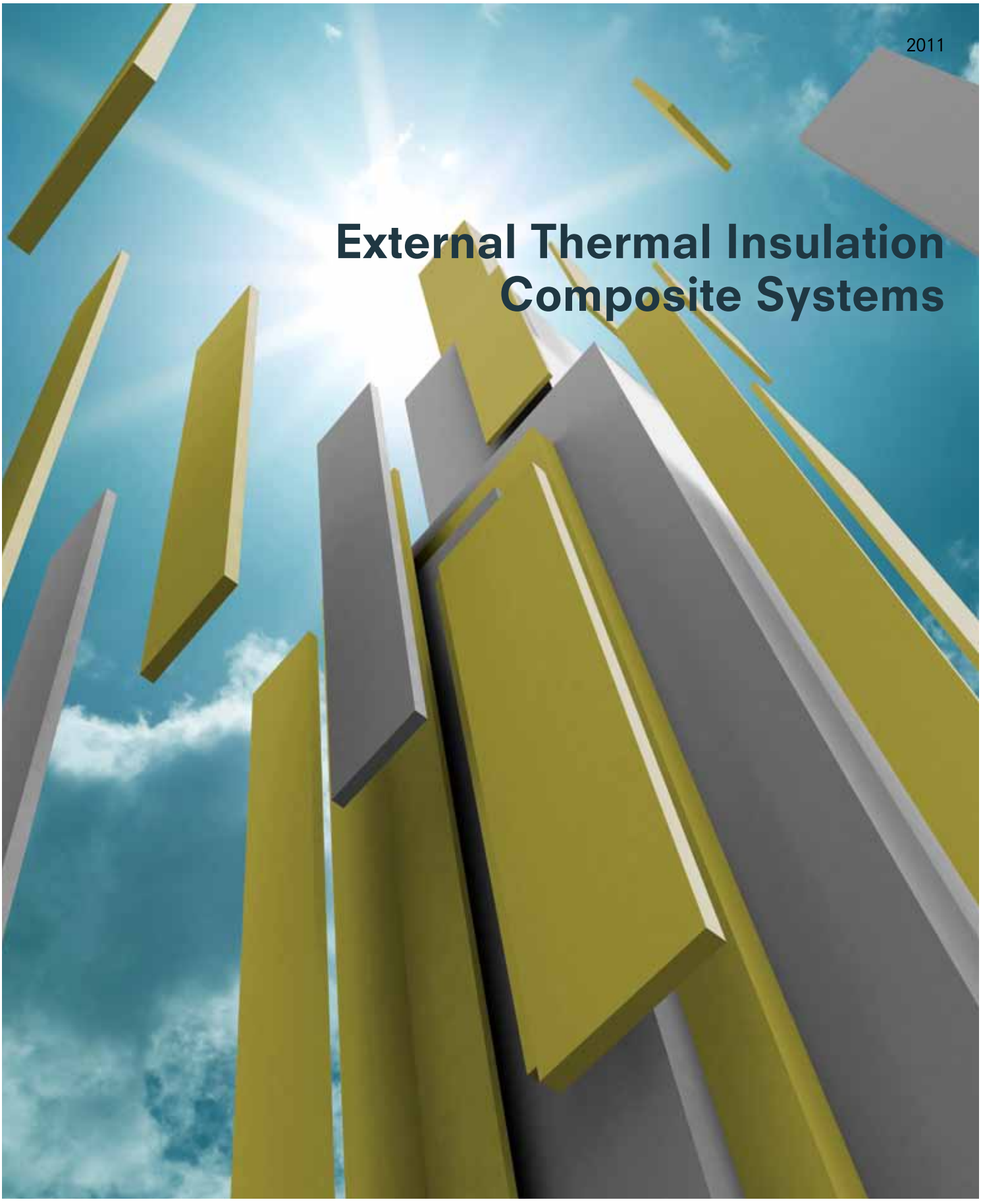
2011

External Thermal Insulation Composite Systems



Kale

Contents


Kalekim
Daima en iyi
Kalekim

Kalekim®
Always the best

Kalekim A.Ş., established in 1973 by Dr. İbrahim Bodur, founder of Kale Group Companies, began its operation with the production of ceramic adhesives and joint sealants, and continues today with the production of all kinds of construction chemicals for the construction sector.

In 2003, Kalekim A.Ş. made the decision to merge with Kaleterasit A.Ş., which was established in 1968 and which was one of Kale Group's leading establishments in the plaster and paint sector.

After this merging, Kaleterasit brand decorative ready-made colored plasters and Kalecolor brand interior and exterior paints were added to the product range of Kalekim A.Ş. As part of the corporate identity renewal in 2010, Kale became the new brand of interior and exterior paints and decorative exterior facade plasters.

In 2004, Kalekim began its operation in thermal insulation sector under Blue'Safe Mavi Kale brand with business partners Dow Chemical and Mardav A.Ş.

With the growing thermal insulation sector, Kalekim added rockwool to its product range in 2010 by partnering with Rockwool. EPS was added to the Thermal Insulation Systems product range in 2011. Package systems having rockwool and thermal insulation boards were presented to the sector under Kale Thermal Insulation Systems brand. Thus, Kalekim began servicing domestic Exterior Sheathing Market with rockwool and EPS under Kale Thermal Insulation Systems brand and package with XPS under Blue'Safe Mavi Kale brand.

With the important progress achieved in waterproofing products, Kalekim is aiming at market leadership in this sector, too. Kale, the brand of interior and exterior paints and decorative exterior facade plasters, is among the top 5 brands of the sector in Turkey.

With the enormous investments made to its manufacturing technology and R&D activities, Kalekim produces top quality products. Kalekim has become a great power and an exemplary company within its sector in terms of technology and R&D operations with the experience it has gained. Kalekim has managed to reach the level of manufacturing products with the same quality and performance and in accordance with European Quality Standards in all its factories no matter where it goes with the raw materials of the area in which it operates. Manufactured in accordance with ISO 9001 Quality Management System and TSE and European Standards, Kalekim products preserve their quality not only in the manufacturing process but also during and after application for many years.

Kalekim performs its manufacturing activities in its İstanbul, Isparta, Mersin and Yozgat Central Anatolian Facilities at home. Moreover, Kale Group's first foreign investment, Kalekim Russia Factory, began production in the Serpuhov region of Moscow in 2008. Today, Kalekim manufactures ceramic adhesives, joint sealants, waterproofing and thermal insulation products, mastics, foams, surface preparation products, ceramic cleaning and maintenance products, interior and exterior facade paints and decorative exterior facade plasters in its six factories at home and abroad.

Kalekim, which has a total manufacturing capacity of 700 thousand tons of construction chemicals with its 4 construction chemicals factories at home and its Russian Facilities, can also produce 60 thousand tons of paint and 40 thousand tons of plaster per year in its Kaleterasit facility located in İstanbul.

Thermal Insulation in Buildings

Thermal insulation is the process of reducing the heat transfer between the surfaces using special materials in order to prevent the cold air in the exterior environment from causing temperature loss in the interior environments in winter months, and hot air in the exterior environment from causing temperature increase in the interior environments in summer months.

In order to balance the temperature in our houses, we try to increase the temperature using fuels like natural gas and coal in winter, and decrease the temperature using air conditioners or similar cooling appliances in summer. We consume a certain amount of energy during all these heating and cooling processes. Unfortunately, more than half of the energy, which is used for heating purposes in buildings, is lost when there is no thermal insulation.

Thermal insulation is the heat loss that occurs in sections of buildings like columns, beams, walls and marble under windows. Thermal bridges existing in our buildings causes a significant amount of loss in the energy we spend by conducting heat transfer from exterior environment. Thermal Insulation prevents heat transfer from exterior environment by eliminating thermal bridges, thus provides energy saving by allowing for the most efficient use of the energy we spend.

Our world is facing global warming threat due to gas effect that emerges with the consumption of resources like petroleum and coal. Season changes are experienced as a result of that effect. Maximum energy efficiency is one of the issues on which the scientists study most against this phenomenon that threatens the future of humankind. Thermal Insulation not only is a precaution against global warming by providing more than 50 percent energy saving and reducing the consumption of the resources like petroleum and coal that are consumed for heating purposes but also contributes to the national economy and protection of the environment.

In other words, Thermal Insulation means providing maximum saving and comfort in buildings.

Benefits of Thermal Insulation

A thermal insulation that is performed in accordance with the “Regulation on Thermal Insulation in Buildings” issued by the Ministry of Public Works and Settlement:

— Provides 50% saving on the expenses made for heating and cooling purposes in buildings, and contributes to comfortable life with an efficient heating in winter and an efficient cooling in summer.

— Contributes to the combat against greenhouse effect, global warming and climate change by reducing the emission of carbon dioxide (CO_2), sulfur dioxide (SO_2) and other harmful gases to the atmosphere thanks to maximum benefit it provides in the use of energy.

— Contributes to the national economy by energy saving since a great deal of the energy we use is generated from fossil fuels and we import fossil fuels.

— Provides comfortable life in thermal insulated buildings by preventing the formation of humidity and mold.

— Prevents corrosion (rusting) since no humidity will occur in thermal insulated buildings. Thus, it increases the earthquake safety by protecting the carrier elements of the building, and it prolongs the building life.

— Contributes to the comfortable life and health of occupants in thermal insulated buildings since the heat distribution between the places will be homogenous.

— Makes an important contribution to sound insulation since it absorbs the noise coming from the exterior environment.

Thermal Insulation and Environment

Protecting the environment by thermal insulation can be considered as leaving a liveable environment for future generations. The most basic indication of protecting our natural environment is to take effective measures against global warming caused by greenhouse effect, and prevent pollution in the nature and atmosphere.

Greenhouse gases, which come off as a result of using fossil fuels for heating and cooling purposes, cause temperature increase in our world. Carbon dioxide (CO_2) is the most polluting gas in the atmosphere. The increasing amount of CO_2 in the atmosphere triggers the global warming.

Potential threats, which will be faced by humankind due to climate changes caused by the global warming, can be listed as follows:

— Threat against the future of animal and plant species due to the fact that disturbed natural balance causes great destruction in the ecological system,

— Mass famine and epidemics with the fact that drought and desertification increasingly have effects on larger areas,

— Sulfur dioxide (SO_2) gas causes a significant destruction on forestlands and acid rains by combining with water vapor.

Thermal insulation, which is performed in accordance with the related rules, is one of the most effective tools in combating against greenhouses gases like carbon dioxide and sulfur dioxide that have the most destructive effect on the nature.

Thermal Insulation and Comfort

Among the investments made on buildings, it can be asserted that Thermal Insulation is the one that pay off itself in the shortest time. Moreover, it starts a transformation process that is a plus value input in the lives of the building occupants. We can list the comfort factors provided by Thermal Insulation as follows:

— It provides a healty living environment by preventing formation of humidity, mold and fungus that affect life comfort in buildings,

— It provides protection of building's load bearing elements against negative effects like corrosion, flaking and swelling by enveloping the building from the outside,

— Temperature difference between the environments in the building must be 3°C maximum. Thermal Insulation increases the environmental comfort by ensuring that heat in the building is distributed homogenously everywhere,

— It renders effective the physical and mental activities of the people living in the environment by ensuring the optimum use of the building and residences,

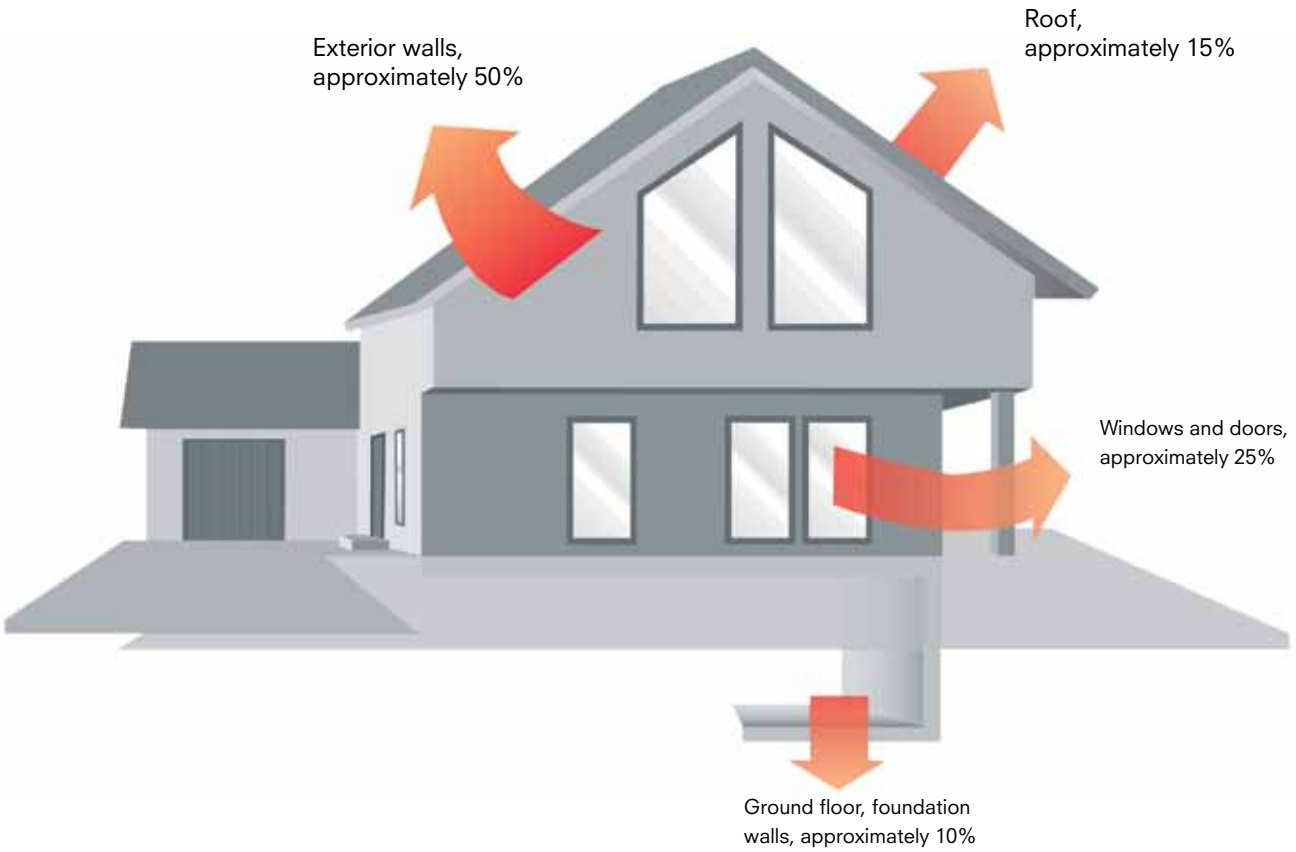
— It contributes to family economy and national economy via energy saving.

Thermal Insulation and Energy Saving

While energy sources are diminishing day by day all around the world, consumption need grows much bigger.

Energy saving gains a particular importance under these conditions. Thermal Insulation stands out as one of the most successful energy saving tools apart from its other benefits. Development of saving awareness and saving skill has become a necessity for all economies as well as families in view of the increasing costs. Therefore, Regulation on Energy Performance in Buildings was put into practice, and implementation of forming Energy Identity in Buildings started.

Thermal bridges, which cause heat loss, are completely removed since thermally insulated buildings are insulated all around from the exterior environment. Energy consumed for heating and cooling is utilized in the most effective way since heat exchange with the exterior air is prevented. Energy saving provided by Thermal Insulation made possible to use energy and sources more effectively by decreasing your heating and cooling expenses 50 percent.



Fire Insulation

The fact that fire safety holds a vital importance in buildings is a reality known by everyone. However, it is a matter of discussion how well the fire insulation is performed compliant with this reality. Insurance companies check whether or not a building has fire insulation when calculating the premium payments for the building. Fire insulation must be performed using Class A1 fireproof materials that prevent flames from spreading during fire and that are compliant with EN 13501-1 standard.

Melting point of Rockwool is over 1000°C. Therefore, Rockwool is included in the category of fireproof construction materials in accordance with the construction materials standards. Rockwool is classified as Class A1 pursuant to ISO 1182, which is the highest fire resistance category, thanks to its perfect fire resistance and high heat resistance.

Rockwool stands out as a unique material in thermal and sound insulation as well as being a superior construction material with perfect fire resistance.

Sound Insulation

Today, noise is an important environmental pollution component that causes physiological and psychological disorders. It is everyone's right to rest in home environment away from the exterior noise, and rejuvenate both physically and mentally. Moreover, it is a known fact that working under minimum noise in offices and workplaces positively affects the performance of all employees. Exposure to excessive noise causes disturbances like angriness, perception loss, ineffectiveness and hearing loss.

The precondition of protection against the negative effects of noise is to have sound insulation. Sound insulation must be performed compliant with the rules using correct materials. Rockwool products provide excellent sound insulation thanks to their open porosity, sound absorbance and acoustic feature. Rockwool's short and intermeshing fibrous texture is the guarantee for the most successful sound insulation as well as excellent thermal insulation. Rockwool products provide healthful spaces by insulating them from the negative effects of noise pollution.

Approved Quality

Efficiency of the Thermal Insulation System Depends on All Components of the System...

Kale Thermal Insulation Boards (Rockwool - EPS), Kale Mantotech Thermal Insulation Board Adhesive Mortar, Kale Mantoplast Thermal Insulation Board Plaster Mortar, Kale Reinforcement Mesh, Kale Anchor and Kale Meshed PVC Corner Profile manufactured by Kalekim are collectively put on market as package system components under the Kale Thermal Insulation Systems brand. Kale brand Exterior Facade Plaster and Paints, which set the fashion of the exterior facades on the topcoat coatings, are included as the system components in the package system.

The performance of the system as a whole is important in thermal insulation. Moreover; components, which constitute the system, must have CE certificates and comply with the Construction Materials Regulation. It is only when each system component meets the quality criteria and complies with the regulations that success can be achieved in the performance of the entire thermal insulation system.

Kale brand exterior facade paints and decorative ready mixed plasters, which are used in the Thermal Insulation Systems, do not allow water into the system thanks to their silicone structure. Furthermore; all our topcoat coatings, which we recommend for Thermal Insulation Systems, allow the system to breathe and provide full protection against humidity thanks to their water-based feature.

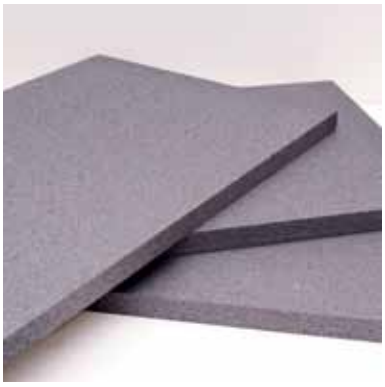
One of the most important things for a successful Thermal Insulation application is that the application must be performed by preferring a package system. All products offered with Thermal Insulation Boards in Kale Thermal Insulation System not only have the quality and assurance of Kale brand, but also are the outcome of Kalekim’s 40-year experience in the sector. Kale Thermal Insulation System components guarantee the system success by offering together the harmony, quality and assurance.

Success of Thermal Insulation System is also directly related with the competence and mastery of the team that performs the application. We recommend you to prefer our expert masters, who took their licenses approved by the Ministry of National Education after successfully completing Kalekim Master Orientation and Improvement Course, or to request expert masters from Kalekim’s Familiar Master Recommendation System.

Kale EPS

— Kale EPS thermal insulation board is a grey EPS Thermal Insulation Board that is manufactured out of Expanded Polystyrene. Thanks to the graphite within its contents, it prevents thermal energy from spreading via radiation. Dry and calm air is trapped within the many number of (3-6 billion in a 1-m3 EPS depending on the density) small cells with closed pores. Since 98% of the material is composed of air, it is light and does not bring large additional loads to the structures. Thanks to the graphite within its contents, it provides better thermal insulation compared to other EPS Thermal Insulation Boards. It is manufactured in compliance with TS EN 13163 and as to meet the conditions of TS EN 13499.

Kale EPS System Components



Kale Thermal Insulation Board

— It is graphite - carbon black reflector-reinforced thermal insulation board developed for exterior wall insulation.

Technical Specifications

Standard	: TS EN 7316 EN 13163
Thermal conductivity value	: 0,032 W/mK
Fire resistance	: B1, difficult to ignite according to DIN 4102 E according to EN 13501-1
Density	: Min. 16 kg/m^3
Dimensional stability	: ± % 0.2 DS (N) 2
Compressive strength at (%10 deformation) (min)	: CS (10) 70
Tensile strength perpendicular to faces	: TR100
Long term water absorption by total immersion	: WL (T) 3
Water vapor diffusion resistance coefficient (μ)	: 20 - 40
Flexural strength	: 1,15 kPa

Dimensions

Length	: 1.000 mm
Width	: 500 mm
Thickness	: 20, 30, 40, 50, 60, 70, 80 mm

Kale EPS System Components

Kale Mantotech Thermal Insulation Board Adhesive Mortar

— Cement-based thermal insulation board adhesive with high adhesion strength that provides ease of application.
— It ensures the performance and life of the system with its high adhesion strength.
— Kale Mantotech Thermal Insulation Board Adhesive Mortar is manufactured with the assurance of "Kalekim", the expert and sector leader.

Technical Specifications

Application Tool	: Notched trowel – Trowel
Workability Time	: 15 - 20 minutes
Appearance	: Grey powder
Consumption	: 4 kg/m2
Mixing Ratio	: 25 kg powder, 5,5 - 6 lt water
Application Temperature	: +5°C / +35°C
Pot Life	: 3 hours
Shelf Life	: 12 months in unopened packages in dry environment
Flexibility	: Medium
Tensile Adhesion Strength	
Inital	: Min. 0.5N / mm² TS EN 1348
After immersion in water	: Min. 0.5N / mm² TS EN 1348
After heat exposure	: Min. 0.5N / mm² TS EN 1348
After freeze / Thaw cycles	: Min. 0.5N / mm² TS EN 1348
Open Time	: 15 minutes Min. 0.5N / mm² TS EN 1348
Package	: 25 kg kraft bag
Storage	: Kale Mantotech Thermal Insulation Board Adhesive Mortar must be stored in a dry environment in 10 layer stacks maximum.

Kale Mantoplast Thermal Insulation Board Plaster Mortar

— It is thermal insulation board plaster mortar with high flexibility and adhesion strength that can breathe and is resistant against negative weather conditions, water and shocks.
— Thanks to its high water vapor permeability, it provides a healthful solution that can breathe and is suitable for the physical feature of the building.
— Kale Mantoplast Thermal Insulation Board Plaster Mortar is manufactured with the assurance of "Kalekim", the expert and sector leader.

Technical Specifications

Application Tool	: Steel trowel
Workability Time	: 15 - 20 minutes
Appearance	: Grey powder
Consumption	: 1.7 kg/m²/mm
Mixture Rate Range	: 25 kg powder, 6 – 6,5 lt water
Application Temperature	: +5°C / +35°C
Pot Life	: 3 hours
Shelf Life	: 12 months in unopened packages in dry environment
Flexibility	: High
Water Absorption	: 30 minutes Maximum 5 gr EN 12808-5 240 minutes Maximum 10 gr EN 12808-5
Flexural Strength	: Min. 2N / mm² TS 24
Compressive Strength	: Min. 6N / mm² TS 24
Water Vapor Permeability	: Sd < 0.3 m TS 7847
Adhesion Strength	: Min. 0.3N / mm² TS 6433
Adhesion Strength on Thermal Insulation Board	: Min. 0.08N / mm²
Package	: 25 kg kraft bag
Storage	: Kale Mantoplast Thermal Insulation Board Plaster Mortar must be stored in a dry environment in 10 layer stacks maximum.

Kale EPS Reinforcement Mesh

— Alkali resistant fibrous plaster mesh

Technical Specifications

Density	: 160 gr/m²
Mesh Interval	: 4×4 mm
Tensile strength	: Min. 1900 N/5 cm
Tensile strength	: Min. 1200 N/5 cm (In %5 NaOH solution test)
Tensile strength	: Min. 1250 N/5 cm (Accelerated test)

Kale EPS Meshed PVC Corner Profile

— It is the Meshed PVC Corner Profile that is used to reinforce the weak corners.

Technical Specifications

Density	: 160 gr/m²
Mesh Interval	: 4×4 mm
Tensile strength	: Min. 1900 N/5 cm
Tensile strength	: Min. 1200 N/5 cm (In %5 NaOH solution test)
Tensile strength	: Min. 1250 N/5 cm (Accelerated test)

Kale EPS Anchor

— It is the mechanical fitting piece that is used to fix the Kale EPS Thermal Insulation Boards to the facade.

Kale EPS System Application

Kale Inundation Profile Installation

The surface is taken to the square using Kale Inundation Wedges in order to smooth the obliquities on the surface while installing the Kale Inundation Profile.

— Balancing the Kale Inundation Profile with plastic wedges.

— Installing the Kale Inundation Profile with anchors.

— Installing the Kale EPS Thermal Insulation Boards.

Bonding Kale EPS Thermal Insulation Boards

The surface must be definitely checked before the application. If deemed necessary, the surface must be repaired using structural repair mortar.

— Kale EPS Mantotech Thermal Insulation Board Adhesive Mortar must be applied on the edges of the board, and adequate number of lumps must be formed at the center of the plate according to the dimension of the board.

— Raking must be performed (Notched trowel with 10×10 tooth dimensions) depending on the smoothness of the surface.

Installing Kale EPS Thermal Insulation Boards

Kale EPS Thermal Insulation Boards, which have been applied Kale EPS Mantotech Thermal Insulation Board Adhesive Mortar, are installed on the Inundation profile and pasted on the wall by slightly shifting in a way that no space is left between the boards.

— Bonding Kale EPS Thermal Insulation Boards, the backsides of which have been applied Kale EPS Mantotech Thermal Insulation Board Adhesive Mortar, on the surface.

Anchoring Kale EPS Thermal Insulation Boards

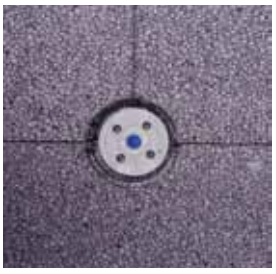
In addition to the bonding process, mechanical fitting pieces are needed for Kale EPS Thermal Insulation Boards to maintain their continuance and performance in a long-lasting way. 24 hours after the bonding process performed with Kale EPS Mantotech Thermal Insulation Board Adhesive Mortar, anchors must be installed as 6 units per square meter on the points where the building height is lower than 8 meters, and continuance must be maintained. The higher the building height, the higher the number of utilized anchors per square meter.

— Counterboring must be performed in order for the anchor head to be firmly placed on the pasted Kale EPS Thermal Insulation Board.

— Anchor point is drilled with a drill.

— Anchor is placed.

— Anchor pin is removed.



— Mechanical fixing is completed.

Forming Building Corners and Window Borders

In order to form a smooth and durable corner in edge and corner finishing, aluminum or Kale Meshed PVC Corner Profile is placed in the first layer of the Kale Mantoplast Thermal Insulation Board Plaster Mortar. First layer of plaster is applied on the center corners of windows, and Kale Meshed PVC Corner Profile is placed. The first layer of the exterior facade is completed by overlapping with 10 cm Kale Reinforcement Mesh and Kale Meshed PVC Corner Profile that have been placed in Kale Mantoplast Thermal Insulation Board Plaster Mortar.

Forming the Layers of Kale Mantoplast Thermal Insulation Board Plaster Mortar

The first layer of Kale Mantoplast Thermal Insulation Board Plaster Mortar must be applied at least 24 hours after the adhesion application. The first layer of Kale Mantoplast Thermal Insulation Board Plaster Mortar must be raked with a notched trowel having 4×4 tooth dimensions in order to maintain an equal consumption and get a homogenous thickness.

— Application of first layer of Kale Mantoplast Thermal Insulation Board Plaster Mortar with a steel trowel.

— The first coat of Kale Mantoplast Thermal Insulation Board Plaster Mortar must be raked with a notched trowel having 4×4 tooth dimensions in order to maintain an equal consumption and get a homogenous thickness.

— Right after applying the first layer of Kale Mantoplast Thermal Insulation Board Plaster Mortar, Kale EPS Reinforcement Mesh is placed horizontally or vertically by being lightly immersed in the mortar.

— Second layer of plaster mortar is applied before the first layer of plaster mortar is dried. While applying the second layer of plaster mortar, wait for the first layer of plaster mortar to lightly give off its water for preventing Kale EPS Reinforcement Mesh from coming loose or immersing in the first layer of plaster mortar depending on the weather conditions.

Formation of Kale Decorative Coatings

After Mantoplast Thermal Insulation Board Plaster Mortar has been dried, surface preparation must be performed in accordance with the type of the decorative coating material that will be applied on the surface.

— The surface on which acrylic based decorative coating material will be applied, must firstly be primed with Kale Silastar. If mineral based Kale Minart is preferred as topcoat Kale Silastar must be applied on the surface after Minart application.

— Kale decorative coatings are applied on the surface using a trowel. Thickness, of the application changes depending on the plaster type.

— Texture is formed by glazing the coatings on their surface with a plastic trowel before they dry. Since Kale Minart is mineral based, it must necessarily be painted with water-based Kale Exterior Paint after it dries.

— Paint application on Kale Minart.

1. Kale EPS Mantotech Adhesive Mortar
2. Kale EPS Thermal Insulation Board
3. Kale EPS Anchor
4. Kale EPS Mantoplast Plaster Mortar
5. Kale EPS Reinforcement Mesh
6. Kale EPS Mantoplast Plaster Mortar
7. Kale Silastar
8. Kale Decorative Coating

— Kale EPS system application layers.

Kale Rockwool

Rockwool is manufactured by melting basalt at high temperatures and transforming it into fibers. It approximately contains 98% mineral material and 2% binding agent.

The fact that rockwool has a very low thermal conductivity value makes it a good thermal insulation material. Rockwool is an excellent thermal insulation material that protect against both heat and cold. Rockwool insulation systems provide high energy saving in heating and cooling. Moreover, it provides comfortable climatic conditions in buildings.

Rockwool has high acoustic features. Rockwool turns sound vibration energy passing through the insulation into thermal energy. The structure of rockwool with its numerous crisscrossed fibers neutralizes the vibrations. This unique fibrous structure makes rockwool one of the best sound absorbing building materials.

Rockwool has a melting point of over 1000°C. It is classified as fireproof material. Rockwool exterior facade insulation boards have fire protection feature and are classified as Class A1 pursuant to ISO 1182 which is the highest fire resistance category.

When exposed to water or rain, Rockwool can sometimes look like it is wet. In fact, water stays on the surface because the fibers of Rockwool are water repellent. The impregnation of rockwool fibers is throughout the products, not just on the surface. Thus, water cannot get into the inner layers of the products.

Rockwool is vapor permeable. Therefore, humidity cannot stay inside the building, and this makes insulated residences and office buildings comfortable.

The dimensions of Rockwool do not change with the increase or decrease in temperatures. The homogeneous orientation of rockwool fibers gives Rockwool products excellent mechanical properties as well as permanent dimension stability.

Kale Rockwool System Components

Frontrock MAX-E BOARD

— Dual density products, which are manufactured with special Rockwool technology and which include 2 different densities in one board, allow for a more economical and efficient insulation thanks to their low thermal conductivity. Dual density thermal insulation boards are fixed with both adhesive and mechanically. They can be used with thinly coated or thickly coated systems in the sections that need thermal, sound and fire insulation in old and new buildings.

Technical Specifications

Fire resistance	: A1 EN 13501-1
Thermal conductivity value	: µD 0.036 W/mk EN 12667
Water vapor diffusion resistance coefficient	: µ 1.4 EN 12086
Tensile strength ≥ 70 mm	: TR10 ≥ 10 kPa EN 1607
Tensile strength (50-60 mm)	: TR7,5 ≥ 7,5 kPa EN 1607
Compressive strength at %10 deformation	: CS(10)20 ≥ 20 kPa EN 826
Tensile strength perpendicular to faces	: Fp ≥ 250 N EN 12430
Short term water absorption by total immersion	: WS ≤ 1.0 kg/m² EN 1609
Long term water absorption by total immersion	: WL(P) ≤ 3.0 kg/m² EN 12087
Thickness tolerance	: T5 -1 +3 mm EN 823
Melting point	: Tt > 1000°C DIN 4102
Frontrock MAX-E CE - certificate number	: ÉMI EC 1415-CPD-35-(C-7/2010)
Product code (50-60 mm)	: MW-EN 13162-T5-DS(T+)-DS(TH)-CS(10)20-TR7,5-PL(5)250-WS-WL(P)-MU1
Product code (≥ 70 mm)	: MW-EN 13162-T5-DS(T+)-DS(TH)-CS(10)20-TR10-PL(5)250-WS-WL(P)-MU1

Dimensions

Length	: 1.000 mm
Width	: 600 mm
Thickness	: 50, 60, 70, 80, 90, 100, 110, 120 mm

Fasrock MAX-E BOARD 135 - 150 kg/m³

— Dual density thermal insulation boards are fixed with both adhesive and mechanically. These boards are manufactured from longitudinally oriented fibers as having single density.
— They can be used for thinly coated or thickly coated systems. They are recommended to be used in the sections that need thermal, sound and fire insulation in old and new buildings.

Technical Specifications

Fire resistance	: A1 EN 13501-1
Thermal conductivity value	: µD 0.039 W/mk EN 12667
Water vapor diffusion resistance coefficient	: µ 1.4 EN 12086
Tensile strength	: TR15 ≥ 15 kPa EN 1607
Compressive strength at %10 deformation	: CS(10)40 ≥ 40 kPa EN 826
Tensile strength perpendicular to faces	: Fp ≥ 250 N EN 12430
Short term water absorption by total immersion	: WS ≤ 1.0 kg/m² EN 1609
Long term water absorption by total immersion	: WL(P) ≤ 3.0 kg/m² EN 12087
Thickness tolerance	: T5 -1 +3 mm EN 823
Melting point	: Tt > 1000°C DIN 4102
Fasrock CE – certificate number	: ÉMI EC 1415-CPD-35-(C-7/2010)
Fasrock 150 CE – certificate number	: ÉMI EC 1415-CPD-35-(C-7/2010)
Product code	: MW-EN 13162-T5-DS(T+)-CS(10)40-TR15-WS-WL(P)-MU1

Dimensions

Length	: 1.000 mm
Width	: 600 mm
Thickness	: 50, 60, 70, 80, 90, 100 mm

Kale Rockwool System Components

Kale Mantotech Thermal Insulation Board Adhesive Mortar

— Cement-based thermal insulation board adhesive with high adhesion strength that provides ease of application.
— It ensures the performance and life of the system with its high adhesion strength.
— Kale Mantotech Thermal Insulation Board Adhesive Mortar is manufactured with the assurance of "Kalekim", the expert and sector leader.

Technical Specifications

Application Tool	: Notched trowel - Trowel
Workability Time	: 15 - 20 minutes
Appearance	: Grey powder
Consumption	: 5 kg/m²
Mixing Ratio	: 25 kg powder, 5,5 - 6 lt water
Application Temperature	: +5°C / +35°C
Pot Life	: 3 hours
Shelf Life	: 12 months in unopened packages in dry environment
Flexibility	: Medium
Tensile Adhesion Strength	
Inital	: Min. 0.5N / mm² TS EN 1348
After immersion in water	: Min. 0.5N / mm² TS EN 1348
After heat exposure	: Min. 0.5N / mm² TS EN 1348
After freeze / Thaw cycles	: Min. 0.5N / mm² TS EN 1348
Open Time	: 15 minutes Min. 0.5N / mm² TS EN 1348
Package	: 25 kg kraft bag
Storage	: Kale Mantotech Thermal Insulation Board Adhesive Mortar must be stored in a dry environment in 10 layer stacks maximum.

Kale Mantoplast Thermal Insulation Board Plaster Mortar

— It is thermal insulation board plaster mortar having high flexibility and adhesion strength that can breathe and is resistant against negative weather conditions, water and shocks.
— Thanks to its high water vapor permeability, it provides a healthful solution that can breathe and is appropriate to the physical feature of the building.
— Kale Mantoplast Thermal Insulation Board Plaster Mortar is manufactured with the assurance of "Kalekim", the expert and sector leader.

Technical Specifications

Application Tool	: Steel trowel
Workability Time	: 15 - 20 minutes
Appearance	: Grey powder
Consumption	: 1.7 kg / m² / mm
Mixture Rate Range	: 25 kg powder, 6 - 6,5 lt water
Application Temperature	: +5°C / +35°C
Pot Life	: 3 hours
Shelf Life	: 12 months in unopened packages in dry environment
Flexibility	: High
Water Absorption	: 30 minutes Maximum 5 gr EN 12808-5 240 minutes Maximum 10 gr EN 12808-5
Flexural Strength	: Min. 2N / mm² TS 24
Compressive Strength	: Min. 6N / mm² TS 24
Water Vapor Permeability	: Sd < 0.3 m TS 7847
Adhesion Strength	: Min. 0.3N / mm² TS 6433
Adhesion Strength on Thermal Insulation Board	: Min. 0.08N / mm²
Package	: 25 kg kraft bag
Storage	: Kale Mantoplast Thermal Insulation Board Plaster Mortar must be stored in a dry environment in 10 layer stacks maximum.

Kale EPS Reinforcement Mesh

— It is a glass wool material having impregnated fiber layers against alkali and chemicals.

Technical Specifications

Density	: 160 gr/m^2
Mesh Interval	: 4×4 mm
Tensile strength	: Min. 1900 N/5 cm
Tensile strength	: Min. 1200 N/5 cm (In %5 NaOH solution test)
Tensile strength	: Min. 1250 N/5 cm (Accelerated test)

Kale EPS Meshed PVC Corner Profile

— It is the meshed PVC profile that is used to reinforce the weak sections (edges, corners, etc.) that are most easily affected from external factors.

Technical Specifications

Density	: 160 gr/m^2
Mesh Interval	: 4×4 mm
Tensile strength	: Min. 1900 N/5 cm
Tensile strength	: Min. 1200 N/5 cm (In %5 NaOH solution test)
Tensile strength	: Min. 1250 N/5 cm (Accelerated test)

Kale EPS Anchor

— It is the mechanical fitting piece that is used to fix the Kale EPS Thermal Insulation Boards to the facade.

Kale Rockwool System Application

Kale Inundation Profile

Before installing Fasrock 135, Fasrock 150 or Frontrock MAX E insulation boards, mark the height of the profile. The profile should be fixed at least 40 cm above the ground. It must be attached horizontally around the entire building.

— Measuring profile height and placing it

— Drilling holes for screws

— Installing profile and fixing with screws

Bonding Kale Rockwool Boards

The insulation boards are applied to the wall with Kale Mantotech Thermal Insulation Board Adhesive Mortar that has been applied in line along the edge of the board as lumps. Adhesive is applied using a trowel. Place the board on a rockwool package, table or a similar object to gain access to both sides. Apply the adhesive along the edge of the board and as lumps on the board. Apply enough adhesive to make sure that it firmly adheres along the all edges of the board and the lumps.

— Applying Kale Mantotech Thermal Insulation Board Adhesive Mortar along the edges of the boards.

— Applying Kale Mantotech Thermal Insulation Board Adhesive Mortar on points.

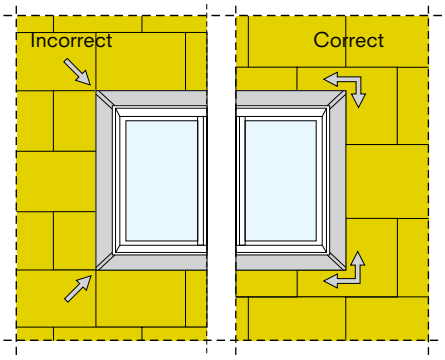
Installing Kale Rockwool Boards

The Rockwool Fasrock or Frontrock MAX E boards are bonded to each other by being pressed against each other. Remember to remove any surplus adhesive that may emerge from the previously attached boards. The flatness of external insulation surface should be carefully checked, since the surface flatness is determined in the phase of attaching boards. Possible irregularities and small deviations can be removed with thick sand paper. Make sure that the boards are laid to bond with each other, and in particular, at the corner of the building, window corners and door heads. Corners of windows and doors must be insulated using the entire board to prevent possible cracks and breakages in the corner. All joints between boards and other elements (window frames, roof, balcony, etc.) should be filled with a material that enlarges and takes shape or an appropriate elastic filling material.

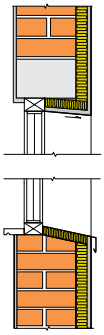
— Removing surplus adhesive

— Detail of an angle bond

— Cutting off surplus insulation in the corner



Installing boards around the window openings



Cross-section of an insulated window

Fixing Kale Rockwool Thermal Insulation Boards with Anchors

Rockwool Fasrock or Frontrock MAX E boards with longitudinal oriented fibers must be fixed with anchors at least 24 hours after they have been attached to the wall. Holes are drilled with a hammer drill. Reinforcement mesh, perforated bricks and aerated concrete are drilled with a standard drill. Plastic parts of the anchors are inserted in the hole and hammered with steel nail.

Minimum distance from the edge of the wall:
— 5 cm (concrete wall)
— 10 cm (brick wall)
Minimum anchor depth in a normal wall
— 5 cm in concrete
— 8 to 9 cm in perforated brick and aerated concrete

— Drilling a hole with a drill

— Hammering the anchor in its place

Kale Rockwool and Plaster Application

Before applying the first layer of Kale Rockwool Mantotech Thermal Insulation Board Adhesive Mortar, smooth and reinforce all corners of the building and the corners of the windows and doors using Kale Rockwool Reinforcement Mesh. To prevent facade cracks, paste Kale Rockwool Reinforcement Mesh at least 30×20 cm above the windows and doors at an angle of 45°. Apply the mortar on the mesh with a notched trowel that has 10×10 mm tooth dimensions. First, apply some plaster to the board with the smooth side of the trowel, and then spread the plaster over the whole board surface with the notched side. Kale Rockwool Reinforcement Mesh is applied on the freshly applied adhesive with sufficient overlap (at least 10 cm).

— Reinforcing a corner

— Smoothing adhesive mortar with the smooth side of the trowel

— Applying the adhesive mortar with the notched side of the trowel

— Applying Kale Rockwool Reinforcement Mesh

— Preventing danger of cracking

— Reinforcing and smoothing the corners

— Cutting off surplus mesh

Formation of Kale Decorative Coatings

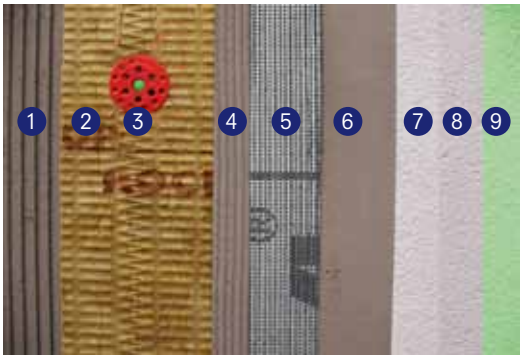
After Kale Mantoplast Thermal Insulation Board Plaster Mortar has been dried, surface preparation must be performed in accordance with the type of the decorative coating material that will be applied on the surface.

— The surface on which acrylic based decorative coating material will be applied, must firstly be primed with Kale Silastar. If mineral based Kale Minart is preferred as topcoat, Kale Silastar must be applied on the surface after Minart application.

— Kale decorative coatings are applied on the surface using a trowel. Thickness, of the application changes depending on the plaster type.

— Texture is formed by glazing the coatings on their surface with a plastic trowel before they dry. Since Kale Minart is mineral based, it must necessarily be painted with water-based Kale Exterior Paint after it dries.

— Paint application on Kale Minart.



1. Kale Rockwool Mantotech Adhesive Mortar
2. Kale Rockwool Thermal Insulation Board
3. Kale EPS Anchor
4. Kale Rockwool Mantoplast Plaster Mortar
5. Kale Rockwool Reinforcement Mesh
6. Kale Rockwool Mantoplast Plaster Mortar
7. Kale Minart
8. Kale Silastar
9. Kale Exterior Paint

— Kale Rockwool system application layers.

Kale Accessories

Kale Inundation Profile

— It is an aluminum profile which protects the system against impacts and that is used asinundation plane.

Kale Inundation Wedge

— It is a plastic material which is used to smooth the undulation existing on the facade and balance the inundation profile.

Kale Aluminum Corner Profile

— It is an aluminum profile which protects the external corners against impacts.

Kale Aluminum Edging Profile

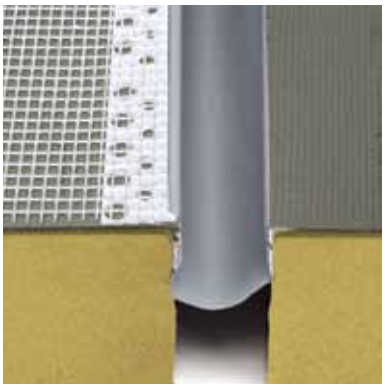
— It is an aluminum profile which is used in corbels to protect the facade against water.

Kale Meshed PVC Edging Profile

— It is a meshed PVC profile which is used in corbels to protect the facade against water.

Kale Sill Profile

— It is an aluminum profile which is used to lengthen the current windowsill.



Kale Dilatation Profile

— It is a profile which is used to cover the dilatation space and enable sheathing system to function at dilatation points.

Kale Fuqua Profile

— It is a profile which is used to form joints on the facade.

Kale Sinker Heading

— It is a fixture which is used to place the anchor heading firmly on Kale EPS boards.

Kale Anchor with Steel Nail

— It is a mechanical fitting piece which is used to fix the Kale Thermal Insulation Boards to the reinforced concrete and hard surfaces.

Kale Wooden “OSB” Anchor with Screw

— It is a mechanical fitting piece which is used to fix the Kale Thermal Insulation Boards to OSB and wooden surfaces.

Kale Aerated Concrete Anchor

— It is a mechanical fitting piece which is used to fix the Kale Thermal Insulation Boards to the aerated concrete and similar surfaces.

Kale Exterior Paints And Plasters

Exterior Paints and Surface Prepation Materials

Kale PROTEKTA

Ceramic Micro Spheres and Silicone Enhanced, Mildew and Algae Resistant, Water Based, Exterior Wall Paint

— Contributes to heat insulation with its ceramic micro spheres. — Water repellent; provides rain to slide away without wetting the wall. — Resistant against mildew and algae growth on walls. — Water resistant. — Superior hiding power — High water vapour permeability, allowing the building to breathe. — Long lasting, resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — Alkali resistant. — Water thinnable and ecologically compatible. — Solvent free and practically odourless.

2.5 lt, 7.5 lt and 15 lt pails.

Application Tools
Brush, roller, airless spraying equipment

Depending on the evenness and the porosity of the surface approximately 0.130 lt/m² per coat

TS 5808

Kale PERFORMA +

Extra Elastic, Water Based, Exterior Wall Paint

— Extra elastic; covers the hair cracks on the surface and resists to movements of the building and keeps its elasticity in low temperatures. — Waterproof; gives perfect protection against rain therefore prevents salt crystallization, frost cracks, algae and fungus formation, chemical corrosion. — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — High water vapour permeability, allowing buildings to breathe. — Superior hiding power. — Solvent free and practically odourless. — Water thinnable and ecologically compatible.

2.5 lt and 15 lt pails.

Application Tools
Brush, roller, airless spraying equipment

Depending on the evenness and the porosity of the surface approximately 0.130 lt/m² per coat.

TS 5808

Kale JOKER PLUS EXT

Silicone Enhanced, Water Based Exterior Wall Paint

— Water repellent, provides rain to slide away without wetting the wall. — High water vapour permeability, allowing building to breathe. — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties without cracking, blistering or fading. Alkali resistant. — Superior hiding power. — Solvent free and practically odorless. — Water thinnable and ecologically compatible.

2.5 lt, 7.5 lt and
15 lt pails

Application Tools
Brush, roller, airless
spraying equipment

Depending on the evenness
and the porosity of the surface
approximately 0.130 lt/m² per coat

TS 5808

Kale SİLİKONA

Silicone Enhanced, Water Based Exterior Wall Paint

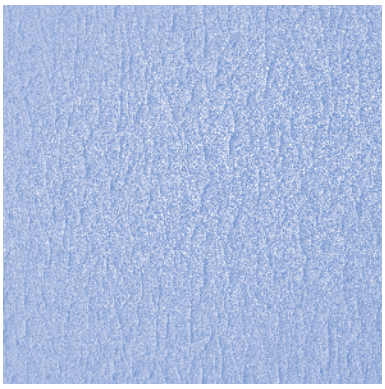
— Water repellent; provides rain to slide away without wetting the wall. — High water vapour permeability, allowing the building to breathe. — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties without cracking, blistering or fading.— Alkali resistant.— Superior hiding power. — Solvent free and practically odourless, — Water thinnable and ecologically compatible.

2.5 lt, 7.5 lt and
15 lt pails.

Application Tools
Brush, roller, airless
spraying equipment

Depending on the evenness
and the porosity of the surface
approximately 0.130 lt/m² per coat.

TS 5808



Kale SİLİKONA GRENLİ

Silicone Enhanced, Water Based Textured Coating

— Water repellent; provides rain to slide away without wetting the wall — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — High water vapour permeability, allowing the building to breathe. — Alkali resistant. — Covers the surface defects by its thickness and texture. — Superior hiding power. — Solvent free and practically odourless. — Water thinnable and ecologically compatible

25 kg pails.

Application Tools
Brush, roller, airless spraying equipment

Depending on the evenness, the porosity of the surface and the desired texture 700 - 1000 gr/m²

TS 7847

Kale SİLİKONATEX

Silicone Enhanced, Elastic, Water Based Textured Coating

— Elastic; covers hair cracks on the surface and resists to movements of the building and keeps its elasticity in low temperatures. — Water repellent; provides rain to slide away without wetting the wall — High water vapour permeability, allowing the building to breathe. — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — Covers the surface defects with its texture and thickness. — Alkali resistant. — Superior hiding power. — Solvent free and practically odourless. — Water thinnable and ecologically compatible.

2.5 lt. and 15 lt pails

Application Tools
Roller, airless spraying equipment

Depending on the evenness, the porosity of the surface and the desired texture 0.400 - 0.660 lt/m² (700 - 1000 gr/m²)

TS 7847

Kale GRENA

Water Based Exterior Wall Paint

— Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — High water vapour permeability, allowing building to breathe. — Alkali resistant. — Water resistant. — Superior hiding power. — Solvent free and practically odourless. — Water thinnable and ecologically compatible.

2.5 lt, 7.5 lt and
15 lt pails

Application Tools
Brush, roller, airless spraying equipment

Depending on the evenness and the porosity of the surface approximately 0.130 lt/m² per coat.

TS 5808

Kale SİLASTAR

Silicone Enhanced Primer

Silicone enhanced, acrylic emulsion based, pigmented primer with high penetration and water proofing power for priming the surfaces on which any type of water based decorative coating will be applied.

— Silicone content enables deep penetration under the surface reducing water absorption. — Pigmented; provides hiding. — Reinforces the substrates, increases the adhesion of surface coating. — Decreases paint consumption by decreasing the absorbency of the substrate. — Solvent free and practically odourless. — Water thinnable and ecologically compatible.

2.5 lt and 15 lt pails

Application Tools
Brush, roller, airless spraying equipment

Depending on the evenness and the porosity of the surface approximately 0.090 lt/m²

TSEK

Kale MACUNART

Cement Based, Water Resistant, Fine, Surface Smoothening Putty

Cement based, fine, white, surface smoothening putty formulated for smoothing the uneven concrete and mineral surfaces, filling up the hair cracks and for covering interior and exterior surface defects.

— Forms very strong, non-dusting and smooth surfaces, thus contributes to the appearance and the resistance of the top coat. — Resistant to water and to moisture; when dampened, does not soften or does not weaken the adherence of the top coat to the substrate. — Compared to gypsum panels and gypsum based materials, has higher durability and adherence strength therefore more resistant against cracking. — Reduces paint consumption by decreasing the absorbency of the surface. — Having high filling capacity, at most 2 layers will be sufficient to achieve a smooth surface. — Easy to apply. — Easy to sand, non-dusting. — Does not prevent the water vapour permeability of the wall.

20 kg multi-ply paper bags.

Application Tools
Stainless steel trowel, spatula

Depending on the evenness and the porosity of the surface approximately 0.5-1.0 kg for 1 mm. application thickness. Application should be held in maximum 3 mm.

Complies with TS EN 1504-3

CE

Kale KALIN AKRİLİK MACUN

Water Based, Thick Surface Smoothening Putty

— Forms very strong, non-dusting and smooth surfaces. — Resistant to moisture. — Does not prevent the water vapour permeability of the wall. — Decreases paint consumption by decreasing the surface porosity — Easy to apply, ready to use. — High filling capacity, creates a surface, at maximum, in two coats. — Easily sandable. — Water based and ecologically compatible.

5 kg and 25 kg pails

Application Tools
Spatula, elastic stainless steel trowel.

Depending on the smoothess and the porosity of the surface approximately 1.2 - 2.2 kg/ m^2

Kale Decorative Coatings

Kale DEKOR

Line Textured Ready Mixed Plaster

— High water vapour permeability allowing building to breathe. — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — Alkali resistant. — Horizontal, vertical or circular line textures can be obtained by movements of trowel. — Water resistant. — Solvent free and practically odourless. — Water thinnable and ecologically compatible

Available in 25 kg pails.

Application Tools
Plastic trowel.

Depending on the smoothess of the surface approximately 3.3 - 3.5 kg/m²

TS 7847

Kale DEKOR PLUS

Silicone Enhanced, Elastic, Line Textured, Ready Mixed Plaster

— Elastic; covers the hair cracks on the surface and resists to movements of the building. — Water repellent; provides rain to slide away without wetting the wall. — High water vapour permeability allowing the building to breathe. — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — Alkali resistant. — Horizontal, vertical or circular line textures can be obtained by movements of trowel. — Water resistant — Solvent free and practically odourless, — Water thinnable and ecologically compatible

Available in 25 kg pails.

Application Tools
Plastic trowel.

Depending on the evenness of the surface approximately 3.3 - 3.5 kg/m²

TS 7847

Kale GRENART

Silicone Enhanced, Elastic, Ready Mixed Plaster

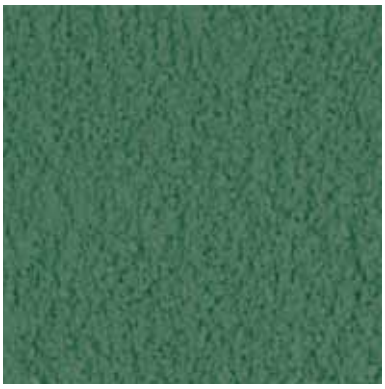
— Elastic; covers the hair cracks on the surface and resists to movements of the building. — Water repellent; provides rain to slide away without wetting the wall. — High water vapour permeability allowing the building to breathe. — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — Water resistant. — Alkali resistant. — Solvent free and practically odourless. — Water thinnable and ecologically compatible.

Available in 25 kg pails.

Application Tools
Steel or plastic trowel

Depending on the smoothess of the surface approximately 2.5 - 3.1 kg/m^2

TS 7847



Kale GRENART MİDİ

Silicone and Fiber Enhanced, Elastic, Ready Mixed Plaster

— Elastic; covers the hair cracks on the surface and resists to movements of the building. — Fiber enhanced; easily applicable. — Water repellent; provides rain to slide away without wetting the wall. — High water vapour permeability allowing the building to breathe. — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — Water resistant. — Alkali resistant. — Solvent free and practically odourless. — Water thinnable and ecologically compatible.

Available in 25 kg pails.

Application Tools
Steel or plastic trowel

Depending on the smoothess of the surface approximately 2.4 - 2.9 kg/m^2

TS 7847

Kale GRENART MİCRO

Silicone Enhanced, Elastic, Ready Mixed Plaster

— Elastic; covers the hair cracks on the surface and resists to movements of the building. — Water repellent; provides rain to slide away without wetting the wall. — High water vapour permeability allowing building to breathe. — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — Alkali resistant. — Water resistant. — Solvent free and practically odourless. — Water thinnable and ecologically compatible.

Available in 25 kg pails.

Application Tools
Steel or plastic trowel

Depending on the evenness of the surface approximately 2.2 - 2.8 kg/m²

TS 7847

Kale RENOTEX

Roller Applied Ready Mixed Plaster

— High water vapour permeability allowing the building to breathe. — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — Water resistant — Alkali resistant. — Various decorative textures obtained by the use of different thinning ratios and different rollers. — Solvent free and practically odourless. — Water thinnable and ecologically compatible.

Available in 25 kg pails.

Application Tools
Roller, airless spraying system

Consumption
Flat textures 1.0 - 1.2 kg/m²
Fine textures 1.2 - 1.7 kg/m²
Coarse textures 1.7 - 2.0 kg/m²

TS 7847

Kale RENOTEX PLUS

Silicone Enhanced, Roller Applied Ready Mixed Plaster

— Water repellent; provides rain to slide away without wetting the wall. — High water vapour permeability allowing the building to breathe. — Long lasting; resists to UV rays, rain, heat and frost, thus retains its original properties for years without cracking, blistering and fading. — Alkali resistant. — Various decorative textures obtained by the use of different thinning ratios and different rollers. — Solvent free and practically odourless. — Water thinnable and ecologically compatible.

Available in 25 kg pails.

Application Tools
Roller, airless spraying system

Consumption
Flat textures 1.0 - 1.2 kg/m²
Fine textures 1.2 - 1.7 kg/m²
Coarse textures 1.7 - 2.0 kg/m²

TS 7847

Kale MİNART

Mineral Based Decorative Exterior Coating

— Specially designed for thermal insulation systems and resistant against extreme climatic conditions with its superior performance. — Forms a natural and decorative textured surface with its characteristic filling. — High water vapour permeability allowing the building to breathe. — White in color. — After drying, it must be painted with water based Kale Exterior Paint.

Available in 25 kg multi-ply paper bags.

Application Tools
Stainless steel and plastic trowel

Depending on the evenness of the surface approximately 2.4 - 2.8 kg/m²

TS 7847

kale.com.tr

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Kale

Kalekim Kimyevi Maddeler San. ve Tic. A.Ş.
Esenyurt Yolu Üzeri No:188 34325 Firuzköy, Avcılar - İstanbul / Turkey
T +90 212 423 0018 (pbx) F +90 212 423 3188
kalekim@kale.com.tr