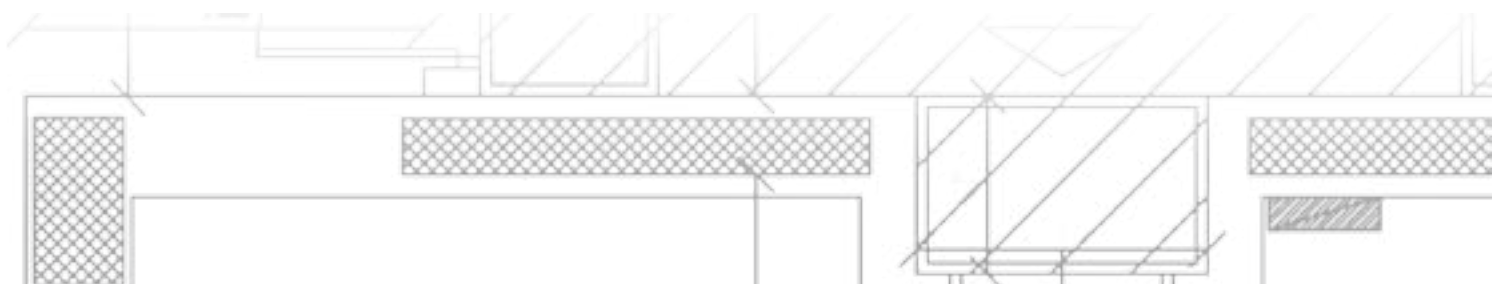




Technical Notebook

# INSTALLING RESILIENT WALL AND FLOOR COVERINGS

Materials and systems to install resilient wall and floor coverings correctly



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## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

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### 1. INTRODUCTION

The aim of this Technical Notebook is to offer useful guidelines to assist in the correct installation of resilient wall and floor coverings. To achieve long-lasting results, it is recommended you use technologically advanced products and systems made by MAPEI, which are supported thanks to the company's extensive experience gained over the years, as well as constant technical support from the company's Research and Development laboratories.

To solve typical problems encountered when installing these types of material, MAPEI offers a complete range of products including screeds, primers, levelling compounds and adhesives.

This manual also illustrates examples of quality, long-lasting installation methods for rubber, PVC and linoleum for various types of application and environment.



## 2. TYPICAL CHARACTERISTICS OF RESILIENT WALL AND FLOOR COVERINGS



### 2.1 DEFINITION AND ADVANTAGES

When we talk about resilient wall and floor coverings, we mean those products characterised by a higher degree of flexibility compared with so-called “hard materials”. If this type of material is subjected to a load on the surface, it has the property, known as resilience, to deform flexibly for brief periods due to the load, and then quickly return to its original configuration prior to applying the load. Deformation may become permanent if the load is continuous and constant.

Numerous products are part of this family and may be divided into three types: rubber, linoleum and vinyl. These products are available on the market in the form of sheets and tiles.

Resilient coverings have specific characteristics:

- **Performance characteristics:** flexibility, permanent elasticity, impermeability, strength, cleanability, warm to the touch, comfort under foot, soundproofing against impact noise (reduction by up to 20 dB) (acoustic floor coverings only), thermal resistance comparable to that of wood and carpet, good resistance to wear, stains and water and low electrical conductivity.

- **Application characteristics:** these materials are very light (from 1 to 6 kg/m<sup>2</sup>), easy to handle, they may be adapted to any geometrical form (easy to cut) and, therefore, stand out from other materials because they are so easy to apply.

These types of covering are normally used in airports, offices, shops, gymnasiums, industrial facilities, clinics, hospitals, schools and nurseries, and on buses, trains and ships, that is, in all those places where cleanability,

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hygiene and comfortable surfaces are of primary importance, yet at the same time where surfaces are subjected to intense, continuous use. This is why careful substrate design is of fundamental importance.

## 2.2 SPECIAL CHARACTERISTICS OF RESILIENT MATERIALS AND PRECAUTIONS DURING INSTALLATION

The precautions that need to be taken when installing resilient materials are quite different to those of other covering materials. In fact, certain considerations regarding the very nature of resilient materials need to be made:

- **Deformability:** resilient flooring is usually deformable and, if subjected to concentrated loads, does not have the capacity to distribute stresses, and tends to transfer them to the underlying substrate, which therefore must have high performance characteristics (especially regarding strength and resistance to abrasion) (Fig. 2.1).
- **Thin:** they are only a few millimetres thick, which makes them suitable for flooring in areas where the design level does not permit the use of other types of flooring. On the other hand, its low thickness will not cover or hide defects or uneven areas present on the sub-floor. For this reason, surfaces must always be prepared adequately with specific smoothing products. With particularly thin coverings choosing the right adhesive is important, in that high viscosity adhesive could cause unsightly defects in the surface of the covering (ribs of adhesive could mirror through the finished flooring).
- **Resilience:** the characteristic of resilience in these materials helps to increase their soundproofing capacity and impact resistance. Their tendency to return to their original configuration, however, makes it difficult to install them in correspondence with curves and sharp edges. In such cases, they must be installed using an adhesive with a strong

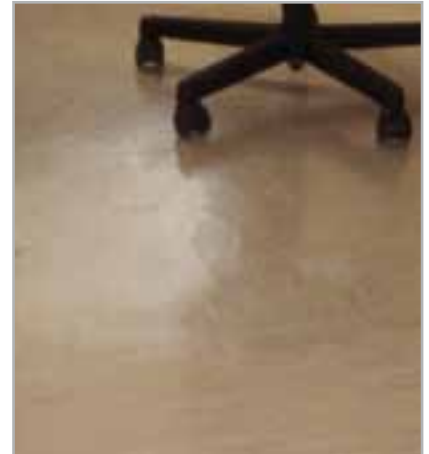


Fig. 2.1 - Installation on a skim coat with low resistance to abrasion



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initial bond (contact adhesive or adhesive strip) that impedes the elastic return of the material and prevents them detaching from corners. At the same time, sheets of resilient material in roll form tend to “remember” their shape when packed and, therefore, must be removed from the packaging a minimum of 24 hours prior to installation and laid out into the area where it is to be installed at a temperature of no less than 18°C, so that they may take up their initial conformation.

- **Dimensional stability:** certain resilient materials may change in size if subjected to temperature variations. If this characteristic is not correctly considered when choosing the adhesive to be used for installing them, it is possible to have a problem with joints pushing together or opening. In such cases, you must choose an adhesive that stops the material moving and guarantees its durability once installed. This often occurs due to the production technique used to manufacture the covering (calendering), manufacturers mark the material to indicate the best direction to install it so that it has less influence. The direction must be respected when installing the floor covering.

Because of the inherent characteristics of resilient coverings, special care has to be taken when it is installed to prevent defects appearing afterwards.

- **Dryness:** this characteristic means that the substrate must be checked to make sure it is dry prior to installation to prevent bubbles forming on the surface. Apart from construction or residual moisture in the substrate, there are another two reasons why bubbling may occur. The first one is due to insufficient rolling after installing the covering. It must be rolled from the centre towards the edges to eliminate any air bubbles that have been trapped in during installation of the sheets or tiles. The second is due to mistakes during installation; the floor covering must never be subjected to trafficking until the adhesive has set. If not, displacement

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of fresh adhesive can occur. Once set lustre or no adhesion in that area can result in the formation of bubbles.

- **High resistance to wear:** resilient materials are very resistant, even in areas where there is high levels of traffic. However, in order to guarantee its durability, the right adhesive must be used to suit the service conditions of the flooring. For example, if the flooring is maintained frequently or water is allowed to accumulate on the surface (and the joints are not going to be sealed or welded), adhesives in water dispersion must be avoided and a reactive adhesive must be used to prevent the layer of adhesive deteriorating which would result in the covering becoming de-bonded.



### 3. SUBSTRATE PREPARATION

Substrates must be prepared according to specific requirements to make them suitable for laying resilient wall and floor coverings, and these requirements vary according to their final use.



#### 3.1 THICKNESS OF THE SUBSTRATE

For more detailed information about preparing screeds, please refer to the Mapei Technical Notebook "Installation of screeds for laying floors".

With resilient materials, we always recommend installing an unbonded screed and laying a suitable vapour barrier (or checking that there is one in the case of an existing screed) to block rising damp from the layers below. The barrier should be made from sheets of polyethylene at least 0.3 mm thick, and all the overlaps should be sealed with waterproof tape. A vapour barrier is required because resilient coverings form an impermeable surface. It is vitally important, therefore, that the substrate does not have any problem due to moisture to prevent detachment of the covering or the formation of blisters. The unbonded screed must be at least 4 cm thick, and the thickness must be increased in certain cases,



Fig. 3.1 - A substrate sinking around through pipe-work due to its insufficient thickness

depending on the type of substrate and the loads to which the flooring will be subjected to when in service.

The thickness must also take into consideration the presence of layers of compressible material or pipe-work (in all cases, at least 2.5 cm above through pipe-work to prevent localised settling, Fig. 3.1). Since resilient floor coverings, due to their very nature, are unable to distribute the loads acting on them, their reliability and durability depend mainly on the mechanical characteristics and surface finish of the substrate, consisting of the screed and a smoothing compound. This must guarantee its capacity to withstand the design service loads, including point loads.

### 3.2 MECHANICAL STRENGTH AND COMPACTNESS

Mechanical strength requirements must be assessed according to service conditions and final use. A value of 20 MPa is generally considered sufficient for substrates in civil applications, and this value should be increased to around 30 MPa for commercial and industrial environments. Since substrates are usually smoothed over before installing resilient material, the smoothing products used must also meet the same mechanical requirements and have a value of 20-25 MPa.

EN 13813 standard “Screed materials and screeds” helps the choice of products with adequate mechanical strength, giving an accurate classification of products for screeds and smoothing compounds according to their compressive and flexural strength and their fire resistance.

For existing substrates that do not have the specified mechanical characteristics, a consolidating cycle may be considered using a suitable consolidating product such as:

- two-component epoxy primer: **PRIMER MF** or **PRIMER MF EC PLUS** surface blinded with quartz sand;
- one-component polyurethane primer: **ECO PRIM PU 1K** surface blinded with quartz sand.

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#### 3.3 CURING

Before installing the material, the substrate must be well cured. The curing time for traditional cementitious substrates made from sand and cement is around 7-10 days per centimetre of thickness. During this period, screeds and render are subject to hygrometric shrinkage which may form cracks. If resilient coverings are installed without respecting curing times, the cracks may be transferred to the covering with the risk of de-bonding. If installation is carried out before the substrate is completely dry, bubbles may form on the surface (Figs. 3.2 and 3.3).

Curing times may be reduced if required by using pre-blended, controlled-shrinkage, quick or rapid-drying binders or mortars such as:

- **TOPCEM** special hydraulic binder used to make normal-setting, quick-drying (4 days), controlled-shrinkage screeds.
- **TOPCEM PRONTO** ready-to-use, pre-blended, normal-setting, quick-drying (4 days), controlled-shrinkage mortar, class CT-C30-F6-A1fl according to EN 13813, certified by GEV as a product with very low emission of volatile organic compounds (EMICODE EC1R PLUS).
- **MAPECEM** special rapid-setting and drying (24 hours), controlled-shrinkage hydraulic binder for screeds.
- **MAPECEM PRONTO** pre-blended, ready-to-use, rapid-setting and drying (24 hours), controlled-shrinkage mortar, class CT-C60-F10-A1fl according to EN 13813.

Compared with a traditional screed, using pre-blended mortars has the following advantages:

- There is no longer the problem of having to source good quality



Fig. 3.2 - Formation of bubbles caused by installing flooring on a damp substrate



Fig. 3.3 - Formation of bubbles caused by installing flooring on a damp substrate

aggregates, clean, dry, with the right aggregate size, which are often hard to find in certain areas.

- Dosage errors and problems due to manpower are avoided.

- It is the ideal solution when the storage of raw materials (aggregates, cement, etc.) is a problem, for example when carrying out renovation work in historic town centres.

- Guarantee shorter drying and curing times, and are particularly recommended, for installing flooring sensitive to humidity, such as resilient flooring.

- Since this type of product must be labeled with CE mark, in compliance with EN 13813 standard, it allows users to know beforehand the final mechanical characteristics of the screed.



Fig. 3.4 - Carbide hygrometer used to measure residual humidity in screeds



Fig. 3.5 - Electric hygrometer

### 3.4 DRYING

For all types of resilient covering, it is extremely important to make sure that the substrate is dry prior to installation. The dryness of substrates is measured with a hygrometer: in order to install resilient materials, residual humidity must be lower than 2.5-3% for cementitious substrates and lower than 0.5% for gypsum or anhydrite-based screeds. The most reliable measurements are obtained using a carbide hygrometer (Fig. 3.4), although an electric hygrometer may also be used (Fig. 3.5).

If the level of residual moisture is slightly higher than the aforementioned values, and it is not possible to wait any further for excess water to evaporate, a waterproofing surface membrane may be applied before installing resilient coverings, and in all cases before applying the levelling layer, such as:

- **PRIMER MF** or **PRIMER MF EC PLUS**: two-component, solvent-free epoxy primer.

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- **PRIMER MF EC PLUS:** certified by GEV as a product with very low emission of volatile organic compounds (EMICODE EC1R PLUS).
- **ECO PRIM PU 1K:** one-component, solvent-free, moisture-hardening polyurethane primer with very low emission of volatile organic compounds (EMICODE EC1R).
- **TRIBLOCK P:** three-component epoxy-cementitious primer for waterproofing damp, non-absorbent substrates.

If a resilient covering has to be installed on a substrate with residual moisture, and it is not possible to install an isolating screed, **MAPELAY** waterproof isolating PVC sheets with glass fibres (Fig. 3.6) may be laid, including on cracked substrates. **MAPELAY** sheets have stacked back in PVC foam (Fig 3.7) that, when laid on the substrate, form a small gap through which air may circulate.

**MAPELAY** sheets are loose laid on the substrate without adhesive. A gap of around 1 cm must be left near walls, they must have an overlap at least 1 cm wide and all joints must be staggered. Resilient flooring may be installed over **MAPELAY** using a polyurethane based reactive adhesive such as **ADESILEX G20** (Fig. 3.8).

By adopting this system, the floor is similar to a floating floor, which means it will not be suitable for heavy traffic (such as cars or fork-lift trucks).

### 3.5 CLEANING

Surfaces on which resilient materials are to be installed must be sufficiently clean and free of dust, grease, oil, paint, loose portions and any other substance that could compromise adhesion.

On particularly dirty surfaces with oil stains, on which it is not possible to install the flooring directly, the **MAPELAY** system may be used.



Fig. 3.6 - A sheet of MAPELAY



Fig. 3.7 - PVC dimples on the back of a sheet of MAPELAY



Fig. 3.8 - Installing PVC flooring over MAPELAY using ADESILEX G20



Fig. 3.9 - Sealing a cracked screed by applying EPORIP



Fig. 3.10 - Sand blinding on the surface of fresh EPORIP



Fig. 3.11 - Swollen covering due to cracking not being sealed

### 3.6 CRACKS

All cracks must be filled with a suitable product before installing resilient coverings, such as **EPORIP**, **EPOJET** or **EPORIP TURBO** (Figs. 3.9 and 3.10).

If cracks are not correctly sealed, the covering may de-bond or bubbles may form on the surface (Fig. 3.11).

### 3.7 FLATNESS

Resilient coverings are very thin and the substrate on which they are installed must be very even: imperfections in the substrate and substrates that are not perfectly flat could create defects on the surface of the covering (Fig. 3.12).

The installation surface, must be perfectly flat and lower as much as by the total thickness of the covering, the adhesive layer and the levelling or skimming layer if required.

The acceptable tolerance for flatness, which basically corresponds to the tolerance of the finished floor, is usually 6 mm measured with a 3 metre long metal straight edge.

Eliminating rough areas in the surface, and small corrections in flatness, are carried out before installing the covering with a suitable product such as:

- **PLANIPATCH** ultra rapid-drying, fine texture, thixotropic cementitious skimming compound for layers from 3 to 20 mm thick on horizontal and vertical surfaces, class CT-C40-F10-A2fl according to EN 13813 and certified by GEV as a product with very low emission of volatile organic compounds (EMICODE EC1 PLUS). When mixed with **LATEX PLUS** instead of water, it forms a highly flexible smoothing compound with excellent adhesion, including on metal surfaces and old flooring in rubber, PVC, chipboard, parquet, linoleum, etc.

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- **ULTRAPLAN/ULTRAPLAN MAXI** self-levelling, ultra rapid-drying skimming compound for layers from 1 to 10 mm thick and 3 to 30 mm thick respectively, classes CT-C30-F7-A2fl and CT-C35-F7-A2fl according to EN 13813, certified by GEV as products with very low emission of volatile organic compounds (EMICODE EC1 PLUS).

**ULTRAPLAN** is also certified by DER BLAUE ENGEL.

- **ULTRAPLAN ECO** self-levelling, ultra rapid-hardening smoothing compound with very low emission of volatile organic compounds (VOC) applied in layers from 1 to 10 mm thick, class CT-C25-F7-A2fl, certified by GEV as a product with very low emission of volatile organic compounds (EMICODE EC1 PLUS) and by DER BLAUE ENGEL.

All substrates must be primed with a suitable adhesion promoter before applying the levelling layer. The products must be chosen according to the condition of the substrate:

- Dusty and/or porous surfaces: **PRIMER G**, **ECO PRIM T**.
- Non-absorbent surfaces: **ECO PRIM T** or **ECO PRIM GRIP**.
- Weak or damp surfaces: **PRIMER MF**, **PRIMER MF EC PLUS**, **ECO PRIM PU 1K** or **TRIBLOCK P** (for damp, non-absorbent surfaces only).



Fig. 3.12 - Installation on a substrate not levelled off sufficiently

## 4. CHOOSING THE RIGHT ADHESIVE SYSTEM

### 4.1 TYPES OF ADHESIVE FOR RESILIENT MATERIALS

Adhesives for resilient materials may be divided into the following categories:



• **Adhesives in watery emulsion:** this type of adhesive does not generally contain toxic substances, and its viscosity allows it to be spread easily. After the spreading it is defined a waiting time, necessary to improve the tack, before the covering installation.

• **Adhesives in solvent:** for this type of adhesive, the solvent offers a degree of viscosity that makes it easy to spread. The solvent evaporates quickly so the waiting time before installing the covering is relatively short.

• **Reactive adhesives:** this type of adhesive is made from reactive resins, mainly polyurethane or epoxy-polyurethane, and is also suitable for use on non-absorbent substrates and on substrates where particularly high bond strength is required (e.g. surfaces subjected to intense traffic).

• **Polychloroprenic (contact) adhesives:** this type of adhesive, either with or without solvent, is applied using the double sided technique. It holds material in place immediately when it is installed, and so is suitable for use on curved surfaces (fillets), around edges (usually rounded off) and pre-formed profiles (skirting, stair guards, edge guards, etc.).

• **Double-sided tape:** instead of using contact adhesive, reinforced acrylic-based, double-sided tape is also available on the market which is suitable for bonding profiles, fillets and coverings where an immediate hold is required.



## **4.2 FACTORS THAT INFLUENCE THE CHOICE OF ADHESIVE**

### **4.2.1 REQUIREMENTS OF THE ADHESIVE**

The most popular adhesives currently available on the market are those in water dispersion, thanks particularly to their low emission of VOC. This type of adhesive, unlike reactive adhesives that harden through a chemical reaction between their components, hardens when the water

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contained in the product evaporates off.

This characteristic means that products in this category differ according to the following (Fig 4.1):

- **WAITING TIME** ( $T_1$ ): the time that passes from the application of the adhesive on the substrate to the development of tack, obtaining by losing part of its water content
- **OPEN TIME** ( $T_2$ ): the time that passes from the application of the adhesive to the complete loss of tack
- **INSTALLATION TIME** ( $T_2 - T_1$ ): the time between the end of the waiting time and the open time, during which the material must be installed.
- **SETTING TIME** ( $T_3$ ): the time required for the adhesive to dry and, therefore, completely anchor the covering installed.

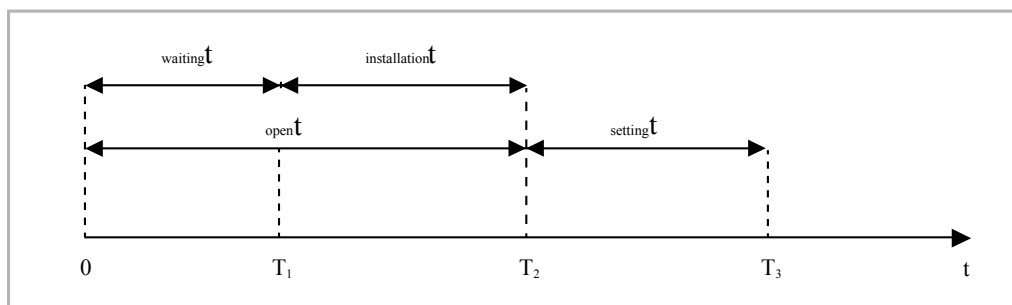


Fig. 4.1 - Schematic illustration of the times required for adhesives in dispersion

Apart from the characteristics mentioned above, one of the most important characteristics of an adhesive is its tack, its stickiness and capacity to hold the covering to the substrate. For wall coverings, this means the capacity of the adhesive to prevent the covering slipping under its own weight. Tack usually increases as the waiting time passes, and it reaches its maximum value towards the end of the open time (Fig. 4.2). The latest generation of adhesives are characterised by their high initial



Fig. 4.2 - Checking tack



Fig. 4.3 - Inlaid flooring



Fig. 4.4 - The legs effect of adhesives with high initial tack

tack, that is, they hold the material quite immediately after application. This means coverings may be installed much more quickly without the risk of movements.

In view of all these properties, when choosing the most suitable adhesive to install resilient wall and floor coverings, specific site requirements are usually taken into consideration:

- **OPEN TIME:** large sheets, or coverings with inlays, decorative features or special features (Fig. 4.3), usually require a product with a long open time so that there is enough time available to form or trim the elements and put them in place.

- **BONDING SPEED OF THE COVERING (HIGH INITIAL TACK):** in certain cases (on walls, curved surfaces, coverings with high spring-back, etc.), adhesive with a more rapid bonding speed that develops its adhesion strength quickly may be required (Figs. 4.4 and 4.5).

- **RESIDUAL TACK:** this characteristic defines the adhesion strength of the product over time. Adhesives characterised by high residual tack allow small adjustments even after covering has been finished.

- **HARDNESS OF THE ADHESIVE FILM AFTER DRYING:** along with bonding speed, this characteristic is important for certain types of covering characterised by problems of dimensional stability (section 4.2.2).

- **LOW EMISSION OF VOC:** this characteristic is currently very important especially for sites where, right from the design phase, the use of products with low emission of volatile compounds is clearly specified.

Moreover, where a high level of adhesion is required (areas with heavy traffic), for the bonding of non-absorbent coverings on non-absorbent substrates, or to install coverings in wet areas subject to presence

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of water (where acrylic-based adhesives are not enough resistant), designers have to choose a reactive adhesive. Unlike acrylic adhesives, reactive adhesives have no initial tack and the setting time depends on the reaction time between its components. Especially in the case of materials with a certain degree of “memory” (see the “Characteristics of resilient materials” section), the lack of tack means that weights have to be applied on the joints between the sheets until the adhesive has completely set.

If you require an immediate hold of the covering material (e.g. when bonding on fillets, stairs, pre-formed profiles or curved surfaces), a contact adhesive or double-sided tape needs to be used.

With polychloroprene (contact) adhesives, the double-sided technique is used. This means the adhesive is applied on the back of the covering as well as on the substrate, and then you have to wait until the solvent has evaporated off before coupling them. The material is held in place immediately and has to be positioned accurately, because it adheres so strongly to the substrate that its removal is impossible without damaging either the covering or the substrate.

The adhesion strength of double-sided tape is usually lower in the initial phase, allowing little adjustment after coupling, and may be used nonetheless for similar applications as contact adhesive, as well as for areas where a solvent-free product is required.



Fig. 4.5 - Installing a wall covering where adhesive with high initial hold is required



Fig. 4.6 - Covering with a high degree of memory



Fig. 4.7 - Unstable flooring with joints pushing together



Fig. 4.8 - Unstable flooring with joints pulling apart

## 4.2.2 CHARACTERISTICS OF RESILIENT MATERIALS

Resilient coverings are available on the market in sheet and tiles for depending on the type of material.

As far as materials are manufactured in sheet, if they are stored for a long time in rolls, there could be problems due to the tendency of the material to maintain a slight deformation caused by the packaging, particularly at low temperatures. This is why the producers always recommend to unpack the rolls of covering and to lay them free on the substrate for a few days prior to installation to eliminate their “memory” of being packaged in rolls (Fig. 4.6). This procedure has not been carried on installation, before the presence of particularly rigid coverings, the covering tends to lift its edges as soon as the laying has been finished. In such cases, we recommend using an adhesive with a strong initial tack.

Apart from problems caused their by packaging, there are also problems inherent to resilient materials regarding their dimensional stability, due mainly to the production methods used.

UNI standards for vinyl and rubber flooring specify that the dimensional variation of free materials (not bonded) after exposure to heat should be no more than 0.3% for tiles and 0.4% for sheets. Such variations may be both positive and negative and are generally different if they are measured longitudinally or laterally to the calendaring direction.

The adhesive chosen to bond resilient coverings should improve the material’s stability so that it falls within the limits specified in EN 14259 (see Tab. A).

If the wrong adhesive is used to install resilient covering, excessive stress is generated in the film of adhesive leading to the following defects:

- Tiles or sheets that push against each other at the joints (Fig. 4.7)
- Joints that tend to open (Fig. 4.8)

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- Detached areas in the covering caused by cracks in the film of adhesive or failure of the substrate.

To overcome these problems, the construction of the substrate must always be checked and an adhesive compatible with the covering must be used, in order to have the capacity to hold the material firm and to reach the right degree of deformability once set.

The following are also important to reduce the problem of dimensional stability:

- the covering should be taken out of its packaging so it may acclimatise to the areas in which it is to be installed until it becomes dimensionally stable in the surrounding conditions;
- install the covering when the surrounding conditions are in an intermediate state with respect to the variations to which it will be subjected when in service ( $15^{\circ}\text{C} < T < 30^{\circ}\text{C}$ ).

#### 4.2.3 COMPATIBILITY OF RESILIENT MATERIALS AND ADHESIVE

Apart from the material's inherent characteristics, the choice of the adhesive also depends on performance requirements of the covering material itself.

In fact, the adhesive must comply with specific peel, shear and dimensional stability requirements described by EN 14259 standards, depending on the type of covering (see Tab. A).

Table A - Reference values specified by EN 14259 standards

ADHESIVE FOR:	REFERENCE STANDARDS AND CORRESPONDING PERFORMANCE REQUIREMENTS				REFERENCE STANDARDS FOR THE COVERING
	EN 1372 Minimum peel test value (N/mm)	EN 1373 Minimum shear test value (N/mm <sup>2</sup> )	EN 1841 Dimensional variation (transversal) % max.	EN 1903 Dimensional variation % max.	
PVC flooring	1.0	0.3	n.a.	0.2	EN 649
Smooth rubber flooring	1.2 *)	n.r.	n.a.	0.2	EN 1817
Polyolefin flooring	1.0	0.3	n.a.	0.2	Homogeneous type
Linoleum flooring	0.5	0.5	0.2	n.a.	EN 548
Textile flooring	0.5	n.r.	n.a.	n.a.	EN 1307 EN 1470

\*) = for applications where there will be heavy traffic the specified value is 2.0 N/mm  
n.a. = not applicable  
n.r. = not required

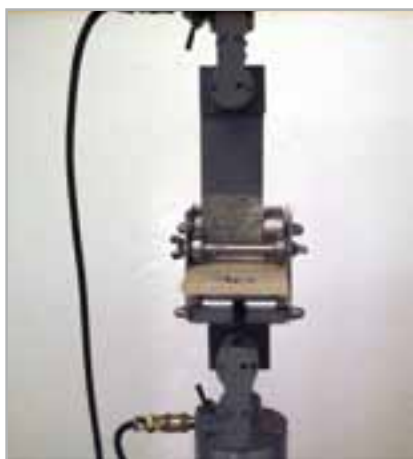


Fig. 4.9 - Instrument used to measure peel strength according to EN 1372 standards

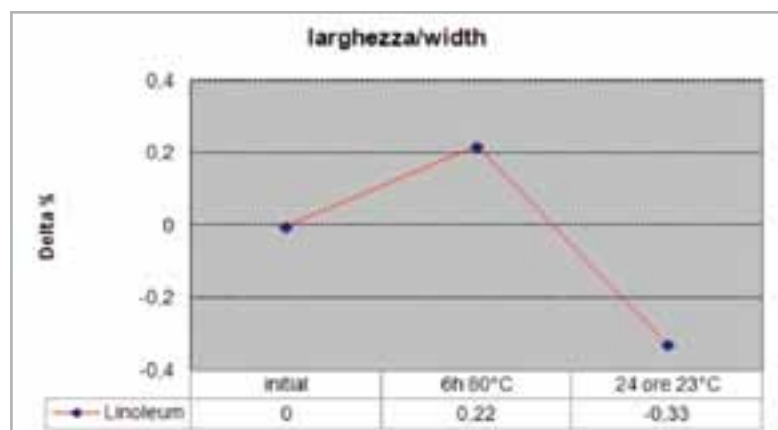
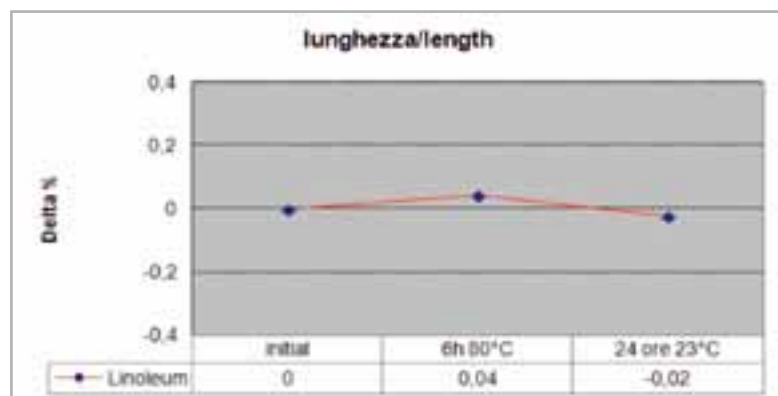


Fig. 26 - Graph showing the dimensional stability of free linoleum sheets: maximum permitted variation  $\pm 0,4\%$

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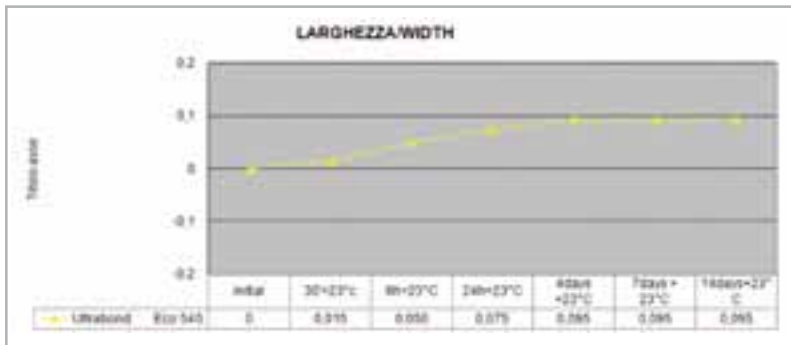


Fig. 27 - Graph showing the dimensional stability of bonded covering: the adhesive must guarantee maximum variation of 2% in different conditions.

To achieve this, MAPEI constantly carries out laboratory tests to find the most suitable adhesive for all types of resilient covering in order to comply with the dimensional stability for bonded coverings specified by EN 14259 standards (Figs. 4.9, 4.10, 4.11 and 4.12).

If the wrong product is used, there could be problems during installation, as described in the previous section and illustrated in the accompanying pictures.

## 4.2.4 ABSORPTION OF THE SUBSTRATE AND PERMEABILITY OF RESILIENT MATERIALS

Once installed, resilient coverings form a seamless, waterproof surface. This is why the choice of the right adhesive is heavily influenced by the absorbency of the substrate. Installing resilient covering on impermeable substrates (such as old ceramic) means that an adhesive system with



Fig. 4.10 - Instrument used to measure dimensional stability (after accelerated ageing) according to EN 1903 standards: on the left a free covering, on the right a bonded covering

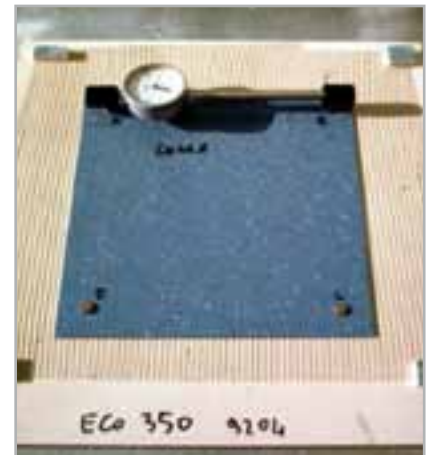


Fig. 4.11 - Instrument used to measure dimensional stability (after accelerated ageing) according to EN 1903 standards: on the left a free covering, on the right a bonded covering



Fig. 4.12 - Shear tests



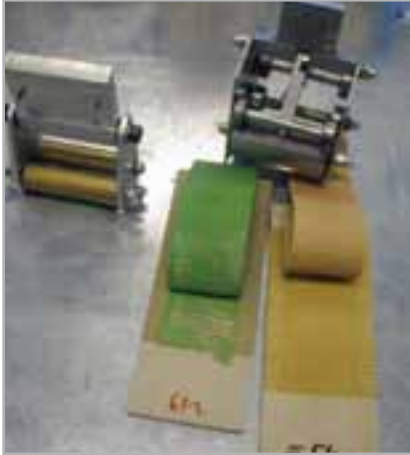


Fig. 4.13 - Result of shear tests for a reactive adhesive (green) compared with an acrylic adhesive (yellow)



Fig. 4.14 - Sealing rubber flooring



Fig. 4.15 - Sealing rubber flooring

no water must be used or, if a dispersion adhesive is used, that water or solvent must evaporate completely (quite until the end of the prescribed open time) before installing the covering. If this is not done, the adhesive will not be able to dry off and bubbles will form in the covering.

In general, we recommend using reactive adhesives to install resilient coverings on non-absorbent substrates.

#### 4.2.5 END USE OF FLOORING

Not only do adhesives differ for their installation times, they also differ for their final characteristics after bonding the covering. In fact, reactive adhesives are usually the only ones that guarantee the peel strength values specified for rubber or PVC when used for high traffic areas (see Tab. B). These tests highlight the different characteristics of adhesives, particularly the high adhesion strength obtained using reactive adhesives compared with the values obtained with acrylic adhesives. Tests carried out using reactive adhesives usually lead to failure of the covering, while tests carried out using acrylic adhesives usually lead to cohesive failure of the film of adhesive (Fig. 4.13).

Type of adhesive	In emulsion	In solvent	Polychloroprenic	Reactive
Waiting time	0-20 min	0-10 min	10-20 min* 30-60 min**	-
Open time	20-60 min	20 min	-	60 min
Hold	-	-	Immediate	After 9-10 h
Peel (90°) (EN 1372)	1,5-2,5 N/mm	2-3 N/mm	1,8-2,5 N/mm	> 3 N/mm
Intense traffic - heavy loads	NO	NO	NO	YES
Damp environments (non-welded flooring)	NO	NO	YES	YES
Non-absorbent surfaces	NO***	NO***	YES	YES
External (rubber)	NO	NO	NO	YES

Tab B - Typical characteristics of adhesives

## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

### Materials and systems to install resilient wall and floor coverings correctly

As far as a covering's end use is concerned, its exposure to water must also be taken into consideration. If the surface needs to be washed frequently we do not recommend to use acrylic adhesives, unless it has been sealed (rubber) (Figs. 4.14 and 4.15) or welded (PVC). If it is not, a reactive or polychloroprenic adhesive should be used.

## 5. APPLICATION OF RESILIENT FLOORING

### 5.1 APPLICATION PROCEDURE

If we take into consideration the previous sections, the procedure for installing resilient coverings must be the following:

**a. Adequate substrate preparation:** substrates must be smooth and flat, dry, absorbent, mechanically strong, free of dust, loose particles, cracks, paint, wax, oil, rust and traces of gypsum, and any products which may compromise adhesion. The maximum humidity level must be within the specified range: maximum 2.5-3% for cementitious substrates and 0.5% for gypsum or anhydrite substrates. It is important to check that there is no rising damp. If necessary, substrates must be consolidated or waterproofed with products mentioned previously (Figs. 5.1 and 5.2). Smoothing compounds to form a suitable installation surface must only be applied after priming the surface (Figs. 5.3 and 5.4).

**b. Acclimatise the materials:** before commencing installation, make sure the floor, covering material, adhesive and substrate have been acclimatised at the specified temperature. The covering material must be removed from its packaging 24 hours prior to installation. Sheets must be rolled out to acclimatise them to the surrounding temperature and to remove stresses caused by the packaging. Make sure the surrounding temperature is between +15°C and +35°C.



Fig. 5.1 - Application of adhesion promoting primer



Fig. 5.2 - Application of consolidating/waterproofing membrane



Fig. 5.3 - Application of smoothing compound and going over the surface with a spiked roller to remove any air bubbles



Fig. 5.4 - Application of smoothing compound and going over the surface with a spiked roller to remove any air bubbles



Fig. 5.5 - Application of adhesive with a suitable notched trowel



Fig. 5.6 - Installation of covering in sheet form on adhesive with sufficient tack

**c. Prepare the adhesive:** mix the adhesive well in its bucket before using. If a two-component adhesive is used, carefully mix the components according to the proportions indicated in the relative Technical Data Sheet to form a homogeneous mix.

**d. Spreading the adhesive:** use a trowel with notches suitable for the type adhesive and backing on the covering to be installed (Fig. 5.5). Spread the adhesive evenly and only on an area which will be covered within its open time.

**e. Installing flooring:** when using acrylic adhesive, always respect the waiting times specified for the product and make sure the tack is sufficient to keep the material in contact with the substrate (Fig. 5.6). Non-absorbent substrates require longer waiting times so that the water can evaporate completely, but without exceeding the open time of the adhesive, that is, when the adhesive is still able to be transferred onto the back of the flooring material.

If a reactive adhesive is used, the flooring can be installed immediately after application, but always make sure the adhesive is still fresh. If the flooring or covering material is particularly thin, make sure the rolling phase also eliminates any ridges in the adhesive which could mirror through on the surface.

When installing flooring with a reactive adhesive, these products do not guarantee immediate tack and, to prevent defects forming around joints and at the ends, we recommend applying weights in these areas (such as sandbags, bricks or similar) until the adhesive has completely hardened. Immediately after installation, the tiles or sheets must be carefully smoothed with a wooden trowel or roller (Fig. 5.7), starting from the centre and working towards the edges. Rolling the covering is very important for various reasons:

- 1) Helps remove air bubbles between the substrate and covering.

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2) Guarantees that the back of the covering is completely in contact with the adhesive and presses down the ridges formed in the adhesive by the trowel.

3) Breaks up any skin that may have formed on the surface of the adhesive towards the end of its open time.

4) Allows the adhesive to penetrate into imperfections in the back of the covering and increases the area in contact.

**f. Ready for use:** before putting the covering into service, wait until the adhesive has completely set. It is also very important to avoid stepping on the covering if the adhesive is still fresh. Bubbles often form in the flooring due to it being used too soon after application which pushes and dissipates the fresh adhesive away from areas under the flooring (Figs. 5.8 and 5.9).

## 5.2 ADHESIVES FOR INSTALLING PVC AND RUBBER

### 5.2.1 INSTALLING PVC AND RUBBER FOR NORMAL AREAS

The adhesives mainly used for installing PVC and rubber are:

- **ULTRABOND ECO V4 SP:** multi-purpose adhesive with very low emission of volatile organic compounds (EMICODE EC1 PLUS and certified by BLAUER ENGEL) with extended open time. The adhesive maintains a certain degree of elasticity even when it has hardened, has high performance characteristics and is suitable for all areas of use and all types of PVC (sheets and tiles) and rubber covering.

- **ULTRABOND ECO V4 SP Fiber:** multi-purpose adhesive with very low emission of volatile organic compounds (EMICODE EC1 PLUS and certified by BLAUER ENGEL) with extended open time. Particularly suitable for rubber coverings and improves the material's dimensional stability.



Fig. 5.7 - Going over a floor covering with a roller to remove air bubbles



Fig. 5.8 - Going over flooring just after installation while the adhesive is still fresh



Fig. 5.9 - Emptying the adhesive from under floor covering

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- **ULTRABOND ECO VS90:** multi-purpose adhesive with very low emission of volatile organic compounds (EMICODE EC1) with a strong initial grab and short open time, suitable for any type of PVC and rubber. The hardened film is quite rigid.

- **ULTRABOND ECO 380:** adhesive with extended open time and very low emission of volatile organic compounds (EMICODE EC1 PLUS), characterised by its rapid, strong initial grab, its rapid bonding capacity and its high residual tack, suitable for installing PVC. The hardened film is highly elastic.

- **MAPECRYL ECO:** adhesive with very low emission of volatile organic compounds (EMICODE EC1) with a short open time and quite rapid anchoring capacity for installing PVC. The hardened film is quite rigid.

## 5.2.2 INSTALLING PVC AND RUBBER FOR HIGH TRAFFIC AREAS

Rubber and PVC flooring for high traffic areas must be installed using a reactive adhesive such as:

- **ADESILEX G19:** two-component, epoxy-polyurethane adhesive with extended open time suitable for installing rubber and PVC flooring for heavy traffic, playing surfaces and external surfaces, including on asphalt.

- **ADESILEX G20:** two-component, epoxy-polyurethane adhesive with low viscosity suitable for installing rubber and PVC flooring, including thin flooring, for heavy traffic.

- **ULTRABOND ECO 571 2K:** rapid polyurethane adhesive with very low emission of volatile organic compounds (EMICODE EC1 PLUS) suitable for bonding PVC and rubber flooring for high traffic areas. This product does not contain epoxy resin, so is suitable for installers sensitive or allergic to amines.

## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

### Materials and systems to install resilient wall and floor coverings correctly

#### 5.2.3 INSTALLING RUBBER AND PVC TILES

To install tiles, use **ULTRABOND ECO FIX** pressure-sensitive adhesive with very low emission of volatile organic compounds (EMICODE EC1). In this case, the tiles can only be installed once the adhesive is completely dry. It forms a sticky, pressure-sensitive film that allows the tiles to be attached and removed numerous times.

#### 5.3 ADHESIVES FOR INSTALLING LINOLEUM

The adhesives mainly used for installing linoleum are:

- **ULTRABOND ECO 540:** adhesive with very low emission of volatile organic compounds (EMICODE EC1) with extended open time. This adhesive is characterised by its rapid bonding capacity and good initial tack, it has good residual pressure sensitivity and the film of adhesive remains highly elastic, even after hardening.
- **ULTRABOND ECO 520:** adhesive with very low emission of volatile organic compounds (EMICODE EC1 PLUS), extended open time, high initial tack and good residual pressure sensitivity. The film of adhesive remains elastic, even after hardening.
- **AQUACOL T:** adhesive with very low emission of volatile organic compounds (EMICODE EC1) and a short open time, which makes it unsuitable for particularly deformed linoleum. The hardened film is quite rigid.
- **ADESILEX F57:** an old type of adhesive made from synthetic resin and alcohol, with a short open time and immediate bonding of the covering. The hardened film of adhesive is rigid.





Fig. 5.10 - Application procedure for fillets using MAPECONTACT



Fig. 5.11 - Application procedure for fillets using MAPECONTACT



Fig. 5.12 - Application procedure for fillets using MAPECONTACT

## 5.4 ADHESIVES FOR INSTALLING WALL COVERINGS

The adhesives mainly used for installing wall coverings are:

- **ADESILEX VS45:** acrylic adhesive in water dispersion for installing PVC wall coverings with a short open time and rapid bonding capacity. The adhesive dries to form a rigid film.
- **ADESILEX MT32:** acrylic adhesive for installing PVC coverings with extended open time and a slow initial grab. The adhesive dries to form a rigid film.

## 5.5 INSTALLING RESILIENT MATERIALS USING CONTACT ADHESIVE

The installation of steps that have not been pre-formed, fillets or coverings on curved surfaces require an immediate hold and, therefore, products such as:

- **ULTRABOND AQUA CONTACT:** solvent-free, double-sided elastomeric adhesive in water dispersion for installing rubber and PVC profiles or coverings where an immediate hold is required.
- **ADESILEX LP/ADESILEX VZ:** solvent-free, double-sided polychloroprenic adhesive in solvent for installing rubber and PVC coverings where an immediate hold is required.
- **MAPECONTACT:** reinforced double-sided adhesive tape for installing profiles, skirting, fillets and resilient and textile flooring on stairs (Figs. 5.10, 5.11 and 5.12).

## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

Materials and systems to install resilient wall and floor coverings correctly

### 5.6 TABLE OF ADHESIVES FOR RESILIENT MATERIALS

PRODUCT	CERTIFICATIONS	MAIN CHARACTERISTICS
ULTRABOND ECO V4 SP	EC1 PLUS BLAUER ENGEL	Suitable for installing rubber and PVC, extended open time. The hardened film remains elastic.
ULTRABOND ECO V4 SP FIBER	EC1 PLUS BLAUER ENGEL	Multi-purpose adhesive reinforced with fibres, improves dimensional stability of coverings. Extended open time, elastic hardened film.
ULTRABOND ECO VS 90	EC1	Suitable for installing rubber and PVC, short open time. The hardened film is rigid.
ULTRABOND ECO 380	EC1 PLUS	Suitable for installing PVC, strong initial hold and high residual pressure-sensitivity. The hardened film remains elastic.
MAPECRYL ECO	EC1	Suitable for installing PVC, short open time, rapid bonding capacity. The hardened film is rigid.
ULTRABOND ECO 540	EC1	Adhesive for linoleum characterised by its rapid bonding capacity and good initial tack. The film of adhesive remains elastic, even after hardening.
ULTRABOND ECO 520	EC1 PLUS	Adhesive for linoleum with high residual pressure sensitivity characterised by its rapid bonding capacity and strong initial tack. The film of adhesive remains elastic, even after hardening.
AQUACOL T	EC1	Rapid hold adhesive, short open time. The hardened film is rigid.
ADESILEX F57	-	Adhesive in solvent with a short open time and immediate anchor of the covering, suitable for particularly deformed linoleum. The hardened film is rigid.
ADESILEX VS45	-	Adhesive for installing PVC wall coverings with a short open time and rapid bonding capacity. The hardened film is quite rigid.
ADESILEX MT32	-	Adhesive for installing PVC coverings with extended open time and a slow initial hold. The adhesive dries to form a rigid film.
ADESILEX G19	-	Reactive adhesive with extended open time, suitable for installing floor coverings for heavy traffic or on non-absorbent surfaces, including externally.
ADESILEX G20	-	Reactive adhesive with low viscosity, suitable for installing floor coverings for heavy traffic or on non-absorbent surfaces, including thin flooring.
ULTRABOND ECO 571 2K	EC1R PLUS	Reactive adhesive with very low emission of VOC, suitable for installers sensitive or allergic to amines, for installing rubber or PVC in areas subjected to intense traffic or on non-absorbent surfaces.
ULTRABOND ECO FIX	EC1	Pressure-sensitive adhesive for installing self-laying tiles.
ULTRABOND AQUA CONTACT	-	Solvent-free, double-buttering adhesive with an immediate hold.
ADESILEX LP ADESILEX VZ	-	Double-buttering adhesive in solvent with an immediate hold.
MAPECONTACT	-	Reinforced double-sided tape for use where an immediate hold is required.





## 6. TECHNICAL SPECIFICATIONS



### 6.1 INSTALLING VINYL FLOORING

#### 6.1.1 INSTALLING VINYL FLOORING USING ADHESIVE IN WATER DISPERSION (MAPECRYL ECO)

Installation of sheets or tiles of homogeneous and heterogeneous vinyl floor covering with PVC or polyurethane foam backing in any geometric pattern, after checking and preparing the installation surface according to specification, using acrylic adhesive in water dispersion with very low emission of volatile organic compounds (such as **MAPECRYL ECO** produced by MAPEI S.p.A.).

*The adhesive used for installation must have the following characteristics:*

density (g/cm<sup>3</sup>): 1.40

waiting time: 0-10 minutes

open time: 30 minutes

set to light foot traffic: approximately 2 hours

EMICODE: EC1

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€

## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

Materials and systems to install resilient wall and floor coverings correctly

### 6.1.2 INSTALLING VINYL FLOORING USING ADHESIVE IN WATER DISPERSION WITH A STRONG INITIAL GRAB (ULTRABOND ECO 380)

Installation of sheets or tiles of homogeneous and heterogeneous vinyl floor covering with PVC or polyurethane foam backing in any geometric pattern, after checking and preparing the installation surface according to specification, using acrylic adhesive in water dispersion with a rapid, strong initial grab, extended open time and very low emission of volatile organic compounds (such as **ULTRABOND ECO 380** produced by MAPEI S.p.A.).

*The adhesive used for installation must have the following characteristics:*

density (g/cm<sup>3</sup>): 1.22

waiting time: 10-20 minutes

open time: 70 minutes

set to light foot traffic: 3-4 hours

EMICODE: EC1 Plus

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€

### 6.1.3 INSTALLING VINYL FLOORING USING ADHESIVE IN WATER DISPERSION WITH EXTENDED OPEN TIME (ULTRABOND ECO V4 SP)

Installation of sheets or tiles of homogeneous and heterogeneous vinyl floor covering with PVC or polyurethane foam backing in any geometric

pattern, after checking and preparing the installation surface according to specification, using acrylic adhesive in water dispersion with extended open time and very low emission of volatile organic compounds (such as **ULTRABOND ECO V4 SP** produced by MAPEI S.p.A.).

*The adhesive used for installation must have the following characteristics:*

density (g/cm<sup>3</sup>): 1.2

waiting time: 10-20 minutes (30-40 minutes on non-absorbent substrates)

open time: 40-45 minutes

set to light foot traffic: 3-5 hours

EMICODE: EC1 Plus

DER BLAUE ENGEL certification

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€

#### **6.1.4 INSTALLING VINYL FLOORING, INCLUDING FOR HIGH TRAFFIC AREAS OR ON NON-ABSORBENT SUBSTRATES (ADESILEX G19)**

Installation of sheets or tiles of homogeneous and heterogeneous vinyl flooring with PVC or polyurethane foam backing in any geometric pattern, after checking and preparing the installation surface according to specification, using two-component epoxy-polyurethane adhesive (such as **ADESILEX G19** produced by MAPEI S.p.A.).

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*The adhesive used for installation must have the following characteristics:*

density of mix (kg/cm<sup>3</sup>): 1450

pot life of mix: 50-60 minutes

open time: 1 hour

time to completely set: 9 hours

set to light foot traffic: 12-24 hours

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup> €

#### **6.1.5 INSTALLING VINYL FLOORING USING PRESSURE SENSITIVE ADHESIVE IN WATER DISPERSION (ULTRABOND ECO FIX)**

Installation of vinyl floor tiles, after checking and preparing the installation surface according to specification, using pressure-sensitive adhesive in water dispersion (such as **ULTRABOND ECO FIX** produced by MAPEI S.p.A.).

*The adhesive used for installation must have the following characteristics:*

density (g/cm<sup>3</sup>): 1.07

waiting time: from 30 minutes to 12 hours

set to light foot traffic: immediately after installation

EMICODE: EC1

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€

**6.1.6 INSTALLING VINYL WALL AND FLOOR COVERINGS WHERE AN IMMEDIATE HOLD IS REQUIRED USING REINFORCED, DOUBLE-SIDED ADHESIVE TAPE (MAPECONTACT)**

Installation of profiles, skirting, fillets and vinyl coatings in general where an immediate hold is required, after checking and preparing the installation surface according to specification, using reinforced double-sided adhesive tape (such as **MAPECONTACT** produced by MAPEI S.p.A.).

*The double-sided adhesive tape used for installation must have the following characteristics:*

weight per m<sup>2</sup>: 0.38 kg/m<sup>2</sup>

waiting time: immediate bond

set to light foot traffic: immediate

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€

## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

Materials and systems to install resilient wall and floor coverings correctly



### 6.2 INSTALLING RUBBER FLOORING

#### 6.2.1 INSTALLING NATURAL FINISH OR DIMPLED RUBBER FLOORING WITH A SMOOTH BACKING USING MULTI-PURPOSE ACRYLIC ADHESIVE IN WATER DISPERSION (ULTRABOND ECO V4 SP FIBER)

Installation of natural finish or studded rubber flooring with a smooth backing in any geometric pattern, after checking and preparing the installation surface according to specification, using multi-purpose acrylic, fibre-reinforced adhesive in water dispersion with extended open time and very low emission of volatile organic compounds (such as **ULTRABOND ECO V4 SP FIBER** produced by MAPEI S.p.A.).

*The adhesive used for installation must have the following characteristics:*

density (g/cm<sup>3</sup>): 1.2

waiting time: 10-20 minutes (30-40 minutes on non-absorbent substrates)

open time: 40-45 minutes

set to light foot traffic: 3-5 hours

EMICODE: EC1 Plus

DER BLAUE ENGEL certification

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€

### **6.2.2 INSTALLING RUBBER FLOORING, INCLUDING ON NON-ABSORBENT SUBSTRATES, USING TWO-COMPONENT POLYURETHANE ADHESIVE (ULTRABOND ECO 571 2K)**

Installation of rubber flooring in any geometric pattern, after checking and preparing the installation surface according to specification, using two-component, water and solvent-free polyurethane adhesive (such as **ULTRABOND ECO 571 2K** produced by MAPEI S.p.A.).

*The adhesive used for installation must have the following characteristics:*

density of mix (kg/cm<sup>3</sup>): 1550

pot life of mix: 30 minutes

open time: 50-60 minutes

time to completely set: 4 hours

set to light foot traffic: 12-24 hours

EMICODE: EC1R Plus

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€

### **6.2.3 INSTALLING RUBBER FLOORING, INCLUDING FOR HIGH TRAFFIC AREAS OR ON NON-ABSORBENT SUBSTRATES, USING EPOXY-POLYURETHANE ADHESIVE (ADESILEX G19)**

Installation of sheets or tiles of rubber flooring in any geometric pattern, after checking and preparing the installation surface according to specification, using two-component epoxy-polyurethane adhesive (such as **ADESILEX G19** produced by MAPEI S.p.A.).

## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

### Materials and systems to install resilient wall and floor coverings correctly

*The adhesive used for installation must have the following characteristics:*

density of mix (kg/cm<sup>3</sup>): 1450

pot life of mix: 50-60 minutes

open time: 1 hour

time to completely set: 9 hours

set to light foot traffic: 12-24 hours

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup> €

#### 6.2.4 INSTALLING RUBBER FLOORING USING PRESSURE SENSITIVE ADHESIVE IN WATER DISPERSION (ULTRABOND ECO FIX)

Installation of rubber floor tiles, after checking and preparing the installation surface according to specification, using pressure-sensitive adhesive in water dispersion (such as **ULTRABOND ECO FIX** produced by MAPEI S.p.A.).

*The adhesive used for installation must have the following characteristics:*

density (g/cm<sup>3</sup>): 1.07

waiting time: from 30 minutes to 12 hours

set to light foot traffic: immediately after installation

EMICODE: EC1



*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€



**6.2.5 INSTALLING RUBBER WALL AND FLOOR COVERINGS WHERE AN IMMEDIATE BOND IS REQUIRED USING REINFORCED, DOUBLE-SIDED ADHESIVE TAPE (MAPECONTACT)**

Installation of profiles, skirting, fillets and rubber coverings where an immediate hold is required, after checking and preparing the installation surface according to specification, using reinforced double-sided adhesive tape (such as **MAPECONTACT** produced by MAPEI S.p.A.).

*The double-sided adhesive used for installation must have the following characteristics:*

weight per m<sup>2</sup>: 0.38 kg/m<sup>2</sup>

waiting time: immediate bond

set to light foot traffic: immediate

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€

## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

### Materials and systems to install resilient wall and floor coverings correctly

#### 6.2.6 OVERLAYING RUBBER FLOORING ON CEMENT (GRANIRAPID)

Overlaying rubber flooring on cement, after checking and preparing the installation surface according to specification, using two-component, rapid-setting and hydrating cementitious adhesive with very low emission of volatile organic compounds (such as **GRANIRAPID** produced by MAPEI S.p.A.).

*The adhesive used for installation must have the following characteristics:*

density of mix (g/cm<sup>3</sup>): 1.01

pot life of mix: 45 minutes

open time: 20 minutes

setting time: 2 hours

set to light foot traffic: 3-4 hours

EMICODE: EC1

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€

#### 6.3 INSTALLING LINOLEUM FLOORING

##### 6.3.1 INSTALLING LINOLEUM FLOORING WITH NATURAL JUTE BACKING USING ADHESIVE IN WATER DISPERSION WITH A VERY RAPID, STRONG INITIAL HOLD (ULTRABOND ECO 520)

Installation of linoleum flooring, after checking and preparing the

installation surface according to specification, using adhesive in water dispersion with a rapid, strong initial bond and very low emission of volatile organic compounds (such as **ULTRABOND ECO 520** produced by MAPEI S.p.A.).

*The adhesive used for installation must have the following characteristics:*

density (g/cm<sup>3</sup>): 1.4

waiting time: 0-20 minutes

open time: 30-40 minutes

set to light foot traffic: approximately 3 hours

EMICODE: EC1 Plus

*The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€

### **6.3.2 INSTALLING LINOLEUM FLOORING WITH SYNTHETIC JUTE BACKING USING MULTI-PURPOSE ACRYLIC ADHESIVE IN WATER DISPERSION (ULTRABOND ECO V4 SP)**

Installation of linoleum flooring with synthetic jute backing, after checking and preparing the installation surface according to specification, using multi-purpose adhesive in water dispersion with extended open time and very low emission of volatile organic compounds (such as **ULTRABOND ECO V4 SP** produced by MAPEI S.p.A.).

*The adhesive used for installation must have the following*

## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

### Materials and systems to install resilient wall and floor coverings correctly

#### *characteristics:*

density (g/cm<sup>3</sup>): 1.2

waiting time: 10-20 minutes (30-40 minutes on non-absorbent substrates)

open time: 40-45 minutes

set to light foot traffic: 3-5 hours

EMICODE: EC1 Plus

DER BLAUE ENGEL certification

#### *The following are included and calculated in the price:*

checking the suitability of the installation surface;

cutting and trimming to size and sealing where required;

cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup> €

## 6.4 INSTALLING VINYL WALL AND FLOOR COVERINGS

### 6.4.1 INSTALLING VINYL WALL AND FLOOR COVERINGS (ADESILEX VS45)

Installation of vinyl coverings, after preparing surfaces with a natural-finish skimming layer or by sanding, using acrylic adhesive in water dispersion (such as **ADESILEX VS45** produced by MAPEI S.p.A.).

#### *The adhesive used for installation must have the following*

##### *characteristics:*

density (g/cm<sup>3</sup>): 1.32

waiting time: 0-15 minutes

open time: 30-40 minutes

setting time: 24 hours

*The following are included and calculated in the price:*

preparation of the installation surface;

cutting and trimming to size;

scaffolding, tools and distribution of materials to where required;

cleaning the material installed, removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup>

€

#### **6.4.2 INSTALLING VINYL WALL AND FLOOR COVERINGS WHERE AN IMMEDIATE BOND IS REQUIRED (MAPECONTACT)**

Installation of vinyl coverings where an immediate bond is required, after preparing surfaces with a natural-finish skimming layer or by sanding, using reinforced double-sided adhesive tape (such as **MAPECONTACT** produced by MAPEI S.p.A.).

*The double-sided adhesive tape used for installation must have the following characteristics:*

weight per m<sup>2</sup>: 0.38 kg/m<sup>2</sup>

waiting time: immediate bond

set to light foot traffic: immediate

*The following are included and calculated in the price:*

preparation of the installation surface;

cutting and trimming to size;

scaffolding, tools and distribution of materials to where required;

cleaning the material installed, removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

### Materials and systems to install resilient wall and floor coverings correctly

all other activities required to consign work carried out according to specification.

Cost per m<sup>2</sup> €

#### 6.5 SUPPLY AND INSTALLATION OF AN ISOLATING LAYER FOR RESILIENT FLOORING (MAPELAY)

Supply and application of waterproof, isolating PVC sheets reinforced with glass fibres, for installing internal resilient or textile flooring on cracked, dirty or damp substrates or on substrates with rising damp (such as **MAPELAY** produced by MAPEI S.p.A.). Loose lay the sheets on the surface by overlapping adjacent sheets approximately 10 mm, stagger the end joints in the sheets and leave a 5-10 mm gap between the sheets and the walls and columns. If a waterproof adhesive is not used to install the flooring, the joints in the sheets must be sealed with waterproof adhesive tape.

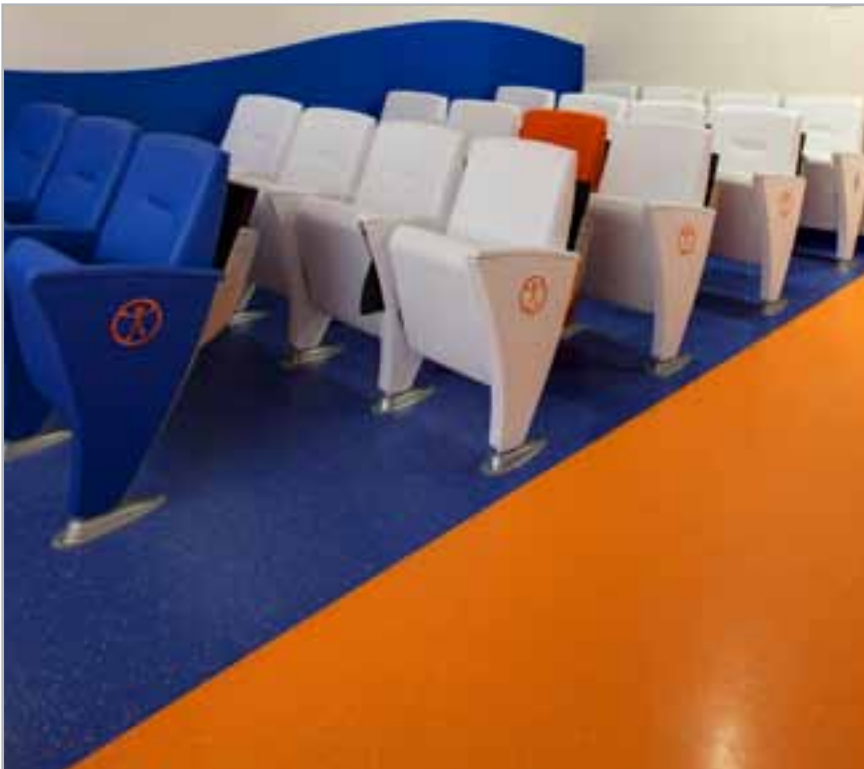
Preparation of the substrate and cutting and trimming the sheets, cut-offs, taping the joints in the sheets where required and final cleaning included and calculated in the price for work completed according to specification.

Cost per m<sup>2</sup> €



**NEMO FOUNDATION  
NIGUARDA HOSPITAL,  
MILAN - ITALY**

Installation of resilient flooring  
using:  
EPORIP, PRIMER G,  
ULTRAPLAN ECO,  
ULTRABOND ECO V4 SP FIBER



**NEMO FOUNDATION  
NIGUARDA HOSPITAL,  
MILAN - ITALY**

Installation of resilient flooring  
using:  
EPORIP, PRIMER G,  
ULTRAPLAN ECO,  
ULTRABOND ECO V4 SP FIBER

## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

Materials and systems to install resilient wall and floor coverings correctly



### **PAOLO VI PASTORAL CENTRE FATIMA - PORTUGAL**

Installation of resilient flooring  
using:  
ECO PRIM T, PRIMER G,  
ULTRAPLAN ECO,  
ULTRABOND ECO 310,  
ULTRABOND ECO 375,  
ULTRABOND ECO V4 SP



### **THE SPACE CINEMA GENOA - ITALY**

Installation of resilient flooring  
using:  
NIVORAPID, PRIMER G,  
ULTRAPLAN ECO,  
ULTRABOND ECO V4 SP





#### **MILAN SCHOOL - ITALY**

Installation of resilient flooring  
using:  
NIVORAPID, ECO PRIM T,  
ULTRAPLAN,  
ULTRABOND ECO 520



#### **MUSEUM OF MILITARY HISTORY DRESDEN - GERMANY**

Installation of resilient flooring  
using:  
ULTRAPLAN,  
PRIMER G, PRIMER MF,  
ULTRABOND ECO V4 SP,  
ULTRABOND ECO V4 SP  
CONDUCTIVE,  
ULTRAPLAN ECO 170

## INSTALLING RESILIENT WALL AND FLOOR COVERINGS

Materials and systems to install resilient wall and floor coverings correctly



### **SERRIS SECONDARY SCHOOL - FRANCE**

Installation of resilient flooring using:  
PRIMER G, MAPESOL 3,  
ULTRABOND ECO 370



### **COGNACQ JAY HOSPITAL, PARIS - FRANCE**

Installation of resilient flooring using:  
ECO PRIM T, PRIMER G,  
MAPESOL 3,  
ULTRABOND ECO 540



**PRAGUE INTERNATIONAL  
SCHOOL - CZECH REPUBLIC**

Installation of resilient flooring  
using:  
NIVORAPID, ULTRAPLAN ECO,  
ULTRABOND ECO 540,  
ULTRABOND ECO VS 90,  
ULTRABOND ECO V4 SP,  
ADESILEX G19, ADESILEX G20

# Technical Notebook

# INSTALLING RESILIENT WALL AND FLOOR COVERINGS

Materials and systems to install  
resilient wall and floor coverings  
correctly

## HEADQUARTERS

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