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ASBESTOS ENCAPSULATION TECHNIQUE



ARREGHINI[®]

ITALIAN PAINTS SINCE 1950



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ASBESTOS ENCAPSULATION TECHNIQUE

It is now common knowledge that asbestos dispersed in the air is a real cancer risk for those who inhale its fibres.



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DIAGNOSTICS OF THE PROBLEM

When this problem emerged, the common conviction was that the only practical solution that could guarantee total reclamation of the environment was the removal and disposal of the material. The current tendency, now consolidated thanks to numerous experiences, is that of the "encapsulation and containment technique" of the structure on its site of installation.

This technique is favourably viewed because it creates less pollution for the surrounding environment, it is more economical and avoids the inconvenience of disposing of the waste materials. To eliminate Eternit roofing alone, in fact, Italy would need many more toxic waste dumps. The removal, destruction and transportation of these materials would be a costly and hazardous operation as it would increase the dispersion of the fibres in the air.

So the encapsulation technique involves less expense and greater safety compared with removal and disposal.





WHAT IS ENCAPSULATION

Encapsulation is a form of maintenance operation on the original roofing, performed by applying specific products which enable the fixing and sealing of the asbestos fibres contained in the structure.

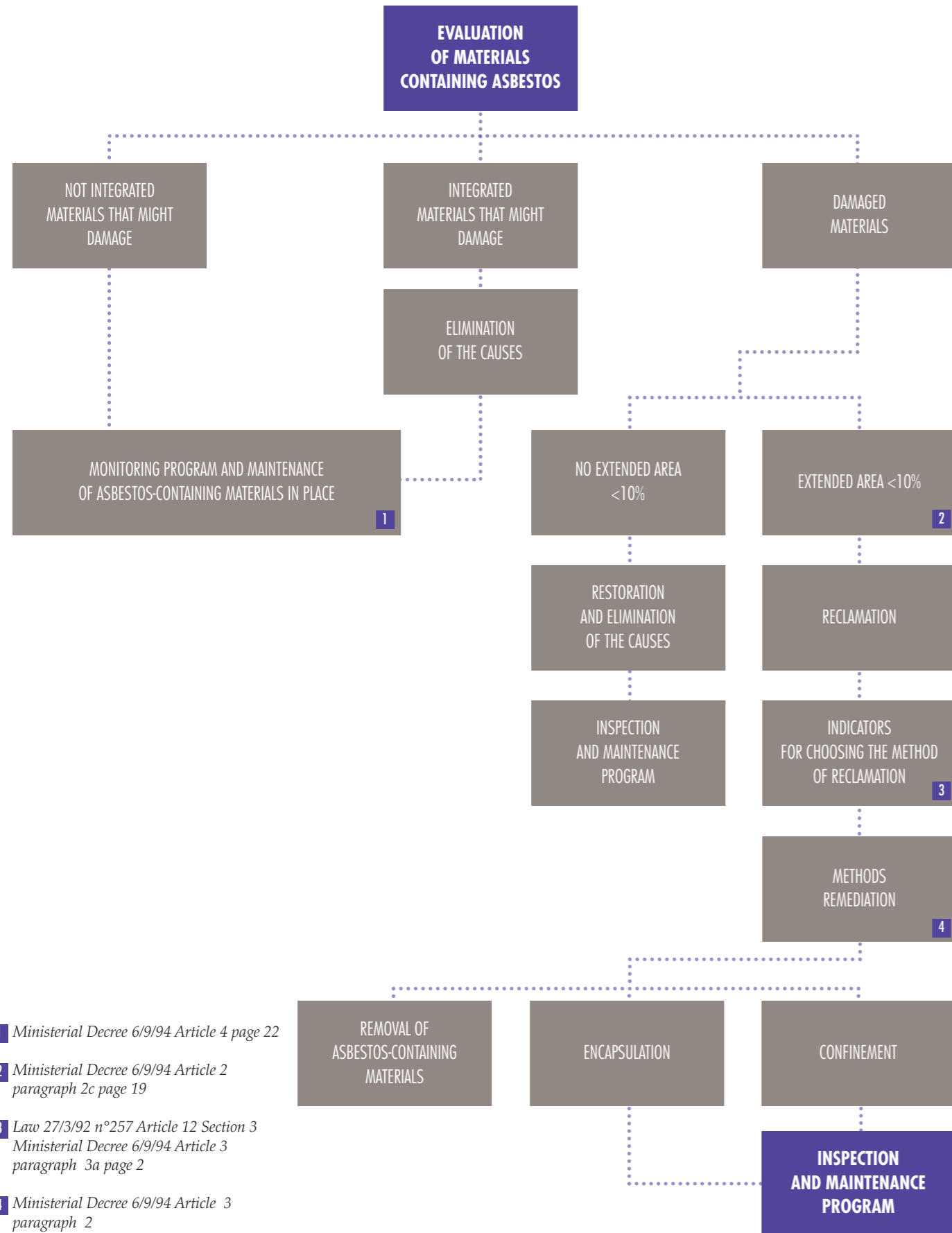
In addition to the efficacious fixing and coating of the asbestos fibres, the treatment also preserves and impermeabilizes the roof, prolonging its life for many years.

The choice of the encapsulation product to use is crucial for the success of the operation and involves a careful analysis of the characteristics of the various encapsulating products. These must contain a good chemical composition that soaks and encapsulates the asbestos fibres and guarantees optimum adhesion to the substrate; the products must have high resistance to alkalinity as the substrates to be treated often have a high pH, and they must also be elastic so as to avoid cracking. Resistance to abrasion, impact and sudden temperature differences are also factors of vital importance.

Operations concerning the installation of encapsulating coatings for the reclamation of cement-asbestos structures are governed by regulations which establish minimum performance requirements for the encapsulating coatings, application protocols and obligations to be fulfilled in order to guarantee that operations involved in the reclamation of cement-asbestos structures are carried out correctly.

The choice of the method of reclamation is made with the aid of the process flow shown in Table 1 as provided for by article 2 of the Italian Ministerial Decree D.M. 6/9/94.

CHOICE OF THE METHOD OF BONIFICATION



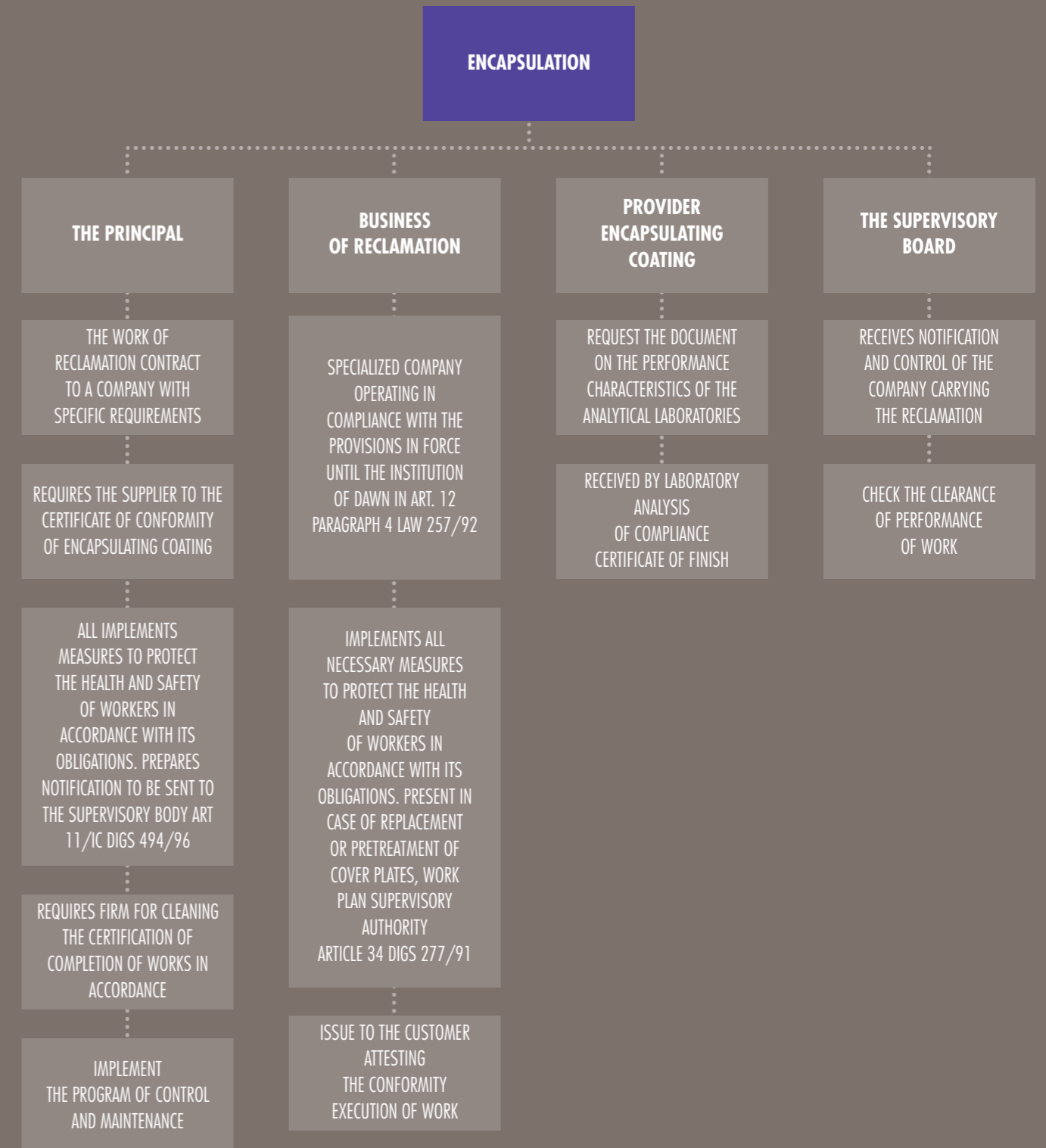
¹ Ministerial Decree 6/9/94 Article 4 page 22

² Ministerial Decree 6/9/94 Article 2 paragraph 2c page 19

³ Law 27/3/92 n°257 Article 12 Section 3
Ministerial Decree 6/9/94 Article 3 paragraph 3a page 2

⁴ Ministerial Decree 6/9/94 Article 3 paragraph 2

ENCAPSULATION PROCESS



Operations to perform encapsulation are governed by the laws mentioned, and are carried out according to the flow chart shown in table 2, annexed to the Ministerial Decree 20/8/99, published in the Official Journal of 10/22/99.

THE DIFFERENT TYPES OF ENCAPSULATION

Depending on the application, the encapsulating coating is divided into the following types:

FAIR-FACED EXTERNAL

If applied to encapsulate structures made of cement-asbestos exposed to atmospheric agents and hence subject to progressive deterioration, with surfacing and release of fibres.



FAIR-FACED INTERNAL

If applied to encapsulate structures made of cement-asbestos located in interior environments, whole, but either subject to "damage" or "damaged".



NON FAIR-FACED

To encapsulate structures in cement-asbestos, as part of a containment strategy, which only together with an encapsulating treatment prevent the release of fibres in its interior.



AUXILIARY

If applied to avoid the dispersion of fibres into the environment, as part of a removal strategy.



The encapsulating coating must be of a different colour to that of the substrate. The supplier shall indicate the thickness of the dry film, the quantity to be applied per square metre and the drying time.

THE PERFORMANCE FEATURES OF THE ENCAPSULATION COATINGS

the performance characteristics of the encapsulating coatings, which shall be certified by a qualified laboratory, are as follows:

ENCAPSULATING COATINGS TYPE A

The average thickness of the dry encapsulating coating shall not be less than 300 μm and at no point should it be less than 250 μm . The last two coats of the encapsulating cycle shall cover the structure with a different and contrasting colour.

The following laboratory tests must be carried out on TYPE A ENCAPSULATING coatings, in compliance with the methods illustrated in the paragraphs cited by the standard UNI 10686:

1. ADHESION
2. WATER IMPERMEABILITY
3. FREEZE-THAW RESISTANCE
4. RESISTANCE TO ACCELERATED AGING
5. RESISTENZA ALL'INVECCHIAMENTO ACCELERATO
6. REACTION TO FIRE: ONLY FOR THICKNESSES OF OVER 600 μm .

ENCAPSULATING COATINGS TYPE B

The average thickness of the dry encapsulating coating shall not be less than 250 μm and at no point should it be less than 200 μm .

The last two coats of the encapsulating cycle shall cover the structure with a different and contrasting colour. The average thickness of the final coat shall not be greater than the average thickness of the second last coat.

The following laboratory tests must be carried out on TYPE B ENCAPSULATING coatings, in compliance the standard UNI 10686:

1. ADHESION
2. RESISTANCE TO WASHING: THE RESULT MUST NOT BE LESS THAN 5000 WASHING CYCLES
3. REACTION TO FIRE: ONLY FOR THICKNESSES OF OVER 600 μm .

ENCAPSULATING COATINGS TYPE C

The thickness of the dry encapsulating coating shall not be less than 200 μm and none of the measurements taken shall be less than this value.

For the laboratory tests described below, the thickness of the coating shall not be less than 100 μm .

The following laboratory tests must be carried out on TYPE C ENCAPSULATING coatings, in compliance with the standard UNI 10686:

1. ADHESION
2. WATER IMPERMEABILITY
3. FREEZE-THAW RESISTANCE
4. REACTION TO FIRE: ONLY FOR THICKNESSES OF OVER 600 μm .

THE CAP ARREGHINI SOLUTIONS

To resolve the asbestos problem with the encapsulation technique, CAP ARREGHINI SpA proposes **K81 AMIANTO** a paint with certificate of conformity, in accordance with the Decree of the Ministry of Health dated 20/8/99, attesting to its suitability to neutralize structures containing asbestos.

K81 AMIANTO, applied as a simple paint on Eternit substrates, prevents the asbestos from causing harm and protects the surrounding atmosphere from the emission of fibres. Scientifically tested.

K81 AMIANTO, due to its special formula ensures:

- CHEMICAL COMPOSITION THAT WET AND WRAP THE ASBESTOS FIBRES AND ENSURE EXCELLENT ADHESION TO THE SUPPORT;
- HIGH ALKALINITY RESISTANCE EVEN ON SUBSTRATES WITH HIGH PH;
- APPROPRIATE ELASTICITY THAT PREVENTS CRACKING;
- HIGH RESISTANCE TO ABRASION AND SHOCKS IN ORDER TO PERFORM MAINTENANCE AFTER A LONG TIME;
- RESISTANCE TO DRASTIC TEMPERATURE CHANGES MAINTAINING ELASTICITY OVER TIME;
- RESISTANCE TO WEATHERING, TO BIOLOGICAL AND CHEMICAL POLLUTION DUE TO ACID RAIN.

While **K81 AMIANTO** is accompanied by certificates of conformity for encapsulation types A, B and C - issued by the Istituto Giordano -, **ACRILIFIX** been declared suitable as Type D encapsulating products.

The products proposed guarantee an encapsulation of the penetrating type as they enter the material, bonding the asbestos fibres together with the cement-based material, and of the covering type, as they form a membrane on the surface of the structure.



THE "FAIR-FACED EXTERNAL" ENCAPSULATION SYSTEM

PREPARATION OF THE SURFACE

Must be carried out in order to guarantee efficacious adherence of the encapsulating coating and may involve - depending on the state of pollution and deterioration of the substrate - a cleaning treatment which must be carried out with the aid of suitable equipment in order to prevent the release of asbestos fibres into the environment. Any waste waters from the washing cycle, together with any waste containing asbestos and any mud generated by the operations, will be disposed of in compliance with the legislation in force. In order to prevent the dispersion into the air of the asbestos fibres that have surfaced as a result of the preparation of the substrate, the subsequent phases of the encapsulation cycle will have to be carried out as soon as possible.

APPLICATION SYSTEM

- Application of an anti-mould product **B1** in the event of pollution from mould and moss;
- Application of **MURISOL** primer in quantities of 150 g/m²;
- Application of **K81 AMIANTO** in several coats, the final coat being of a different colour and in sufficient quantities to achieve the minimum thickness required by the standard: >300 m, 500 ml/m². In order to guarantee resistance against mould and moss, add 1 litre of **B25** to every 14 litres of paint.

CAP ARREGHINI PRODUCTS PERFORMANCE DATA



B1
Anti-mould masonry disinfectant

Aqueous solution of a fungicidal agent, chosen due to the wide range of action against different species of moulds and for its very low toxicity. It is a product that, when applied on is complete, does not present residual unpleasant odours. It is applied directly on the surface after washing with a highpressure water jet cleaner.



B25
Anti-mould anti-algae additive for exteriors

Algacide and fungicide in water-based paste, chosen for its high efficacy against various species of algae, moss and mould. It is a product that, when application is complete, does not present residual unpleasant odours. It is used as an additive in acrylic and Siloxane products for outdoor use.



MURISOL
Solventborne masonry undercoat

Consolidating pigmented solvent-based primer with special technology that ensures secure adhesion on different types of surfaces, it has insulating and consolidating capacities. It ensures uniformity of absorption, hence uniform finishes and excellent adhesion for later coatings. According to the type of resin and the particular lamellar pigments contained within them, it ensures high breathability, improves colour resistance and a saves up on subsequent layers in the coating system.



K81 AMIANTO
Asbestos encapsulating paint

Water-soluble paint that is waterproof, easy to apply, ideal for professional use as it is extremely compatible and has excellent adhesion, filling power and coverage of different types of surfaces. Elastomeric resin based paint in dispersion and light-resistant pigments with high resistance to UV and heat shock. It is specific for the intervention of products containing asbestos by using the encapsulating technique.

THE “FAIR-FACED INTERNAL” ENCAPSULATION SYSTEM

PREPARATION OF THE SURFACE

Preparation of the substrate by simply aspirating any dust deposited on the surface.

APPLICATION SYSTEM

- Then anti-mould treatment with **B1** in the event of mould pollution;
- Application of **MURISOL W** in quantities of 150 g/m²;
- Application of **K81 AMIANTO** in several coats, the final coat being of a different colour, and applied in sufficient quantities to reach the minimum required thickness: >250 m, 420 ml/m².

CAP ARREGHINI PRODUCTS PERFORMANCE DATA



B1

Anti-mould masonry disinfectant

Aqueous solution of a fungicidal agent, chosen due to the wide range of action against different species of moulds and for its very low toxicity. It is a product that, when application is complete, does not present residual unpleasant odours. It is applied directly on the surface after washing with a highpressure water jet cleaner.



MURISOL W

Waterborne masonry undercoat

Wall primer formulated with synthetic resins dispersed in water with special technology that ensures secure adhesion on different types of surfaces, it has insulating and consolidating capacities. It ensures uniformity of absorption and therefore uniform finishes and excellent adhesion for later coatings. According to the type of resin and the particular lamellar pigments contained within them, it ensures high breathability, improves colour resistance and a saves up on subsequent layers in the coating system.



K81 AMIANTO

Asbestos encapsulating paint

Water-soluble paint that is waterproof, easy to apply, ideal for professional use as it is extremely compatible and has excellent adhesion, filling power and coverage of different types of surfaces. Elastomeric resin based paint in dispersion and light-resistant pigments with high resistance to UV and heat shock. It is specific for the intervention of products containing asbestos by using the encapsulating technique.

THE “NON FAIR-FACED” ENCAPSULATION SYSTEM

PREPARATION OF THE SURFACE

Preparation of the substrate by simply aspirating any dust deposited on the surface.

APPLICATION SYSTEM

- Then anti-mould treatment with **B1** in the event of mould pollution;
- Application of **MURISOL W** in quantities of 150 g/m²;
- Application of **K81 AMIANTO** in several coats, in sufficient quantities to reach the minimum required thickness: >200 m, 330 ml/m².

CAP ARREGHINI PRODUCTS PERFORMANCE DATA



B1

Anti-mould masonry disinfectant

Aqueous solution of a fungicidal agent, chosen due to the wide range of action against different species of moulds and for its very low toxicity. It is a product that, when application is complete, does not present residual unpleasant odours. It is applied directly on the surface after washing with a highpressure water jet cleaner.



MURISOL W

Waterborne masonry undercoat

Wall primer formulated with synthetic resins dispersed in water with special technology that ensures secure adhesion on different types of surfaces, it has insulating and consolidating capacities. It ensures uniformity of absorption and therefore uniform finishes and excellent adhesion for later coatings. According to the type of resin and the particular lamellar pigments contained within them, it ensures high breathability, improves colour resistance and a saves up on subsequent layers in the coating system.



K81 AMIANTO

Asbestos encapsulating paint

Water-soluble paint that is waterproof, easy to apply, ideal for professional use as it is extremely compatible and has excellent adhesion, filling power and coverage of different types of surfaces. Elastomeric resin based paint in dispersion and light-resistant pigments with high resistance to UV and heat shock. It is specific for the intervention of products containing asbestos by using the encapsulating technique.

THE TYPE D ENCAPSULATION SYSTEM

APPLICATION SYSTEM

- Application of **ACRILIFIX**, 170 ml/m². The surface treated can withstand foot traffic after 8 hours.

CAP ARREGHINI PRODUCTS PERFORMANCE DATA



ACRILIFIX

Waterborne wall primer

This is a primer for walls, formulated with acrylic resins in aqueous dispersion. It is suitable for securing the adhesion on different types of surfaces, as well as insulating and consolidating capacities. It ensures uniformity of absorption, a uniform finish and excellent adhesion for later coatings. It is formulated for indoor and outdoor acrylic processing. It is also suitable to attach airborne asbestos fibres and to consolidate and encapsulate the surface during the removal and cleaning up phases. Pursuant to the Ministerial Decree dated the 20th August 1999 it is classified as a type D auxiliary penetrating and covering encapsulating coat.

CONTROL AND MAINTENANCE

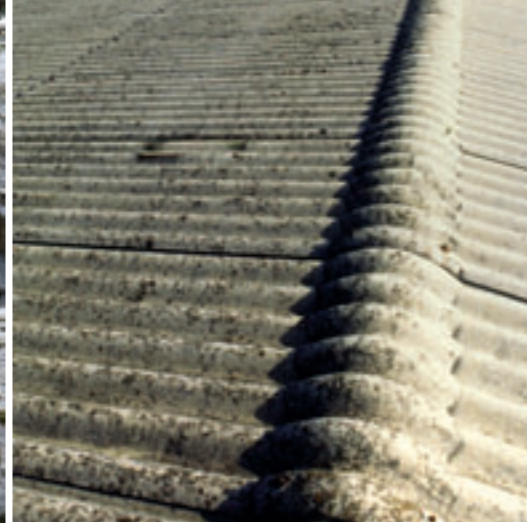
In order to guarantee the efficacy over time of the “fair-faced” encapsulation systems (types a and b), it is necessary to keep to a periodical control and maintenance plan.

The customer will be required to carry out the following periodical checks: check that no areas of the encapsulating coating covering the surface of the structure have spalled, flaked off or cracked; ensure that the colour of the final coat has not worn off, revealing the colour of the product underneath.

Depending on the results of the check, the appropriate measures will be taken, and could involve:

- RESTORING OF THE CONTINUITY OF THE ENCAPSULATING COATING WITH SUITABLE OPERATIONS TO BE DECIDED UPON, ON A CASE BY CASE BASIS;
- APPLICATION OF ANOTHER COAT OF PRODUCT TO REPLACE THE ONE WORN AWAY BY ATMOSPHERIC AGENTS.





SEE ALSO THE OTHER CAP ARREGHINI BOOKS



PROTECTION OF PLASTER IN EXTERIOR ENVIRONMENTS



PROCESS OF CRACKING



TYPES OF PLASTER: PREPARATION AND RESTORATION WORKS



MOULD AND ALGAE



PROTECTION AND REHABILITATION OF CONCRETE



THERMAL INSULATION WITH THERMOCAP THICK COATING SYSTEM



TREATMENT OF DAMP WALLS



TREATMENT OF METALS



TREATMENT OF WOOD



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