MICROCEMENT
UTILIZATION MANUAL

farbe

INDEX

*** All the information contained in this manual is subject to the technical specifications of the products referenced.**

MICROCEMENT UTILIZATION MANUAL

Microcements are high-performance hydraulic micro-mortars, based on special cements and sands of variable granulometry, in addition to other additives that, in combination, endow them with excellent physiochemical properties and pleasing aesthetics.

They are used in the application of highly continuous decorative coatings with a cement-mineral appearance in floors, walls, bathtubs, washbasins, etc., and can be used to achieve light-dark effects. The look is inspired by "polished cement", but they offer a much simpler construction.

MEDIUM MICROCEMENT

FINE MICROCEMENT

LOCATIONS - SOLUTIONS

The manual is based on the most common locations in which micro-cement may be applied.

1 FLOOR SLABS

Before describing the various scenarios, a number of observations and diagnoses will be reviewed with simple verifications to be carried out on a floor slab:

* Although there are many portable devices on the market that may be used to perform different measurements, it is unusual for a conventional application company to utilize them (depending on their understanding of the product), therefore this series of simple tests is proposed in the event that they prove necessary.

- Gather data on thicknesses and on how long it has been applied.
- Absorption: one way to verify this is by pouring water at different points

Figure 1

Figure 2

Figure 3


Figure 4


Figure 5


Figure 6


Figure 7

on the floor slab, observing the absorption speed. If it is very high the microcements will "pull" very quickly, a negative characteristic in the smoothing operation; in this case, it would be convenient to apply the Ultrafine Consolidating Primer.

- Humidity: if the floor slab has been poured recently, check the humidity. Sometimes a surface measurement with a portable hygrometre is not enough, and therefore it is recommended to place various thick plastic rectangles in several points and remove them after 48-60 hours. If they are dry when removed, it is a sign that the floor slab contains a moderate amount of moisture; on the contrary, if condensed water is observed at the different points, or in some of them, on the plastic sheet, it means that its interior still contains water, and therefore it is not suitable for application of microcements. (Figures 1, 2 and 3)

- Cohesion/hardness: with a 2 mm steel/vanadium screwdriver, semi-circular movements are made while pressing the surface. If perforated lightly, it is a non-cohesive/sandstone slab, and if microcements are to be applied, it will be necessary to follow the indications provided in the chapter "non-cohesive flood slabs"; if on the contrary it offers remarkable resistance to perforation, it is in ideal condition for the application of microcements (Figures 4 and 5)

- Fissures/cracks: these may be static, meaning, they continue to open, such as those generated by mortar retractions, or dynamics resulting from construction deficiencies that will always generate movements. When in doubt, it shall be verified simply by making 3-4 mm thick plaster "moulds", which cover the fissures well. They will be placed for a minimum of 1 week (or as long as possible) in order to observe if

movement has occurred causing a break in the "mould", generating the consequent crack/fissure. If so, it is not advisable to apply microcements. (Figure 6)

- Planimetry-roughness: even in cases where it is smooth, a support with poor planimetry, for example with many undulations, may lead to a significant increase in product consumption, with consequent budgetary overruns. This deficiency may be verified with a 1.5-2 metre rule. The same happens if it presents excessive roughness; this is visually apparent. (Figures 7 and 8)


Figure 8

EXAMPLES AND TYPES OF FLOOR SLABS

• FLOOR SLABS IN GOOD CONDITIONS

Floor slabs in perfect conditions with regard to planimetry, absorption, roughness, compressive strength, etc. are highly recommended as support for the application of microcement. (Figures 9 and 10)

It is recommended to proceed as follows:

1) Aspiration with powerful professional equipment.
2) Application of first coat of medium microcement or base micro-concrete with a trowel of approximately 28 x 12cms, with application as smooth as possible. (Figure 11)
3) When the 1st coat is dry, apply the 2nd coat of medium microcement or base micro-concrete. For this second coat, two different finishes may be applied: (Figure 12)
   - **Finishes with medium microcement or base micro-concrete:** in this case, the product is applied, then allowed to dry slightly, and when it is still wet, but somewhat hard, it is com-


Figure 9


Figure 10

Figure 11

1ST COAT

Figure 12

2ND COAT

Figure 13

FINISHES WITH WATER: MORE UNIFORM EFFECTS

Figure 14

FINISHES WITHOUT WATER: MORE PRONOUNCED EFFECTS

pressed with a small 20 x 8 cm trowel. For this process, a small water sprayer may be used to create grout, imitating what a "helicopter" (mechanical floor screed) would do to smooth the floor slabs. They may also be smoothed, under the same conditions, without applying water; this will essentially depend on the person performing the application and their technique. This finish is more resistant than the fine microcement. (Figures 13 and 14)

With this type of medium finish, if in completed sections, as in the case of a room or space of similar dimensions, the support is not highly absorbent, or the temperatures of both the environment and the support are relatively low, and advance continues without being able to smooth that which has been previously applied because the microcement is still wet, an extruded polyurethane sheet shall be used, like those used as insulating sheets in construction, so as not to step on the newly applied microcement, to prevent pressure, while smoothing the part of microcement that has begun to harden. (Figure 15)

- **Finishing with Fine Microcement:** if a finer finish is desired, it is recommended to first apply 2 layers of medium microcement or base micro-concrete with a trowel of approximately 28 x 12 cm., allow it to dry and apply one final layer of Fine microcement.

This finish with fine microcement differs fundamentally from medium microcement or base micro-concrete in two aspects:

- aesthetics, as it is somewhat between the appearance of smoothed slab mortar and stucco

- in the working method, since

with this finish no further pressure needs to be applied.

The finish is laid down as it is applied, always performing semicircles with the trowel. (Figure 16)

Keep in mind that fine finishes (absence of aggregates in their composition) are always less resistant than medium finishes (presence of aggregates) (Figure 16)

- **Other types of finishes:** apart from these two finishes that we have described, there is a third to take into account, which is being used for its quicker implementation, is the finish using crushing and mechanical polishing. To perform this technique, the second layer of the medium microcement or base micro-concrete is left practically without smoothing and when the microcement is completely dry, depending on the degree of roughness, polishing is carried out with different sanding grains until it is totally smoothed; Large, medium and small machines may be used depending on the work surface. With this system, we are able to deal with longer sections without segmentation. (Figure 17)

* One finish or another will be used depending on the aesthetics and use, which will determine the level of resistance required.

As previously mentioned, dual-component and mono-component microcements are prepared to be finished with medium microcements, base micro-concrete or fine microcements. This is due to their excellent formulation.

Obviously, perfect floor slabs do exist but are not abundant and this type of support is frequent along with its imperfections. Below certain types of floor slabs with problems are discussed.


Figure 15


Figure 16


Figure 17

• NON-COHESIVE FLOOR SLABS

Figure 18

Microcement should not be applied if the floor slabs have not been repaired. These have a powdery surface layer that prevents the microcement from fusing with the substrate, apart from sandblasting throughout its thickness, and also have low or no compressive strength. Depending on the level of debonding, the process to carry out will be different. (Figure 18)

Floor slabs with a light superficial non-cohesive layer (pulverulent) will be prepared with water-based Ultrafine Consolidating Primer or solvent-based Pisanol.

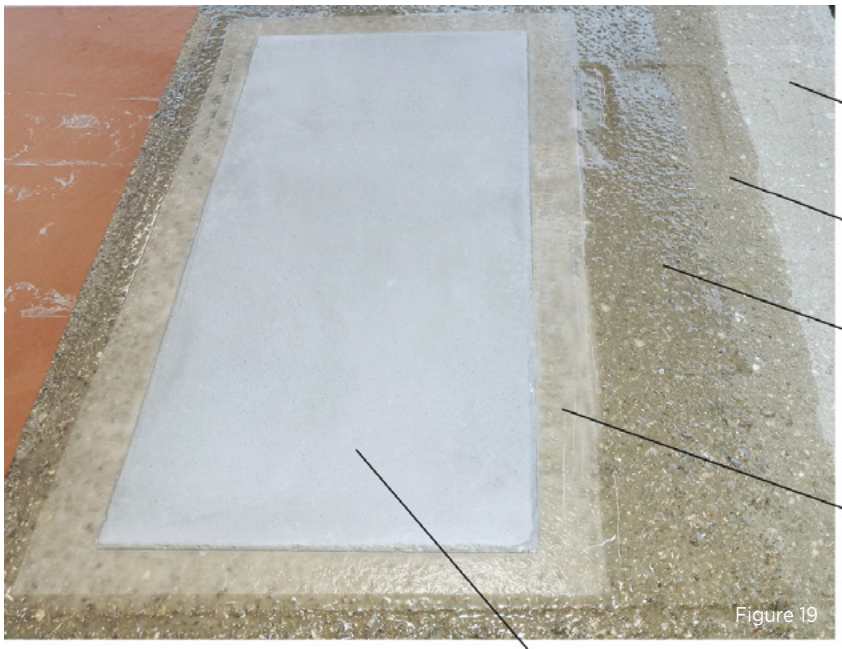


Figure 19

In the event that the problem is more severe (debonding/sandblasting over the entire thickness of the floor slab), it should be treated with the Penetrating Epoxy Primer; and if this is not enough, repair it with high-solids epoxy coating system without solvent, using a veil of fiberglass, forming a hard layer adhered to the substrate upon which the microcement is applied. (Figure 19)

• SPLIT TITURESENTING MOVEMENTS

If the floor slab is split (Figure 20) and presents signs of movement, the application of microcement is not recommended; however, if it must be performed for necessary reasons, before proceeding with the high solids epoxy system described in the previous chapter, "concrete staples" will be used as seen in the figure. (Figures 21 and 22)

To work with this system using steel staples, the floor slab must be very cohesive and hard.

Figure 20

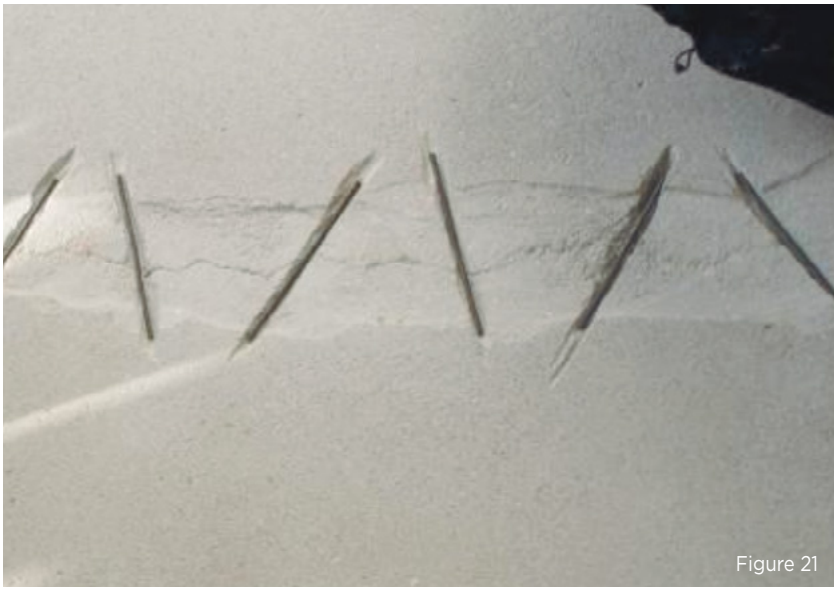


Figure 21

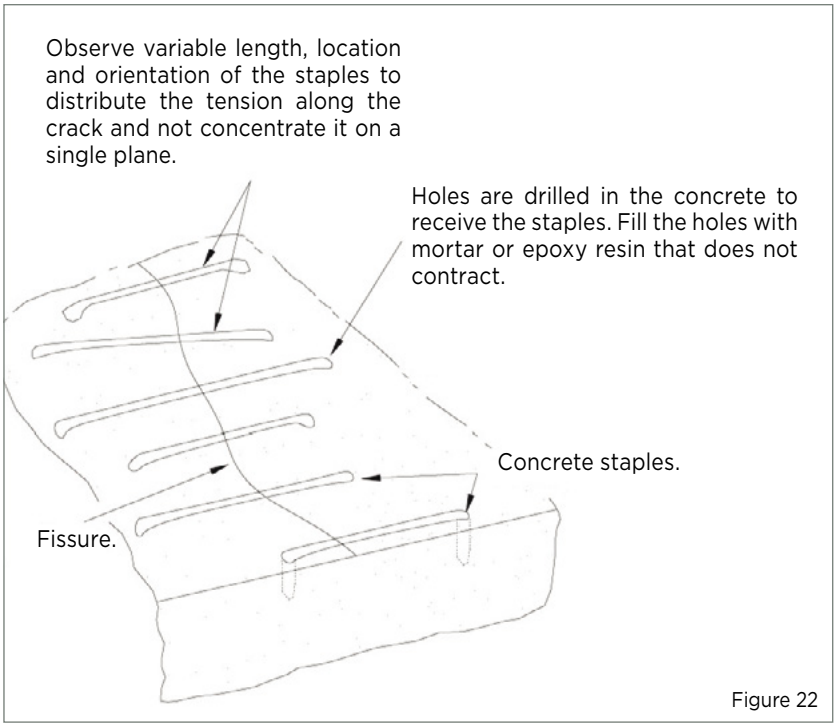


Figure 22

• UNCURED FLOOR SLABS

Figure 23

This refers to floor slabs that have not yet cured on which it is not convenient to apply the microcement, since they are still subject to movement and retractions that may generate cracks that will cause the microcement to fissure. Depending on the thickness, type of mortar and surface, the solution is to wait until the floor slab is sufficiently cured, preventing it from transferring problems to the microcements applied on it. (Figure 23)

• CURED CRACKED FLOOR SLABS

Figure 24

Figure 25

These must be repaired with epoxy mortar without solvents filling the largest cracks. (Figures 24 and 25)

• IRREGULAR FLOOR SLABS: PRONOUNCED TEXTURE AND POOR PLANIMETRY

Depending on the level of irregularity (excessive roughness) and/or poor planimetry of the surface, self-levelling mortar is applied, chosen according to the thickness of the screed, maturation time, etc. Once the mortar is ready, it will be applied on the microcement. If applied directly, consumption could increase by ± 40% with respect to when conditions are good, apart from labour. (Figures 26 and 27)

Figure 26

Figure 27

• NON-DEBONDED FLOOR SLABS IN BUILDINGS PRONE TO DIFFERENT TYPES OF MOVEMENTS

Due to the movement of the building, it will transmit it to the concrete slab and will produce cracks that will appear in the microcement. Application is not recommended. (Figures 28 and 29)

Figure 28

Figure 29

• LOW-THICKNESS FLOOR SLABS

Figure 30

These types of floor slabs are not normal, and application is not recommended. Only in the case of applying it in small locations, for example a bathroom of 2.4 x 2.8 m, the high-solids epoxy system and fiberglass veil described above can be used, with the aim of preventing fracture of the plate. (Figure 30)

• HIGHLY POLISHED FLOOR SLABS

Figure 31

If they are free of substances that might impede adhesion, like curing or other paraffin solids, the microcement may be applied directly. (Figure 31)

• FLOOR SLABS IN CONTACT WITH OTHER MATERIALS

Whenever floor slabs are found in contact with other materials such as ceramics, terrazzo, repaired mortar and/or filler that may brush against them, it is advisable to place fiberglass mesh with 4 x 4 mm mesh and 68-80 grs/m² throughout the surface, since it is most likely to crack in the joints between the floor slab and these materials. (Figures 32, 33 and 34)


Figure 32


Figure 33


Figure 34

STEEL MESH PLACEMENT SYSTEM

Once the 1st layer of microcement has been applied, a coat of Impritex is applied, 4 x 4, to regulate the absorption of the support produced as a result of the difference in materials and differences in thickness. Next, a layer of microcement is applied over the dry primer; when this is fresh, the mesh is inserted, and a trowel is passed over it with the objective that it flows through it. It is allowed to dry and then the other layers of micro cement are carried out until its final finish. It must be borne in mind that mesh placement implies a greater consumption of product. (Figure 35)


Figure 35

• FLOOR SLABS WITH RADIANT HEATING

Figure 36

For these types of floor slabs, our more flexible microcement will be applied, which is the standard medium-medium or medium-fine dual-component. Due to their continuous movements produced by the cold-heat alternation, the perimeter and transverse expansion joints must always be respected. (Figure 36)

• FLOOR SLABS AFFECTED BY HUMIDITY DUE TO INSTALLATION IN BUILDINGS WITH POOR GROUND INSULATION

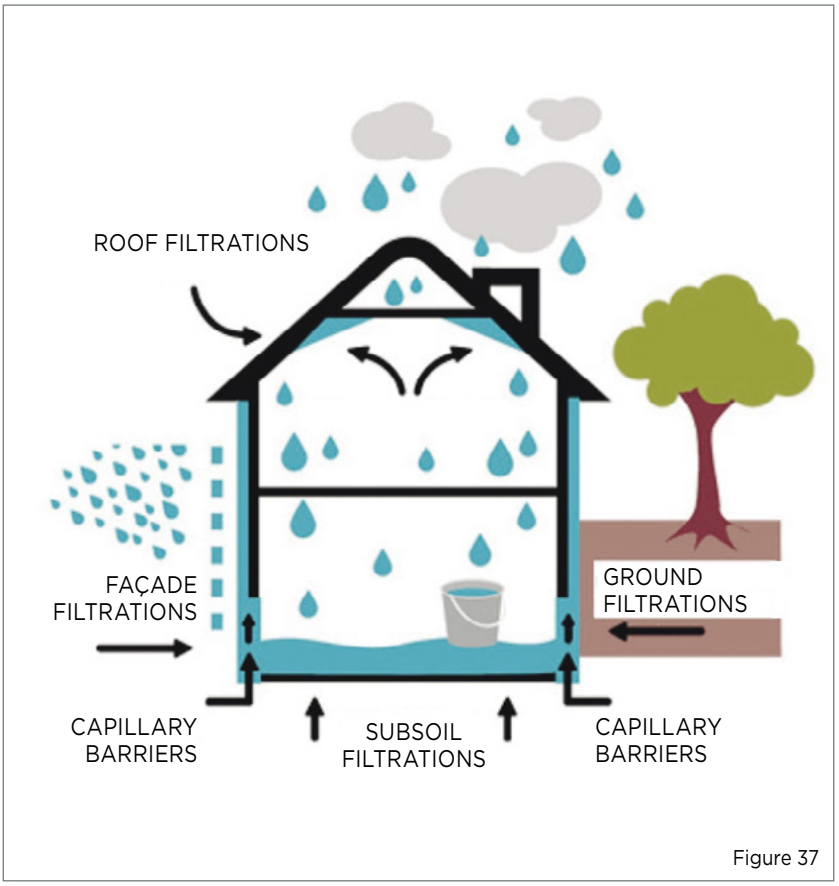


Figure 37

Humidity in buildings is produced by different causes; when it appears in walls or flooring, this means that the building is not well insulated from the water coming from the ground. In this case, it is not recommended to apply microcement. (Figure 37)

2 CERAMICS, MARBLE, GRANITE, TERRAZZO

Our microcements are specifically formulated to adhere to difficult substrates such as ceramics, marble, granite and terrazzo without previous priming, as long as they are in good condition and clean of all types of contamination such as grease, waxes, etc. that might prevent anchorage. (Figures 38, 39 and 40)

Application process: one or several coats of Repair/Levelling Enduit or any of our microcements are applied throughout the floor or wall. It is then allowed to dry completely and then the Impritex 4 x 4 rolling primer is applied. (Figures 41 and 42)

This system minimizes the possibility of the subsequent appearance of marking of joints, which can appear in a somewhat exaggerated manner, resulting in notable colour differences produced by difference in absorption between the mortar of the joint and the ceramics, difference in thickness, or very slow drying (very low temperatures and high relative humidity). (Figures 43 and 44)

Once the primer is dry, the chosen microcement system is applied the same as with a floor slab, as described at the beginning of this guide.


Figure 38


Figure 39


Figure 40

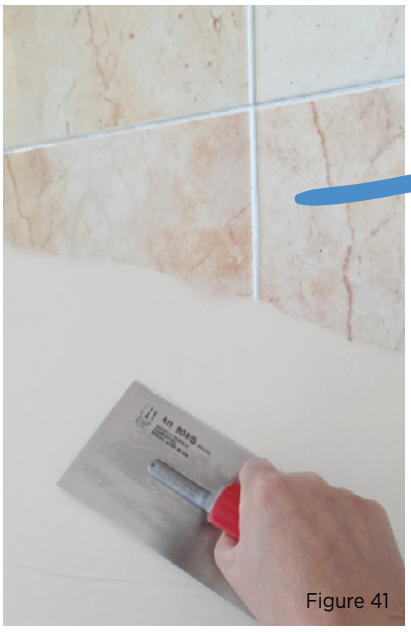


Figure 41


Figure 42


Figure 43

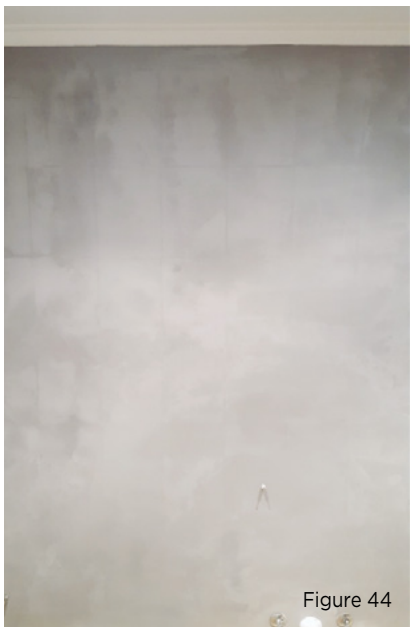


Figure 44

• MAIN PROBLEMS THAT WE FACE WITH CERAMIC, MARBLE, GRANITE OR TERRAZZO SUPPORTS

Figure 45

Figure 46

Figure 47

- **Broken or chipped ceramics.**

  If there are pieces of broken ceramics, those that are loose will be removed and filled, as will any gaps from new connections that typically originate in the rehabilitation of commercial premises, bathrooms, etc. in order to achieve a level surface. If repairs have been made or are being carried out with mortar, this will require placement of a steel mesh, since there are mixed supports and contact between the different materials (by retraction of the filling mortar) may generate cracks. Application process: several layers of Repair/Levelling Enduit or any of our microcements are applied throughout the floor or wall. Subsequently, a layer of Impritex 4x4 is applied to screen for problems in the joints (difference of absorptions and thickness). Once this primer is dry, the microcement system is applied using the steel mesh described in the previous chapter; **Floor slabs in contact with other types of materials** (Figures 45 and 46)

- **Ceramic supports located against poorly insulated ground.**

  This scenario may occur in bathrooms, kitchens, commercial premises or homes on the ground floor that are poorly isolated from the ground, and which may transmit moisture issues to the support that can be aggravated by the application of microcement. Application scenarios must be taken into account, due to the fact that problems may not be visible. Moisture from the soil may evaporate through the ceramic joints and not significantly affect the aesthetic appearance. For application of microcement and waterproofing with varnishes, transpiration of the humidity of the subsoil is prevented, leading to significant problems in the aspect

of the microcement. This problem requires a difficult solution and is not easy to repair. It is not recommended to apply microcement in these cases. (Figure 47)

- **Terrazzo flooring**

  Many of the foundations found in the rehabilitation of buildings date from previous decades and are subject to small movements barely noticeable due to the type of finish they present.

  For this type of support, it is recommended to install microcement with steel mesh as described in the chapter **Broken or chipped ceramics.** (Figure 48)

- **Ceramic tiles with high relief and joints**

  It must be remembered that the direct application of microcement will increase the consumption per square metre and the number of layers. For this reason, in some cases that the soil can be somewhat increased, and, if the execution time allows, the best option is fibrous self-levelling mortar systems prior to the application of microcement. (Figure 49)

Figure 48

Figure 49

3 RENDERINGS WITH STRIPPED OR MIXED CEMENTS

Figure 50

Figure 51

Apply Quartz Primer to the microcement to unify absorptions and fix loose grains. The ideal mortars are those of industrial production that present a low retraction and a homogenous dosage. (Figure 50)

When created "on-site", special care must be taken with application times, due to the fact that cracks may appear due to retraction at certain times as can be seen in the photo (Figure 51). These materials also tend to have a considerable roughness, with the consequent increase in the cost of microcement, making it necessary to proceed with a previous smoothing stage, whether it is a plaster or another type of finishing coat. In addition, if it is suspected that there may be residual movements, the microcement is to be assembled using steel mesh, as previously described.

4 DECORATIVE AND GYPSUM PLASTER

Figure 52

Figure 53

Several types of plasters, like the previous renderings, are included in this group: projected plasters, manual plasters, perlite plasters, fine finishes, special finishes, or gypsum plaster. Assuming that they are cohesive or hard (free of residual dust) application of the Quartz Primer is carried out before applying the microcement. (Figure 52) If, on the other hand, if these are dusty, soft, thin gypsum surfaces that detach easily, an Ultrafine Consolidating Primer must be applied before the Quartz Primer. (Figure 53)

5 PLADUR (plasterboard)

Quartz Primer is applied as a first step to regulate the different absorption between the surface of the plates and the plaster joints, thus avoiding the appearance of undesirable dark/light areas. When it has dried correctly, proceed with the chosen microcement system. This primer is also used to avoid possible damage that microcement may cause on the plasterboard surface of this type of support. The plasterboard plates must be carefully placed to avoid movements that can cause cracking (Figure 54)

Figure 54

6 HYDROFUGE MDF BOARDS

Microcement can be applied on a hydrofuge MDF board support by previously applying an Insulating Primer, preventing the wood from transferring issues to the microcement in the form of stains.

Floor-wall integrated furnishings made of wood agglomerates

The union with other materials that make up the floor or the wall must be made in a compact manner to avoid fissures in joints at contact points, that is, avoiding lag screws and resorting to pressure gluing; for example, by screwing and gluing the "slats" that fasten the furnishing frame to the floor or wall, to later fix the panels that close the furnishing with glue. (Figures 55, 56, 57 and 58)

Figure 55

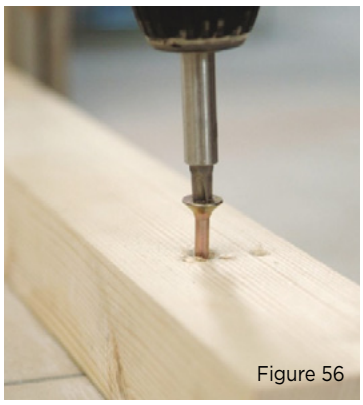


Figure 56

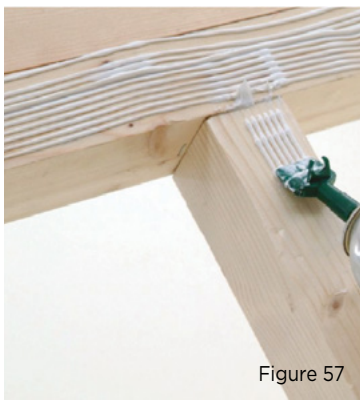
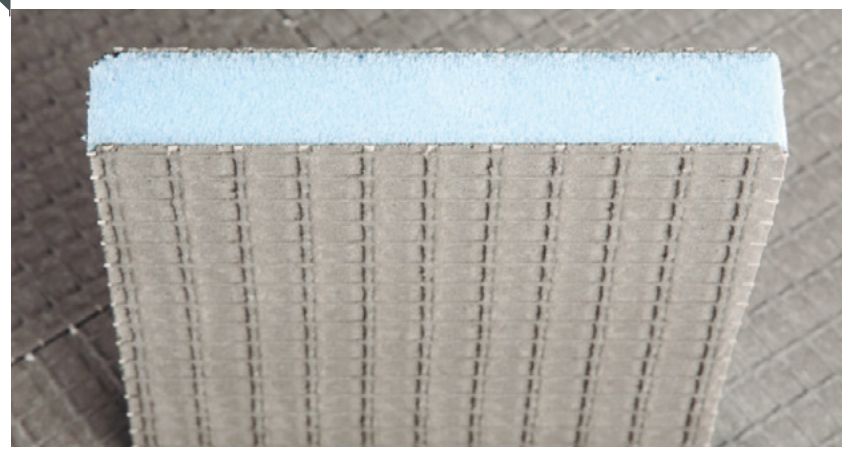


Figure 57

Figure 58

7 WEDI BUILDING BOARDS or similar



These are enclosure and partition wall systems, although furniture, washbasins, and shower trays are also built with this this material; apply Quartz Primer to the microcement first.

8 PAINT - COATINGS

It is not recommended to use microcement on top of paint or similar materials in outdoor settings. In these instances, remove it completely until the mortar is exposed.

Indoors, it can be applied to paint in good condition by previously applying 2 layers of Insulating Foundation so that the high alkalinity of the microcement and the tension it will exert does not result in damage to the paint.

Paint that is not in good condition should be eliminated.

9 REMODELLING INVOLVING VARIOUS TYPES OF SUPPORTS

When remodelling bathrooms, there may be 5 different supports on the floor and wall; ceramic, mortar on the floor, insulating board on the shower walls, plasterboard on the rest of the walls, and granite on the sink/countertop. The preparation of the different supports and subsequent microcement application will be as follows:

- Pladur, insulating board and mortar floor slab with 2 layers: quartz primer, slightly diluted with water.
- Washbasin/countertop and ceramic: nothing.
- Afterwards, a layer of medium microcement or base micro-concrete will be applied, and, while still wet, steel mesh will be placed as described in previous chapters, noting, in this case, that the reinforcing mesh is not cut in the interior squares, but rather, a flap of ± 20 cm is left to have access to the floor or wall. Allow the drying process to conclude.
- In the areas where ceramic material is present, apply the Impritex 4 X 4 primer on top of the microcement with steel mesh, when already dry; the covered area of the granite washbasins/counter-top is carried out in the same manner.
- Upon reaching this point, the selected microcement system is applied similarly in the soil-wall, i.e. 2 layers of medium microcements/base micro-concrete or 2 layers of medium/base micro-concrete plus one layer of fine microcements.

10 MICROCEMENTS

Occasionally, there are surfaces coated with microcements, previously varnished, that require re-application for various reasons: deterioration due to movements in the supports, poor execution, cases where the customer does not like the colour, etc. The process is simple; surface sanding, application of Imprimex 4×4 multi-adherent water-based primer; allow this to dry and apply the chosen micro-cement system. (Figures 59 and 60).

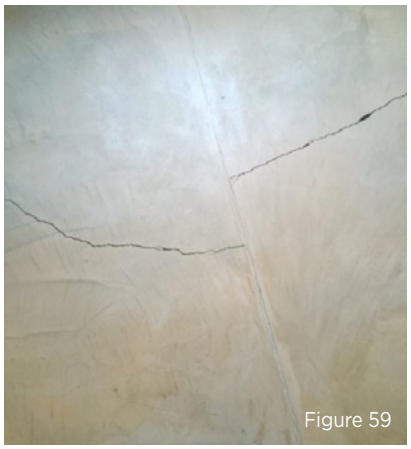


Figure 59

Figure 60

The microcement must be protected/sealed, in order to avoid contact with liquids of any type and to increase its chemical resistance; similar to polished cement, it is hard but absorbent. Although there are other protection systems available, our recommendation is to perform this using a system of application of aqueous varnishes, 2K solvent varnishes, or high-solid varnishes without solvents. The choice to use one or the other, or their combination, will be determined by the use of and location of the microcement.

The most common are:

- **Bathrooms**

  Bathrooms have become one of the most popular locations for microcement application. This is due to its aesthetically pleasing avant-garde appearance and the fact that it helps to avoid disruptive work in homes (pitted tiles, debris, levelling, etc.), especially when these spaces are still occupied by their users. Bathrooms are one of the places where microcement protection must be more rigorous, due to the continuous contact with the water of showers and toilets, and various chemical substances such as colognes, shower gels, nail polish removers, greasy makeup, etc.

  Once the final layer of microcement has been applied and has fully dried (ensuring that it is thoroughly dry), then 3 coats of water-based varnish are applied, sealing any microcement pore perfectly with an expenditure of 200-220 g/m² and with minimum intervals of 4-6 hours between layers. This will depend, however, on environmental humidity, ventilation and temperature factors. Prior to applying the upper layers, the previous ones must be perfectly dry (Figures 61 and 62)

  After applying the necessary layers of water-based varnish in order to comply with the recommended product consumption and after a minimum period of 36 hours (depending on temperature, humidity, etc.) the final protection of Farbetano H/R AD 2K varnish will be applied. The aliphatic 2K polyurethanes are usually slow to cure, and this will be taken into account when setting delivery times for work and the terms of first use. After the application of the Farbetano varnish, and once cured, a bead of transparent polyurethane mastic sealant is applied, placing tape on both sides of the joint and performing a half-round. This will be carried out when dealing with different materials in showers, sinks, screens, toilets, etc. to seal the different joints correctly (Figure 63)

  * Keep in mind that any pore left in the varnish layers can be a means of water reaching the microcement that will cause it to darken and most likely not clear up. This situation forces us repeat part of the work with the consequent disturbance to both the professional as well as the owner.

Figure 61

Figure 62

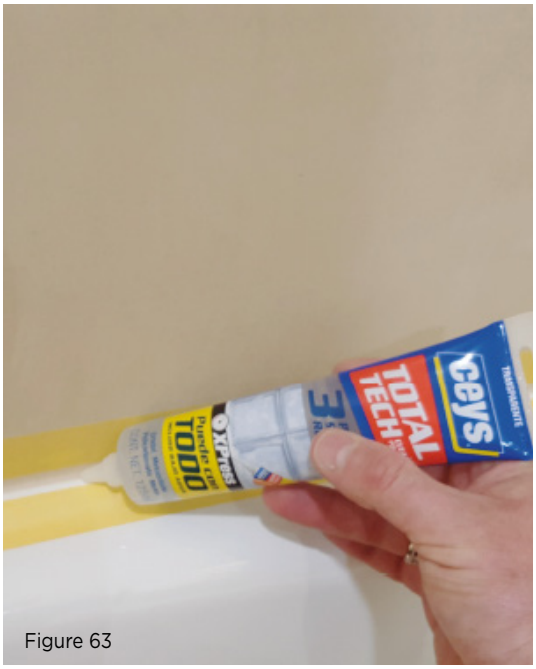


Figure 63

* One other observation is that many bathrooms do not have good air circulation (ventilation), which means that water can be trapped much longer in microcements in comparison with when used in the floors and walls of a conventional location, and the drying process can potentially be prolonged; this must be taken into account when varnishing, and an air convector can be used to help the drying process.

- **Kitchens**

  Kitchens require special treatment due to the large number of aggressive products used that may affect the microcement, such as hot oil, vinegar, wine, coffee, tomato sauce, cleaning products, etc. This means that waterproofing protection must be used, but with high chemical resistance so it will be finishes in the same manner as in the bathrooms, with three layers of water-based varnish, and one final layer with aliphatic, solvent-based Farbetano H/R AD varnish, or with a water-based polyurethane 2K varnish that guarantees chemical resistance.

- **Restaurants and barber shops**

  These locations are one more example of the need for chemical resistance due to the large number of chemicals and aggressive foods products used. In this case, 3 coats of water-based protectants and two coats of aliphatic, solvent-based Farbetano H/R AD varnish, or an equivalent water-based varnish will be applied.

* In other locations, the needs of chemical and mechanical resistance must be considered, in order to choose the most appropriate protection system

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