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NO-NONSENSE GUIDELINES TO STAIN REMOVAL

We all know what a stain is, right? ... Or do we ...

Let's start by saying that a stain is a discoloration. So far, so good.

The fact is, however, that not all discolorations are stains. Let's take, for example, a piece of fabric. Fabric is typically absorbent; therefore if we spill some liquid onto it, the material will **absorb** it. If it's only water, we'll have a temporary stain. In fact, once it dries the fabric will go back to its original colour (plus, maybe, some mineral deposit can we can just brush away), but if we spill some coffee, or cooking oil on it we will make a stain, because the fabric will **absorb** the staining agent and change its colour in a permanent way, unless we do something to remove the agent from the fabric.

On the other hand, if we spill some bleach on the same fabric we will still have a discoloration, but it can hardly be defined as a stain, because it's actually a permanent **damage** to the dye that originally made the colour of the fabric.

When it comes to natural stone we are, once again, dealing with stains and "stains."

All stones are, more or less, absorbent. One may say that diamonds and many other gemstones are **not** absorbent. That's right, but those particular gemstone are not actually what we call dimensional stone: it's in fact made of one crystal of one single mineral. All other (less noble) stones are the composition of many crystals, either of the same mineral, or of different minerals bonded together. The "space" in between these molecules of minerals is mostly what determines the porosity of a stone. That said, what's next is the fact that the porosity of stones varies greatly, and so does, of course, their absorbency. Some of them are extremely dense; therefore their porosity is minimal. What this translates into is the fact that the absorbency of such types of stone is so marginal that – by all practical intents and purposes – can be considered irrelevant. Some other stones present a medium porosity, and some other ones – at the very end of the spectrum – are extremely porous. Because of their inherent porosity, many a stone will absorb liquids, and if such liquids are staining agents, a true stain will occur. Consequently ...

A true stain is a discoloration of the stone produced by a staining agent that was actually **absorbed** by the stone. Moreover, as a good rule of thumb with no-known exception that I can think of, a stain – a true stain – is always darker than the stained material. If it is lighter, it's either a mark of corrosion (etching) caused by an acid or a caustic mark

(bleaching) created by a base (a.k.a. alkali). Therefore, if a stain is lighter or of the same colour but duller, it is never a stain, but a "stain".

A "stain" is something that has nothing to do with the porosity (absorbency) of the stone: It has instead to do with its natural chemical makeup. It is still a discoloration, but – like with the example of the fabric and the bleach above – it's actual **damage** to the stone surface. All those "stains" that look like "water spots", or "water rings," are actually marks of corrosion (etches) created by some chemically active liquid (mostly – but not necessarily limited to – acids) which had a chance to come in contact with a stone that turned out to be sensitive to harsh chemicals. All Calcite-based stones such as marble, limestone, onyx, travertine, etc. are sensitive to acids; therefore they will etch readily (within a few seconds). Many a slate, too, will etch, and so will some sandstones, and even a few "granites" that instead of being 100% silicate rocks, are mixed with a certain percentage of minerals sensitive to pH active substances.

Now let's see what to do to remove stains and "stains."

How to Remove a Stain – The Poulticing Method

Definition of a Poultice.

What's a poultice? It is the combination of a very absorbent medium (it must be more absorbent than the stone) mixed with a chemical, which is to be selected in accordance with the type of stain to be removed. The concept is to re-absorb the stain out of the stone. The chemical will attack the stain inside the stone, and the absorbent agent will pull them both out together.

It's intuitive that while the absorbent agent can be the same all the time, regardless of the nature of the stain to be removed, the chemical will be different, in accordance with the nature of the staining agent, since it will have to interact with it.

The absorbent part of a poultice could be (in order of the writer's preference), talc powder (Baby powder), paper-towel ("Bounty" or "Viva" are the best), and diatomaceous earth (the white stuff inside your swimming pool filter) for larger projects.

Consumers can also find so-called "professional poulticing kits" at a local tile and marble retailer. It is the opinion of this writer that they are nothing but a marketing gimmick. In fact, very few true professionals ever use any of them! Not only are they expensive, but more importantly, they are limited to removing only the type of stains the kit's chemical agent is designed for. Everybody – with no experience whatsoever – can make their own homemade poultice, which will be just as good as the "professional kits" (if not better!) Moreover, the consumer will purchase the (easy-to-find) chemicals that will be deemed right for the task at end.

As we said before, the chemical must be selected in accordance with the nature of the staining agent. There are five major classifications of stains:

1. **Organic** stains (i.e. coffee, tea, colouring agents of dark sodas and other drinks, gravy, mustard, etc.)
2. **Inorganic** stains (i.e. ink, colour dies, dirt – water spilling over from flower and plant pot, etc.)
3. **Oily** stains (i.e. any type of vegetable oil, certain mineral oils – motor oil, butter, margarine, melted animal fat, etc.)

4. **Biological** stains (i.e. mildew, mould, etc.)
5. **Metal** stains (i.e. rust, copper, etc.)

The chemical of choice for both **Organic** and **Inorganic** stains is **Hydrogen Peroxide** (30/40 volumes, the clear type – available at your local beauty salon. The one from the drugstore is too weak, at 3.5% = 10 volume volumes). Sometime, in the case of ink, Denatured Alcohol (or rubbing alcohol) may turn out to be more effective.

For **Oily** stains our favourite is **Acetone**, which is available at any hardware or paint store. (Forget your nail polish remover: some of them contain other chemicals, and some other ones contain no acetone whatever.)

For **Biological** stains, one can try using regular household bleach, but we recommend our **MB-9**. It represents a much more complete and effective formulation for these kinds of stains, not to mention that's rate safe on any natural stone.

For **Metal** stains, our favourite is a white powder (to be melted in water), which is available at fine hardware stores all over the country under the trade name of "Iron-out."

How to Prepare a Poultice and Use It to Remove Stains.

Now that we have all our ingredients, we can prepare the right concoction to remove the stain at hand.

**WEAR RUBBER GLOVES ALL THE TIME,
WHILE HANDLING CHEMICALS!**

If you've chosen talc powder (baby powder) as your absorbent medium,

1. You mix it – using a **metal** spatula or spoon – in a glass or stainless steel bowl, together with the chemical, to form a paste just a tad thinner than peanut butter (thin enough, but not running.) Now you have made your **poultice**.

If you're attempting to remove a metal (rust) stain, first you melt the "Iron-out" with water – according with the directions written on the container – and then you mix it with an equal amount of talc powder, adding water if it turns out to be too thick, or talc if it's too "runny".

2. Apply the poultice onto the stain, going approximately ½" over it all around, keeping it as thick as possible (at least ¼".)
3. Cover the poultice with plastic wrap, and tape it down using masking tape.
4. Leave the whole thing alone for at least 24 hours, and then remove the plastic wrap.
5. Allow the poultice to **dry thoroughly!** It may take from a couple of hours to a couple of days or better, depending on the chemical. **Do NOT peek!** This is the phase during which the absorbing agent is re-absorbing the chemical that was forced into the stone, together (hopefully) with the staining agent, and you do NOT want to interrupt that process!
6. Once the poultice is completely dry, scrape it off the surface of the stone with a **plastic** spatula, clean the area with a little squirt of our **MB-5 Marble, Granite & More Spray Cleaner**, then wipe it dry with a clean rag or a sheet of paper-towel.

If the stain is gone, your mission is over! If some of it is still there, repeat the whole procedure (especially in the case of oily stains, it may take up to 4 or 5 attempts!). If it didn't move at all, either you made a mistake while evaluating the nature of the stain (and

consequently used the wrong chemical), or the stain is too old and will not come out, or it was not a stain, but it was a "stain" instead.

If you decide to use paper-towel instead of talc powder, make a "pillow" with it (8 or 10 fold thick) a little wider than the stain, soak it with the chemical to a point that's wet through but not dripping, apply it on the stain and tap it with your **gloved** fingertips to insure full contact with the surface of the stone. Then you take it from the point 3 above.

How to Remove a "Stain"

We already established what a "stain" is. It's obvious that if you keep thinking "stain" just because those "weird things" look like stains (water spots, or rings), you're misleading your thoughts, because you would automatically research in the database that you have in between your ears for a solution pertinent to stain removal that, of course, would turn out to be totally useless. Now the question is: "How do I remove a chemical etch-mark, which, as seen, is not a stain but a surface damage?"

You don't!

In fact an etch mark can be effectively compared to, and defined as, a shallow chemical scratch. A scratch is something missing (a groove), and nobody can remove something missing. It would be like trying to remove a hole from a doughnut. The only thing one can do is to eat the doughnut, and... the hole is gone! Same thing with a scratch: One must actually remove whatever is around the groove, down to the depth of the deepest point of the scratch.

We're actually facing a full-fledged – though small in size – stone restoration project!

Can you, average Mr. or Mrs. Homeowner handle the task?

The answer is: Maybe.

If it is polished marble or travertine or Onyx, then there's hope. If it is hone-finished marble or travertine, or hone-finished slate (like a chalk-board), it should not be a problem (more on this later on); but if it's mixed "granite", then you'd better hire a professional stone refinisher. If it's a cleft-finished slate (rippled on its surface), than nobody can actually do anything about it, other than attempting to apply a good quality stone colour enhancer, such as our **MB-6 Stone Colour Enhancer**.

Concentrating now on the case of polished marble or limestone or travertine or onyx, if the etch is severe (deep to the point that it looks and feels rough), then you do need a professional stone refinisher. But if the etch is light (the depth is undetectable by the naked eye, and it looks and feels smooth), then there are a few polishing creams or powders, available to the do-it-yourselfers that are user-friendly enough to be handled by just about everybody. Just follow the directions on the container. It is a fact that, to the best of our knowledge, we've been the first company to market one such a product, **MB-11 Polishing Compound for Marble** (since 1992. Its latest version is a powder) that actually works quite well without requiring the experience of a pro and no specific tools, other than a piece of terrycloth.

Finally, we may have a combination of a stain with a "stain". For example, if some red wine is spilled on an absorbent polished limestone, then the acidity of the wine (Acetic acid) will etch (acid burn) the surface on contact, while the dark colour of the wine will stain the stone by being absorbed by it. In such a case, first you remove the stain by poulticing (Hydrogen Peroxide), and then you repair the "stain" by refinishing the surface.

In the case of etch-marks on hone-finished stone surfaces, such as marble, travertine, limestone, etc., this is what you have to do:

All you need is some good old metal grade sand-paper. You can use it by hand, but you'd be better off if you had a small hand-held orbital sander to use it with (**never** use a belt-sander). Hit the etch-mark with a 120 grit to start with, and then follow up with 240 and 400 grit. (Or maybe the 240 will do.) Never apply too much pressure; just moderate to light. This will usually get a result pretty close to factory finish. If it doesn't, don't worry too much: a few weeks of foot traffic will take care of producing a perfect blending. Don't be happy with a few strokes: work each grit intensively and make sure to widen the area you're working on of at least 1" all around each grit up.

If the stone had been sealed with an impregnator, it may need to be sealed again in the areas you worked on.

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Leading the way and always one step ahead!

You can expect that from us!^(R)

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Stain Removal Basics

Marble, granite and natural stone are more or less porous materials. This porosity is why it stains so easily. It is also why stains can be removed. All that's needed to remove a stain is to reverse the staining process. In other words, the stone has literally absorbed the stain and we simply re-absorb it into a different material. This different material is what we call a poultice. A poultice can be made with powdered whiting and hydrogen peroxide or a chemical reducing agent depending on the nature of the stain. Whiting is sold in most paint stores. The poultice should be made and applied as described for removal of each particular stain.

Poulticing Materials:

I have found that most stains can be classified into one of the following categories:

- Oil-Based Stains: Grease, tar, cooking oil and food stains.
- Organic Stains: Coffee, tea, fruit, tobacco, cosmetics, etc.
- Metal Stains: Iron (rust), copper, bronze, etc.
- Biological Stains: Algae, mildew, lichens, etc.
- Ink Stains: Magic marker, pen, ink, etc.

There are, of course, other materials that will cause staining. but these five categories are the most common.

Applying the Poultice

Once the stain is identified, the following steps can be followed:

Wet the stained area with distilled water. Pre-wetting fills the pores of the stone with water isolating the stain and accelerating the removal by the chemical. Prepare the poultice. If a powder is to be used, pre mix the powder and the chemical of choice into a thick paste, the consistency of peanut butter. In other words, wet it enough so that it does not run. If a paper poultice is to be used, soak the paper in the chemical. Lift the paper out of the chemical until it stops dripping.

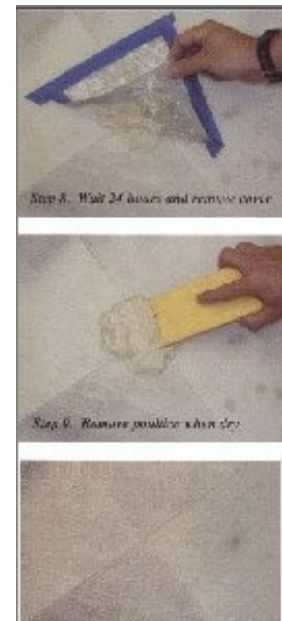
Allow the poultice to dry thoroughly. This is a very important step. The drying of the poultice is what pulls the stain from the stone into the poultice material. If the poultice is not allowed to dry, the stain may not be removed. Drying usually takes from 24 to 48 hours. Remove the poultice from the stain. Rinse with distilled water and buff dry with a soft cloth. If the stain is not removed, apply the poultice again. It may take up to five applications for difficult stains. Some chemicals may etch marble and limestone surfaces. If this occurs, then apply polishing powder and buff with a piece of burlap to restore the shine.



Poulticing Powders:

Clays (Attapulgate, Kaolin, Fullers earth) Talc Chalk (whiting) Sepiolite (hydrous magnesium silicate) Diatomaceous Earth Methyl Cellulose Clays and diatomaceous earth are usually the best. Do not use whiting or iron-type clays, such as Fullers Earth, with acidic chemicals. They will react with the material, cancelling the effect of the poultice.

Many stains are so deeply imbedded that the poultice alone will not be completely effective. Some type of chemical solution will need to be added to the poultice. When the poultice and chemical are applied, the chemical is absorbed into the stone. The chemical reacts with the stain and is re-absorbed into the powder/material.



Stain Removing Chemicals

How do you choose the proper chemical for a given stain?

First, you need to identify the stain. This is the most important step in stain removal. If you know what caused the stain, you can easily look at a stain removal chart for the proper chemical to apply. If the stain is unknown, then you need to play detective. Try what caused the stain. If the stain is near a plant container, it might be that the plant was over watered and the soil has leached iron onto the stone. The colour of the stain may help to identify the cause. Brownish colour stains may be iron (rust) stains. The shape or the pattern of the stain may be helpful. Small droplet size spots leading from the coffeepot to someone's desk are a sure giveaway. Do some investigating and use your powers of observation. This will almost always lead to the identification of the cause of the stain.

If, after thorough investigation, you still have no idea what the stain is, then you will need to perform a patch test. A patch test simply means applying several chemical poultices to determine which will remove the stain.

One way to reduce the amount of staining on any stone surface is to make sure it is sealed with a good penetrating sealer or impregnator.

Stain Removal Guide

Iron (rust) - Poultice with Oxalic Acid + Powder + Water. May also try a product called Iron-Out (available at hardware stores). Both mixtures may etch polished marble, so re polishing will be necessary.

Ink - Poultice with Mineral Spirits or Methylene Chloride + Powder.

Oil - Poultice with Ammonia+ Powder Methylene Chloride can also be used on tough oil stains.

Coffee, Tea & Food - Poultice with 20 percent Hydrogen Peroxide + Powder.

Copper - Poultice with Ammonium Chloride + Powder

Paint (water-based) - poultice with a commercial paint remover + Powder

Paint (oil) Poultice with Mineral Spirits + Powder. Deep stains may require Methylene Chloride.

Please use extra caution when handling all chemical listed above.