

### **Anchoring**

#### **Structural consolidation and reinforcement of structures:**

FRP; Collaborative castings;  
Injections; Reinforced rendering;  
Microposts;  
Wall-building;  
Restoration and protection;  
of reinforced concrete;  
Break-fill.

### **Dehumidification**

Dehumidifying render;  
Chemical barrier;  
Anti-mould treatment.

### **Water-proofing**

Cement-based;  
Resin-based; Mixed.

### **Encapsulation of concrete-asbestos**

### **Thermal insulation**

Walls; Ceilings;  
External thermal insulation system.

### **Cleaning, consolidation and surface protection of stonework**

### **Production of screeds**

### **Resin-based floors and/or coatings**

Floors and coatings;  
Restoration;  
Coatings.

### **Preparation, consolidation and protection of render and finishes**

### **Treatment and protection of facades**

### **Application of ceramic tiles**

## **LIST OF KIMIA SOLUTIONS**

*<-- Click on intervention areas on the left*

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## **Anchoring**

Kimia provides cement-based and resin-based anchoring systems of various types for anchoring to different supports

*Anchoring to rock and soil using tie rods with high resistance to sulphates*

*Anchoring reinforcements on compact reinforced concrete, terracotta, stone, wooden structures, with holes set horizontally or in the ceiling, using epoxy resins*

*Anchoring reinforcements on compact reinforced concrete, terracotta, stone, wooden structures, with holes set horizontally or inclined downward, using epoxy resins*

*Anchoring reinforcements, structures and materials*

*Anchoring metal structures or machinery*

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## **Structural consolidation and reinforcement of structures in reinforced concrete, brickwork, wood, steel, other materials**

Kimia solutions for structural consolidation and reinforcement involve both more traditional systems (such as injection, collaborative casting, reinforced plaster/render, break-fill), and more innovative FRP consolidation systems.

### **FRP**

### **Collaborative casting**

### **Injection**

### **Reinforced rendering**

### **Microposts**

### **Wall-building**

### **Restoration and protection of reinforced concrete**

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## **FRP**

FRP consolidation systems involve gluing of carbon fibre, fibre glass or aramidic fabric or strips onto a suitably prepared support, using epoxy resins. These systems are characterised by their extremely high tensile strength, low specific weight, high resistance to environmental stress. They are fast, simple and economic to apply, both when working on reinforced concrete structures and on brickwork and steel structures.

*Consolidation for degraded wooden beams at the anchor point with the wall*

*Consolidation of reed and gypsum vaults with uni-directional fibre glass mesh strips*

*Consolidation of reed and gypsum vaults with heavyweight bi-directional fibre glass strips*

*Consolidation of reed and gypsum vaults with bi-directional fibre glass strips*

*Consolidation of brick vaults with heavyweight bi-directional carbon fibre mesh strips*

*Consolidation of brick vaults with uni-directional carbon fibre mesh strips*

*Consolidation of brick vaults with uni-directional fibre glass mesh strips*

*Consolidation of brick vaults with heavyweight bi-directional fibre glass strips*

*Consolidation of brick vaults with bi-directional fibre glass strips*

*Consolidation for wooden structures without altering the intrados*

*Reinforcement of wooden structures with heavyweight bi-directional carbon fibre mesh strips*

*Reinforcement of wooden structures with uni-directional carbon fibre mesh strips*

*Reinforcement of steel beams with carbon fibre sheets*

*Reinforcement of steel beams with uni-directional carbon fibre mesh strips*

*Reinforcement of wooden beams with carbon fibre sheets*

*Structural reinforcement of masonry with carbon fibre sheets*

*Structural reinforcement of masonry with heavyweight uni-directional carbon fibre mesh strips*

*Structural reinforcement of masonry with uni-directional carbon fibre mesh strips*

*Structural reinforcement of masonry with uni-directional fibre glass mesh strips*

*Structural reinforcement of reinforced concrete pillars and columns with uni-directional carbon fibre mesh strips*

*Structural reinforcement of reinforced concrete pillars and columns with bi-directional carbon fibre mesh strips*

*Structural reinforcement of brick pillars with uni-directional carbon fibre mesh strips*

*Structural reinforcement of reinforced concrete beams and joists with uni-directional carbon fibre mesh strips*

*Structural reinforcement of reinforced concrete beams with bi-directional carbon fibre mesh strips*

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## **Collaborative casting**

Traditional system to recover/improve the strength of structural elements, involving increase of the withstanding section of said elements by casting mortar or concrete so that it is integral with the existing structure.

*Consolidation of reinforced concrete structures by means of collaborative casting*

*Consolidation of brick or stone vaults with thicknesses equal to or exceeding 13 cm*

*Consolidation of brick or stone vaults with thicknesses equal to or exceeding 13 cm with frescos in the intrados*

## **Injection**

Among the operation methods used to improve the shear strength of masonry structures, the one that has proved to be most efficient, in experiments that have been going on since the early Eighties, is that of injection into the masonry of lime-based or cement-based mortars compatible with the existing ones. The method consists in filling the empty spaces left in the original mortar, or those caused by settling, with an injection (6-8 holes/m<sup>2</sup> of wall) of new mortar, so as to restore the evenness and connection of the masonry elements. Injection makes it possible to render the behaviour of the masonry more even, as it fills cavities and restores the continuity of the material, thus increasing its shear strength.

*Consolidation of foundations by injecting*

*Consolidation of mixed masonry by injecting special sulphate-resistant, cement-based mortars*

*Regeneration and pre-consolidation of old dry-stone walls by injection of mixes with a high mechanical strength and low water-soluble salt content*

*Regeneration and pre-consolidation of old dry-stone walls by injection of mixes with a zero water-soluble salt content*

## **Reinforced rendering**

The restoration/reinforcement method most widely used in Italy since the Eighties is that of a cement-based or lime-based render reinforced with metal mesh. This operation is able to increase the deformation and energy dissipation capacities of masonry structures, both in compressed elements (pillars) and in shear-resistant elements (wall panels subject to seismic stress).

*Consolidation of masonry using reinforced composite-action plaster in sandwich form*

*Consolidation of masonry using reinforced composite-action plaster on one side only*

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## Microposts

Microposts are foundation posts with a diameter of between 90 and 300 mm and a length varying from 2 to 50 metres. They are used in various situations: to consolidate direct foundations whose bearing capacity is insufficient to support the superstructure; to restore and/or repair foundations damaged by external physical-chemical agents (differential settling, erosion at the feet of bridge piles); for consolidation of soil before casting direct foundations; to create anchor points/tie rods (application to rock barriers, tie rods to prevent overturning of dividing walls, ...). To lock tie rods and connectors and for pre-consolidation of soil before subsequent excavation of road and railway tunnels.

*Reinforced microposts with excellent resistance to sulphates*

## Wall-building

Often during recovery of old structures it is necessary to construct new walls for architectural-structural reasons.

*Construction of clay brick and natural stone walls using binder mixed with sand  
Construction of clay brick and natural stone walls using ready-to-use mortar*

## Restoration and protection of reinforced concrete

If the elements in a reinforced concrete structure are excessively damaged, restoration and protection of deteriorated reinforced concrete structures with exposed metal reinforcement

*Restoration and protection of deteriorated reinforced concrete structures with exposed metal reinforcement.*

## Break-fill

Traditional system for recovery of masonry walls involving replacement and filling of the deteriorated clay brick material.

*Recovery of walls by means of the "break-fill" system using NHL Z5 binder mixed with sand  
Recovery of walls by means of the "break-fill" system using ready-to-use mortar*

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## **Dehumidification**

Kimia offers a number of solutions to solve problems connected to the presence of damp within buildings: dehumidifying renders, chemical barriers and anti-mould treatments. These solutions can be used individually or in combination with each other.

### **Dehumidifying render**

A dehumidifying render allows continuous evaporation of the water in the masonry, leaving the surface dry and the rooms healthy and with an attractive appearance.

*To restore masonry work subject to rising damp*

### **Chemical barrier**

System used to form a horizontal barrier against rising damp in old walls, involving the use of an horizontal chemical barrier inserted by injecting hydrophobic liquid into the masonry. The characteristics of the injected material are such that they prevent the water from rising through the material, thus solving the problem of rising damp.

*Chemical barrier against rising damp and restoration of damp walls*

### **Anti-mould treatment**

Indoor areas with mould or fungal growths must be treated using specific procedures, to ensure that the operation be as successful and long-lasting as possible. Mould grows in points where the building's thermal insulation is poor and damp condenses. Application of specific anti-mould products, associated with a possible increase in the building's insulating capacity, or more simply more care in keeping the rooms aired, will always guarantee that the walls are restored to a normal appearance and to a proper state of hygiene.

*Anti-moisture and anti-mould treatment*

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## **Water-proofing**

Kimia solutions for waterproofing (of ceilings, walls, plaster, roofing, baths, swimming pools, road and railway bridges, etc...) involve the use of both cement-based, resin-based and mixed systems, which can be selected and customised by each client based on his own needs.

### **Cement-based**

Waterproofing retaining structures from the outside  
Waterproofing balconies and small terraces, and subsequent tiling  
Waterproofing underwater rooms with negative pressure infiltration  
Waterproofing shower trays, and subsequent tiling  
Waterproofing tanks containing non-drinking water  
Waterproofing terraces using an elastic cement-based system, and subsequent tiling  
Waterproofing terraces using an elastic cement-based system without demolition of the existing floor, and subsequent tiling  
Waterproofing and subsequent tiling of reinforced concrete swimming pools  
Elastic protection of concrete structures exposed to aggressive chemicals (antifreeze salts, carbon dioxide, sulphates, chlorides, etc.)  
Levelling of plasterwork and concrete structures with micro-cracks (caused by shrinking)

### **Resin-based**

Gutter waterproofing  
Waterproofing damaged facades using elastomeric resins  
Protection of metal roofs

### **Mixed**

Waterproofing tanks containing drinking water  
Waterproofing weightbearing roofs without demolition of the existing floor  
Waterproofing and painting of reinforced concrete swimming pools  
Internal waterproofing of reinforced concrete structures containing aggressive chemicals  
Internal waterproofing of reinforced concrete structures containing extremely aggressive chemicals  
Thermal insulation, soundproofing and waterproofing of new weightbearing roofs  
Undertile thermal insulation, soundproofing and waterproofing  
Waterproofing road and railway bridges  
Treatment of expansion joints and cold joints in cast concrete structures

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## **Encapsulation of concrete-asbestos**

Asbestos, which in the past was widely used in building construction, particularly to manufacture asbestos cement, has proved to be dangerous because progressive aging or mechanical stress causes the release and dispersion into the surrounding air of asbestos dust, which can cause numerous pathologies if breathed (asbestos poisoning, cancer, etc.). Italian MD 20.8.99 regulated this problem, setting the characteristics required for products that are used for the various forms of restoration foreseen.

Encapsulation of "type d" concrete-asbestos covers, to assist in removal (based on the requirements of Italian Ministry of Health Decree 20/08/99)

Encapsulation of "type c" concrete-asbestos structures, confining (based on the requirements of Italian Ministry of Health Decree 20/08/99) and subsequent laying of sandwich panels in direct contact with the concrete-asbestos structure

Encapsulation of "type c" unexposed concrete-asbestos structures, confining (based on the requirements of Italian Ministry of Health Decree 20/08/99) and subsequent laying of false ceiling or raised overroof detached from the concrete-asbestos structure

Encapsulation and protection of externally exposed "type a" concrete-asbestos covers (based on the requirements of Italian Ministry of Health Decree 20.08.99)

Encapsulation and protection of internally exposed "type b" concrete-asbestos structures (based on the requirements of Italian Ministry of Health Decree 20.08.99)

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## **Thermal insulation**

Kimia has studied a number of products for thermal insulation of buildings, including screeds, renders and certified thermal insulation systems.

### **Walls**

Creating sound-absorbent plasters/renders  
Creating thermally insulating plasters/renders

### **Ceilings**

Thermal insulation, soundproofing and waterproofing of new weightbearing roofs  
Undertile thermal insulation, soundproofing and waterproofing  
In lightened, sound-absorbent screeds.

### **External thermal insulation system**

EC certified (ETA004) thermal insulation system, to be installed externally on clay brick and/or stone walls, at any height  
EC certified (ETA004) thermal insulation system, to be installed externally on reinforced concrete walls, at any height  
EC certified (ETA004) thermal insulation system, to be installed externally on reinforced concrete frame and infill walls or brickwork structures, at any height

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## **Cleaning, consolidation and surface protection of stonework**

Throughout history, stonework in all its architectural uses has suffered day-to-day attack by a number of factors, which must be neutralised in a decided manner so as to prevent irreparable deterioration. Kimia has prepared a series of products and application cycles aimed at conserving and protecting "stone" in an efficient manner, compatible with the material itself, and capable of acting selectively on the causes of deterioration, safeguarding the structure of the stone. These products do not form films, and do not change the external appearance of the treated support.

*Consolidation for mainly silicate stonework*

*Consolidation for mainly carbonate stonework*

*Cleaning and protection of stonework against soiling with paint or felt-tip pens*

*Cleaning and protection of stonework against microflora and mould*

*Cleaning and protection of delicate carbonate or silicate stonework*

*Cleaning and protection of delicate carbonate or silicate stonework using moistened pads*

*Cleaning and protection of compact natural carbonate and/or imitation stone.*

*Cleaning and protection of compact natural silicate and/or imitation stone*

*Cleaning and protection of soft natural silicate and/or imitation stone*

*Water / Oil repellent protection of facades*

*Restoration and protection of crumbling stonework (tufa, sandstone, etc.)*

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## **Production of screeds**

Workability and ease of application are the main points around which Kimia research hinges when defining products to be used to produce screeds, building materials that are employed for levelling operations prior to laying.

*Production of screeds*

*Production of lightened, sound-absorbent screeds*

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## **Production of resin-based floors and/or coatings**

Kimia offers extensively customisable solutions for civil and industrial floors and coatings.

### **Floors and coatings**

*Self-levelling, hygienic and easy-to-clean continuous flooring*

*Extra-thick, epoxy resin armoured floor*

*Easy-to-clean, hygienic dust-proof protection for floors, without vapour barrier*

*Self-levelling, easy-to-clean, continuous hygienic protection for floors, without vapour barrier*

### **Restoration**

*Restoration of concrete floors with damp surfaces*

*Restoration and sealing of deteriorated joints in concrete flooring*

### **Coatings**

*Synthetically painted tennis courts*

*Non-toxic continuous coatings*

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## **Preparation, consolidation and protection of render and finishes**

Render is a multiple-layer protective coating applied to walls. The first layer, in contact with the brickwork, is known as the rough coat: it acts as an adhesive bond between the body of the render and the masonry; it is applied in an uneven manner so that it coats 60-80% of the wall: its rather large grain size creates rough areas that act as a binding for subsequent layers. The second layer is known as the rustic render, and has a medium grain size (approximately 1.5 millimetres in diameter maximum) and is applied in thicknesses of between 1.5 and 2 centimetres, forming the skeleton of the entire render. Its main task is to even out the surface of the wall. The final layer, known as the final render or skim coat (application of this layer is generally known as skimming) generally has two functions: to protect the render and to give it a pleasing appearance. Kimia offers a number of solutions for application of new render and restoration of old render.

*Waterproofing damaged facades using elastomeric resins*

*Bonding and consolidation of frescoes that have separated from their substrate by injecting the product*

*Regeneration and preconsolidation of frescoed curtain walls by injecting the product*

*Stucco finish on exterior facades or internal walls with a smooth mineral levelling finish*

*Finishing coats on exterior facades or internal walls with a rustic mineral levelling finish with max. 0.6 mm granulometry*

*Finishing coat for plasters and/or renders made with max. 1 mm granulometry*

*For lime-based internal plastering and/or exterior rendering without radioactive emissions*

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## **Treatment and protection of facades**

For treatment and protection of facades, Kimia offers various waterproofing systems and products for pointing.

Pointing of joints consists in replacing deteriorated mortar with fresh mortar (if possible hydraulic lime), paying particular attention both to the colour and thickness; it is advisable not to allow the mortar to protrude beyond the surface of the brickwork, but on the contrary be indented by at least 1 mm.

*Waterproofing damaged facades using elastomeric resins*

*Water-repellent, invisible waterproofing of exposed walls or structures*

*Pointing of terracotta or regularly shaped stone surfaces with joints less than 1 cm wide using a binder mixed with sand*

*Pointing of terracotta or exposed stone surfaces using a binder mixed with sand*

*Pointing of terracotta or exposed stone surfaces using a binder mixed with sand*

*Pointing of terracotta or exposed stone surfaces using a ready-to-use mortar*

## **Anchoring**

### **Structural consolidation and reinforcement of structures:**

FRP; Collaborative castings;  
Injections; Reinforced rendering;  
Microposts;  
Wall-building;  
Restoration and protection;  
of reinforced concrete;  
Break-fill.

### **Dehumidification**

Dehumidifying render;  
Chemical barrier;  
Anti-mould treatment.

### **Water-proofing**

Cement-based;  
Resin-based; Mixed.

### **Encapsulation of concrete-asbestos**

### **Thermal insulation**

Walls; Ceilings;  
External thermal insulation system.

### **Cleaning, consolidation and surface protection of stonework**

### **Production of screeds**

### **Resin-based floors and/or coatings**

Floors and coatings;  
Restoration;  
Coatings.

### **Preparation, consolidation and protection of render and finishes**

### **Treatment and protection of facades**

### **Application of ceramic tiles**

## **Application of ceramic tiles**

CE-marked adhesives for internal and external application of ceramic tiles of various classes, for application of ceramic tiles, natural and artificial stone, overlay.

*Application of ceramic tiles, natural and artificial stone slabs, overlay*