A Complete Metal Polishing Guide for Professionals, Enthusiasts and Newcomers alike

The Now and Zen of Custom Metal Polishing

Or the 6 P's

Antique Restoration, Museum Preservation, Custom finishing, Show Polishing, restoring, Preserving , Cleaning or Polishing?

(what's the difference?)

By

English Custom Polishing

Custom Metal Polish Manufacturer, Custom Polishing and Plating Shop

Introduction:
This book is intended to help and assist both the experienced polisher and the absolute beginner. It doesn't matter if you have a stainless steel fabrication you have to turn into a gleaming mirror for a motor yacht, or an old brass plate from a flea market you'd like to restore for curiosity sake or profit, this book will have something to offer. The offering may be in a slightly off beat manner at times. That is intentional in order to make the book better reading, enabling us to keep your attention, help you retain the information, and us to distribute more copies.
Now imagine the possible consequences of people reading this book. If we stimulate enough people into reading this book and learning what it has to offer, all the dull, tarnished, and oxidized metals around us could soon be bright and gleaming again. That could stimulate an upward trend in the sales of antiques, suntan lotion, sunglasses (We sell them on our website, just in case!) and even reduce the sales of

new vehicles and all manner of hardware and paraphenalia, conserving our planets vital resources, just because the older bits and bobs look better.
Any way, that's enough of the waffle, let's get on with the job.
But remember,
The future is always bright if you're a polisher.

WHAT EXACTLY IS METAL POLISHING AS A PROCESS?
Well, it's a little bit more than cleaning. Let's start with that.
CLEANING, can come in different forms. Wiping it over with a clean rag is dusting. Using a solvent, detergent or powder, to remove dirt and surface grime is cleaning. By cleaning with the correct chemicals we can even neutralize and remove surface oxidization, and because of the method you would say that was cleaning. As a note here, beware the ultrasonic cleaner! if you are cleaning Brass, copper or bronze with an ultrasonic cleaner do not use anhydrous chemicals, alternatives are available. Before you polish the surface has to be clean, that is obvious. Cleaning is a process that contains no abrasion. The moment you add abrasives it becomes polishing. Polishing is the process of removing surface imperfections so that it reflects light rather than absorbs it. The more light it reflects the better it is polished.
When a piece is polished, what we do is to change its outer surface. We remove larger surface imperfections by scratching them off with various grits. Starting with a coarser grit and reducing it to finer ones. Each grit has a scratch factor. We work our way from a coarse scratch to one the eye cannot see. The Ions or small particles on the surface layer become polarized. They line up like soldiers and the surface becomes slightly harder, and more resistant to oxidization, acid and water stains. Water runs off easier or ponds, as it is unable to cling to the polished surface. It is higher resistant to corrosion, just because of its smoothness and its improved hardness. But of course nature will change that with time, and so will we, adding to the corrosion by bombardment with acids from handling, atmosphere and all sorts of sources.
WHAT IS CORROSION OR OXIDIZATION?
Corrosion sets in when our ions no longer line up like soldiers. The pattern has been disrupted by the constant bombardment of the elements, there is confusion in the ranks. 1 little atom stick its head up, and one of those nasty little bits of acid or grime tears his head of and leaves us with a bloody corpse we know as oxidization. This is the first act of WAR!
Actually oxidization is the bonding of individual atoms from the metal with oxygen. This normally happens when atoms are released by acid or alkali attack.
Once the oxidization starts, if left unattended, it runs rampant. Nuts and bolts seize. Once bright and beautiful surfaces become gray, then black, or green. Or both.
The Polishers job is to restore this sick and jaded old war hero back to a gleaming piece of lustrous art that even the rain dare hardly touch.
We remove the contamination, cut out the cancer, and restore beauty to the metal.
Incidently, believe it or not many polishes actually cause oxidization. Or at least, re-oxidization, although they clean and polish the metals. They may even contain a preserving wax, which of course they will trap the oxidization under! Some polishes work by using an oxidizing agent such as ammonia, ammonia bi-flouride or sodium hydroxide, to remove corrosion. The problem is that these chemicals go on working,

eating into the metals, causing brittleness, pitting, and fissures or minute cracks. Some of the worst offenders are household names. There are some very well known brands which are prime offenders and which have been found to be detrimental for use on brass, bronze or any related alloys. At the end of the day, cleaners or polishes, which contain ammoniates or ammonia (often called anhydrous products) no longer have a place in the polishing or restoring industries. They are very detrimental to any metals, the environment, and often detrimental to health if used in poorly ventilated areas. So now you have to read the labels!

Chemicals such as these not only attack aluminum and brass, they eat chrome!

There are so called professional cleaners, which normally means no more than they are very dangerous, if not used correctly. It does NOT mean that they are good for the metals. There is a "professional" liquid chrome cleaner made from hydrochloric acid. We use hydrochloric acid to STRIP chrome.

With Sodium Hydroxide in industrial strength you can wipe chrome straight off steel.

There are " professional" aluminum cleaners or brighteners made from hydroflouric acid. This stuff digests aluminum, which is why it goes white.

As an added bonus, hydroflouric acid is one of the most unstable, volatile and dangerous acids there is.

There are "professional" brass cleaners that contain sodium hydroxide. This stuff will turn brass red. That is because they eat the zinc. They are turning it into copper. Sodium hydroxide also eats aluminum. It will remove the zinc from steel in a heartbeat and makes the steel brittle.

These products are all bad for your metals.

They are all "professional", and many professionals use them.

To save time!

Not to protect your metals!

*One conservator states "We have been using ****** for over 100 years, why should we change now!"*

DUH??!!

That's rather like saying people have been smoking for nearly 400 years, so it must be O.K.!

As far as I'm concerned that conservator should be fired!

If you ignore the facts and destroy your antiques prematurely, your are destroying our history and heritage.

Hardly what conservation is about.

WHY DO WE POLISH?

Well man, and woman, for that matter, are attracted to fine looking objects.

We have gathered and collected fine looking metals and stones since the beginning of time. If it sparkles, glitters or glows we have admired, collected, saved, and even killed for it.

If you ride down the road on a mat black Harley, You're an outlaw on a smelly, noisy, dirty motorcycle. But if it's custom polished to the max, it becomes a fine piece of machinery that any man, and many women for that matter, would be glad to ride. Should the motorcycle be noisy, that's an acceptable sign of latent power, and it can make all the noise it wants, "`COS IT"S A CUSTOM CYCLE!!"

Get my drift?
Who wants a cupboard full of old, dirty and heavily tarnished silver or brassware with its black and green corrosion?
Polish it up and everybody ooh aahs!
Yard sale trash suddenly becomes cash!
Dirty old and rusting steam engines become great feats of engineering that everybody admires, and semi's, well, I've got a soft spot for big rigs any way, but a pretty truck will turn almost as many heads as a pretty woman.
As a polisher, it's good for our egos to take something ugly and make it beautiful again. It's great to restore a beautiful piece of antique silverware, classic boating pieces, components to antique automobiles, and to be able to say, I polished that. Almost any custom car or hot rod, normally gets attention anywhere. The more it shines, the more attention it gets.
It almost becomes an addiction.
RESTORATION varies from polishing in that the main purpose of restoration is to clean and item and return it to its original condition. Restorers do not like to over polish, and are far more likely to use cleaning agents than polishes. However, they should also be aware of the news regarding ammoniates, and be alert to the products that use them. By the same token when a restorer needs a finish to be bright, they need to achieve that brightness with the minimum of particle removal from the item and so require only the finest of abrasives with anti oxidants and inhibitors. Enhancers should be unnecessary in a restorer's polish. Vegetable based waxes like carnauba and beeswax should be avoided, as should polishes that contain ammoniates, of course.
CUSTOM POLISHING is something else. Often applying a matte or satin finish is called custom polishing, to me that's finishing. I consider that custom polishing is taking things that are normally dull and polishing them for the sake of it, to look nice, or to make it perform better. Anyway, custom polishing is about going for the max. Trying to get the most reflective finish that is possible. Image and colour abound in a polishers world. We see reflections with silvery aluminum glows, the reddish tints of copper and yellow and reddish hues of bronze, and the gleaming blaze of brass. Preservation on the other hand is cleaning and preserving. This is often achieved by the application of waxes (not vegetable based), clear coats, varnishes, laquers or glazes.
SO O.K. WHAT HAS ALL THIS GOT TO DO WITH ZEN?
Well folks, I could always reply with, " What has Zen got to do with all of this?"
The answer would of course be exactly the same,
ABSOLUTELY NOTHING!
Unless of course you're a practicing Zen Buddhist who uses polishing as a means of meditation, and so find it a part of the path to enlightenment, in which case,
It's EVERYTHING!
You'll see.

WHAT EXACTLY MAKES A POLISH?
Well, a polish is a substance, liquid, powder, paste or compound that that is abrasive. When applied to a metal, paint, plastic or whatever, it scratches the surface removing minor imperfections and increasing the light reflectivity. The finer the abrasive, the less material it will remove, and the better the finish it is capable of achieving, and the

better the image. All polishes basically scratch the surface. Some are coarser than others, and so a coarse polish will cut quickly and gain a degree of brightness, while a finer polish will cut much slower, but be capable of achieving a better finish. When finishing fabrications a series of abrasive systems and compounds are used.
Any polish is only as fine as its coarsest component! And any one who tells you they manufacture a polish with two different abrasives in it is an idiot. No professional manufacturer would ever dream of doing such a thing.
Any polish capable of producing a mirror on say stainless steel, or removing pit marks from chrome is totally destructive on gold or silver. Many polishes that are beautiful on gold, silver and even aluminum, will not even touch stainless or chrome.
The industry has marketed all manner of polishes in the past, and called most of them universal. They are NOT!
Metals and alloys vary in hardness, a soft metal can be polished by almost anything. But a hard metal needs an even harder compound to cut it.(Normally, there are exceptions to every rule.) We are also governed by the size of the grit as to whether we will get a scratch free surface. Another governing factor is the shape of the grit. Some grits will tend to dig and scratch, others lose their abrasive qualities quickly.
There is no one size fits all polish!
Remember any polish is only as fine as its coarsest component.
Add to that the fact that it will only cut as well as its hardest or sharpest component. This is why at English Custom Polishing we manufacture a vast range of polishes. Matching abrasive qualities, waxes, inhibitors and enhancers to provide the finest quality polish for the job at hand.
We even balance the pH of the polishes to ensure that there is no chemical etch, and to allow the finish to endure as long as is possible.
These are what we refer to as "TARGET POLISHES"
WHAT ARE "TARGET POLISHES?"
These are polishes designed to work on specific metals, providing a finish to suit the environment that it has to last in. They are of specific grades and types of abrasives, Combined with specific waxes, purposely blended with a particular task in mind.
And while they all perform well in most situations they have a particular job, a particular environment and metal that they are aimed at. "TARGET POLISHES, give a better quality finish and last longer within their designed field of application than general purpose polishes.
WHAT IS A WET LAP?
No, it's not where I spilled my beer, it's not what the baby did, or me for that matter!
A wet lap is the mechanism used to place the abrasive on the work piece, or the solution that the abrasive is suspended in. Some wet laps are no more than that. A solution that abrasive is suspended in. Some wet laps, however, contain anti-oxidants, inhibitors, slip agents, enhancers, waxes and or oils. At English Custom polishing we believe that the wet lap is as important as the abrasive. Our wet laps contain all that you need to finish the job. Unless of course you intend to lacquer or clear coat the finished article, and so our wet laps vary according to what is expected from the polish. Then we ask that you notify us, so that we can blend the polishes to be wax free, so that you can lacquer or clear coat over them. Clear coats and lacquers will not adhere to a waxed finish. They crack and float about.

ARE ALL POLISHES GOOD TO USE WITHIN THEIR SPECIFIED MARKETS?
Well, I'll let you into a secret. There are many established and trusted brands of polish that are actually bad to use. It has been established by a federal research agency, that they will damage what you are trying to preserve in the long run. The culprits are polishes that use ammonia and anhydrous solvents in their wet lap. These cause fissures and cracks to appear in metals like brass and related alloys. These metals, the most commonly affected being brass, bronze, copper, zinc, aluminum, etc. age prematurely and become brittle, solely due to the use of these polishes. Fissures are tiny cracks. Many of the brands that use these components are household names, and have been accepted as top brand products for years and command a lot of trust. In fact, they used to be stalwarts of the military in both the U.S.A, and Europe, and were standard issue for the cleaning of buttons, badges, buckles, medals, etc. No more! The truth of the matter is that although these products will make your brass ware bright, in six to twelve months, maybe even weeks in some cases, the produced finish will look worse than if you had left it alone.
What you thought was oxidization caused by atmospheric conditions, is actually being caused by your polish.
Now if you're a metal polish manufacturer, that's cool, because that means that you will need to polish it again. That means they sell more products, while your antique corrodes or deteriorates because of over polishing and etching! Nice move, Mr. Manufacturer! A product which makes you need it more, from the first time that you use it.
Now that's how to do business!
Remember, if it contains ammonia, or anhydrous chemicals, don't use it! It will cause premature aging of your piece. Some polishes have waxes in them too, these are to enhance and protect your finish.
OR DO THEY?
WAXES, LACQUERS, GLAZES,CLEARCOATS AND VARNISHES.
What are they all for? Basically, the same thing. To protect and enhance the beautiful finish that you've just broke your heart trying to put onto this beautiful piece of metal, right?
WRONG! That is what the industry wants you to think!
O.K. so you say "This guy is a nut!"
What I have said so far has made sense hasn't it?
Well, you just take this all in.
Museums will not apply clear coats or lacquers
WHY NOT?
Because they are normally porous and trap oxidization underneath them, as well as being hard to get off when a piece needs to be restored. Plus ALL lacquers and clear coats discolour , (Some times as soon as they are applied) and deteriorate with age, and so in a museum environment they have to come off, too regularly to be a viable proposition.
Museums are also terrified of vegetable waxes like beeswax, and carnauba.
They are based about vegetable materials and are acidic. They are also porous. That means moisture can and does penetrate them. This causes oxidization and acid corrosion to go on beneath them. I'm sure you've all seen the white clouds that form

on cars left in the sun too long. I'll let you into a secret. You only get that on cars that have been waxed. Unwaxed cars go dull and the paint might even crack if it gets too much heat and is not given the natural oils it needs to keep it soft, but will not get the great white clouds on the bonnet or hood that a waxed car does. It's normally removable of course, with the right polish!
Waxing your car will also increase sun damage.
It amplifies the suns ultraviolet rays and fries the paint.
Basically it microwaves it.
As a plus, waxes also collect dust and grit, as they are relatively soft in nature. That can make for an awesome grinding paste on the hood of your car.
On road vehicles waxing, laquering and clearcoating INCREASES PITTING!
YEP, I SAID INCREASES PITTING!
Yep, I'm being contrary again.
Well listen to my reasoning and you'll see that I really am not so crazy,
Again this is down to another con operated on us all by the industry!
The reason is very simple. An armour piercing bullet has a soft outer skin on it. What is known in the gun industry and military as a full metal jacket. I'm sure those of you who have no connections with the gun industry or military, have at least seen the movie. This outer jacket spreads on impact and keeps the bullet point first and centered, allowing it to penetrate the armour. In fact the concept of the full metal jacket is not new. The English put beeswax on their arrowheads at the battle of Agincourt, back in when ever a donkey sits, so that the arrows would pierce the Norman chain mail. When you wax you are putting a soft outer shell on your item which guides the road grime and grit into the wheels, tanks, paint or whatever they are supposed to be protecting. Much the same effect as putting a piece of electrical tape on a piece of body work before you drill it, in order to stop the drill from drifting.
Waxes, laquers, varnishes and clear coats all discolour with age, as I said earlier. The only exception being synthetic waxes. They can all be a devil to get off. To my knowledge there is no such thing as a perfectly clear , clear coat or laquer. They are all coloured. We have a brand of clear coat which we use at the shop for marine applications, which is about as clear as we could find, but it still has a slight yellow tint to it, and it still detracts slightly from the finished product. Synthetic waxes however, are what museums use to protect just about everything that they can apply them to. Most synthetic waxes are p.h. neutral. Renaissance is the brand that we favour. This is solely because it is used by the British Museum and the Smithsonian Institute, amongst others. If it's good enough for them it's good enough for me.
Being P.H. Neutral means they are not acid or alkali, and they do not deteriorate with age. However, they do not like being handled and are easily removed, and so are really only practical in museum and antique environments.
By the same token, I am not denouncing all other waxes, lacquers, glazes, clearcoats or varnishes. They all have their place, uses and benefits.
To a showman carnauba is invaluable. It has the capability of buffing to a higher lustre than any other wax known to man.
Lacquers, glazes or clearcoats are about the only way you can preserve bronze or brass on boats for any period of time.

But when it ages you have to get it off. That can often cost more than the polishing. So before you add a coating, ask yourself, do you really need it?
I have run a semi over the road with waxed and unwaxed tanks, and do you want to know what I came up with?
Waxed tanks and wheels look nicer, with out doubt, unless the polish job is absolutely fantastic.
But the unwaxed areas stayed cleaner, longer. That's less time repolishing.
AND, repolishes were easier and faster. Because there was less over all deterioration in the finish, and I didn't have all that wax to remove! That was running around 30,000 miles between polishes. Which is 3 years mileage on the average car! About 3 months for the truck.
SO WHY USE THESE PRODUCTS AT ALL?
For the same reason as we polish, they can enhance the appearance of the finished article (beautifully and quickly) when used properly!
Also applying carnauba in winter does give a degree of protection from salt etch. Carnauba is acid, salt is alkaline, so the salt has to neutralise the acid before it can etch your tanks or wheels.
Of course, it will increase grit damage, so you have to choose which devil you prefer.
Now here's a little tip for when you do apply a clearcoat, wax lacquer or paint for that matter. Once you've finished it, if the piece is small throw it in the oven on about 140 degrees for a few hours. DON'T USE THE MICROWAVE!! They create a little electric storm that lasts all of two seconds if you throw something metallic in them. Before you realise what you've done it's too late. They go to microwave heaven! Never to nuke a hotdog, or in my case, hotdog in a foil tray, again.
If you are in a hot climate you can use mother nature.
Stick your pieces out in the sun for a day, covered with black plastic. 140 degrees, no problem! You'll achieve that with about 90 degrees air temperature in direct sunlight in a couple of hours.
Remember, decide if you need it, and if you need the extra work that it entails. If you intend to sell the item, If you want to have an O.k. finish 12 months down the road, and are prepared to accept the long term deterioration, if you are a showman and don't mind doing what it takes to win. Or if you just like the little bit extra lustre or even the feel of the finish. Use them! I use them on my truck, but I put in the extra work. If I go onto dusty work, or know it's going to be a while before I can hit it again. Then I use HOT ENVIRONMENT POLISHES.
These are wax free. Waxes go grey when they get hot. So most polishes are unsuitable for use on superchargers, turbochargers, manifolds, overheads, carburetors, intercoolers, overhead cam covers or parts of the engine that suffer with heat. The hot environment polishes definitely do better on exhaust stacks and bumpers too. Just because the bugs and dust won't stick to them so much. Again, if you need a polish for these applications, let us know and we'll supply the polish for the job.
HOW DO I KNOW WHICH POLISHES I SHOULDUSE?
Now that really is a six million dollar question! It is much easier to tell you what not to use, but I am not about to start slamming other products, so where do we begin?
Well, you can read the manufacturers label. Not forgetting the fact that they are trying to sell you their products, and see what metals the product is recommended for. Check

out if it suits the environment it has to live in. Check out what waxes it contains. Don't expect too much information to come from the manufacturer. Apart from the fact he is trying to sell you his product, he has to put directions on the label too. Plus, the company logo. They only have so much space to work with.

Stay away from all polishes that contain ammonia, or contain anhydrous products. You can smell it, normally, if it is not stated on the bottle. Very sour and pungent odour, just the same as smelling salts, but milder. Avoid vegetable based waxes like carnauba, unless you are into competition finishes and repolishing. That is a regular requirement if you use carnauba. Avoid clear coats and lacquers, unless you are a boater, or have similar problems with extreme atmospheric corrosion in which case they justifiably have their place.

Watch out what you use on exhausts, manifolds, cam covers, locomotive tubing, and any areas subject to heat. Most polishes become grey when they are subjected to heat. Those that can tolerate heat, at all, normally become soft and sticky. A great way to collect dust and bugs is polish the stacks of a semi and then take it out on a desert highway just before sundown. You will find every species of bug known to man after just one good night in the desert. Really the same goes for your paint. If you polish with the right grade of polish, water will pond on flat metal or paint, just like it has been waxed. Just for the simple reason that if the surface is truly flat, the water has nothing to cling to. But while water will run off your surface, will dust and grit do the same? On a waxed surface it will stick more. Especially if it is hot!

You can always contact a company like English Custom Polishing, or one of our competitors to find out what they would recommend for you. If you read the rest of the booklet at least you will know what they are talking about, and if they are talking sense, or if it is just a representative giving you sales hype. You will be able to find out if the company manufactures one polish, or a range of products, and what their products are targeted at. Many companies will only make a single line of polish. It is up to you to find out what that polish is intended to work on.

If it is a regular automotive polish you don't want to use it on your best silver. By the same token you cannot ask a product intended for use on antiques to remove scratches on wheels and tanks.

Is it formulated for use on a specific metal? If it is a general purpose polish, will it do what you need? Will it endure? Will it be easy to apply? Will it be easy to remove? Does it contain ammonia? Does it use waxes? Anti oxidants? Inhibitors? Enhancers?Slip agents? If you have a yes to the right questions then you should try it. Especially if you have seen the results obtained with it at the hands of an aquaintance, and they were not only good, but lasting.

WHAT ARE DEGREASING AGENTS?

Most polishes will act as a degreasing agent just by their nature. It is an expensive way of doing things though, and all surface grease and oil should be removed from the surface prior to its being polished. Commercial car wash liquids sold by the gallon at any car accessory store are cheap, fast and good. Again, avoid ammonia or nitrous products. Don't use ordinary washing up liquid. Not only is it more expensive, it probably has ammonia in it and even if it doesn't it's not particularly good for your polish or paint. A gallon of commercial car wash from any accessory store will cost

about as much as a pint of washing up liquid. So it's a no brainer. BUT MAKE SURE IT IS NOT A WAX WASH.

WHAT ARE ANTIOXIDANTS?

Just that, they are chemicals that attack and breakdown oxides. They attack rust and corrosion, helping the abrasives in the polishes to clean and polish true metal, not rust. At English Custom Polishing we believe in releasing these oxides from the metals, and using them to work as abrasives for us. Now this makes a lot of sense. This is because an oxide is always harder than the surface it comes off. It will be no coarser than the abrasive used to release it. It will contain almost all of the properties of the metal that it is released from. All polishes should have an antioxidant in them. Even Stainless oxidizes, albeit slowly. You should always remember that stainless steel is not stain proof. It merely stains less! So beware of overheating stainless, not only may you warp it, but you will release the carbon from it, then it will rust. It won't be stainless any more.

INHIBITORS

On the other hand inhibitors go to work when the polish job is finished. It is their job to prevent the oxidization from returning. These set up a defensive barrier against oxidization and help protect from naturally occurring acid attack.

Coupled with the fact that any polished surface is far more corrosion resistant than an unpolished one, inhibitors go a long way towards protecting the finish. They sit on the surface in a microscopic layer and help prevent acids and oxidization disrupting the ions that I spoke of earlier. That's when the corrosion or oxidization sets in. And that's when you need to polish it again. Polishes that contain inhibitors are able to keep their finishes longer. That means less wear of the piece and less work for the polisher. That also happens to mean less expense for the polishee.

What is a polishee? You ask.

If they don't do it themselves, the polishee is the owner of the piece, or payer of the bill! O.K. so I made that up, but why not? I'm trying to keep this light.

SLIP AGENTS

These are sometimes combined in polishes. These help the polish to be moved around the piece that you are polishing, and also help prevent the polish from setting prematurely on you. So many of the pastes and creams suffer with this problem. Especially when polishing in hot climates. Slip agents help to eliminate drag as you are polishing, and in effect make the job slightly easier, much like lubricating any surface. This allows you to use the abrasive content in the polish to its maximum.

DO NOT POLISH IN DIRECT SUNLIGHT!

This will make chemicals in the polishes evaporate, before they can do their job. Also causing the polish to set and harden before it has had time to do its work. So the problem is compounded. The anti-oxidants won't have time to work, the slip agents won't slip, the polish won't cut. You end up pushing a dirty sticky mess around your work piece that only seems to get stickier and WONT come off! And the enhancer will be enhancing a lousy finish, which will probably be hazy to boot. So don't be hard on your self. Polish in the shade and allow the components of the polishes to work efficiently.

When you apply your liquid polishes, DON'T TURN YOUR CLOTH as soon as it gets dirty, keep rubbing the residue in. MAKE IT WORK FOR YOU! It's oxidization. No

coarser than the abrasive that you are using in your polish, and probably exactly what your polish is made of. Not turning the cloth will make the oxidization work in your favour by allowing you to use less polish, it will make you rub in any enhancers, inhibitors, waxes or what ever else is in the polish you are using. Turn your cloth when you want to take it off. Then rebuff it with a clean cloth. Only use white cloths for finishing, and inspect them regularly. Every time you finish an area, inspect your cloth. If it has ANY dirt on the cloth, buff it again with a clean cloth. When your cloth is perfectly clean, so is your finish! Once it looks perfectly clean, then it is time to go over it with the microfibre. This will take off dirt you didn't even see. Get into nooks and crannies like nothing else, and really enhance the finish.
I didn't believe how good these products were until I tried one.
Now I always finish with microfibre.
ENHANCERS.
These are waxes, lacquers, clearcoats varnishes and oils. They are sometimes incorporated into polishes in order to make the polish job really stand out. The most successful enhancers on metals being waxes and oils. How they actually work is that they sit the finished surface and trap the light, while not reducing the reflectivity of the piece. Infact, they enhance it. Hence the name. Many polishes contain enhancers. However, they do nothing to actually improve the true finish of the metal. Some polishes do no more than slightly polish the surface and leave a layer of oil or wax so thick that all you need is one dusty road and the polish job is wasted. The surface then becomes layered with an abrasive mix of wax and grit. Not good!
Of course another negative is the fact that waxed or oiled surfaces do not lend themselves to laquer, varnish, glaze or clear coat. It reduces the adhesion to the point of being abysmal. No laquered, varnished , glazed or clear coated surface should be prepolished with a polish that contains oils or waxes. In fact, you should be careful when you polish these surfaces, not to out do yourself. Hard coatings, like varnishes, laquers and clear coats do not like highly polished surfaces and tend to crack up and float about. Quite simply, they do not have enough adhesion. This often results in a crazy network of lines like a road map all over the item, with the odd section occasionally coming off completely. Allowing oxidization to get in between the cracks and run rampant. You only have to look at an old set of wheels from a seventies car to see what I mean. Normally clearcoats and lacquers begin to fail after two years. You are doing well, and I mean very well if you can get five years out of these products without discoloration or oxidization setting in. Many last only a season(3 months) before deterioration sets in. On high mileage vehicles the life expectancy of these products is considerably less. Should you decide that they are the best products for your needs, be very careful how you apply them. Follow the manufacturers requirement to the letter.
Make sure that the surface you apply them to is warm enough. Most clearcoats and lacquers like to be applied in temperatures above 60 degrees Farenhiet. Do not go for the ultimate lustre before you apply the coating. It will need something to key into.
DO NOT USE THEM ON ANTIQUES!! They will increase the damage caused by ultrviolet light. In fact most museums use filters on their lighting systems to reduce U.V. damage and do not like people using cameras with flash because of the deterioration that U.V. light causes, and with a flash camera the U.V. burst is very,

very intense. There are some glazes however that reduce U.V. damage, but they can be hard to remove. Choose them with care.
I HAD thought that GLAZES are much better at preserving lustre than clear coats and waxes, appear to bond better. They are normally based on a polymer known as poly siloxene, commonly known as liquid glass. It does a good job at enhancing just about anything and lasts 6 months to 3 years, depending on conditions and application.
But be warned, not many of them live up to the manufacturers claims.
Which is what we found. U/V protection? Well the only damage we have to our clear coat is where we applied a polysiloxene. The heat just burned it up, and we're in Maine!!
Think I'll stick with the old fashioned polish and carnauba wax.
Of course you should never wax a clearcoat, you'll make it dull and hazy.
Simple micro-abrasive polish will do the job.
Solid paint you might like to wax for a little extra enhancement, but be warned, Waxing will increase visibilty of any swirl marks.
We recommend running paint dry of wax, until winter sets in. Then wax offers protection from the salt if you happen to be in the rapidly coroding north.
REMOVING CLEARCOATS, LAQUERS, GLAZES AND WAXES.
Not such a pleasant job. It takes some pretty strong strippers sometimes. Stick to thick strippers. They adhere to the surface and get the chance to do something. Liquid strippers run off and end up on what ever is underneath your piece serving no useful purpose, spreading fumes, causing brain damage and harming the environment.
Always wear a protective mask and work in very well ventilated areas when working with strippers, and of course avoid skin contact, as they are all pretty severe irritants.
Always protect yourself as much as possible from contact or inhilation of fumes from these products. Especially ones that contain acetone, ketone, formaldehyde, toluene and especially M.T.K. and M.E.K.! I know of one clear coat manufacturer who actually recommends that people wash off with acetone! Another recommends mineral spirits or turpentine to remove their products from the skin.
YEAH RIGHT!! We all need kidney or liver failure. Mineral spirits are not as bad as acetone, but they can still mess you up. Ignore these idiots they are dangerous. Just because they may come from a big company doesn't make their actions or recommendations safe. After all, what about cigarettes, M.T.B.E. thalidomide,etc.
The list of products that have come onto the market and have had to be withdrawn because they are detrimental to health is massive. Because these "EXPERTS" come from large companies don't believe that they won't give you bad advice. The authorities new about mad cow disease in the 1980's and livestock are still being fed offel in 2001,c'mon! Yep, I trust these big company moguls, like I trust politicians, NOT A LOT, BUT I TRUST THEM! Some of them have been known to actually lie and distort figures in order to sell their products.
Basically, if you have to get something off your skin use soap. Use a pumice soap if it is really bad. The safest course of action is to not get it on you in the first place.
DO NOT USE THINNERS OR SOLVENTS TO REMOVE ANYTHING FROM YOUR SKIN.
THEY CAN KILL YOU!
ABRASIVES.

There are so many abrasives out there too. Some better in one application than another. The ability of any abrasive to cut is dependent on three things.

1) *Its general size and coarseness or grit.*
2) *The shape of the abrasive crystal.*
3) *The hardness of that particular crystal.*

The size and coarseness determines how deep the scratch is that any one crystal can make. How well that crystal can actually achieve its maximum cut is determined by the angles between the edges. In other words a thin crystal will slice, and a cuboid or round crystal will turn over. If the crystal is relatively soft it will not hold a good cutting edge particularly long. The same applies if the crystal is very brittle. It may cut like nothing in this world, but not for long. So the industry actually develops abrasives with crystals of perfected shapes for various cutting operations. Aluminum oxides make very good general purpose abrasives and come in various grades, But I find they fail very quickly on harder metals like Chrome and Stainless. Ferrous oxides used in Jewelers Rouge are also quick to loose their abrasion next to a good chromium oxide. By the same token, while the stainless compounds are awesome cutters with great mirror qualities, they leave a deep scratch compared to good chrome oxides and aluminates. So for our finish we go for the softer and less enduring alumina compounds, which have great colouring characteristics but less aggression. Colouring is the term given to forming a mirror finish, and denotes the ability of the finish to reflect light and colour. Image.

EMERY is a coarse hard cutting abrasive that is normally the first buffing stage of a polishing job. Leaves a satin finish when applied with sisal wheels.

STAINLESS STEEL compounds, or at least compounds blended to cut stainless, is what I should really say, tend to be good cutting compounds, and give a reasonable start to your mirror. Necessary when working on stainless and other hard metals.

FERRIC OXIDE is the foundation of jewelers rouge. It peeves me to hear all other abrasives in bar form called jewelers rouge, very often by the industry itself, I might add. Jewelers rouge is made of a synthetic rust,basically. That's why it's red. Rouge is french for red. If it is yellow, blue, green, white or any other colour but red, if it is made of any other abrasive than Ferric oxide. IT AIN'T ROUGE!

ZIRCONIUM compounds tend to be quite soft cutting, and very good for finishing chrome, stainless and other metals. These compounds have good colouring characteristics. Very slow cut. Some abrasives using zirconium cut quite well and become progressively finer with use as the crystals break down. This is actually intended, and can in the right situation save going from grit to grit.

TRIPOLI is a fairly good and hard cutting compound, available in various grades for use on softer metals like aluminum, copper, brass, etc. and also has quite good colouring characteristics. Infact, tripoli comes from missouri and is a combination of a particular silica and clay which happens to occur only in that area.

CHROMIUM OXIDE tends to be a finer, yet harder cut than tripoli, but comes in some quite fine grades making it suitable for finishing chrome, and stainless.(It is chrome that gives stainless its brightness.) it is also very good on nickel, titanium and cadmium. Because it can be of super fine quality it is often used in the dental and jewelry industry, it is replacing jewelers rouge in many quarters. It is also quite expensive as abrasives go.

ALUMINUM OXIDE, the hardest compound on the planet, only pure carbon (diamond) is harder. It is a good cutter for aluminum and removes the blueing that you get on overheated chrome. It will give a nice finish on copper, brass, bronze and soft alloys. Finer grades have very good colouring abilities. Aluminum oxide is probably the most popular abrasive in industry today. The crystals are grown in many wondrous shapes and sizes and are available in a wide variety of grades.
ALUMINUM SILICATE gives a beautiful lustre to about everything that you put it on but it is a soft cutter and takes time on harder metals like stainless, nickel, titanium and chrome.
CALCINED ALUMINUM OXIDE is superfine, expensive and gives an awesome finsh on just about anything, but it is a slow abrasive for finishing only.
SILICA, the most common abrasive of all is the most abundant element on the planet. Under every ocean, in just about every area of the world in some form or another you can find silica, some where.
Aluminates and chromium oxides are available in very superfine grades, and can be fine enough for optical polishing, and are often used in scientific applications.
Of course some compounds cut better than others just because of the shape of the crystals they are made from, and generally they cut less as they become finer, but that is not necessarily a hard and fast rule. Some compounds can retain good cutting characteristics at very fine grades. Which means that they give quality finishes quicker. These are not all of the compounds and abrasives on the market but constitute the most common.

BUFFWHEELS AND POWERBUFFING.
Firstly a safety note. Never allow dust from two different metals to mix. They become overloaded with static, react between each other and become big fireworks. They can be a serious form of fire. Hot, and hard to extinguish.
Vacuum when you finish polishing, then empty your vacuum, shop vacs are the best type because you know they are empty.
No, don't dump a big pile of it on the garden bonfire while it's burning, it'll put you on your butt.
Been there!
Done that!
I thought the pretty sparks would amuse the kids!
They laughed more at my lack of eyebrows!
So don't be clever and end up a fool.
AIRBORNE BUFFING DUST CAN EXPLODE VIOLENTLY!
Give yourself a draft to move it out.
People do not get out of dust explosions alive.
So okay, enough, lets get on.
There are basic and fundamental differences between using a hand held power buff, a pedestal buff, and a bench grinder adapted to buffing. On a proper pedestal buff the buff wheels stand out from the pedestal enough to allow access to both top and bottom edge of the wheel. If guards are fitted they should be rotary. Allowing access to both top and bottom edges. The top edge of the buff normally rotates towards you. The buffing process is carried out on the lower section off the buff where the rotation is

both downward and away from you. The piece is pulled backwards and forwards along this area, ensuring that a leading edge of the piece never comes in contact with the wheel. That will cause it to snag. When needed this is the area that compound is applied to the wheel. Again, present no leading edges. Hold the compound to the buff until the wheel is visibly full. This will take 2 to 4 seconds. Depending on how warm the compound is. With a bench grinder the shield is fixed and in the wrong place do allow this and the area of work is the front area where the wheel is rotating towards you. I do not like this set up. It is the wrong place to apply compound, and definitely the wrong place to be holding a piece of stainless in my opinion. But there are those amongst us that do it for what ever reason, be it economics or convenience. This set up means that you cannot see the piece you are buffing with out removing it completely away from the buff. Please be careful when using this type of set up. The final set up using a hand buff is potentially the most dangerous. You have to move the buff over the metal, being aware of cables, fittings, fixtures and all sorts of traps if you are working on a boat, car, truck or whatever. You have to be aware as you move into different areas of what is around you and what the draft of your buff may disturb. The last thing you want to do is foul up the lights, or get lashed by the cable as you foul up the lights. Then get a ticket from D.o.T. to go with the medical bill and the pain. That would really suck! Anyway, on a hand held buff the wheel normally rotates so that the top edge turns away from you. The farthest edge turning downward. It is on the top away and downward edge that we apply the compound. But we buff with the lower edge. That is turning downwards and towards you. This is where you have to be careful not to snag anything. If something is insecure or breaks lose you might catch it anywhere between the crown jewels and the eye. Even worse, you might scratch the workpiece or spill your coffee. And we all know what I think of that! So be CAREFUL with this kind of tool. The fact that you are moving the tool probably trebles the snag factor. So always wear your goggles or face mask. An apron will often soak up a lot of force of anything going between your legs. If you don't trust that, wear a groin box and be branded as a paranoid.(And don't forget to cover your coffee to keep the dust out.) Now buff wheels come in all sorts of sizes and shapes, the most important thing to remember is your cutting speeds and the formula <Diameter X 3 over 4. >This is your surface feet per minute. Or S.F.P.M. Most compounds are good for 7200 feet per minute, some prefer to move a little slower, but I know of no compound that likes to travel faster, It will leave the buff and you'll end up wearing it. To save you the effort of working it out, and a little soap, I've made up the following table:

					R.P.M				
Dia.	***1000***	***1500***	***2000***	***2500***	***3000***	***3500***	***4000***	***4500***	***5000***
2"	***500***	***750***	***1000***	***1250***	***1500***	***1750***	***2000***	***2250***	***2500***
4"	***1000***	***1500***	***2000***	***2500***	***3000***	***3500***	***4000***	***4500***	***5000***
6"	***1500***	***2250***	***3000***	***3750***	***4500***	***5250***	***6000***	***6750***	***7500***
8"	***2000***	***3000***	***4000***	***5000***	***6000***	***7000***			
10"	***2500***	***3750***	***5000***	***6250***	***7500***				

The speeds given are surface feet per minute. The end of the 8 and 10" tables being left blank because they are unimportant. Compound will not stay on buff wheels at speeds in excess of 7500 feet per minute, with a 4" buff you can actually turn at speeds of up to 7,000 rpm quite safely and a two inch is good to 14,000. So your Dremels and other really small tools will work. Small tools tend to be slow because the surface area they cut with is so small, plus the fobs have to be almost continuously loaded with compound so that they can cut, as the abrasive is in contact with the metal much more when the diameter of the wheel is so tiny. I mean think about it.7200 feet per minute is 1.36 miles per minute. That is 81.6 miles per hour or 130.56 kilometres if you are a european. That is a lot of surface going over your work piece. If it is not loaded with abrasive and doing it's job, that's a lot of wasted effort. I have heard a lot of people complain that these high speed small rotary tools will not do their job. Well, You gotta put abrasive on it, bud! Don't try and load it every 3 or 4 minutes, your not being fair. You can't expect the abrasive to last much more than 20 or thirty seconds before it needs loading again, I mean, it's already travelled ½ a mile or more, grinding its heart out on a hard piece of stainless or whatever, give it a chance, LOAD IT UP!

A word of warning. If you have only one buff wheel, do your stainless first if you are buffing a boat or semi. If your buff wheel becomes contaminated with steel your stainless will stain! It can go all the colours of the rainbow. You can do chrome or aluminum 1st, no problem. But touch one steel bolt or bracket and you might get a nasty result when you go to your stainless. So either isolate your stainless buffs from the rest, or do it first, your choice.

Also many people tend to overspeed with buffs. They often achieve reasonable results. However, by working at the optimal speed for the cutting compound, you will achieve better! The compound stays on the buff and cuts longer, while generating less heat. Buffs that are over sped, not only tend to scratch the surface, they can fly apart. Not a good thing! They generate unnecessary heat. Again, not a good thing. They are also harder to control. Another downside is that the operator tends to wear all the abrasive.

BUFFS.

There are sisal buffs, which make excellent coarse cuts and leave a satin type finish on the surface. They are also very good for tearing out the marks left from machining and coarse polishing. They work well with emery and coarse stainless compounds.

Then we have hybrid sisal and canvas buffs, these still cut exceptionally hard and are used with hard cutting compounds like emery and stainless, maybe a good tripoli.

Very popular are the reinforced canvas buffs. Some of them are mill treated to help stiffen them. Some of them are stitched in many innovative and unusual ways to help stiffen them up. These work very well with tripoli, stainless and aluminum oxide, they are still quite coarse but really are the beginning of your mirror.

We also have canvas pleated buffs, some being mill treated or reinforced to stiffen them. The pleating allows them to hold more compound than an unpleated buff. This of course makes them cut better and run cooler.

After the canvas buffs come the linen buffs. These are for use with fine compounds. They have no great degree of stiffness, and are for use as the project nears completion. These buffs are normally used with very fine chrome oxides, or fine aluminates.

Finally we come to buffs like canton cotton. These are finishing buffs only. We use these to apply very fine abrasives. When they become old and too dirty to finish with use them to apply slightly harder cuts.
Then lastly come the loose flannel buffs, these are for bringing up the super lustre and scratch free finishes.
These are only the basic catagories of buffs and many manufacturers have many variations and methods of binding or reinforcing. You have to get out there and find out what works for you. The options can be astounding.
Nearly all buffs are designed to run with clamps around the inner core. These not only stiffen the buff, but also help to stop them flying apart. Many buffs can be unsuitable for hand machines just because of this factor. The arbor just isn't long enough to take the clamps. If a buff is intended to have clamps you are being foolish to use them with out. Should it come apart, the centre could do you some serious injury. Always use clamps when using pedestal buffs. The arbors are normally big enough to accept them.
NOW WE COME TO THE 6 P's.
There are only 5 if you are polite! Or in the company of ladies or youngsters.
What are the 6 P's?
Perfect Preparation Prevents Pxxx Poor Polishing!
Preparation is everything!
If you have bad scratches or surface imperfections to remove, you must always pay attention to the 6 P's. Every process and cut other than the final polish must be looked upon as a complete preparation cycle in itself. If you skimp or cut short any one stage of the process you will end up with a scratched or hazy surface. After 6 or 7 machine cuts with a belt polisher and rotary tools and 4 or 5 buffing operations, can you imagine how it feels to hold a beautiful piece of perfect brass or stainless up to the light and see a scratch. Just one. One PEACH of a scratch, right there, RIGHT IN THE MIDDLE OF THE BELLY, or CROWN! Trapping the light and glaring at you so much that even a blind man on a stampeding horse at midnight can see it!
Well, you're going to have to pay the price and do it again. And just to make it worse, don't think that just another final cut will get rid of it. NO WAY JOSE! You have to go back to a cut that is at least as coarse as that scratch, which is normally way, way back in the earlier stages. You Broke The Law! And no one is above the law, not the law of the six p's anyway.
The 6 P's cannot be ignored, EVER!
Every stage is a preparetory stage for the next one. Right up to the ultimate finishing polish. Leave one mark from a previous cut visible and it will haunt you to the end.
Make sure you have the best equipment available to do the job. Make sure that you have enough room to work in, nobody wants cables to get tied in knots, pulling other items to the floor, spilling chemicals, compounds, coffee (OH,XXXX , NOT THE COFFEE, AGAIN!) or polishes, damaging pieces or just being a nuisance. Always clear your work area. Give yourself room.
Dress for the occasion! I guess you could say that's a preparetory stage. Tuxedos have no place in the polishers world. Bandanas or skull caps are useful. Wear a face mask. Cover exposed areas of skin. Tuck away long hair to prevent it becoming entangled in machinery. Wear clothing free of metal buttons, buckles, badges, zippers, studs or clasps. They can all scratch your work piece. In fact, a brand label on your polishing

cloth can scratch your work. Rip or tear them off. Don't wear clothing that is excessively lose or baggy. Better still, wear an apron to protect your clothes. But remember to tie it at the back. I'd hate for someone to discover you hanging from a pedestal, red faced and suspended from your apron strings, or for it to snag on a hand held buff and have it direct 2 ½ horsepower and a fully loaded emery buff at your crotch. Remove necklaces, bracelets and collar pieces that may become entangled. Make sure that cuffs are fairly tight fitting and use barrier cream for your hands. Protect your eyes with goggles or a full face visor when you are power buffing. Make sure that what you are buffing is secure, or if you are taking it to the buff ensure that the pedestal is solid and so is your grip on the item. Just like in the song, hold on loosely, but don't let go. A tight grip will become tiring and will not last. Use a loose grip and keep the piece stable, of course when you approach the buff make sure that you contact it at a point which will pull the item away from you should it snag. If you contact the buff wheel at a point where it is rotating in your general direction, should it snag you might just end up wearing it. Better off to approach the other side of the wheel so if it snags it will fly away from you. Bystanders and onlookers can handle the pain and inconvenience much better than you, after all you have a polishing job to do! Do not buff beside you new car! Flying pieces might hit it! If they don't you will succeed in covering it with compound. In fact you will cover everything in your workshop with compound unless you have some kind of extractor system, and if you intend doing a lot of polishing. THAT IS A MUST. The various metals if inhaled or skin absorbed WILL damage your health in a big way if you don't TAKE PRECAUTIONS! Beware of edges! When a buff contacts the leading edge of any item it WILL snag. When you approach edges, be sure that it is a trailing edge, and on the outward rotating area of the buff.

Always ensure that all exposed areas of skin are protected from flying particles, burrs and polish, and of course ensure that your buff wheel is tight and turning at speeds within its design specification. Finally, make sure that your buff will fit into all the areas which you are going to work, corners and edges of other pieces around the component can sometimes get you into trouble, grabbing the wheel and locking it up, or damaging the piece. If you have a very powerful buffer it may even damage you, Jamming your wheel and transferring all the torque of the machine into your wrists, snapping your hands into what ever may be around your work, or the work piece itself. Quite a painful experience, I can assure you. Oh, and I almost forgot, watch out for burrs and sharp edges. They'll get you every time! The last thing you need is a load of claret (blood) everywhere, spilling all over your beautiful work piece and making a mess of your work area. Blood will stain and etch almost any metal it contacts if it is not removed immediately, so if you do cut yourself, clean up NOW!

NOT YOU!

THE WORKPIECE!

You come second! I told you that blood will etch!

DEALING WITH FABRICATIONS and CASTINGS.

From the machined finish to the perfect mirror!

This in itself is work, especially if you are working with a hard metal like stainless. If your item is flat and requires a straight line finish, you will need a belt polisher. Normally the wider the better, in that you want the belt to be wider than your work

piece. Where possible. We use our Band-its on very large pieces. These are very stable hand held machines that remove metal FAST!We normally begin with around a 120 grit belt. A coarser grade is rarely necessary. We remove all machine marks and surface imperfections. Once this is done, we repeat the process with a 180 grit belt, where possible cutting at 90 degrees to the first cut in order to see when all surface marks left by the first cut are removed. We then cut across the second cut with around a 240 grit belt, then we repeat the process with something around 320, then 400 grit, and again with around a 600 grit. Then maybe a 1200 grit. From here on in we are ready to use compounds and buff wheels. Starting with coarse stainless compound, then on to a fine stainless. Then we move to maybe chromium oxide or a zirconium which will truly begin the coloring process, and finish off with calcined alumina for a magical scratch free finish. Scratch Free? Why sure! Four things are important in getting a scratch free finish,

1) *Don't hurry! Be sure to remove all traces of previous cuts before progressing to the next.*
2) *Move your buff slowly and cut at the right speeds for the wheels and compounds you are using.*
3) *Use a very light touch and go over your work surface as gently as you can on your final cuts. Don't be heavy on the buff, It's unnecessary and forces the abrasive to dig into your piece.*
4) *When you have reached your last cut, you haven't. Well, you don't really cut it again, you give it a light misting with water and then sprinkle on some flour, talcum powder or sodium bicarbonate, and buff it again with a nice soft buff like a domet.*
5) *Don't handle your finished piece with anything metallic, in fact don't handle it. The chances are your hands have enough grit on them to make a mess of it. Use a soft cloth.*

Either way we haven't got that far yet, lets get back to the job.
Sometimes a belt polisher is not practical, in which case the process has to be done with normal rotary tools. Dual Action sanders work well. Stability is the problem with smaller tools, so use the biggest cutting face you can fit on your tools if this is the option that you have to pursue, and watch your speed. The manufacturers of the disks and wheels make them to so many different specifications that it really is impossible to list cutting speeds. However, the manufacturers recommendations should never be exceeded, and turning slower will only improve stability. Follow the same methodology of crossing your cuts, and reducing your grits until you reach the buff wheel stage.
REMEMBER, most castings are porous to some degree. Once you have obtained a nice smooth finish on your casting leave it at that. If a pit mark suddenly appears out of nowhere, it's in the casting. In Brass and aluminum these can often be closed or filled by pushing metal into them with a jewelers peen hammer. Fabrications do not normally have this problem as they are made from rolled metals and flat stock.
Very often to remove the odd pit mark, scratch or blemish from a work piece, rather than cut down the whole piece, I often use a painters or carpenters sanding pad, of the smoothest I can find. These are normally coarse on one side and one edge and fine on the other side and edge. Readily available at most hardware stores, they fit the hand

quite nicely, and the budget too. They are suitable for using wet or dry and are easy to handle. They bend quite nicely for working radiuses, and leave a finish smooth enough to power buff for the finished article. Stay away from the coarse ones though. They will scar your work pieces badly.

LOADING THE BUFFS.

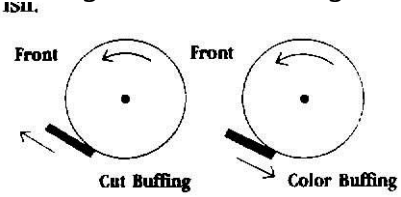
This in itself can be a risky business, and I have seen more than one polisher with a lump on his head due to presenting the compound to the buff in the incorrect manner. Make sure that the edge you apply the compound to is rotating away from you and do it gently. The best way to load your buff wheels is to dip the outer edge of the buff in warm water, while the compound is softening in hot, not boiling water. Rub the compound into the buff, and then set it out to dry. Many people paste an adhesive on the buff, then apply the compound to the paste. With this method the buff will last the longest and cut the most efficiently. Apply compound to it in the normal manner of applying the compound bar to the buff as soon as cutting ability slows down. You can tell when your buff leads loading. On a cut stroke there should be a thin trail of compound behind the buff. We remove this on the polishing stroke. Loading the buff should only take 2 or 3 seconds.

Only use 1 grade of compound to every buff. This prevents scratching and hazing. If you mix buffs and grits you will never achieve a truly scratch free surface.

A good idea is to relegate your buffs as they get older. Dirty finish buffs become final cut applicators. Last cut applicators go to penultimate cuts, and so on down the chain. When they become small use them in tight areas. Of course the smaller they become the stiffer they are, so the harder they cut, and of course the smaller the spaces that they can get into, and of course the faster speeds that you are able to cut at (see chart) with out the compound parting from the wheel.

Now for the act of buffing! To polish metals we end cut with the buff wheel, that is we only use the outer edge of the buff wheel. If we were to face buff the center and the outer areas of the wheel would be traveling at grossly different speeds, producing an uneven or hazy finish. The piece should be pushed or pulled along that edge, moving across less than the width of the wheel for the next cut. If the piece is fixed then we should move the buff in or against the direction of its rotation. Not across it!

To move the piece in the direction of the buffs rotation is called a coloring stroke, or a Polishing stroke, to move against it is a cutting stroke.



You should not apply pressure to the buff wheel. Allow the abrasives to do the work. It will cause overheating. That will cause waxing of the compound and can lead to a hazy uneven finish and even warping of the product. Stainless steel can become corrupted and become prone to rusting. Also, a lighter cut is less likely to leave scratches. The thin stainless steel often used in automotive trim is particularly prone to warping and discolouring.

Now there is another problem when you are working with stainless. Keep every thing, I mean everything away from steel. As I mentioned earlier, if you touch a piece of steel

with your buff and then go onto stainless, LOOK OUT! You might just turn it every colour of the rainbow, and it's a devil to get out!
Make sure that the buff you are using is turning at its correct speed. There is nothing wrong in being too slow. It slows down the aggressiveness of the cut. It reduces overheating. It makes your tools more controllable. It throws less compound in your face. It takes longer to do the job, but you see what is happening better. Over speeding on the other hand is dangerous. Buff wheels can come apart. Compound flies every where. Cutting can be too aggressive and uneven. It increases the risks of overheating and warping. It is much harder to control your buffer, and it is very easy to over cut. You think polishing this stuff off is tough. Ever tried to put it back on? You would do better trying to push toothpaste back into the tube. Only work small areas at a time getting them to a finished standard before you move on.
When you feel you have reached the desired finish it is time to go to work hand polishing. If your final cut was done with a chromium oxide then that is at least the grade of polish that you have to apply if not finer. Decide on whether or not you are going to wax, laquer, glaze or clearcoat and choose your type of polish. Make your final application of polish across your last cut to ensure that no scratches are visible. Use Turkish cotton to hand polish for the best results. Buff up your finished piece with a perfectly clean terrycloth (Which must be prewashed and have all labels removed) or Turkish cotton. Make sure that there is absolutely no trace of polish left on the piece and then we add the "coup de gras." We spray a superfine dusting of water over the item and rebuff. This helps to seal it from water stains that may be caused from rain, humidity or just overnight condensation.Then we buff out by hand with a microfibre cloth. This will remove any last traces of dirt and smooth your finish beautifully.
RAKING YOUR BUFF WHEELS.
This is done to remove dead compound and waste from the wheel. You can buy professional buff rakes, or you can improvise. I have two or three saw toothed bits of metal I do mine with, and I find them easier to hold than traditional rakes. Then I have a stainless steel rake for when I work on stainless. The rake should always approach the buff in an area that is rotating away from you, Normally the same area as you load up with compound in. Keep the rake angled so it is trailing as it connects with the buff, then turn it until it is at 90 degrees to the face you are raking and draw it across the face. The waste will build up on the rake and your buff is ready to be loaded for a nice clean cut. Be careful not to go beyond 90 degrees, It will fly, I assure you it will fly. At about eighty miles an hour. More than enough to inflict some intense pain and suffering, let alone spill the claret.
THE POWER QUESTION.
How much power do you need for your buffs? Well you can easily work buffs up to 3" inches wide with a half horsepower.
I like the old fashioned ½ horse motor with a belt and separate mandril.
It's easy to vary speed with pulleys. Motors are easy to replace.
They are inexpensive and do a nice job.
Big power makes the parts vulnerable to over heating, easier to snag, easier to damage, and most of all, easier to hurt yourself.
Sure professional shops have big power.
They work on big pieces and need it.

But smaller power gives best overall finish.

REMOVING DENTS AND DIMPLES. This can be quite tricky, bearing in mind that when a dent or dimple appears the metal is stretched. The bigger the fault, the bigger the problem. Small dents and dimples can be pushed back quite gently with very good results. Firstly you need a pattern to go inside the material that is misformed. Generally speaking for auto trim wood is good. Shape it to exactly what you want and using a hard rubber mallet or a soft leather, lead or even copper mallet, tap around the edges of the fault working your way into it until you have the form that you need. If it is a radius, a mallet with a slightly smaller radius, tapping from the inside with your form on the outside works well. You might on a curved piece of trim need to nick the edge to allow it to fold in.

HIDING REPAIRS. Welds and braizes should be finished with the faults, slag and pot holes cleaned out. If it is deep it should be layered and perfectly clean before the finishing weld is done. The finished weld MUST stand proud of the surface and should run with the grain or length of the piece where this is possible. If it is to be resurfaced a piece of slag or an airhole will ruin the finish, so the weld or braize must be good. Grind the repair until it is almost flat, with what ever does the job best. We use our Belt-it belt files, They are designed for the job. If you can get to it with a belt GREAT! Go with the grain or the length of the piece. When it is almost flat use your eyes and have it in your mind how far out from the repair you are going to go with your blending. Then do it with the finest grade material that you can use to achieve your task. There is no point in scaring up the adjacent surface with a coarse grit, it is more polishing and harder to disguise as you will create a hollow. The finest tool for finishing these areas, especially on tanks, is the Band-it. With grits available to 600 for the Band-it or Belt-it, buffing from there is EASY! If you have to do this task with rotary tools this is where stability is all important. Use the biggest surface wheels that you can, within their designed speed restrictions of course. These are easier to keep stable than smaller wheels. Remove all sight of the weld or braize. If it is a good job all that will be visible is the grain of the weld, and that should take some looking for. Once you have done this go to a finer abrasive and begin the process of developing your mirror just as you would for a regular fabrication. It is very rare that a repair will be totally invisible, however if it is in or near a corner, a little clever blending, not making it quite as bright as the rest can hide it. Polishing will show up every fault and variation in the surface.

The properties of various metals and where you'll find them.

ALUMINUM, known as aluminium in europe is an element (Al) and should not be confused with alloys. Isolated in the early 1800 it never achieved commecial use until after the invention and availability of electricity.(1860's) It is a soft metal and a great conductor of both heat and electricity. It is used in electrical components and is finding its way into industry more and more for use in weight saving components in the automotive and trucking industries. Being the most abundant ore on the planet it is readily available globally in one form or another. Aluminum oxides, aluminum silicates and carbides make useful abrasives. Aluminum if made hot enough will burn underwater or in carbon monoxide as well as carbon dioxide. When polished

aluminum can develop a beautiful lustre like chrome and being a soft metal it responds to almost any abrasive quickly. It will also re-oxidize very quickly and has little on no resistance to salt or ultraviolet light. It is easily attacked by both acids and alkalines. It is great for dissipating heat and so is finding its way into engine casings and other similar applications more and more. You will find aluminum anywhere that weight is a factor. On Trucks, Boats, cars, motorcycles, aircraft, etc. It is one of our planets largest resources being abundant in one form or another, it makes up almost 8% or 1/12th of the weight of the planet, being second only to silicone. Yet until it is refined it never appears as a metal. It is found as a trace element or mineral in the earth, in plants and just about every living organism. It has been found that excessive amounts of aluminum within the body causes hardening or brittleness of the bones and teeth, Alzhiemers and I forget what else. Aluminum based abrasives are of course the best compounds to use on aluminum and will give beautiful finishes.

BRASS.

Going back to biblical times, brass has been around for a long time. An alloy made of copper and zinc, it was once the metal of choice for collecting and storing for prosperity by the wealthy and has only been superceded by gold and silver since the european invasion of the new world (America). The English used to adorn the graves of the wealthy with brass trinkets, plates and plaques bearing their coat of arms. Around 1500 the Brits started adding lead to the brass to make it more machinable. In the 1700's they added tin to it in order to stop it corroding this was known as navy or admiralty brass. Around the 1900's aluminum was added to improve the brass where naval brass failed. Brass used to be very popular with the Romans who used it for armour, goblets, ornamental brooches and pins, military standards, weapons, etc. It is found today on faucets, hinges, door knobs, in many marine applications, in braize, bushings, navigational aids, astrological equipment, candle sticks, sun dials, ammunition casings, beds, and all manner of ornaments and trinkets can come in brass. Many old coach lamps were brass. Nearly all the lamps on old auto's around the early 1900s were brass. Later, the industry started to nickel and chrome plate them. The traditional way of polishing brass is with ground garnets. However, today many compounds are used to finish brass, though most are aluminum oxide based. When it is polished properly, it blazes like the sun.

BRONZE. Goes back at least eight thousand years. An alloy of copper and tin, it is hard than its components and yet melts at a lower temperature than copper, which makes it far more readily castable, and is harder than iron, as well as suffering from corrosion much less. It was the metal of choice for thousands of years for just about everything. The only reason that iron became more proliferate, around 1000 b.c. is because it was more readily available. Bronze was used for everything, armour , weapons, ewers, tools, etc. Bell metal is high in tin content, while statuory bronze has large amounts of zinc and lead, which technically makes it a brass. Bronze becomes very hard with the inclusion of phosphorous and takes the name of phosphor bronze, and is very difficult to machine compared to the other bronzes. In engineering many bronzes contain manganese this is type of bronze is also very hard, while some bronzes also contain trace amounts of aluminum, iron and nickel. Bronzes are used in bearings, bushings, propellers, turbine blades and similar engineering and marine environments. As well as statues, bells and ornaments of course.

Polishing bronze to a high lustre can demand hard cutting abrasives like chrome oxide. Looks beautiful though when it's clean with that light reddish glow. Put side by side with brass in old marine applications, it can look awesome. The light bounces off them beautifully with slight hews and they compliment each other perfectly
CADMIUM (Cd) is a rare element, often found in other metals especially zinc. Often used to coat other metals to protect them from corrosion. It polishes easily to a high lustre, being soft. We find it in batteries of course. But few other household applications But the powder or residue from cadmium is highly toxic. While it has a very high resistance to alkali, it is susceptible to acid attack. Cadmium melts at fairly low temperatures, but will burn readily should it become red. It may be polished with almost any compound but skin absorption MUST be avoided. As must the inhilation of Cadmium dust or vapour. I prefer not to mess with the stuff. But of course, I've got my price. When burnt Cadmium gives off VERY toxic gases. Never heat Cadmium. It is often found in batteries by the way. It is because of this they should never be thrown on the fire for disposal. Often used as a coating on carburettors.
COPPER(Cu) Been around so long. Appears to have originated in cyprus, first called cyprium, them cuprium, and some how the English corrupted it to copper. I don't see any resemblence in the sound, but it's supposedly the same stuff. A basic element, or pure metal. Very soft by nature, and easy to shine. However, when it's mixed with zinc, it gets harder, and we get brass. Mixed with tin we get bronze. I never could figure out how combining two soft metals makes a hard one. But, then scientifically speaking bees can't fly, so I wont go any further on either subject. Copper is about in abundance in old pots, pans, ornamental bits and bobs. Pressurized tubing is often copper, so it makes a lot of appearances on steam locomotives and vehicles.
STAINLESS STEEL. This metal is getting more and more popular, and it is fast replacing bronze and brass in the marine industry. Having all the benefits of bronze with less corrosion and offering beautiful mirror capabilities, it is a low maintenance metal. To make stainless steel the carbon is forced out while it is in its molten state. It does oxidize to a degree, becoming cloudy and suffering with light pitting on road vehicles, however, it is easy to look after. It is the choice of luxury boaters today. Used in everything from surgical instruments, to earrings. The most common stainless steel in boating operations is Austenitic, containing chromium and zinc it is highly resistant to corrosion. It is also used a lot in aero applications. Ferritic stainless contains less chromium and no zinc. Its anticorrosion properties are not as good as austenitic and it normally finds its way into automobile trims. Martinsitic stainless contains, or retains up to 1.2% carbon and is used in tools, knives and surgical instruments. It is very resistant to corrosion and it will hold and edge. It is the chromium in the stainless that gives it its brightness. Responds very well to chrome oxides and of course stainless abrasives. We normally finish it with a Showman's Blend polish.
MONEL. A bright alloy of nickel and copper. Harder than pure nickel. Very resistant to corrosion, especially salt water. Found most often in marine applications. Hard stuff. Treat it like stainless. Vinegar is great for cleaning.
COBALT. A silvery white metal that gives off a bluish tint when polished. Very poisonous, it combines with most metals and alloys to improve hardness. Not seen as a pure metal, normally it appears in things like machine tools and cutters.

CHROMIUM. Discovered in 1797 it is a grey metal that responds highly to polishing. The ore is beautiful, it glistens like some kind of moon rock. Combined with other metals to improve resistance to corrosion and hardness, and added as a protective and brilliant coating over nickel. We all know chrome. Bikes, cars, trucks and all sorts of pretty things are covered by chromium. There was a fad on chromium coffee pots and kitchen ware in the 50's and sixties. Responds well to most abrasives. Calcined Alumina is a good cutter on chromium and gives it beautiful colour.

Chrome should never be waxed, it only increases damage and deterioration, and makes the chrome hazy. Chrome should be dusted or wiped over with a glycerin soap, and polishing should be limited to the removal of surface scratches and light pitting, when necessary. Regular polishing will only lead to the premature deterioration and removal of the chrome from the nickel.

NICKEL. Another pure metal, oddly enough found in abundance in meteorites. It is a silver grey metal and loves to be polished. Added to other metals to improve hardness and corrosion resistance as well as added as a protective coating. Like chromium it is brilliant when polished. It is always the substrata with chromium. Used quite a lot on old cars. On old diving helmets, and maybe making a bit of a come back. I have seen a lot of nickel promotion. We like to use finer abrasives on this such as chrome oxides and fine aluminates. Nickel often used to appear in hot environments.

ZINC. A naturally occurring metal, slightly more abundant than copper. First isolated in the 1300's in India, but plentiful in the old roman brasses. A bluish silver metal it takes on a grey cloudy oxidization. Rarely seen as a pure metal, it normally appears in alloys. Generally used in galvanizing. Not normally polished, but I've seen and done it. The effect can be awesome. Generally found in "Pot metal". The basis for something like 90% of automotive trim castings, and often added to steel to reduce corrosion.

MANGANESE Another pure element often used in alloys to improve hardness and resistance to corrosion. A silvery white metal, rarely seen other than in alloys

MAGNESIUM Another pure element, again silvery white. Although it is a dull metal by nature, and does not shine when polished, there are a couple of polish manufacturers who actually sell a magnesium and aluminum wheel polish. If you have magnesium wheels, forget it. They are conning you. I don't care how reputable the manufacturer is, you cannot polish magnesium and expect it to shine. It's a simple as that. You might as well polish coal. Magnesium is however, the lightest metal known to man. Combined with other metals to improve hardness and castability, and weight. Common in aviation and used quite extensively in the auto and marine world.

PEWTER. An alloy of tin and lead originally. Used to be called black metal. Modern pewter is normally 91% tin,7.5% antimony, and 1.5% copper and doesn't go black any more. In fact, it is very resistant to corrosion. I like polishing modern pewter, though many people say you shouldn't. It is very easy to keep it in its original bright condition. The biggest reason for polishing it is that people will buy it when it's bright. Unless it is obviously very antique and valuable, nobody is interested in black pewter. Modern pewter has a very slight bluish sheen to it and can be every bit as bright as silver.

PHOSPHOROUS. Never seen it by itself in any sizeable amount. Usually added to other metals such as bronze to improve hardness, and it does too. Does not normally appear in situations requiring polish.

STELLITE is an alloy of cobalt, chromium and tungsten. A super hard metal, and I mean super hard. It is used in valve seats, pushrods, cutting tools and the like. Unlikely to appear in a place where you need to polish it. But a useful metal to be aware of if you are into custom performance engines, (which I am, so that's why I mention it.) coat the seat of your cam followers in teflon and your pushrods in stellite, and you have a minimal wear environment.

TUNGSTEN, Yep, good old tungsten combined with other metals to produce tool steels, surgical steels and the like. Stains and blackens easily. Unlikely to be in a polishing environment, though I do have a couple of knives made with tungsten that I polish with our #7.Haven't found much else that will touch them.

Restoring and preserving precious metals

The most important thing to be aware of is handling, or at least the avoidance of it. Sweat is very acidic and every time a metal is handled, unless some kind of preventative steps are taken, such as gloves or cloth, acid is transferred from the hand to the item. Preserving waxes are removed and protective ions are disrupted allowing the acids to begin the action we call oxidization. Protective IONS!? Yes, that's right, protective ions. When we polish something, the surface of the metal is smoothed directionally, making the ions on the surface line up like soldiers. This not only helps conceal miniscule imperfections in the surface, but also helps for a barrier that the acids have to penetrate and disrupt for the oxidization to occur. We can avoid this enormously by not handling anymore than is absolutely necessary. LOOK and ADMIRE, but don't touch. Remember this when you are finished with your handy work restoring the piece to its former glory.

These days, liquid rouges are very popular, like our #2. We have better available in our museum and conossieurs range.

GOLD, should be handled the least, just because of its value, and its softness .It should NEVER be cleaned with abrasives, unless it is absolutely necessary. A good polish can be made for gold by using either acetic acid (Vinegar), or citric acid (lemon or grapefruit juice) and calcium carbonate, (chalk, preferably in a nice talcum). In the event that you need an abrasive only the finest should be used. We don't even use traditional jewelers rouge at English Custom Polishing. Only polishes super low in the micron range should be used on gold. In our range #9 curators choice fits the bill.

We use only one preserving wax, RENAISSANCE.

This wax is P.H. Neutral, a micro-crystaline synthetic wax, developed by the BRITISH MUSEUM and now in use at the SMITHSONIAN, the ROYAL ALBERT MUSEUM and most other major museums around the world.

SILVER, again handling should be minimal. You can save a lot of money and time cleaning your old silver by using a very simple old trick:

Find a plastic bowl, about 5-gallon capacity is normally plenty. The size needs to be enough to cover the silverware you are cleaning, fill with hot water, hotter the better, add 2 tablespoons of sodium bicarbonate,(regular household baking soda)and 2 tablespoons of salt, stir it well, place your silverware into the solution, then place a decent strip of aluminum foil down into the water.(It must not touch the silverware) Watch the oxidization disappear. Again like gold this metal will respond to acetic or citric acid and chalk, any polishing should really be done with a museum quality polish. Apply RENAISSANCE wax, to preserve finish. Or if you really want to make it

bright, polish with our #9 CURATORS CHOICE. A liquid polish that will remove any stubborn oxidization with a compound equivalent to jewelers rouge, and leave a superfine film of RENAISSANCE on the item to preserve and protect the finish.
PLATINUM, treat as silver or gold.
BRASS, can suffer heavily through handling. Because it's not silver or gold it tends to be very neglected. But what a beautiful metal! When it's properly polished and maintained it has such a bright glow. In European circles brass goes back farther than silver and there really are some very old pieces out there. To get the best out of brass it really should be polished with GARNET. Remember to stay away from polishes contain ammonia.
I find that our #5,museum polish will make it give up such a beautiful lustre. Again if you want to save on polish you can often remove bad oxidisation with LEMON JUICE, Cola or Vinegar, either will do the trick. A nice big grapefruit can clean a lot. Don`t forget to rinse it off really well though, or dip the item in a weak solution of water and sodium Bicarbonate to neutralise the acid.
COPPER, The perfect compliment to brass, and beautiful in its own right. I don`t understand people who get gleaming pieces from copper and have it artificially aged, I want to polish it every time I see it, that green oxidization drives me crazy. If its really bad I nuke the oxidisation with a mild acid solution, again vinegar does a fine job. Being a relatively soft metal, I polish with #10 to achieve the ultimate lustre, #5 is also good on copper but is better suited to brass, bronze, stainless steel, nickel and chromium, Use a #7 if it is subjected to heat.
BRONZE. The Boatmans metal, though being replaced more and more these days by stainless. Really severe oxidisation I have been known to nuke with Muriatic acid. Then wash off really fast, or it will etch, and either neutralise with sodium Bicarbonate, or with#5 or #7. (Soaking in vinegar or cola is a very good substitute, although the acid contained in cola is mild be equally thorough in washing off.) Normally exposed to the Elements, Nothing protects against the salt air like laquer, or glaze I am sorry to say. (only because I hate having to remove it for repolishes.)But the difference in lifespan between a laquered finish or waxed finish leaves only the one choice. A clear coat, glaze or laquer. If the item is ornamental and not on a boat, Renaissance is the only way to go.

Restoring and Polishing Brass, Copper and bronze.

#1 Lets get the do nots out into the open.
Do not scour your brass with wire or steel wool, nylon or plastic dish cleaners or other severe abrasives, brass is relatively soft and there is no need for it

Do not use polishes or cleaners that contain ammonia or anhydrous products. It was recently discovered these chemicals cause etching, cracking, fissures and premature aging of soft alloys especially brass! Many accepted and established named products use these as antioxidants. Read the label or smell it. Because the manufacturer says it is good for brass doesn't mean it won't damage it in the long term.

Don't use a vegetable based wax, such as bees wax or carnauba. All vegetable based waxes are acidic and attack what they are supposed to protect. They are also porous and so oxidization can happen underneath them.

Don't use lacquers, clearcoats or glazes to protect your brass unless it is exposed to the elements. It shouldn't be necessary.

O.k. Enough of that and on with the job.
First thing we need to do is clean off unwanted grime and pith.
Find a plastic bowl big enough to submerge your pieces and let them soak in white vinegar. 4 hours is often enough. For really bad pieces it may be necessary to soak for 24 hours. Lift it out and clean off the grime with a rag once or twice during the process so that any thick grime is removed allowing the vinegar to get to the underneath.

DO NOT PLACE TWO DIFFERENT METALS IN THE BATH AT ONE TIME!
If you do this the softer metal will travel to the harder and plate it!

Once you are satisfied that the items are as clean as they are going to get neutralise the acid by dipping them in sodium bicarbonate (baking soda).

If you find any pitmarks in the brass or copper you can fill them by tapping the outer edges in towards the middle with a jewelers peen hammer. Gently and slowly you can fill the hole. This trick is also effective on aluminum. I feel I ought to mention that this trick was given to me by Richard Remsen, who makes superb pieces that can be seen on his website, www.remsen.com ***,Thank you, Richard.***
We are now ready to begin polishing.
You need a soft cotton cloth, a tripoli based polish if your piece needs a lot of attention, and a fine chromium oxide or aluminate based polish to finish. If you intend to coat your pieces, make sure that your polishes are wax free. If you are going to rely on preservatives in the polishes to protect your finish, make sure the waxes involved are not vegetable based.
Only do small areas of your piece at a time getting it up to the finish that you want before you move onto the next.
Apply your polish and using overlapping circles rub it into the piece until a residue begins to form,(unless your piece is big in which case polish in straight lines) Now don't rotate your cloth. This residue is no coarser than the abrasive in your polish, but it is abrasive too and will help to polish your piece. Rub this into the piece and as it is beginning to dry it will start to come off. Now we get a clean cloth, preferably Terrycloth and remove it. When you can wipe the piece over with a perfectly white cloth and see no blacking on it, your piece is perfectly clean.
If you are polishing with tripoli and then finishing with something finer, make the cuts of your second polish cross the direction of your first polishing. This will show up any scratches left in from your first cut. Use the same method, and of course be conscious of each area that you do and be sure to not miss a single spot, because when you coat it with a protective wax, glaze or clear coat it will jump right out at you. Waxing or coating always exaggerates any faults. And will show up anything that you miss.

If you are going to use a lacquer, Clearcoat or glaze you should now be ready to apply it. I must admit I have a liking for polysyloxenes as they give u.v. protection and do not deteriorate as rapidly in my experience as clearcoats or laquers. Polysyloxene is a liquid glass as it's often called. It bonds excellent with the piece and gives a very beautiful protective finish, as well as being easy to apply. You can find it at automotive and marine outlets in various forms.

NICKEL, For some reason responds incredibly well to Coca cola, then wipe it over with the #9 curators choice, a little bit of work rubbing it in and WOW! Beauty is in the eye of the beholder they say, but nickel has something a little different to chrome, it blazes in the sun.

STAINLESS STEEL. Not too many antiques have stainless on them yet, though it is often retrofitted to boats, and soon there will be a lot of it about being the boaters metal of choice these days. It is also very popular on the big rigs. Stainless does not really oxidize unless it has been overheated in polishing, then it will rust out badly, it does however get grey and hazy, this is the disruption of the surface ions, I spoke of earlier, light scratching and pit marking caused by road grit on trucks. Because it is stainless we need to use a chromium oxide based polish, (Not necessarily a chrome polish, that may be different again).

Our #6 fits the bill perfectly, and has carnauba wax to enhance the finish. We can afford to use carnauba wax in this case, because it cannot attack stainless(unless it has been overheated, of course)This will make it glow!

Polishing Stainless Steel, Monel, Titanium And other Hard Metals.

Stainless Steel, Monel and Titanium are hard metals. You can forget many abrasives when working with these metals. Most of them just break down when confronted with these metals. There is only one way to go. Use and abrasive as tough as what your up against. That means Stainless Steel abrasive. One of the greatest risks when working with materials this tough is over heating. Over heating will not only warp your item, but if it is tempered you will break down the tempering and soften the surface. If your work piece is stainless steel you may cause it to release many of its oxides and carbon. Then it won't be stainless any more and will rust like ordinary steel. In the event that you encounter this problem wipe it over with a "Burn Paste". This is available from most metal working/welding supply outlets, and is an acid, which will reseal the wounded area. We then have to neutralize the acid but smothering it with sodium bicarbonate to prevent etching.

If you have a finished product that you are trying to maintain a mirror finish on at least 95% of hand polishes are a big no, no. Most of them will do no more than clean the surface at best, and at worst they will make it hazy by leaving light scratches in the finish. This is because they cut a little and loose their edge in rapid fashion. The polish must be a stainless steel or chromium oxide abrasive to do anything. There are some calcined aluminuates that will do a great finishing job, but they are purely for finishing as they are so fine they have little cutting power, and they are not intended to. With most stainless, monel, etc, Hand polishing is pretty much a waste of time. English Custom Polishing is one of the few manufactures of liquid polishes that will cut these metals, but be prepared for slow going. If you a trying to do any more than clean up a

mirror finish which is in good shape, forget it unless you have power tools. With a fabrication you cannot use abrasive compounds and buff wheels to remove machine or grain marks from manufacture as you can in aluminum or other softer metals. You have to cut with the correct tools. I like the unitized wheels, belts and discs. I don't like to Bandy about trade names but sometimes one company has the product, in this case I must say I like to use the Norton Avos system for my coarser cutting. These are discs with holes in them, The holes keep the disc cooler, which of course helps to keep the job piece cool. And you can see through them as you work. I use the 7" discs when ever I can as these are more stable than the 4". When you have a large area of course it's time to use belts for straight line stability. Unitized belts and wheels will give you a reasonable finish, but still leave you a long way from that perfect mirror. Your next step has to be with a smoother cutter, again wheels or belts, using 600 through 1000, and 1600 grit. The abrasive on the belt or disc should be stainless or chromium oxide, if you wish to cut at any kind of speed. These operations will result in a pretty nice finish. It is important that at every stage you remove all signs of the previous cut, which up until not at least will be easily visible. From here on in it will not be quite as easy as the finish comes up to your mirror. Now it is time to buff wheel.

The first cut should be done with a good heavy stainless compound, almost always black, and a good stiff buff wheel. At English Custom Polishing we find the pleated reinforced canvas is best as it carries plenty of abrasive, is stiff enough to put it down on the piece, and has a degree of flexibility for irregular shapes. The cut should be done in consistant straight lines of course and when finished will leave quite a nice, even, and gritty mirror.

The next two stages should consist of a medium stainless abrasive and a fine one. The medium cut should be done with a pleated mill treated buff. These are still quite stiff and do an excellent job. The fine cut should be done with an untreated canvas buff. The medium and fine stainless compounds tend to vary in colour, depending on the manufacturers dyes.

Each cut should, where ever possible, cross the previous one at 90 degrees. This will show up any marks left in from the previous cuts. Only when all marks are gone are we ready to proceed to the next cut. Once you are satisfied with your final stainless cuts it is time to move on to a good quality chromium oxide. Chromium is what gives stainless steel its brightness, so when we use a chrome oxide it is the perfect compliment and really brings your mirror up to an outstanding finish. Use a good quality linen buff for this operation. Now you should really have something worth looking at. The finishing touches are about to be done.

We do a final cut with a top quality calcined aluminate. These are superfine abrasives which are quite hard, but very, very light cutters. That will do no more than remove very slight surface imperfections, and really bring the mirror to its ultimate lustre. This cut should be done with a very loose linen or cotton buff. If you like carnauba, here's your chance to use it to its full effect. Carnauba will not hurt these metals as long as it is removed every 12 months or so. Apply your carnauba, by hand. Make sure that not a single piece is uncovered and give it a few minutes to dry.

Once it has dried on the workpiece buff it off with a domet flannel buff.

The more you buff the brighter it will get. I mean brighter! Call your friends, fire up the barbeque, pour out the beer and hand out the shades.

You are now ready to show them you work!
CHROMIUM. Often used in hot environments, most polishes will go grey when heated. If the polish has regular waxes, or enhancers in it , it will probably dull as soon as the tempurature of the item exceeds 125 degrees C. Hot environment polishes only for this situation like our Metal Restorer for the rougher pieces and our Hot chrome for the finer pieces. If it is a bumper however or something of that nature then finish with Hot Chrome. Chromium is basically a metallic clear coat and should not be covered with waxes. They detract from the clarity of the reflection and increase sun damage, pitting, and increase deterioration rate. Chrome plating is a two, or sometimes three or even four stage process. Triple plate chrome is normally Nickel, Copper, Nickel then Chromium. Yes, it actually has four stages of metal plating. The metals plate under stress. Particularly the nickel. When it becomes old it can crack and reveal a goldish patina in the metal. This is the copper base. This cannot be polished out. It's coming towards time for rechroming.
Waxing chromium is completely pointless. Always use a wax free polish.

Preparing surfaces for the chrome shop.

Well, the first thing it has to be clean, clean, clean.
Unless you want to pay a lot of extra money you'll remove any paint, clear coat or lacquer, before you send it to them. They will charge you the hourly rate to remove it. With powder coats and some paints, they earn it too.
If you want to save on the chroming and have the tools and skills you can do so by polishing the piece out. Now bear in mind you have to get to around 1200 grit finish for a good result and 2000 grit if you want it to really, I mean really look nice.
If we are polishing aluminum or stainless for show we normally buff from 600 grit. For show chrome we like to get to 2000 grit and then buff the copper, and then you have one hell of a finish. With aluminum you can have an awesome finish from a 2000 grit finish and just have nickel, chrome, with steel giving it a layer of copper only enhances the finish.
Your finished surface must be perfectly flat. Any wrinkles or ripples, will be magnified by the chrome. BIG TIME!!
If you use good quality belt equipment and are going to buff the copper stage you can Stop at 800 grit and get a nice finish, but this will be no good for plating with an industrial plater, and you will see lines in the finish, because he won't use the copper. For a show plating shop it will work, as long as you will pay for them buffing the copper. By the same token, get your work up to 2000 grit finish and practically any plating shop can plate it and give you beautiful results. If it's a show shop, all the better.
ALUMINUM, My favourite metal of all, you can always do something with aluminum. Not too much around on antiques, YET! There will be! Remove severe oxidization, acid and salt stains with Greasy Joe and maybe an application of Metal Restorer. Use the lightest grade abrasive you can. I normally start my cutting on an over the road truck with Truckers Blend, unless it is really bad. I finish my aluminum the same as I would silver or gold, especially on show trucks, then I use polishes with carnauba waxes to finish, like Showmans or Custom Blend. When you get the aluminum to a fine enough quality to use these polishes, it will look like chrome. Of course, if it is a

museum piece, I use Museum or Curators Blend. If it is a cam cover or something similar and having to tolerate heat then I will finish with our Hot Chrome Polish.

Anodized aluminum

Anodizing can be removed very easily from aluminum, if the pieces are off your vehicle of course, by the application of oven cleaner. It must contain sodium hudroxide. Spray it on, wait 15 minutes and wash it off. If your aluminum is thin you might want to rinse of after 5 minutes, but on most types of auto trim 15 minutes is fine. The aluminum will be white, if it still bright after the rinse, then it is still anodized. Do not leave it hours or the sodium hydroxide will eat your aluminum, which is exactly why you shouldn't use a lot of polishes that are out there. They eat your aluminum, and brass come to that. Either way, once the surface is white it can be easily buffed out by hand or machine to a nice mirror. Removing the anodizing will normally remove around 95% of the scratches. If you want to stay factory you can have it re anodized, you can polish it, chrome it, brass or even gold plate it. Take your pick.

Polishing Aluminum Wheels

This article will help you to get the best results out of cleaning and polishing your aluminum wheels. But first, if they are magnesium alloy (mag alloy) you can forget the polishing bit. I don't care what any other polish manufacturer tells you. Magnesium is white and will not polish. If any one tells you they have a mag alloy polish, it's an aluminum polish. Your mag wheels will come clean with a wash, and if you have used an acid or they are oxidizing you can clean them and remove the oxides with polishes if you wish, but magnesium doesn't shine.

If you are using liquid polishes or pastes be sure that they do not contain ammonia or anhydrous chemicals, they are detrimental to your workpiece.

Ammonia and anhydrous chemicals prematurely age metals, cause tarnishing and rampant re-oxidization, and are used by many manufacturers to attack oxidization. The trouble is these chemicals continue the oxidization process too, and often etch into the metals. Which is even worse. English Custom Polishing does not use anhydrous products but knows of many manufacturers that do. Read the labels and avoid products that do.

Now lets get on with the process.

First move is to take the wheels off. Then you can get to everything. This will allow you to ensure that you can see and reach every part of the wheel. The next move is to remove all road grime and dirt (Good old Greasy Joe will do that and it will prep your surface for polishing). Make sure every part is clean and dry. You need to clean between every stage. So an abundant supply of clean terrycloth is necessary. If the surface of the wheel is badly pitted some of the deeper pits can be removed with a foam painters abrasive pad. Using the finest grade you can buy or about a 400 grit wet and dry paper.

Test your surface first. Go to one of the worst areas and try out a 1600 grit, then a 1200,600 and so on, to ensure that you only use an abrasive as coarse as is necessary. Don't go crazy, you don't want to ruin the face or the balance of the wheel. Be careful not to rock or put gouges into the surface.

A belt file like our Belt its, can get into just about every place on most wheels easily and will also do a good job on the faces.

Keep all of your strokes going in even lines around the rim and straight lines on the faces. After a 400 grit (if that is the stage you choose to begin with) you need to go to a 600,1200,then 1600 grit. Make sure that you remove all signs of the previous cut each time. Where possible this is best achieved by going across the previous cut. If you can see scratches now you will definitely see them when you are finished. If you are using rotary tools you can start using something like the Beartex Avos system, or a non woven wheel of medium abrasive and then go to the fine grade. The bigger the cutter the more stable it will be. I like to use 7" cutters. After this go to the roloc type unified discs working from coarse to 2f fine. Again go for the biggest you can get which at the moment is about 4"diameter. Stability is the biggest problem with these types of tools and it is very easy to wrinkle or gouge the face.

On the rim the Belt its are the best deal being able to put the tool inside the rim with a reasonably wide belt. If the rim is wide, such as on the rear wheels of a semi, these tools are a god send, being able to remove deep pits and polish with the same tool.

A serious point to remember when using abrasives, when a paper such as a 240 grit, that is the average grit. The grit may vary by as much as 50%. Generally speaking the higher the price the more consistant the grit. Quality costs.

If you use quality paper and nonwoven abrasives you can probably buff out from 600 grit, most definitely from 800,and get a scratch free surface, use cheap stuff and you might have to go to 1200 or even 1600 grit to get the same result

Be CAREFUL!

I will use any and all combinations of the above machines and techniques as and when circumstances allow or dictate. Wheels come in so many strange shapes and sizes with slots and ribs. Sometimes it's quite amazing how many variations there are of such a simple thing as a wheel.

Whether you have done this stage by hand or by machine. Most of you will do it by hand. As I often have to because machines are just impractical, to expensive, or actually save no time. You will now be ready to powerbuff (see our page on powerbuffing technique if you need information about this process,) with a good compound like a coarse stainless or tripoli. Many people just go with the tripoli, but I prefer and recommend the stainless. Applied with a very stiff mill treated canvas type buff. This will remove all signs of the previous machine cuts quickly. Here's a little time saver of a tip which makes clean up much easier. When you draw the buff wheel against the direction of its rotation you will see a trail of compound. This is a cutting stroke. A polishing stroke goes with the rotation of the wheel and leaves polish only on the leading edge once you stop. This is a polishing or colouring stroke. So we begin with a cutting stroke and finish with a polishing stroke, which removes 90% of the polish for us. If you are limited to a hand operation use our Metal Restorer and work it hard. You will get beautiful results if you have done your preparation properly, and your mirror will begin to show. Liquid polishes like ours tend to perform better than pastes because they encourage you to use the oxidization that you remove as an abrasive. This means not rolling or turning your applicator cloth as the residue appears, but rubbing it in more and making the residue work for you. Later it will ensure that you spread and work in the waxes and enhancers that will brighten the finish.

This should bring you to the stage which you would want to start at if you have clean, unpitted wheels.
The wheel should be cleaned (again) and all polish removed. Do this by going over it with a clean terry cloth. If the cloth is coming up black, there is still polish on the wheel. If you feel you can begin at this stage ensure that the wheel is perfectly clean before you start. Wash off any grit with a hose pipe then clean and prep the aluminum with Greasy Joe.
We now buff with our fine stainless compound (use a new wheel an) or hand polish with High Performance Truckers Blend.
The hand polishing should be smooth and directionally consistant.
If you powerbuff go round all the corners, holes, valve stems and places you can't get to with your machine with the Truckers Blend and blend it in to match the buffed face again. (If places are hard to get into by all means employ a tooth brush, but wrap the bristles with cloth or they'll scratch your finish.)
It is easiest to do about a quarter of the wheel at a time, and this normally gets the best results. So don't go crazy and do it all in one hit. You'll probably get hazy bits if you do.
Clean it off again and replace your wheel if your powerbuffing.
I know the wheels look beautiful but,
I'm not finished yet and nor are you. I thought you wanted these things brite, well that's nice but its not BRITE!
Do you want to be able to get the attention of a blind man on a stampeding horse after midnight, with a patch over his left eye, and a poke on his right, while he's riding sidesaddle and looking backwards, or what?
Ok. That's better!
Like the title says we're gonna polish them wheels!
Have you got it perfectly clean? now you go over the whole lot with a fine chromium oxide, if your hand polishing your up to our Showman's Blend. Which of course is what we blend the awkward bits with again after machining. But now we also use it on the entire wheel. Wipe it off, and buff the living daylights out of it.
Now are you happy? Pleased with youself? Proud?
Good!
'Cos now we're gonna max it out.!
WHAT!?!
Go Get your shades, Pardner!
*Now, you going to do it one more time, with a superfine aluminum silicate. This compound is super, super fine. Finish with our Custom Blend, I honestly do not know of a finishing polish as fine as this stuff. It is intended for competition quality finishes. The more you buff it the more it shines. If you have a lambs wool bonnet or a canton cotton buff wheel hit it with that. So get down and buff the **** out of it.*
Go on, get a clean cloth and do it again,
Then give it a light misting of good ol' H2O,Yep, water,
A real fine misting with a bottle you'd do windows with. Dry it with the best towel in your house.
If you polished it properly, it won't get dirty will it?!
Buff it again. You can buff it as much as you like. It will only get brighter.

I'm serious, buff it, buff it, and then buff it some more.
Looks glorious.
The Towel?
Yes, I know it's dirty!
Mine always get dirty too!
Guess you owe the wife a new one,
But it was worth it wasn't it?!
Look at that wheel!
Almost a shame to put it back on and get it dirty isn't it?
A final tip?
Stay away from kids with greasy fingers, ice cream or soda.
Oh, if you'd like advice, we're available. Use Tech support or sales.
If you want the results that other have obtained using our products and advise(check out our photo gallery).Use our products too.
We can only advise you on what our products can do, and can in no way vouch for the performance of rival products.
Tips
1,When hand polishing do small areas at a time.
2,Be meticulous about cleaning off before every stage.
3,Use only quality cotton to apply and buff up, and finishing cloths to finish.
4,Take the labels off any cloth you use, They scratch your work
5,Apply and remove polish in straight lines or around rim.
6,Clean your hands before each new stage.
7,Use barrier creams or gloves to protect your skin, goggles if you are powerbuffing to protect your eyes. A particulate face mask is good also when buffing.
8) Avoid skin contamination when powerbuffing. Cover up. Excess aluminum in the system causes brittleness of the bones, loss of teeth, Elzheimers disorder, and I don't remember what else.
9) Every stage is a preparation stage, only the last wipe over is your finish.
10)Perfect preparation prevents poor polishing.

How to polish Aluminum Fuel Tanks, Removing Welds and Resurfacing.

This article is about how to custom polish the aluminum tanks on a semi, but can be used as a reference for just about any aluminum surface of size, and needs to be dealt with in three separate stages, because there can be three phases to depending on how far you are prepared or find the need to go.
1)Flatting and removing welds and resurfacing the tank faces.
2) Powerbuffing the tank faces.
3) hand polishing the tank faces and maintainance.

WARNING!!!!
The first phase " flatting and removal of welds." Is not recommended for the inexperienced and is not a process we approve of unless you are going to go to the expense of having the tank tested and recertified. Once the weld is removed the tank

will no longer be to the manufacturers specification and you (the polisher) may be liable for any losses should the fuel tank fail. These can be horrendous as D.E.P. is normally involved and the removal of contaminated soil and it's replacement is expensive, especially if it is beside a major highway. The vehicle insurance will NOT cover a non conforming tank.
So if you should ever do this job, get the owner to sign a disclaimer in which he
1) Assumes total respomsibility
2) Agrees to recertify the tank.
If you fail to do this you will be considered responsible by D.E.P.
You are the professional polisher.
It is your responsibilty to be aware of these things.

1) Removing the welds and resurfacing.
firstly the tank should be cleaned thoroughly, we recommend our Greasy Joe for this task. Greasy Joe will attack and breakdown all the road grime that gathers on the underside and also prep the surface. With its mild etching action it will actually make the aluminum brighten up easier, and will of course help prevent your belts from becoming clogged with dirt.
Once you have rinsed of the Greasy Joe ensure that you are able to access all the areas you need to work with out restriction.
On most aluminum tanks the weld is in from the end of the tank by ½"up to 2 inches, and the end of the tank is actually a cap, which is welded onto the main tank.
Inspect the weld to ensure that it is higher than the tank surface and that they are no low spots. Low spots cannot be smoothed out as you may break through the weld.
Also ensure that if the weld is a joint between two sections of tank that both sections are level. You can get some ugly angles if the tank is uneven. This is often the case on top and side seams that run the length of the tank.
If you are satisfied that the tank is suitable then you can go to work.
The best tool for weld removal is the Belt it. Or a similar quality belt file. Normally the ½" belt is wide enough. 30 or 50 grit being the best place to start.
On end cap seams, you should begin at the top of the tank, start the tool before you come into contact with the weld,and draw the bottom of the belt files end wheel down the weld, being careful not to rock left or right.
Move down the tank fairly quickly so as not to remove too much weld.
Only make the amount of passes necessary to begin the weld flatting operation,
Stay proud of the sides.
Swap your belt for an 80 grit and bring down the height of the weld some more, repeating the process with 120 and 180 grit.
By now your weld should be quite wide and flat. Using a 240 grit belt bring down the weld until the edge of your belt scratches are just marking the face of the tank.
Now it is time to change tool and go to the Band it, or a good quality bladder wheel. Use a 320 grit Band and still starting at the top, again start the tool before you touch the tank and draw it down the weld, it should be also resurfacing the edge of the cap and the tank.

We draw the tools down the tank as it is easier to be consistant with our rate of movement than going with the direction of the belt.
Now swap for 400 grit and blend in the weld and the area around it as necessary.
If the tank has machine marks or pits take them out using the bandit and the 400 grit band.
We do this by starting at the top of the tank at one end and draw the tool from top to bottom. Move over a fraction under the width of the belt and work in this fashion from one side of the tank to the other.
Once this operation is complete go around areas such as cap or fuel line inlets with the Belt-it using also 400 grit paper.
In order to get a really nice finish repeat the process with 600 grit and finally 800 grit if you want a superb scratch free finish.

Now you are ready to go onto the second phase powerbuffing

How to power buff Aluminum Fuel Tanks

This article is about how to custom polish the aluminum tanks on a semi, but can be used as a reference for just about any aluminum surface of size.
2) Power buffing the tank faces.
If you are commencing with this stage we recommend that you prepare and clean the surface by spraying it with Greasy Joe, this will not only remover oil, road tar and grime but Greasy Joe also has a mild etch that will assist with the overall polishing of the surface.
Start with a Mill treated Canvas buff wheel and you of course need a buffer with a speed of around 3500 rpm if you are using 8 inch buffs and up to 5000 rpm if you are using 6 inch buffs.
Ensure that you have read our article on power buffing and begin at the top of the tank using our coarse stainless compound.
Apply the compound to the buff wheel in a safe manner and proceed left to right. When you have covered about 18 inches of tank (This is normally round the first tank strap) drop down about ½ inch and work your way back. There should be a thin trail of compound behind the buff. Drop down another ½ inch and repeat the process. When the thin trail of buff begins to disappear add more compound to the buff. Do not try to polish with a dry buff, the finish will end up inconsistant and hazy.
After you have done around 1/3rd of the tank section go back to the beginning and repeat the process with out compound on the buff. This will push the compound trail down, and you will see a shine beginning to appear. Continue this down to just below where you stopped before.
Raising the buff at least 1 inch up the tank, reapply compound to the buff and begin you left to right sweeps, dropping down ½ inch with each sweep again unti a further 1/3rd of the face is done. Go back, to above your last starting point, and push down the compound trail, again.
Now do the lower section of tank using the same process.
Oce you reach the bottom I recommend going back to the top and doing one more final cutting stroke covering the complete area. This will push the compound all the way to the bottom and leave you with quite a nice looking tank.

Now beginning at the bottom we begin our polishing stroke, working from left to right, and back up the tank, in one steady process. This should leave the tank looking quite bright and with a reasonable mirror.
The polishing stroke should remove just about all the surplus compound.
Now using our metal restorer, blend in by hand the areas you were unable to access with your machine.
Move onto the next section. I reckon ½ the area between the straps is enough. If they are long tanks split it into 3.
And don't forget the straps. They need polishing too.
Swap the buff wheel for another mill treated canvas wheel and using our fine stainless compound go through the entire process again.
You will see the aluminum take on a chrome like colouring as soon as you hit it with the yellow compound. Most people say "WOW!" as soon as they see this compound at work. Your aluminum will really begin to give you a bright mirror as you go through the program with this compound. Use our High Performance Truckers Blend for the hard to get at areas.
Doesn't it shine?
Awesome!
Well we're not finished yet!
The title did say Custom polish aluminum tanks.
Now we go over the whole area again using either a soft flannel or plain canvas buff and a real good quality chrome oxide.
Did somebody tell you that they do a tank in 45 minutes?
Well we're already about an hour and a half to maybe 2 hours into the operation if you have been doing the whole tank properly.
Once you have done the tank and blended the hard to get at areas using our showmans blend go over the whole tank using the showmans blend by hand. Applying and removing in straight up and down lines.
Now you'll have an awesome looking tank.
If you really want to stand out hand polish the tank again using our Custom Blend. However, pleease remember that these polishes are super concentrated. Do not apply a lot of Custom Blend or you will find lines appearing in you work.. These are rpllpes that you put into the wax as you buff it. So remmber. As little as possible.
Then your rig will really gleam

How to hand polish Aluminum Fuel Tanks

Hand polishing the tank faces.
If you are commencing with this stage we recommend that you prepare and clean the tank first with Greasy Joe to remove road grime oil and tar, and also to take advantage of Greasy Joes mild etching action which makes the oxidation looser and the tank easier to polish.
Begin by applying our metal restorer preserver to your aluminum tank. Only a small amount is required, though remember to allow for it soaking into your cloth. Start in an upper corner of the tank and begin with small overlapping circles. This will disrupt any surface oxidization and allow the polish to really work at it's best. You will find a

dark residue appearing. As this residue thickens, start to rub it in straight lines either up and down or across the tank. The residue will begin to come off and dry out.
Much of the residue will be absorbed by the cloth.
Do not try to polish too much at once.
Restrict yourself to an area of 4 X 4 inches or 6X6.
Get this area to the standard you want before going onto the next.
Once you have completed a full section of tank, apply a little polish to your cloth and using straight lines go over the whole area.
As residue dries buff it out and bring up the best finish you can.
Use a clean cloth to ensure whole area is free of residue.
Now do next section.
You should be able to polish the entire tank in this fashion in about 45 minutes.
Ensuring that all signs of metal restorer are removed go to the high performance truckers blend. This is our general purpose aluminum polish designed particularly for use on the trucking metals, aluminum, chrome and stainless steel, and is a rapid cutting but high lustre polish.
Again, do it section by section.
This time apply and take off in straight lines crossing your cut made with the metal restorer at 90 degrees or right angles. This method will enable you to see scratches left by the metal restorer that you couldn't see before. You have to remove every one.
Again as the polish dries out, remove it and buff with a clean cloth.
You will find that you really are beginning to get a nice mirror if you have done the job properly.
Again ensure that all signs of the truckers blend are removed.
Stand back and grab an eyeful.
Pretty, Huh?
Well we're still not done!
Grab a new cloth, our Showman's blend and do it all again, square by square, section by section, going across the cut of the truckers bled (to show you the scratches) until the whole tank is beaming.
Now do a final buff using our finishing cloth. That's the one in the polish.
By now you should be wearing shades, have tired shoulders and an awesome looking rig.
Pardner, Your ready to ride!
Now if your going to a show, get there at least 4 hours early and go over everything with an application of our Custom Blend.
Use only the minutest amount.
Buff it, buff it and buff it.
It'll only get brighter!
Collect your trophy and send us the pictures!

Tips
Clean everything before you start.
You can help prevent rain and water spots after polishing by spraying the tanks with a very, very light misting of water and as it dries buffing out again.

This makes the waxes seal themselves and helps prevent the watermarks that so often appear.
Always ensure that ALL residue is removed before going onto the next step or final buffing.
Cloths used in final buffing should be spotlessly clean, Before and AFTER buffing. If it comes off dirty, buff again.
Many polishing cloths are supplied by idiot manufacturers who know nothing about polishing. They merely supply cloth. Remove all labels and stickers from polishing and buffing cloths. Avoid all sewn edges on cloths unless sewn with cotton.
Don't try to polish in direct sunlight, it evaporates solvents before they can work, dries slip enhancers and hardens waxes. In other words, it's harder work.
If you want to get the results that other customers display in our photogallery, follow our advice and use our products. This is not because other products won't work.
It is because we match our products with the correct abrasives, enhancers, waxes, etc. and the task they have to do.

FINAL ADVICE:
PREVENT INJURY, You can never be over protective of eyes. The are easily damaged, wear goggles or a full face mask at all times when using power tools. Should you be unlucky enough to get something in your eye, DO NOT RUB. If it is abrasive or chemical that is bad enough. Should it be a burr you could develop serious problems. Check substance, if chemicals or abrasive particles, flush out with plenty of water. If it is metal and will not flush out or has obviously penetrated any part of the eye or surrounding tissue, protect from light and seek immediate medical attention.
SKIN CONTAMINATION can be avoided by using barrier creams, light or surgical gloves, and by just being careful. Should you use cotton gloves, remove them immediately any chemicals soak any part of the glove. Do not allow chemicals of any nature to stay in contact with the skin. Excessive exposure to any kind of chemicals is bound to result in a skin reaction. Respiratory problems can be caused by not only chemicals in the polishes, but also airborne metal particles. Inhalation of either is not particularly good for the body, Particulate Breathing masks should be worn at the very least when power buffing, and an extractor system in use to ensure rapid exchange of air. This should be fast enough to carry airborne particles out of the work area. All polishing should be done in well ventilated areas, never in the proximity of a naked flame if the chemicals are flammable. Which is the case in most polishes. If you are powercutting or buffing aluminum in a restricted area, watch out for the risk of dust explosion.
ALWAYS CHANGE BAGS IN DUST COLLECTORS WHEN YOU CHANGE METALS.
IF YOU USE A SHOP VAC. EMPTY IT EVERY TIME YOU VACUUM.
Airborne aluminum dust is VERY EXPLOSIVE! Rare as it maybe, it does happen. Especially when allowed to mix with steel and iron particles.
Again, good extractors eliminate that problem.
ALL METALS IN LARGE AMOUNTS ARE DETRMENTAL TO HEALTH! WASHING OFF.
I'll say it again.

NEVER, EVER, wash off with solvents, mineral spirits or alcohol. They are all absorbed by the skin. They can all induce shock and can lead to a collapse of the internal organs when absorbed in large quantities. Use soap, use a pumice if necessary. Nothing else. If you have a laquer or clear coat on your skin it will wear off. A little mineral spirit or alcohol dabbed on the hands should do no serious harm, when it comes to removing splashes, but never wash off with them.
Oh, I almost forgot. Better remember to put out your cigarette (if you smoke) Before you tip alcohol or thinners all over yourself, and Don't take a big old puff in a shop full of airborne particles. Having witnessed a dust explosion many years ago, I can tell you that the power was awesome. (Several people were killed.) Aluminum is especially dangerous when in heavy airborne concentrations. It is unlikely you would survive.

CARS `N` TRAINS,TRUCKS`N`PLANES,
EVERY TIME I POLISH
IT BLASTED RAINS! (Murpheys Law for Polishers)
It's a fact, every time you polish the car, truck, bike, whatever, it rains.
Ignore the T.v. it doesn't matter what the forecast is, you could be in the sahara, but it will rain. Don't forget to seal the surface. Spray it lightly with water and rebuff it to the max. Then when it does rain it won't eat up your polish job or leave nasty watermarks all over it.
If you are unfortunate enough to get your polish job all finished up and then have a rainfall in the overnight, next day or whatever, Don't worry, just towel it off as soon as the rain stops. In the event that it dries up and you have a few watermarks, never fear. Spray a light mist of water over your finish dry and rebuff. OLE'! Good as new.

Polishing, restoring and preserving Automotive and Marine Paint Finishes

We polish an awful lot of trucks, cars, boats, motorcycles, etc., and often are asked to do the paint. Paint is not our speciality, We use over the counter products and still get great results.
There are three stages to a good polish job.
Washing,
Polishing,
Waxing or glazing.
We have tried most combinations of products available on the market and have a couple of favorite products that give great results, are readily available, and are quite cheap. We have found Japanese clay to give great results, but it is slow. The procedure here gives just as good a result and has saved many very badly sun damaged and neglected paint jobs, on cars, semis and boats.
First the finish must be washed with the cheapest, wax free commercial wash, about $1.99 a gallon.
Rinse off first to remove any surface grit.
Use a regular soft foam sponge and plenty of clean water. Make sure no grit is on the vehicle.
Apply plenty of soap and splash it about. The soap is the lubricant that allows your sponge to lift the finer dust with out scratching the paint job.

Next we towel the finish dry, use a soft towel and remove any labels.
Also remove labels from any cloths that you are going to use. They can scratch the finish.
Once we have a clean surface to work with we apply the polish.
We use terry cloth applicator pads.
Our favorite polish is Ultrafinish, it is fast, economical and gives a beautiful finish on any good paint job.
When that is not at hand or we have a rougher finish to contend with we go over it with Meguires#2. Using a terry cloth pad we apply the polish in a circular motion and then once we have covered a small area, maybe 6"X6" we go from left to right, This ensures that we have covered the area completely. We then do another area of similar size.
Then we go get our 8" buffer. We like the eight inch for this job as it gets into tighter areas than the ten inch. You can keep doing this by hand until the area is as clean and polished as you want, or you can speed it up a bit with a machine. We first put a foam bonnet on the buffer and then we cover it with a terry cloth bonnet, applying a dab of polish to the bonnet , we then go over the polished area and buff the polish in to ensure that everywhere gets a decent polishing. This will remove all of the old wax and grime in the paint or clearcoat. We do this over and over until a large area is polished, we then remove the terry cloth and foam bonnets and replace them with clean ones and remove the polish with the buff. Using a clean terry cloth if you are doing it by hand. On a good paint job we might then go over it with the ultra finish. That really flats the paint and makes it awesome. The beauty of the paint stands right out.
Once we have clean buffed the whole area to a nice finish we wipe over the whole thing by hand with Daiper cloth. This removes little pockets of polish and wax that we may have missed and gives a touch more lustre to the paint.
Then we go for the wax or glaze. We use microcrystaline waxes on museum pieces and carnauba on show pieces. We use Meguires #3 carnauba and a terry cloth pad to apply the wax in exactly the same fashion as the polish, circles first, then left to right preparing small areas at a time then merge the areas together with a buffer using foam and terry cloth. We keep moving and buffing until it stars to dry out then we replace the terry cloth bonnet with a clean one and remove the polish. We will use several bonnets in the removal of the polish and enlist the help of the 10" buffer for polishing the larger areas. This will also have a foam bonnet under the terry cloth. Once the whole thing is bright and glaring we go over it again with a perfectly clean bonnet and then with a diaper cloth. The penultimate stage is to lightly mist the wax with water in a plastic spray bottle, and buff it again with the diaper cloth. Then we fit a lambs wool bonnet to the machines over a new foam bonnet and buff the whole thing again. If you are hand polishing you complete this stage using a fine turkish cloth or diaper cloth. This helps seal the wax and prevent water stains.
A waxed finish will deteriorate according to how much sun exposure it gets, how much wind and grit it is subject to, how humid the weather is and how much variation there is between day and night temperatures.
The best way to tell when your wax job wants redoing is by the little blotches or droplets of water. When the droplets are small, say the size of a dime, your doing o.k. When the drops are bigger, ponds the size of a quarter. Then it's time to get to it.

When you wash off use the same cheap commercial wax free car wash. Stay away from machine washes. Don't use wax washes.
If your paint is antique and in protected conditions use a microcrystaline wax instead of carnauba to protect the finish.
In boating applications Dolphinite seems to do a pretty good job
It may seem like a lot of work but in actual fact it takes about twice the time of a wax job and looks ten times better.
We have tried polysiloxenes, silicates, and various other wonderful inventions and creations and so far found nothing that is brighter than carnauba. It doesn't have to be Meguires, that is the brand we know and use. Basically the whiter the paste, the brighter the shine. Carnauba varies from a slight yellow to a quite deep brown. Polysiloxenes do last longer but are not as bright.
We do not pretend to be experts with paints. This is just what works for us and has won a few trophies for some of the drivers. If you know of better products, time savers, or just damn good looking finishes let us know by contacting polisher@englishcustompolishing.com**.**
Only too pleased to try something new if it improves our finish or saves us time.

THE FLOUR!! I nearly forgot to mention the flour!
O.K., So you've got a tank that's badly pitted, can't sand it. Got a Brass Eagle with loads of lines for the polish to sit in and go black, or white lines where the coach lines of your car body meets and you can't get those blasted white lines out.
Flour!
Apply more polish or wax, rubbing over the cursed area and making sure it gets into exactly where you don't want it. Then while its moist daub it with flour. Blow the flour out with an air gun or brush it out with a soft bristle brush. (NO NYLON!)
Metal, paint, it's all the same.
Clean!
No more ugly lines!
Check it out.
You can use it to speed up a polish job on tanks too.
But remember you get to clean the flour up after too.

WHEN DO I STOP?
Well you stop when you are pleased with the finish you have got. You can become a total perfectionist if you like, and just keep on polishing it for the sake of polishing it. We've got polishes as fine as 1 micron if you want it.(that's 40 millionths of an inch to those who want to look clever .) But there's no real sense in getting anywhere near that fine on a polishing job unless it's for show. Of course there are those amongst us who just do it any way. That's what you call polishing for the sake of polishing. Then it gives you a little something extra. It takes you into another dimension. That's when what you find peace and joy in the reflection!
Who said Zen was nothing to do with it?

Visit English Custom Polishing at the website www.englishcustompolishing.com

BACK PAGE

A detailed guide to all aspects of Metal Polishing and Metal Polishes. For use by: Metal Finishers, Museum Curators, Antique Restorers, Show and Custom Truck polishers, House wives, Hell's Angels, Businessmen, Politicians, Glamour models, Shamen, Gurus, Nuclear Physicists, and to cut a long list short, aspiring, inspired, and devoted Zen Buddhists.

This booklet will take you from a raw fabrication or casting to a beautiful mirror finish.

From a tarnished and blackened piece of trash that nobody wants, to a gleaming, blazing antique that people admire and drool at the mouth for.

From a dull and oxidized, old road dog of a bike, car or truck, to a gleaming hunk of engineering perfection.

What ever you may want to polish, there is something here for every one.

Tips and tricks of the trade, polishes you can make at home, and some very important what not to do's, that will save your antiques, and maybe even you.

A guiding light into the world of metal polishing.

A place where you might reflect on Nirvana, yourself, and polished aluminum, Brass or whatever.

And if it makes your life easier,
then so much the better.

Finally let me apologise for not being able to inform you as to the performance and uses of other brands of polishes.

Not only because it would be unethical to criticize other brands,
but we never have the need to use them,
and we want to sell you ours anyway.

You can see how well others have done using our advice and products by visiting the photogallery at www.englishcustompolishing.com