ADESILEX PG1
ADESILEX PG2

Two-component thixotropic epoxy adhesives for structural bonding





WHERE TO USE

Structural repair, bonding and reinforcement of concrete elements, natural stone, mortar and brick with very low emissions of volatile organic compounds (EMICODE EC1 Plus).

Some application examples

- Structural reinforcement of beams and pillars by bonding steel (béton plaqué method) or composite material (e.g. **Carboplate**) plates to concrete.
- Non-flexible structural bonding of precast concrete elements.
- Sealing injectors and surface damage before injection of **Epojet** by low-pressure pump.
- Sealing large cracks and repairing joint corners in industrial flooring subject to traffic.
- Bonding fibre-reinforced cement slabs and pipes.
- Waterproofing large size joints by bonding TPE strips (e.g. **Mapeband TPE**) to concrete.

TECHNICAL CHARACTERISTICS

Adesilex PG1 and **Adesilex PG2** are two-component products based on epoxy resins, selected fine-grain aggregates and special additives according to a formula developed in MAPEI Research & Development laboratories.
After mixing **Adesilex PG1** or **Adesilex PG2** (part A) with their hardeners (part B), a thixotropic mix, easy to apply even on vertical structures in thicknesses up to 1 cm in a single layer, is obtained. Once prepared, **Adesilex PG1** hardens by chemical reticulation alone in approx. 3 hours, while **Adesilex PG2** hardens in 5 hours without shrinkage. They become compounds with exceptional bonding and mechanical strength.
Adesilex PG1 and **Adesilex PG2** may also be applied on very damp surfaces as long as there is no standing water. The products differ from each other in their working time. **Adesilex PG1** is especially suitable for applications in temperatures between +5°C and +23°C, while **Adesilex PG2** is recommended for higher temperatures.
Adesilex PG1 and **Adesilex PG2** meet the requirements defined by EN 1504-9 ("*Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity – General principles for the use of products*") and the minimum requirements claimed by EN 1504-4 ("*Structural bonding*").

RECOMMENDATIONS

- Do not use **Adesilex PG1** and **Adesilex PG2** for sealing flexible joints or joints subject to movement (use products from **Mapesil** and **Mapeflex** ranges).

- Do not use **Adesilex PG1** and **Adesilex PG2** for shrinkage joints between fresh and hardened concrete (use **Eporip**).
- Do not use **Adesilex PG1** and **Adesilex PG2** on dirty or crumbling surfaces.
- Do not use **Adesilex PG1** and **Adesilex PG2** for bonding and grouting anti-acid ceramic tiles (use **Kerapoxy**).
- Do not use **Adesilex PG1** and **Adesilex PG2** for levelling concrete surfaces before bonding carbon fibre fabrics (e.g. **MapeWrap C UNI-AX**, **MapeWrap C BI-AX** and **MapeWrap C QUADRI-AX**), use **MapeWrap 11** or **MapeWrap 12**.

APPLICATION PROCEDURE

Preparation of the substrate

To ensure good adhesion of **Adesilex PG1** and **Adesilex PG2**, special care must be taken for the preparation of surfaces to be bonded.
The concrete, natural stone or brick substrate must be clean, sound and dry.
Sand-blasting is ideal to remove all loose and crumbling parts, efflorescence, cement laitance and traces of form-release oils. Then remove all dust with compressed air.
All traces of rust, paint and oil must be removed from metal surfaces, preferably by means of sand-blasting (SA 2½) down to bright metal.
With regards to fresh placed concrete, it is necessary that the concrete cures for at least 28 days before applying **Adesilex PG1** or **Adesilex PG2**. This is to avoid tensions induced by hygrometric shrinkage of the concrete concentrated in the interface of the bonding.
The application temperature of **Adesilex PG1** must not be below +5°C and +10°C for **Adesilex PG2**.

Preparing the mixes

The two parts of **Adesilex PG1** and **Adesilex PG2** must be mixed together. Pour part B (white) into part A (grey) and mix at a slow speed with a drill fixed with an agitator until a uniform paste is obtained (a uniform grey). The product is already pre-dosed. To avoid incomplete hardening of **Adesilex PG1** and/or **Adesilex PG2**, do not use partial quantities. When partial quantities are necessary, use a precision electronic scale. The mixing ratio is:

- 3 parts by weight of component A;
- 1 part by weight of component B.

Applying the mixes

Adesilex PG1 and **Adesilex PG2** can be applied on concrete, stone, brick or metal with a flat trowel or float.
To obtain good bonding, it is recommended to spread the adhesive on both surfaces that need bonding and let the product penetrate well, especially on irregular surfaces.
After applying the adhesive, unite the two pieces that need bonding and keep firm until the adhesive has completely hardened. The sufficient thickness to obtain an excellent bonding strength is approximately 1-2 mm.
Thanks to the excellent thixotropic property, **Adesilex PG1** and **Adesilex PG2** can also be applied vertically or on ceilings without slipping.
The sorrounding temperature has an effect on the hardening time of the two products. At +23°C **Adesilex PG1** remains workable for approximately 35 minutes while **Adesilex PG2** remains workable for 50 minutes. After this time, the products begin the hardening process.
Adesilex PG1 and **Adesilex PG2** must be applied within the useful pot life time. It is therefore necessary to plan the work within the time limit mentioned above.



Fixing injection tubes and sealing cracks for structural consolidation



Column cladded with Adesilex PG1



Application of Adesilex PG1 with a notched trowel for structural bonding of pre-fabricated steps



Application of Adesilex PG1 on metal sheet



Placing metal sheet for structural reinforcement

PRECAUTIONS TO BE TAKEN BEFORE APPLICATION

No particular precautions need to be taken with temperatures between +10°C and +30°C.
During summer it is preferable to use **Adesilex PG2**. Do not expose the product to sun light and carry out bonding during the cooler hours of the day in order to prevent the rapid hardening of the product which would make application difficult.
During winter, when outdoor applications at temperatures below +10°C are necessary, it is recommended to use **Adesilex PG1**. Heat the substrate at least 24 hours before bonding and use an appropriate insulating system to avoid freezing. Thermal insulation must be maintained for at least the next 24 hours. Store the product in a heated environment before use.

CLEANING

Due to the high bonding strength of **Adesilex PG1** and **Adesilex PG2** even to metal, it is recommended to clean working tools with solvents (ethyl alcohol, toluol, etc.) before the product hardens.

CONSUMPTION

1.65-1.75 kg/m² per mm of thickness.

PACKAGING

Adesilex PG1
2 kg kit (comp. A: 1.5 kg; comp. B: 0.5 kg).
6 kg kit (comp. A: 4.5 kg; comp. B: 1.5 kg).
Adesilex PG2
6 kg kit (comp. A: 4.5 kg; part B: 1.5 kg).

STORAGE

24 months in their original packaging.
Store the products at temperature not below +5°C.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

When the product reacts it generates considerable heat. After mixing components A and B, we recommend applying the product as soon as possible and never leaving the container unattended until it is completely empty.
Instructions for the safe use of our products can be found on the latest version of the Safety Data Sheet, available from our website www.mapei.com.
PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)

PRODUCT IDENTITY	component A	component B
Consistency:	thick paste	thick paste
Colour:	grey	white
Density:	1.72 kg/l	1.55 kg/l
Brookfield viscosity:	900 Pa·s (rotor F - 5 revs)	600 Pa·s (rotor D - 2.5 revs)
EMICODE:	EC1 Plus - very low emission	

PRODUCT APPLICATION DATA (at +23°C - 50% R.H.)	Adesilex PG1	Adesilex PG2
Mixing ratio:	component A : component B = 3 : 1	
Consistency of mix:	thixotropic paste	thixotropic paste
Colour of mix:	grey	grey
Density of mix:	1.70 kg/l	1.70 kg/l
Brookfield viscosity:	800 Pa·s (rotor F - 5 revs)	
Workability time (EN ISO 9514): – at +10°C: – at +23°C: – at +30°C:	 60 minutes 35 minutes 25 minutes	 150 minutes 50 minutes 35 minutes
Setting time: – at +10°C: – at +23°C: – at +30°C:	 7-8 hours 3 hours-3 hours 30 minutes 1 hour 30 minutes-2 hours	 14-16 hours 4-5 hours 2 hours 30 minutes-3 hours
Application temperature range:	from +5°C to +30°C	from +10°C to +30°C
Complete hardening time:	7 days	

FINAL PERFORMANCE				
Performance characteristic	Test method	Requirements according to EN 1504-4	Product performance	
			Adesilex PG1	Adesilex PG2
Linear shrinkage:	EN 12617-1	≤ 0.1%	0% (at +23°C) 0.05% (at +70°C)	0% (at +23°C) 0.03% (at +70°C)
Compressive modulus of elasticity:	EN 13412	≥ 2,000 N/mm²	6,000 N/mm²	6,000 N/mm²

Coefficient of thermal expansion:	EN 1770	≤ 100 x 10^{-6} K^{-1} (measured between -25°C and +60°C)	43 x 10^{-6} K^{-1}	46 x 10^{-6} K^{-1}
Glass transition temperature:	EN 12614	≥ +40°C	> +40°C	> +40°C
Durability (freeze/thaw and hot, damp cycles):	EN 13733	compressive shear load > tensile strength of concrete no failure of steel test sample	meets specifications	meets specifications
Reaction to fire:	EN 13501-1	Euroclass	B-s1, d0	C-s1, d0
Bond strength on damp concrete according to EN 12636 (N/mm²):	EN 1542	not required	> 3 (failure of concrete)	
Concrete-steel bond strength (N/mm²):	EN 1542	not required	> 3 (failure of concrete)	
Concrete-Carboplate bond strength (N/mm²):	EN 1542	not required	> 3 (failure of concrete)	

BONDED MORTAR OR CONCRETE

Bond strength to concrete:	EN 12636	failure of concrete	meets specifications	meets specifications
Sensitivity to water:	EN 12636	failure of concrete	meets specifications	meets specifications
Shear strength:	EN 12615	≥ 6 N/mm²	> 10 N/mm²	> 10 N/mm²
Compressive strength:	EN 12190	≥ 30 N/mm²	> 70 N/mm²	> 70 N/mm²

STRENGTHENING USING BONDED PLATE

Shear strength:	EN 12188	≥ 12 N/mm²	θ τ 50° > 35 N/mm² 60° > 29 N/mm² 70° > 25 N/mm²	θ τ 50° > 28 N/mm² 60° > 25 N/mm² 70° > 22 N/mm²
Bond strength: – pull out:	EN 12188	≥ 14 N/mm²	> 18 N/mm²	> 18 N/mm²
Bond strength: – inclined shear strength:	EN 12188	θ σ_0 50° ≥ 50 N/mm² 60° ≥ 60 N/mm² 70° ≥ 70 N/mm²	θ σ_0 50° > 73 N/mm² 60° > 69 N/mm² 70° > 80N/mm²	θ σ_0 50° > 58 N/mm² 60° > 60 N/mm² 70° > 70 N/mm²

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

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