



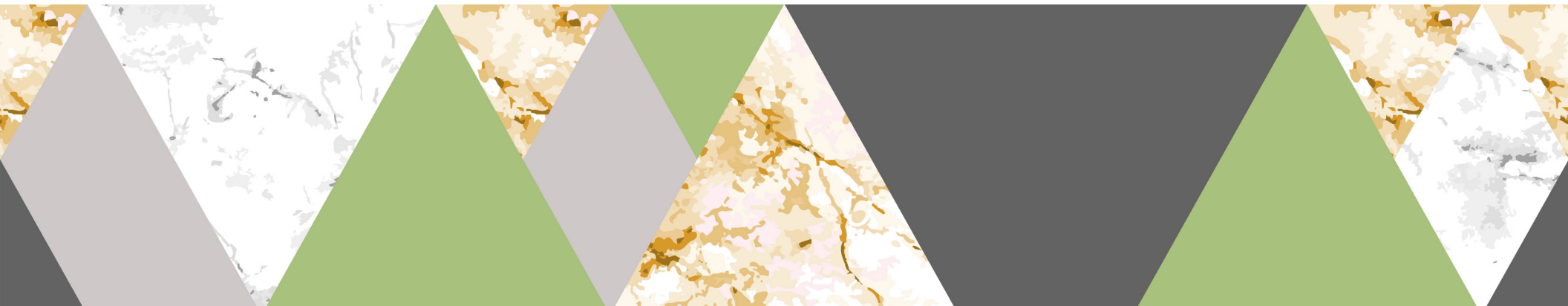
Caring for Your Natural Stone Surfaces Guide

foreword

Natural stone surfaces are an investment that enhance the environment of your home, office or commercial building. The beauty of these natural stone surfaces are an enjoyment that, given the proper routine care and maintenance, should last for many generations.

This guide outlines routine cleaning guidelines (in accordance with the Marble Institute of America and The American Society for Testing and Materials International) to help you develop procedures for maintenance and necessary stain removal.

The American Society for Testing and Materials International (or ASTM) has developed globally recognized standards for cleaning of exterior dimension stone, vertical and horizontal surfaces, new or existing—known as the ASTM C1515-01 and is available for purchase from many online sources.



identification

Know Your Stone

Natural stone is classified into two basic categories given its composition: siliceous stone or calcareous stone. It is critical to know the difference when choosing cleaning products.

Siliceous stone is composed mainly of silica or quartz-like particles. It tends to be very durable and relatively easy to clean with mild acidic cleaning solutions. Types of siliceous stone include: granite, slate, sandstone, quartzite, brownstone, and bluestone.

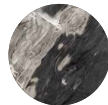
Calcareous stone is composed mainly of calcium carbonate. It is sensitive to acidic cleaning products and frequently requires different cleaning procedures than siliceous stone. Types of calcareous stone include: marble, travertine, limestone, and onyx. What may work on siliceous stone may not be suitable on calcareous surfaces.

Maintain careful records about the type, name, and origin of the stone existing in your building or home. If previous records do not exist, you should explore the following options before determining a cleaning and maintenance program:

- 1. Consult with a professional** stone supplier, installer, or a restoration specialist to help identify whether your stone is siliceous or calcareous.
- 2. Conduct a visual identification** of the stone. While there are exceptions, the following characteristics shown below are common. (Know Your Stone steps continued next page)



Granites have a distinct crystal pattern or small flecks; very little veining.



Marbles are usually veined, fine textured materials that come in virtually unlimited color selections.



Limestones are widely used as a building stone. Colors are typically gray, tan, or buff. A characteristic of many limestones is the presence of shell and/or fossil impressions.



Sandstones vary widely in color due to different minerals and clays found in the stone from light gray to yellow or red.



Slates are dark green, black, gray, dark red, or multi-colored. Commonly used as a flooring material and for roof tiles and are distinguished by distinct cleft texture.

identification

Know Your Stone (continued)

3. Conduct a simple acid sensitivity test to assess if your stone is siliceous or calcareous. You will need:

- 4 ounces of a 10% solution of muriatic acid or household vinegar
- Eyedropper

This test may permanently etch the stone—choose an out-of-the-way area (a corner or closet) several inches away from any mortar joint. Apply a few drops of the acid solution to the stone surface on an area about the size of a quarter. Two possible reactions will occur:

1. Acid drops will bubble or fizz vigorously – a sign that the stone is calcareous.
2. Little or no reaction occurs – stone can be considered siliceous. See note below. Rinse the area thoroughly with clean water and wipe dry.

NOTE: This test may not be effective if surface sealers or liquid polishes have been applied. If an old sealer is present, chip a small piece of the stone away and apply the acid solution to the fractured surface.

CAUTION: Muriatic acid is corrosive and is considered to be a hazardous substance. Proper head and body protection is necessary when acid is used. Again, it is always wise to consult with a stone professional if you are unable to visually identify the stone and/or are uncomfortable using the acid test.

determination

Appraise the Stone's Condition

Determining the condition of the stone is a critical first step. It is recommended that you develop a checklist of questions to use in your routine examination of the current conditions. Your checklist should include questions such as the following:

- Are the tiles flat and even?
- Are there any cracked tiles?
- What type of stone finish exists?
- Has the stone been coated with waxes, acrylics, enhancers, or other coatings? If so, which type and manufacturer?
- Is there an indication of staining? If so, what type?
- If the stone has been sealed with a topical sealer, are there indications that the sealer has worn off?

Keep a checklist of questions
to use in your examination.

Your answers to these and other questions will aid you in identifying your next step. For example:

- Uneven tiles (a sign of lippage) may result in the floor needing to be ground flat, honed, and then polished.
- Cracked tiles will allow dirt and other debris to accumulate in the cracks. This may require that the tiles be replaced, or at a minimum, filled.
- Knowing the type of stain (organic, oil-based, etc.) will help identify the proper stain removal technique needed. Also, the level of stains or spills the stone can be exposed to will play a role in determining if an application of a sealer is appropriate.

determination

Care and Precautions

Guidelines for Both Siliceous and Calcareous Stone Countertops:

Use coasters under all glasses, particularly those containing alcohol or citrus juices. Many common foods and drinks contain acids that will etch or dull a stone surface. This is especially true for calcareous natural stones such as marble, onyx, and travertine. Don't put hot items directly on the stone surface. While many stones can withstand heat, use trivets or mats under hot dishes and placemats under china, ceramics, silver, or other objects that can scratch the surface.

For calcareous stones, many common foods and drinks contain acids that will etch or dull the stone surface.

Flooring Surfaces:

Many flooring surfaces can become slippery when wet. When wet conditions occur, reduce potential hazards by doing the following:

1. Spread carpeted runners from each outside door into lobbies and corridors to help dry shoe soles.
2. Place bright-colored "slippery when wet" pylons on walking surfaces in conspicuous places.
3. Mop or shovel walking surfaces as often as necessary to remove standing water, ice, and/or snow.
4. Issue standard instructions to building maintenance personnel and prominently post at all janitorial workstations.
5. Follow local building and safety codes.

dos & don'ts

Cleaning Dos & Don'ts

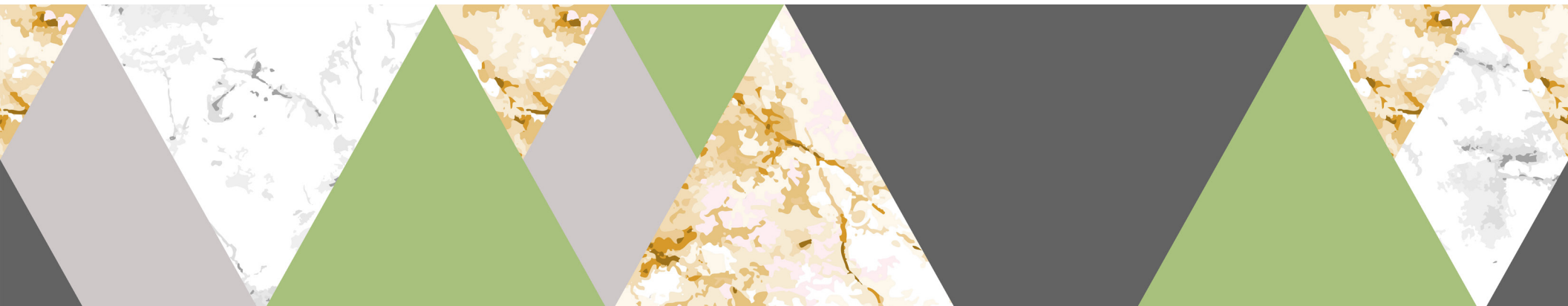
When discussing care and cleaning procedures with your maintenance staff, there are recommended do's and don'ts that should always be followed:

- Do** dust mop floors frequently.
- Do** clean surfaces with mild detergent or stone soap.
- Do** thoroughly rinse and dry the surface with clean, clear water after washing.
- Do** blot up spills immediately.
- Do** protect your floor surfaces with non-slip mats or area rugs and your countertop surfaces with coasters, trivets, or placemats.
- Don't** use vinegar, lemon juice, or any other chemical cleaners containing acids on marble, limestone, travertine, or onyx surfaces.
- Don't** use cleaners that contain acid such as bathroom cleaners, grout cleaners, or tub & tile cleaners.
- Don't** use abrasive cleaners such as dry cleansers or soft cleansers.
- Don't** mix bleach and ammonia; this combination creates a toxic and lethal gas.
- Don't** ever mix chemicals together unless directions specifically instruct you to do so.
- Don't** use vacuum cleaners that are worn. The metal or plastic attachments or the wheels may scratch the stone's surface.

dos & don'ts

General Guidelines for Stain Removal

1. Remove any loose debris.
2. Blot up spills immediately—wiping the area will spread the spill.
3. Flush the area with plain water and mild soap and rinse several times.
4. Dry the area thoroughly with a soft cloth.
5. Repeat as necessary.
6. If the stain remains, refer to the section in this guide on stain removal.
7. If the stain persists or for problems that appear too difficult to treat, call your stone care professional, installer, or restoration specialist.



Sealing Natural Stone

Several factors must be considered prior to determining if the stone should be sealed:

- What is the hardness, density, and durability of the stone?
- How porous is the stone and how fast will it absorb a liquid?
- Will the stone be in recurrent contact with a staining agent?
- What type of finish was applied to the surface? For example, a polished surface is more resistant to staining than a honed surface.
- Will a sealant affect the color or other aesthetics of the stone?
- If a resin was applied to the stone, how will the sealant react with the resin?
- Where is the stone located (e.g. countertop, floor, wall, foyer, bathroom, etc.)? Residential or commercial?
- What type of maintenance program has the stone been subjected to?

The type of stone, its finish, its location, and how it is maintained all need to be considered when determining how to protect the stone.

In some cases it makes sense to seal the stone. Once properly sealed, the stone will be protected against commonplace dirt and spills. In other cases, it is best to leave the stone untreated. Topical sealers can alter the surface texture and finish as well as build up on the surface, creating a layer that is less durable than the stone. Generally, topical sealers are not recommended in exterior applications because they can trap moisture within the top layer of the stone, which may lead to surface deterioration during freeze/thaw cycles.

Sealing Natural Stone

If you have resolved to treat your stone, make sure you fully understand the differences between the different types of sealers available on the market. If you have *any* questions, consult your stone care professional, installer, or restoration specialist.

- **Topical Sealers** are coatings (film formers) designed to protect the surface of the stone against water, oil, and other contaminants. They are formulated from natural wax, acrylic, and other plastic compounds. When a topical sealer is applied, the maintenance program often shifts from a program focused on stone care to a program focused on the maintenance of the sealer (for example: stripping and reapplication).
- **Impregnators** are water- or solvent-based solutions that penetrate below the surface and become repellents. They are generally hydrophobic (water-repelling), but are also oliophobic (oil-repelling). Impregnators keep contaminants out, but do not stop the interior moisture from escaping. These products are considered “breathable,” meaning they have vapor transmission.

Vanity tops and food preparation areas may need to have an impregnator applied. Check with your installer for recommendations. If an impregnator is applied, be sure that it is safe for use on food preparation surfaces. If there are questions, check with the product manufacturer.

Make sure you fully understand the difference between types of sealers available.

Daily Cleaning Recommendations

Countertop Surfaces:

Clean stone surfaces with a few drops of neutral cleaner, stone soap (available at hardware stores or your stone dealer), or a mild liquid dishwashing detergent and warm water. Use a clean soft cloth for best results. Avoid using too much cleaner or soap as it may leave a film and cause streaks. **Do not** use products that contain lemon, vinegar, or other acids on marble or limestone. Rinse the surface thoroughly after washing with the soap solution and dry with a soft cloth. **Do not** use scouring powders or creams as these products contain abrasives that may scratch the surface.

Floor Surfaces:

Dust mop interior floors regularly using a clean, nontreated dry dust mop. Sand, dirt, and grit do the most damage to natural stone surfaces due to their abrasiveness. Mats or area rugs inside and outside an entrance can minimize the sand, dirt, and grit that will scratch the stone floor. Be sure that the underside of the mat or rug is a non-slip surface.

Normal maintenance involves periodic washing with clean, potable water and neutral (pH 7) cleaners. Soapless cleaners are preferred because they minimize streaks and film. Mild, phosphate-free, biodegradable liquid dishwashing soaps or powders or stone soaps are acceptable if rinsing is thorough.

Wet the stone surface with clean water. Using the cleaning solution (following manufacturer's directions), wash in small, overlapping sweeps. Work from the bottom up if it is a vertical surface. Rinse thoroughly with clean, potable water to remove all traces of soap or cleaner solution. Change the water in the rinse bucket with frequency. Dry with soft cloth and allow to thoroughly air dry.

Daily Cleaning Recommendations (continued)

Bath and Other Wet Areas:

Soap scum can be minimized by using a squeegee after each use. To remove soap scum, use a non-acidic soap scum remover or a solution of ammonia and water (about 1/2 cup ammonia to a gallon of water). Frequent or over-use of an ammonia solution may eventually dull the surface of the stone.

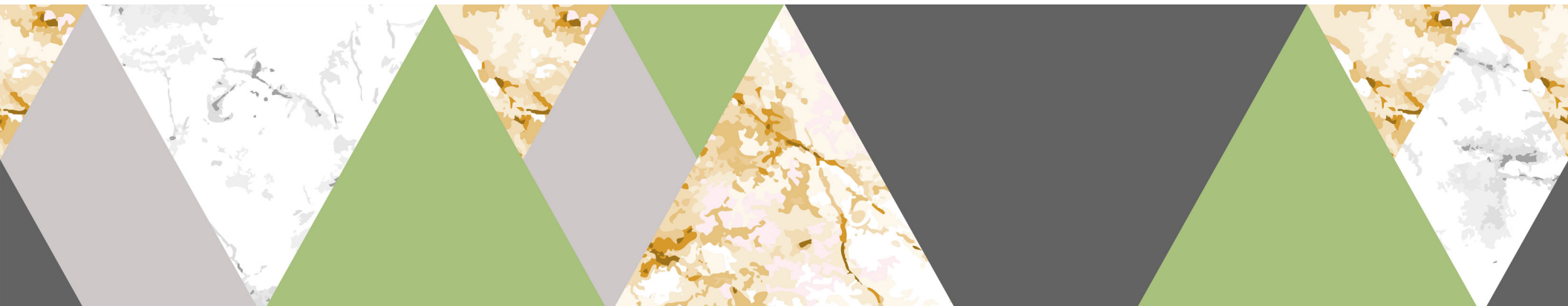
Outdoor Pool and Patio Areas:

In outdoor pool, patio, walkway or hot tub areas, flush with clear water and use a mild bleach solution to remove algae or moss.

Exterior Stone Maintenance:

The large expanses of stone generally found on exterior applications may make it impractical to perform normal maintenance on a frequent basis. Large installations, however, should be given periodic overall cleaning as necessary to remove accumulated pollutants. Easily accessible stone surfaces such as steps, walkways, fountains, etc., should be kept free of debris and soiling by periodically sweeping and washing with water.

Normal maintenance should include periodic inspection of stone surfaces for structural defects, movement, deterioration, or staining.



damage control

Moisture Damage

Water penetrating exterior wall cavities through defective flashing or unsealed joints can cause **efflorescence**, a mineral salt residue left on the surface of masonry when water evaporates. In addition, condensation in wall cavities prevented from reaching the exterior surface because of blocked weep holes can dislodge masonry in a freeze-thaw climate. Look for a darkening affect of the stone.

It is recommended that you contact your stone professional for a remedy.

Moisture coming up through a floor slab seeks the easiest possible pathway to evaporate into the atmosphere. Often, the veining or micro-cracks in the structures of some stones provide that path. The moisture dissolves all the salts from the ground, the substrate, and the stone, carries them to the surface, and deposits them as the moisture evaporates, giving the appearance of a faulty stone.

Contact your professional stone care installer, or restoration specialist for assistance

damage control

Identifying & Removing Stains

Oil Based Stains:

(grease, tar, cooking oil, cosmetics)—Will darken the stone and normally must be chemically dissolved so the stain's source can be rinsed away. Clean gently with a soft liquid cleanser, household detergent, ammonia, mineral spirits, or acetone.

Organic Stains:

(coffee, tea, fruit, tobacco, paper, food, urine, leaves, bark, bird droppings)—May cause a pinkish-brown stain and may disappear after the source of the stain has been removed. Outdoors, with the sources removed, normal sun and rain action will generally bleach out the stains. Indoors, clean with 12% hydrogen peroxide and a few drops of ammonia.

Inorganic Metal Stains:

(iron, rust, copper, bronze) — Iron or rust stains are orange to brown in color and leave the shape of the staining object, such as nails, bolts, screws, cans, flowerpots, or metal furniture. Copper and bronze stains appear as green or muddy brown and result from the action of moisture on nearby or embedded bronze, copper, or brass items. Metal stains must be removed with a poultice. Deep-seated, rusty stains are extremely difficult to remove and the stone may be permanently stained.



(Identifying & Removing Stains continued next page)

damage control

Identifying & Removing Stains

Biological Stains:

(algae, mildew, lichens, moss, fungi)—Clean with a dilute (1/2 cup in a gallon of water) ammonia, bleach, or hydrogen peroxide. **WARNING: DO NOT MIX BLEACH AND AMMONIA! THIS COMBINATION CREATES A TOXIC GAS!**

Ink Stains:

(magic marker, pen, ink)—Clean light colored stones with bleach or hydrogen peroxide. Use lacquer thinner or acetone for dark-colored stones.

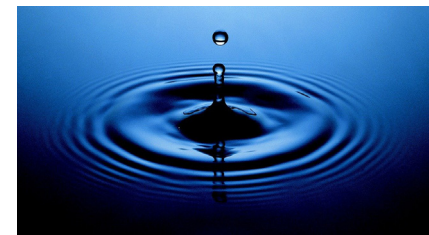
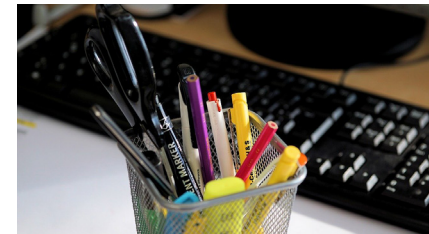
Paint Stains:

Small amounts can be removed with lacquer thinner or scraped off carefully with a razor blade. Heavy paint coverage should be removed with a commercial liquid paint stripper. **DO NOT USE ACIDS OR FLAME TOOLS TO STRIP PAINT FROM STONE.**

Water Spots and Rings:

(surface accumulation of hard water)—Buff with dry 0000 steel wool.

(Identifying & Removing Stains continued next page)

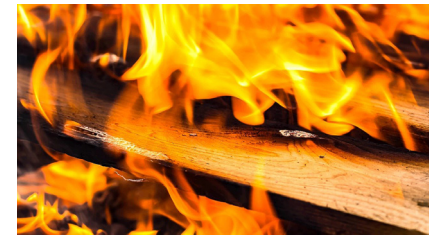


damage control

Identifying & Removing Stains

Fire and Smoke Damage:

Older stones and smoke or fire-stained fireplaces may require a thorough cleaning to restore their original appearance. Commercially available smoke removal products may save time and effort.



Etch Marks:

(calcareous stones)—Caused by acids (typically from milk, fruit juices, alcohol, etc.) left on the surface of the stone, some will etch the finish but not leave a stain; others will both etch and stain. Once the stain has been removed, wet the surface with clear water and sprinkle with marble polishing powder. Rub the powder into the stone with a damp cloth or by using a buffing pad with a low speed power drill or polisher. Continue buffing until the etch mark disappears and the marble surface shines. Honing may be required for deep etching. This process may require the services of a stone maintenance professional.



Efflorescence:

A white powder that may appear on the surface of the stone, it is caused by water carrying mineral salts from below the surface of the stone to the surface and evaporating. When the water evaporates, it leaves the powdery salt residue. If the installation is new, dust mop or vacuum the powder. Repeat as necessary as the stone dries out. Do not use water to remove the powder (adding water will only add to the problem). If the problem persists, contact the stone contractor to identify and remove the cause of the moisture.





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