates. Use on its own wheel.

GREEN = Used exclusively for Stainless Steel.

THE THREE BUFFING STAGES

A = Rough Cut To Remove Scratches

B = Final Cut & Initial Polish*

C = Final Polish (or luster)

* - At Stage B, you should first use your wheel with a cutting action, then finish with a color action. See the page on Cut & Color.