

# PLAM ACID

## Dye acids for concrete surfaces

### DESCRIPTION

PLAM ACID ISOPLAM is a ready-to-use, penetrating, reactive dye, which chemically combines to the cured concrete to create permanent, wide range, translucent color effects.

Formulated to add color to the colorless concrete or to modify the color of the concrete coloring, PLAM ACID chemically reacts to the surface of the cured concrete to create unique and permanent color effects. PLAM ACID creates a variable or translucent color effect, much like the shadings found on natural stone or a worn coating. The distinctive look obtained is ideal for exteriors, interior floors, walls, and artificial rock and water features. The result is unique to each concrete surface and it cannot be duplicated with other coloring materials. Commercial installations shine with colored, satined, polished and easy to maintain floors.

The color of chemically stained concrete is superior in durability and abrasion resistance compared to other concrete surfaces coated with acrylic stains or other types of paint, which can wear, quickly break up or delaminate. Due to their chemical reaction with concrete, PLAM ACID becomes part of the surface. It will not fade, chip, crack or peel and it will resist as much as the concrete itself.

It is possible to have a further range of color effects if the concrete is colored before the chemical dying of its surface.

### WARNINGS

TURCHESE (turquoise), GRANATO VERDE (garnet green) and OLIVA (olive) chemical dye must only be used for interior applications, as they may react with water and may become darker or blacken when exposed to excess moisture. When these colors are used, the underlying base must be well drained (min. 28 days) and not subject to hydrostatic pressure, and the chemically stained concrete must be protected from water.

### LIMITATIONS

PLAM ACID can't be used to hide floor imperfection or to cover construction mistakes.

The variegated colors produced are unique to each concrete surface and they depend on the chemical composition, mix design, porosity, age, texture and color of the concrete substrate.

The surface appearance will also be influenced by the PLAM ACID color, preparation methods and application procedures, the number of PLAM ACID applications, experience in use of the material, sealing or finish-coating materials and other factors. Each will significantly affect the final appearance and characteristics of the chemically colored concrete.

To verify and approve suitability and appearance, test of sections must be conducted on each individual concrete surface, for each color effect, prior to the full application of the product. Mottling and wide variations in color and intensity will generally occur.

There is a certain degree of uncertainty and unpredictability on the use and on the final appearance of chemical stains. If contaminants remain on the surface, the penetration of the chemical dye may be inhibited.

Different concrete casts could appear of different color compared to the adjacent areas when chemically colored.

The wear resistance and durability of PLAM ACID depends on the strength and abrasion resistance of the surface to which it is applied. Chemically colored surfaces, subject to pedestrian and vehicular traffic, will require periodic maintenance. It is also necessary to find out the best suited resine for the customer's needs.

## MATERIAL COMPOSITION

PLAM ACID is an acidic, water based solution of metallic salts which penetrates and reacts with chemical products present in the concrete and with some cementitious, self-levelling concretes. This product produces insoluble color deposits in pores and each color is produced by a different formula, with complex proprieties, which does not contain pigments or resins. They attack the concrete surface to remove efflorescence and to enable increase chemical reaction effectiveness and a deeper color penetration.

## PREPARATION

Before applying PLAM ACID, a representative test sample must be produced and approved and steps should be taken to prevent water penetration in the concrete.

Even if the resulting effect depends on the concrete surface and not on the ambient temperature, the weather condition should be considered before applying PLAM ACID. Completely remove all: dirt, plaster stains, oil, and grease before chemically coloring the surface.

Paint, water repellents, adhesives and antievaporation agents must be removed by sandblasting, and the small colors stain can be removed with a scraper. Acid washing should not be used as a normal cleaning procedure as it may remove reactants require for the chemical dye. Failure to remove all contaminants and coatings that will prevent the PLAM ACID to penetrate into the concrete will cause defects. Particular attention should be given to the areas where objects such as: cartons, nylon sheets, pallets and plastic containers where placed. These areas will have accumulated humidity which reacts differently with the acid.

The new concrete cure time should be at least 14 days, in order for it to be sufficiently reactive. The internal application of the TURCHESE (turquoise), GRANATO VERDE (garnet green) and OLIVA (olive) chemical dyes cure time should be of a sufficient amount so to coincide to the requirements of the water vapor transmission, which is normally 30-60 days.

Horizontal concrete should be washed with a high quality commercial detergent, or brushed with a single rotative brush machine.

A suitable, high-quality commercial detergent will help the cleaning process. The surface must be rinsed after cleaning until the rinse water is completely clear. Pre-existing, older concrete must be cleaned so that the surface is completely penetrable before receiving the initial application of PLAM ACID. An indication of whether the concrete is penetrable can be obtained by spraying small amounts of water on the surface. The water should wet the underlying layer and promptly be absorbed. If the water 'beads' and does not penetrate or only penetrates in some areas, additional surface preparation and re-testing must be performed. On more compact floors, washing with a one per five part of muriatic acid (with a concentration lower than 10%), or light sandblasting could be necessary to render the surface sufficiently permeable to enable the PLAM ACID reaction. Pressure washing or rubbing with red cleaning pad-driver Isoplam single rotative brush is normally required. After cleaning, the surface must be rinsed to remove all residue of dirty water, especially on smaller projects like interior floors. After drying, the surface must be carefully inspected and tested again for its penetration properties. If necessary, additional general or spot cleaning and rinsing should be performed.

Sandblasting is required on surfaces which were spray painted with: reins, dye, paint, wax or water-repellent substances, or for surfaces that cannot be successfully cleaned with other methods.

Sandblasting cleaning should be carried out to the extent to completely remove all paint and sand left from the cleaning, it should be swept or high pressure washed before applying the chemical dye.

## APPLICATION

All surfaces must be dry and properly prepared as described above. Surrounding areas, landscaping, and adjacent surfaces must be covered or protected. The work area should be sealed off, nearby vehicles removed and affected sections closed to potential traffic. Adjoining walls of porous material such as plaster or masonry should be covered. The work area should be divided in small sections, with walls, tape or other stationary structures. This will enable an easier control of the area, of the wet corners and of the overlapping. Walking on the wet surface should be avoided for safety and to safeguard aesthetics. Security measures must be followed and protective clothing must be worn. PLAM ACID should be applied undiluted at the indicated coverage rate and use the described equipment. The color of the PLAM ACID liquid solution will probably have no resemblance to the final color outcome on the concrete surface. The solution will appear transparent when first applied; it will assume a murky or muddy appearance as the chemical reaction takes place.

PLAM ACID normally froth and fizzle while reacting. Some colors are more fizzling than others. If the fizzling does not occur, then it means that the surface has not been adequately prepared or the concrete is not sufficiently reactive to be chemically dyed. If some contaminants hinder the chemical reaction, then another wash cycles are required. The chemical dye solution should be applied to the surface by brush or spray and promptly rubbed in. The solution should be sprayed on surfaces on big areas or on vertical surfaces. For team working, while a worker sprays the PLAM ACID solution a few centimeters in front of the brush, while a second worker rubs it in. As soon as the solution is applied to the surface by spray or brush, the solution must be immediately scrubbed with a circular or eight motion pattern. The chemical dye solution should be gradually applied over small sections and the brush should always be in contact with the surface and in continuous movement, until the fizzling is over.

To avoid joint streaks, the solution shouldn't be applied on the new section and brushed back over the previous processed section. New applications of the chemical dye should be overlapped and processed on the edges of the adjacent areas, which were previously processed and are still wet. The edges must always be maintained wet. While brushing, the surface should be completely covered and uniformly saturated with the liquid solution of PLAM ACID ISOPLAM, it shouldn't be splashed, drained or mixed on the junctions, unless required for the color effects. Avoid walking on wet surfaces. Irregularities or footprints will appear darker than the surrounding surface. PLAM ACID should be applied to vertical surfaces in the same manner. The product should be applied from bottom to top. Excessive streaks must be avoided. Reaction time depends on wind conditions, ambient temperature, and humidity.

Whether PLAM ACID remains wet or it dries on the surface, it should be allowed to remain in contact with the concrete until the desired effect is obtained, which is usually a minimum of 4 hours. Adequate safety measures should be taken to avoid the contact with the surface until the residual dye isn't removed and the surface has been rinsed. For one-color or mixed-color applications, the residue of the chemical reaction shouldn't be removed from the surface before PLAM ACID is applied again. When different colors are used on consecutive applications, the surface is normally washed between applications so that the color effect can be evaluated before another color is applied. After final application of PLAM ACID and it has been on the surface for a minimum of 4 hours, proceed to remove all solution residues with NEUTRALIZE ISOPLAM (500 gr. neutralizer per 20 lt. of water) and with a floor rotary machine or a stiff bristle brush. The floor must be rinsed until the rinse water is completely clean.

Slush could color adjacent areas or damage plants, so it must be removed with a wet vacuum cleaner or cleaned up with an inert material such as sawdust, dye, slush fluid, rinsed water, absorbent materials and consumable equipment used during the application are to be disposed in compliance with local, regional and national laws.

All surfaces should be carefully inspected for safety, including the risk of slipping due to humidity, prior to opening the area to traffic.

## TECHNICAL INFORMATION

### Color effects

The chemical dye is available in 12 standard colors in the Isoplam color guide.

The color effect produced is unique for each kind of concrete surface and it can change considerably from the one shown on the color card. To verify and approve the adequacy of the color, a sample test must be prepared. Great color variations, spots and color differences are normal and usually requested. To produce satisfying color effects on colorless concrete or to change the color of a colored concrete one or two application of the chemical dye may be required, depending on the age of the floor and on the intensity of the new color.

Using DECO NUVOLATO ISOPLAM, the color effects of the chemical dye are much more intense on colored concrete. If it is applied on old or seasoned concrete, the color might not fully develop, and the best results are usually achieved with the darker shades of the chemical dye.

If a polished and a shinier surface aspect is required for a new floor, PLAM ACID ISOPLAM could be applied on the LIGHTA GRAY DECO NUVOLATO ISOPLAM.

### Special effects.

To obtain special color effects, two or more standard chemical dye colors should be mixed before the application or apply one over the other while they are wet or a sequence of applications should be performed by using a different color for each application.

The floors with PLAM ACID may be saw cut, marked or imprinted to obtain the flooring aspect or natural stone tile. Markings or vertical samples can be highlighted through swab application of various chemical dye colors on single stones. High relief projects may be sandblasted on the surface before or after the application of PLAM ACID to produce thin or unique engravings.

A more diversified color can be produced through an uneven application of the PLAM ACID solution.

Spotted color effects can be produced by "spraying" a ferrous granular additive over the surface during the coloring process. Diverse or veined effects can be created by laying or brushing absorbent materials over the surface, for example sawdust or cloth.

### Weaving and resistance to abrasion.

Only creep resistant concrete surfaces such as industrial floors and stamped floors ISOPLAM should be considered for the application of PLAM ACID chemical dye. For safety reasons, a representative trial section should be performed before the full application and the entire surface should be inspected to verify and approve the suitability of the surface when wet and dry. PLAM ACID chemical dye slightly attacks the surface during the application, exposing some of the thin aggregates. The depth of the attack depends on the porosity and on the hardness of the concrete.

### Coverage.

A minimum of two separate applications of chemical dye is normally required on the concrete: further application could be necessary on older or seasoned surfaces or to obtain a particular color effect.

The PLAM ACID chemical dye should be applied at full strength (not diluted). The coverage can change depending on the porosity and on the weaving of the surface, on the composition and on the age of the concrete, on the preparation and application technique, on the number of applications and on other factors. The coverage percentage is 1,75-2,5 square metres per lt. for two applications or 3,5-5,0 square metres per lt. for a single application.

## COLORS

PLAM ACID ISOPLAM is available in 11 colors: Amber, Topaz, Sand, Gray, Aquamarine, Turquoise, Garnet Green, Olive, Brown, Bronze, Coffee.

### Test sections.

To chemically color dye concrete skills, training and trials are required to obtain the desired effects. The achieved color is unique for each concrete surface and it depends on the chemical composition, on the porosity, on the age, on the waving and on the color of the concrete. The aspect will be influenced by the color of the chemical dye, the preparation method, the applicaton process, the number of the chemical dye applications, the experience on using the materials, the materials and the painting and sealing methods and by other factors.

Everything will significantly affect the final aspect. Test on small sertions must be performed before the general application of che chemical dye on the whole surface of the concrete and for each color effect to verify and approve the aspect and its suitability. Tests should be of an adeguate size to be representative and must be performed by the same worker that will apply the PLAM ACID chemical dye. Each test should be prepared, chemically colored and sealed or painted with a finish as described. If the concrete is so old to the extent of not being reactive, the successful use of a chemical dye won't be possible.

## EQUIPMENT FOR PREPARATION AND APPLICATION

Protective clothing must be worn while using equipment and materials for the preparation and installation, follow the manufacturer instructions and safety requirements.

PLAM ACID is normally applied by brush and scrubbed inside the concrete surface. In larger areas, an **all plastic** spray hand-pump may be used to transfer the PLAM ACID solution to the surface while scrubbing. Other types of equipment, such as sponges, sponge trowels, lamb-wool applicators, or acid-

resistant spray bottles may be used to create special effects. All preparation and application procedures should be tested before use.

To transfer and scrub, the brushes should be of a professional quality, long-handle or with non colorless, acid resistant, medium hard nylon bristles which can contain fluid. Cheap brushes can be used for the application of PLAM ACID on small areas. Do not use brushes with colored bristles because they could purge, thus contaminating the surface. Floor rotary machines shouldn't be used. Compressors and cotton fringed brooms shouldn't be used because they cannot effectively rub the chemical dye solution on the surface. The PLAM ACID containers used during the application must be acid resistant. The use of plastic buckets with rubber wheels for cotton fringed brooms render the application easier and they reduce markings or circles of the liquid which flows down from the side of the container. Metal containers are prohibited because they quickly corrode and could change the color of the chemical dye solution. To transfer the solution to the surface, the hand-pump sprayer must be of a professional and should have a fan type tip. Anything to be in contact with the chemical dye must be acid resistant plastic. The use of an airless sprayer isn't recommended. To collect residue and what has over flown, an acid resistant pump may be used and the over flows may be absorbed with inert materials, such as sawdust or by washing with rags.

To clean horizontal or vertical concrete surfaces it is recommended to use a high pressure cleaner. Hot water would make it easier. To clean flat and levelled surfaces a single rotative brush should be used.

To clean the horizontal or vertical concrete we suggested the use of a high-pressure cleaner. Hot water would make it easier. A single rotative brush should be used to clean heavy duty floors and operated at 175 revolutions per minute. A black felt or a nylon wash brush is recommended for cleaning. Scrubber dryers should be considered for the cleaning of wide areas.

#### **Protective resin of the finished work.**

Depending on the type of the chosen resin, the floor resin coating process must be done as soon as possible.

External floors:

PLAM SEALING  
PLAM HARDENING (for high traffic)

Internal floors:

PLAM SEALING  
DECO EPOX W BI+ PLAM POL POLIURETANICA A+B  
PLAM HARDENING (for high traffic)

#### **Maintenance.**

Chemically dyed floors must be kept clean. Dirt must be removed with water. Extremely dirty areas can be cleaned by washing or scrubbing with a rotary cleaning machine and a suited ISOPLAM detergent. Internal floors which need polishing should be maintained with frequent use of IPM METALLIC WAX self-polishing for floors. Without appropriate maintenance, the floor quality could be seriously compromised.

### **PACKAGE AND STORAGE**

PLAM ACID ISOPLAM is available in 1 lt. and 5 lt. canisters. Stored in the original and sealed canisters will have a one year shelf life, it should be kept in closed and protected environments at temperatures of 15 - 30°C.

### **WARNINGS**

PLAM ACID ISOPLAM is an acid base product, for this reason only qualified personnel may use it. Goggles and protective gloves are mandatory.  
CONSULT THE SAFETY CARD BEFORE USE.



**IMPORTANT:**

All information contained herein is based on the best practical experiences and laboratory research. It is the customer's responsibility to determine whether the product is suitable for the intended application. The manufacturer declines all responsibility on the results due to incorrect application of its products. The product shall always be tested on a small area before full scale application. This data sheet replaces all previous data sheets. ISOPLAM reserves the right to change the data on the data sheet at any time. Also note that ISOPLAM products are intended for professional use only. ISOPLAM provides recurring and on demand training for its customers. Use of ISOPLAM products without receiving the proper certification will be at the customer's own risk.