

Troubleshooting

(www.ceramicdecals.org)

The Definitive Guide to Decal Problems and their Remedies

Fixing a Problem – General Advice

Keep in mind that all decals are made with china paints (Overglaze Color is the technical term). That means you can...

- Paint more china paint on top of it and re-fire.
- You can also remove color with “Gold Off” (an acid-etching paste).
- You can also re-decal on top of the problem decal with an identical decal. (This usually doesn't work out very well. You will still see the problem area)
- You can re-work the decoration using another technique like Layering or All-Over (see the Gallery)

I recommend trying the “Gold Off” first. If the color comes off satisfactorily, you can china paint or re-decal the area. If the decal has been fired hot (eg. Cone 015), the “Gold Off” probably won't do the job. It would probably be best to china paint the offending area or perhaps highlight it with gold. (Gold is opaque, you know.)

Forget about firing the decal off. A glaze firing (Cone 06 or hotter) will just fade certain colors and leave the rest, and, as the color pigments begin to ‘migrate’ out into the molten glaze, the details and edges of the design will soften. (Sometimes this doesn't look so bad. See In-Glaze decorating in the Gallery.)

Firing Problems

(Mounting Problems are treated last. See below.)

Fading / Dull Colors

Color appears washed out or not as strong as on prior firings

Remedy:

- > Too Bad!
- > Fire a Cone cooler the next time you use that decal
- > Make sure you were not using a glass decal
- > Possibly put an identical decal overtop and re-fire

Cause: Either your kiln overfired, or you bumped into one of those families of colors that like to fade.

Comments: Oh well, that's life! While you can re-fire a decal at a hotter Cone, you can't re-fire a decal at a cooler Cone. Either try to figure out a way to finesse a different technique onto the piece (like 3-D Layering or adding china paint), or, possibly put an Identical decal overtop of the fired decal and fire again. If you do this,

the design will appear heavier (because you basically have two coats of color instead of one), but if it is a stand alone piece, it probably won't look so bad. If it is a part of a set of pieces... give up. Make another piece, and give the overfired one to a friend.

'Halo' Effect

After firing, there appears to be a slight shadow around the edge of the decal which corresponds to where the covercoat ended

Remedy:

- > Fire a Cone hotter, or,
- > Sand off the halo with scouring powder or 280 mesh sandpaper
- > Use distilled water in the future
- > Always wipe down your ware with clean water before mounting
- > Slow fire in the future (this is the best solution)

Cause: Inorganic impurities in the water.

Comments: Most tap water has traces of iron and dissolved minerals in it. Usually the residue of these is fired away during the normal course of a decal firing. But if fired too fast or fired not hot enough, these Impurities don't have time to burn off and remain on the ware, semi-attached. Re-firing will get rid of them. Sanding them off will get rid of them. Even Gold-Off will get rid of them. Sometimes just a wet rag will get rid of them. But an ounce of prevention is worth a pound of cure. If you're in an area that has particularly hard water, use distilled water to soak your decals in. Also, wipe down your piece with clean water to remove any dust or dirt that might have settled on it. And lastly, slow fire. This 1) gives the covercoat time to burn off thoroughly; 2) It safely takes you through the Quartz Inversion Temperature (1063°F)(573°C)(Don't worry about what this is. You just fire slow.); 3) It promotes a uniform temperature throughout the kiln; and 4) It gives those impurities a chance to burn away completely. Good ventilation also promotes volatilization (burn-off resulting from heat and air).

[Question: "But, sir? Aren't iron and minerals inorganic? How can something inorganic burn away, sir?" Good question, Private! The inorganic compounds found in tap water are not "fluxed" like the inorganic compounds used in China Paints. (A Flux is anything that is used to soften the glaze so that the color will melt into it. Most fluxes in decals are powdered glass.) Because the inorganic compounds in tap water are unfluxed, they volatilize away during the firing, unless there is a heavy concentration of them in the water.]

Matte / Flat Finish

Colors don't look shiny or does not have a smooth feel

Remedy

- > Fire a Cone hotter
- > Fire slower

Cause: Under firing (temperature of the kiln is too low).

Comments: Maybe you kiln fired a little too cool. Maybe you heated too quickly or cracked the lid right after the kiln shut off (you're supposed to leave that lid closed for 2 hours minimum after the kiln has shut down). Maybe you fired your decals with your gold at Cone 018 and put your decal pieces in the bottom of the kiln (where it is cooler). It really doesn't matter. Your decal is underfired. NO PROBLEM! Just put it back into the kiln and fire it again, presumably hotter.

Sandy Feel

Design feels a little like sandpaper after firing

Remedy:

- > Vacuum kiln regularly
- > Fire a Cone cooler the next time you use that particular glaze
- > Take some 280 mesh sandpaper or scouring powder, and lightly sand down the roughness (stop if glaze begins to scratch)

Cause: Typically this from free-floating ceramic dust in the kiln, or, a soft glaze (like some greens) that picks up clumps of color in the decal or catches the dust more easily.

Comments: Some Glazes are soft and respond differently to a decal firing, leaving a sandy or rough texture. Firing the decal one Cone cooler on that glaze usually works.

Also, just for good housekeeping, run a vacuum attachment around the inside of your kiln on a regular basis. Fire brick deteriorates, kiln wash gets crushed to powder, bisque sometimes has a powdery residue (called 'slurry') if not sponged down after cleaning the greenware. Whatever. Your kiln gets dirty, and this kind of dust won't fire away but will float around in your kiln and sometimes attach to your pieces. So vacuum your kiln once in a while.

As for sanding down the roughness, china painters do this all the time, but they are sanding on a harder porcelain finish. Test your hobby ceramics to see how easily the glaze will scratch. Discontinue if it appears that it will scratch too easily.

Chipping

A portion of the design chips off or flakes off, like an egg shell off a hard boiled egg, only thinner

Remedy:

- > Contact the company that sold you the decal

Cause: 100% of the time this is caused by a coefficient of expansion problem.

Comments: If you understand how sometimes a glaze won't "fit" a piece of bisque because the bisque and the glaze expanded (and contracted) at different rates, then

you'll understand how (once In a blue moon) this will happen to a decal. I've seen this once in my life (A Christmas tree decal wouldn't "fit" a certain china plate).

Now you'd think that this would happen more often since sometimes greenware can have hard spots (aka. Hot Spots) in different places which also makes the glaze somewhat harder in those areas. But this rarely happens to the extent that it affects the decal firing, so don't worry about it. Just know that if you are ever privileged to actually see a fired decal that chips off, it is because the decal didn't match the expansion and contraction of the glaze it was being fired on.

FYI: Sharp fractures (ie. chips that look like broken Christmas tree ornaments) occurred during the cool down period; whereas shattered, but still attached to the piece, happened during the heat-up. (It will look like you put the decal on a Krackle Glaze.)

Crawling

A specific color of a design that pulls back or frizzles a lot (aka. 'Roll-up')

Remedy:

> Contact the company that supplied you with the decal

Cause: Combatant Colors

Comments: Once in a great while, you may get a 'bad' decal. What has happened is that a particular color in the decal is "having an argument" with a particular color in a glaze. When colors fight and frizzle with each other, these are known as 'Combatant Colors'. This is rare, but it happens. (A long time ago, I remember that a 'brown' in an Italian decal just wouldn't work with an American Beauty satin-tone ivory glaze.) The reason this is so rare is that the colors in European decals are carefully selected for broad spectrum application. Since a manufacturer of an Open Stock decal doesn't know where his decal is going to end up, he selects colors that will work with the greatest variety of glazes and bodies.

Note, decal colors don't 'go bad', any more than china paints go bad. This is because that they are inorganic (which basically means ground-up minerals, metals, and glass). If a decal is 'bad', it was bad from the beginning.

In lower quality decals, the colors sometimes get contaminated before or during the printing process from organic and inorganic dust particles floating around the printing room. With better companies, the press room is environmentally controlled for temperature and humidity, and is very clean.

When carbon (organic dust particles) becomes imbedded or mixed in with (contaminates) a color, the result is slight frizzling in that one color (since almost all ceramic decal printers print only one color per day to allow sufficient drying time between colors).

Now non-color specific Roll-up can occur in two other cases.

First, if the edges of the decal haven't been squeegeed down well. This seldom happens EXCEPT when a decal has been peeled up to be relocated or has to be peeled up to have foreign matter removed from underneath. Then it often happens that the decal doesn't want to go back down like it was before. If this happens to you, just remove the decal completely, rub it around on the slick side of the wetted paper it came off of, and re-apply it. What you have done is picked up some more of the glue from the paper and transferred it to the decal, so that it will stick to the ware. Newsflash: Without that glue your decal will never stick to the piece (which is essential for it to fire correctly).

Second, if the piece has grease or oil on it, this will sometimes manifest itself in crawling colors. Oil (and grease) react differently to the presence of water than do other impurities. They repel and encapsulate it, making it take longer to dry. Moreover, even when once dry, grease and oil are no friend to ceramic color. When your kiln is firing, they must burn-off as well. And when they do, the color that was on top crawls. But that won't happen to you, right? We assume that you are cleaning your ware like a good little scout, yes?

Two Identical decals that don't fire Identical

Remedy:

- > Place on the same shelf in the kiln when firing
- > Promote air circulation in the kiln
- > Slow fire
- > Make sure that the decals are from the same company

Cause: Temperature differences in the firing chamber

Comments: Ceramic colors change when fired. A ceramic color is chosen for use in a particular glaze or a china paint because it will turn out a certain hue at a certain temperature. In glazes, the change is often profound. In decals and china paints, the change is usually more subtle. (Altho some families of colors, like pinks, oranges, and yellows are more susceptible to temperature variations.)

Your kiln, especially if it is a big one, can have up to a two Cone temperature difference between the top and the bottom when firing decals or gold (the top is hotter, the bottom is cooler).

When you set 2 pieces that have been decorated with the same decal on different shelves in the kiln, you are firing them at different temperatures whether you like it or not. Normally this is not a problem, except if you have one of those fickle families of colors mentioned above. Then your decals will look different depending on where you set them in the kiln.

Ideas for creating uniform temperature:

- The best one (and most expensive one) is to get a Down-draft Kiln Vent. They're great! They almost single-handedly make the temperature uniform from top to

bottom, and, provide much needed air circulation for covercoat bum-off, fume removal, and color maturity.

- Plan B is to: 1) Keep your peep holes open during the entire firing cycle; 2) Put decal pieces on the same shelf, and; 3) Raise and lower the temperature slowly.

Re: Decals from different companies - There are more than a few “copies” of other companies’ decals floating around the market place. In the Industry, we call them “knock-offs”. To the uninitiated, they look the same, but a closer examination will show that they are not. Always use the same company’s decals when using a particular design. This is a good way to avoid unpleasant surprises.

(And lastly, lest we forget, be sure that all the heating elements in the kiln are working properly, and, don’t over pack your kiln with pieces to be fired.)

Pinholes

Spot(s) that fire away, leaving a hole in the design.

Remedy:

- > Always wipe down your ware with clean water before mounting
- > Squeegee thoroughly

Cause: Usually, but not always, this is from an air bubble or water bubble was left behind during mounting.

Comments: This is easy to do, but is also easy to spot (if you tilt the piece so that the light reflects off the decal). If any portion of the color of the decal is not in direct contact with the piece before it is fired, the portion not in contact will fire away during the ‘bum off’ of the covercoat. And what doesn’t fire away, tends to bunch up around the edge of the ‘crater’ of the pinhole.

Also, if too much dust has settled on the piece before mounting, this dust tends to get under the decal, and prevents the color from being in direct contact with the piece. By wiping down the piece with clean water, you eliminate most of the dust, plus you leave a thin film of water on the ware which makes the decal easier to slide around and position when you are mounting it.

When squeegeeing, you start lightly from the center of the decal, stroking outwards towards the edge. As the decal becomes more firmly mounted, you stroke harder. This removes residual water and bubbles. A ‘Decal Squeegee’ is very handy for doing this, but you may also use a silk sponge, or a Kleenex, or a paper towel to squeegee with. (One person I know swears by cloth baby diapers... unsoiled, of course.) Just make sure that you have squeegeed very thoroughly, taking time to examine the decal in the light to check for air/water bubbles.

Pitting

Tiny depressions all over the piece, not just the decal

Remedy

- > Properly fired bisque
- > Follow manufacture's instructions for firing the glaze
- > Toss the piece

Cause: Air bubbles coming up thru the glaze.

Comments: This is not a decal firing problem. It is a glaze/bisque firing problem. Trapped carbon and air (and remember, all carbon and anything else organic must be fired away in each and every firing) in underfired bisque will start to burn off at anything over 600°F. If the bisque was fired too quickly or underfired, carbon (and air) still remains in the ware and will come out to say "hello" at various undesired times. Maybe it will do it after the glaze firing. Maybe it will do it after the over-glaze firing. Who knows. But just like Murphy's Law, you will see it when you least desire it. Sooo... bisque your hobby greenware to at least Cone 04, if not 03, buy bisque from reputable local sources who will replace with no questions asked, and apply and fire your glazes according to the manufacturer's specifications (the instructions may look simple, but don't deviate from them). Note: If the pits are just in the decal decorated area, this is still a glaze problem. They just manifested on the decal because the fluxes (softening agents) in the decal allowed the glaze to release trapped air and carbon thru the softened areas. Another Note: Pitting is different from Pinholes. Pinholes are just on the surface and feel slightly rough. Pits are tiny sunken areas and are smooth to the touch.

Voids

Large sections of the decal that fire away (aka. 'Blow-outs')

Remedy:

- > Always Squeegee thoroughly
- > Allow 24 hours to dry before firing

Cause: This is a sneaky problem that is usually caused by squeegeeing too lightly.

Comments: What has happened is that a 'film of water is left under the decal. Because it is a large area, it is easy to overlook when one is examining the ware for the much smaller air and water bubbles. So what happens is that the whole area that has too much water under it fires away.

This is why you should squeegee progressively harder as the decal becomes more firmly mounted. You will even see the residual water that is being pulled out from under the decal as you continue to squeegee. This is also why manufacturers recommend a 12 to 24 hour drying period before firing. This allows for even more water to evaporate, and so, provide insurance for a decal that might not have been tightly mounted.

By the way, this is why you can't mount decals on 'Krackle Glazes' (unless you surface prep with a product like Apt-II), because the water soaks through the cracks and is impossible to get out from under the decal except by a lengthy drying period (days and days). When fired, that water turns to steam and blows out the decal.

Frizzling

A large area of the design that is rough and 'etchy'

Remedy:

- > Always Squeegee thoroughly
- > Allow 24 hours to dry before firing

Cause: This is related to the 'Voids' problem described above, wherein a film of water has been left behind.

Comments: In this case the culprit is usually from firing too soon after mounting, rather than not squeegeeing hard enough, and very often happens to those who 'fast fire' their decals. Even a little bit of water can have an effect on a decal that is being fired because of the violent transformation of water into steam at 212°F (100°C). So guess what happens when a film of water, even a very thin film, is left behind? Snap, crackle, pop... all over the areas where the water film is. That's why we let the decal dry for a while, even when firmly mounted; so as to get as much water out as possible.

Now I'll also mention 'Fast Firing'. When you burn off a covercoat too quickly (say, in an hour or less), especially with a recently mounted decal, you invite trouble, usually in the form of frizzling. Carbon burn-off takes time. Carbon can even hang around in a poor ventilated kiln and re-attach to the covercoat as it is softening and burning off. Don't be in such a hurry. (Unless you are firing glass decals, then be in a hurry. But also make sure that your glass pieces have had plenty of time to dry. 24 hours minimum.)

Scumming

Colors appear dirty, as if they came out of a bad dishwasher

Remedy:

- > Re-fire at a hotter Cone
- > 'wring out' your kiln

Cause: Impurities in the firing chamber that have built up over time

Your kiln is a sponge. It soaks up organic fumes and chemical reactions every time it fires. Like a sponge, it can only hold so much before it gives some back. The result is "scumming", and is especially noticeable on golds. The solution is to 'wring out' your kiln by high firing it to bum off these residues that have built up. Since most people use their kilns to bisque fire as well as decal fire, this is not really an issue. However, for those people who only use their kilns for decals, gold, or china paints, it is an issue. So, maybe once every 6 months, 'wring out' your kiln.

Straight Line Cracks

A crack in the design that goes right down to the glaze

Remedy:

> Aw, Shucks!

Cause: You already had a micro-crack in you glaze before you applied the decal. The decal firing just made it bigger.

Comments: Why? Because your glaze didn't 'fit' your bisque to begin with. This is the most common reason for cracked or 'crazed' glazes. What to do? In the future, make sure your bisque is fired to the recommended Cone specified by the color company, and don't cheap-out (or over-do) with the glaze application.

'Brown' pinks I Dull Reds

- Brown decals that are supposed to fire pink, but stay brown
- Reds that are supposed to fire bright red, but come out dull or dark

Remedy:

- > Fire a Cone hotter (for brighter pinks)
- > Promote air circulation in your kiln (for brighter reds)

Cause: Brown pinks and dull reds are actually unrelated problems.

> A 'brown' pink didn't get enough heat to turn pink.

> A dull or dark red was starved for oxygen.

Comments: Pink is one of those colors that will change its hue depending on how hot it is fired. Cooler = Browner; Hotter = Brighter Pink (altho if too hot, it will fade a little bit). I recommend a Cone 017 for pinks. At this Cone you usually get nice pinks without endangering your fleshtones and yellows (which are always the first to fade).

With reds it is a question of air, not heat. Reds like air. The more fresh air that a red gets, the better it likes it. (This is also true for red glazes too.) Want a bright red? Set your piece about 2" from an open peep hole and it will be the brightest red it can be. Actually, many colors need air to mature properly. This is why leaving those peep holes open for the complete firing cycle is advised. (For glazes too.) PS- Don't over pack your kiln either. This inhibits air circulation and heat distribution.

Scratch or Wipe off the Design

Self explanatory

Remedy:

> Good News! Just re-fire the ware at the proper Cone

Cause: Altho there are exceptions, it is usually because your kiln has underfired.

Comments: Ceramic decals won't fuse at lower than their intended temperature. Furthermore, and this is important, decals must be fired hotter if applied to 'harder' ware.

Recommended Cones:

- Hobby Ceramics and Terra Cotta: Cone 018 to 016
- China, porcelain, and stoneware: Cone 017 to 014

And here's where it gets tricky. There's no one "all-purpose" one for hobby ceramics. Decal manufacturers recommend a 'range of temperatures', not a specific Cone. This is because some people want a shiny, glassy finish, (and so fire hotter), while others want more depth (and so fire at the normal temperatures).

The two exceptions are In-glaze Decals and Glass Decals. In-glaze decals were meant to be fired at Cone 06 or hotter. (Don't worry. In-glaze Decals are not generally available to the public.) An underfired In-glaze Decal is rough to the touch, though it doesn't scratch off. This is because it is made from underglazes, and so must be brought up the glaze firing temperatures before it will melt into the glaze. A Glass Decal was meant to fire and fuse at Cone 022. If fired hotter, it fades significantly (sometimes almost disappearing). And, of course, there's always the possibility of mistaking a non-firing decal for a ceramic decal (which disappears when fired).

Squiggles and 'Odd Spots'

A squiggly line or peculiarly shaped pinhole

Remedy:

- > Wipe down your piece with clean water before mounting decal
- > Keep your decal water fairly clean

Cause: Squiggles> A hair got under your decal when you were mounting it
Odd Spots> Foreign matter got under the decal during mounting.

Comments: It is very easy to forget that your water tray accumulates lint and debris while you are decaling. Often bits and pieces of other decals float around in the water, like sharks, waiting to sneak underneath a decal that you are applying. Happily, these are as easy to spot as water and air bubbles. Unhappily, you usually have to peel back the decal to remove the offending speck, and then hope that the decal will squeegee back down without a hassle.

I recommend changing your decal water every so often, and, if you see a particle floating around on top of the water, pick it out. I also recommend that you trim around your decal with a pair of scissors before you soak it in the water, maybe ¼' from the edge of the covercoat. This will help prevent loose scrapes from neighboring decals (that were on the same sheet of decal paper) from being put in the water and floating off the paper to cause you trouble later.

Tight Wax Paper

The wax paper, which frequently comes with a decal to protect it, does not want to separate easily, but instead, sticks to the decal

Remedy:

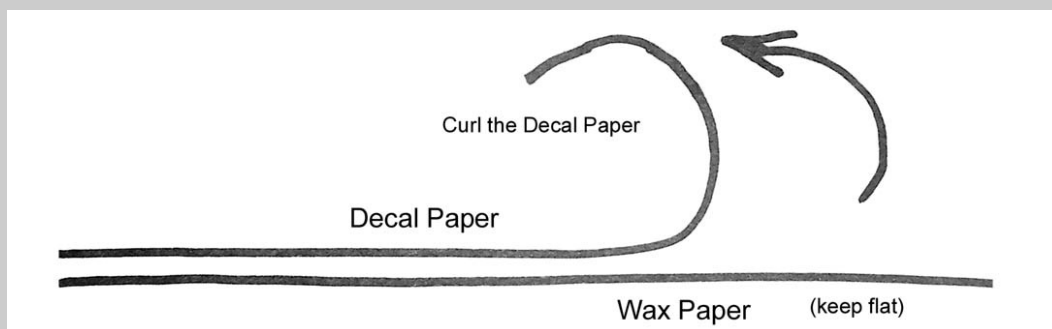
> The Reverse Curl' (see below)

Cause: Tight wax is caused by storing decals under too much pressure or in too much heat or both.

Comments: All wax paper must be removed from the decal before soaking it in water. What do you do if the wax won't come off easily? Some people try to coax it off a little at a time. Some try to slide a pencil in between. I do the Reverse Curl'. (I learned this from a decal manufacturer.)

1) Turn the decal face down on a flat surface.

2) Holding the wax paper against the flat surface with one hand, curl back the decal with the other hand. Go slow.



This works amazingly well. If any traces of wax paper remain on the decal, just moisten your fingertip and scratch them off with your fingernail.

Won't Release from Paper when Wet

As described

Remedy

- > Try warmer water
- > Scratch the 'hot spots' on the back
- > Throw away decal

Cause: Melted wax from the wax paper is impregnated in the paper.

Comments: If a decal with a wax paper slip sheet is stored in too hot a place, the wax melts and becomes impregnated in the paper. When the decal is put in water, the melted wax repels the water and won't let it soak through the paper to allow the decal to release. These spots of melted wax are called 'hot spots'. (This is Decal Lingo and not to be confused with the Hot Spots found in greenware and bisque.)

For the most part, these decals are no good anymore. But for diehards like me, there are still a couple things that can be tried.

- Use warmer water. This sometimes softens the wax and allows the water to pass thru.

- Turn the decal over and scratch the white spots with your fingernail.

What you are doing is massaging the water into and thru the hot spot. Often the decal will finally release, but instead of sliding it off the paper, you'll have to peel it off (don't reverse it by accident).

Hot Spots are the #1 cause of ruined decals bought at the ceramic shows. Unsuspecting people buy their decals, take them out to the car, throw them in the back seat... on a sunny day... and guess what? So keep those decals in the shade when traveling.

Brittle Decals

When ready to mount, decal wants to pull apart and crack

Remedy:

- > Toss decal

- > Try very warm water

Cause: Old decals

Comments: While the colors in a decal don't age, the covercoat will. Covercoats are composed of organics and plastics (so that they will burn off). These can become stiff over the years, especially if not stored properly. So when soaked in water, instead of being pliable, they crack and come apart. Very warm water is a good idea. It can have a rejuvenating effect on old plastic and organics.

Commercial decorators sometimes use products like Butyl-Cellosolve

(Ethylene glycol monobutyl ether) in a 1% to 3% water solution. But this is because they want to reclaim a brittle decal, not because they want a short cut to easier decal decorating. In fact, it takes longer when products like this are used because you must let the decal dry longer to allow the chemical to thoroughly evaporate out. Moreover, Butyl Cellosolve is a toxic chemical to which prolonged exposure can result in liver and kidney damage, anemia, and behavior problems (alho it is not nearly so dangerous once mixed with water). Bottom line, it is a good rescue solution, but not a good production solution.

In days past, you could buy liquid covercoat and spread it on top of a brittle decal to save it. Frankly, I haven't kept up with who still has this for sale.

Disintegrates in water

Decal breaks apart when put in water

Remedy:

> Contact company that sold you the decal

Cause: No covercoat or too thin a covercoat.

Comments: This can happen to the best of companies, altho I rarely see it. The covercoat is the last thing to be printed. It is always done on a silk-screen press. Sometimes a sheet gets mis-fed in the press, or, the level of the... goo (I don't know what they call the covercoat when it is still in liquid form.) gets a little too low on the screen, and you get a pass or two that doesn't leave enough covercoat on the decal. So, when you go to soak the decal, it breaks apart or dissolves.

This seldom happens in the better decal companies, because each sheet is inspected after each pass through the press. Renegade sheets are usually caught and so never make it to the public or the commercial decorator.

Sometimes a company gets cheap and uses a finer mesh screen to print the covercoat with. This leaves a thinner deposit, and so uses less covercoat. It may lower the price of the decal, but it makes them harder to work with. A decal with a little 'body' is generally to be preferred.

Won't Stick to Ware when Mounting

As described

Remedy:

> Peel the decal off the ware, rub it around on the slick side of the paper it came off of, and remount.

Cause: Not enough glue on the underside of the decal

Comments: Don't leave decals in the water too long. When you do this, the decal will separate from the paper and float on top of the water while the glue underneath washes away. You need that glue (So never let your decal float in water.) That's why, if you rub it back around on the paper it came off of, you can pick up more glue, which will make it stick to the ware like it should.

Now there are two other ways to encounter this problem. The most common one is to re-position the decal too much. I know that it's fun to slide a decal around on a piece to position it and get it just right. But if you slide it too much, you won't have enough glue left to make it stick. Then you'll have to peel it off again and so on.

The other less common circumstance is that a decal manufacturer used a cheaper paper to print on which didn't have much gum to begin with. (Decal paper is basically a water absorbent paper with a coating of dried gum on one side.) This is rare with European decals, but some American and oriental decals do use cheaper paper. Cheap paper doesn't mean they won't work, it just means you can't play with them as much.

Hard to Stretch when Mounting on Curved Surfaces

As described

Remedy

- > Warm water
- > Possibly warm the piece to be decorated
- > Make cuts with a razor blade (as a last resort)

Cause: You are putting a 2 dimensional object on a 3 dimensional surface (a theoretical impossibility).(Welcome to the world of decals!)

Comments: Depending on the manufacturer, most covercoats will stretch and conform to curved surfaces very easily, while others stretch very little and are hard to make conform. The All-Time Best Idea to make a decal more pliable is to use extra warm water to soak the decal in. Because heat tends to make most covercoats soft, the warm water both warms the covercoat and makes the decal release from the paper more quickly.

In fact, the warmer the water, the more pliable the decal (altho after 135°F, the decal tends to stretch too much and distort). This same principle is behind warming the piece before it is to be decorated. It keeps the warmed decal warm, and so stays easier to stretch. Also, a judicious slice with a razor blade can often be just what the doctor ordered. When I go to decal, the three things I always have ready are warm water, a razor blade, and a squeegee.