

## TECHNICAL DATA SHEET

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very low specific weight injection mortar for large size cavities consolidation with expansive and not destructive power during the plastic phase. Cracks width up to 30mm

## ◆ PARTICULAR FEATURES

Pre-mix suitable to carry out the filling up of voids present among plaster's layers (till 30 mm), sealing of superficial cracks and re-gluing of plaster's parts degraded and friable. As well as a specific weight particularly limited the formulation presents suitable mechanical resistances.

## ◆ COMPOSITION OF FORMULATION

It is made up of natural limes and special hydraulic binders (C30), chemically stable and with very low soluble salt contents, pozzolana, ventilated perlite and a special combination of fluidifying, retentive, airing additives. The special formulation, produced in 1/10,000 planetary dispersion for a time under 20 minutes, forms a homogenous pre-mix of a white colour. To the mortar can be added micro-fibres to improve its mechanical features in special uses.

## ◆ APPLICATION FIELDS

The product, considering the low specific weight and the low mechanical resistances, results suitable to carry out re-adherence of elements lacking of static functions and not possible to be made heavy.

The 3 LEDAN RI.STAT products can be used mixed together in order to achieve the best chemical, physical and mechanical performances for the work to be done.

## Ⓐ PREPARATION'S INSTRUCTIONS

Knead energetically, for about three minutes, LEDAN RI.STAT EXTRA with demineralised water. If necessary, and in case of application with tubes of which the diameter is less than 5 mm, filter the grout obtained to eliminate possible lumps formed in the kneading phase.

RECOMENDED DOSES		
USE	LEDAN RI.STAT A	WATER
FILLING UP OF CRACKS AND HOLLOWES	1 Kg	1 l
INJECTIONS OF BIG HOLLOWES (carried out with syringes having a diameter over 6 mm)	1 Kg	1,2 l

## INSTRUCTIONS FOR USE

- 1) Before to execute the plasters, remove well friable and incoherent parts and apply only on previously desalinated and reinforced supports.
- 2) Plaster well the product's possible outlets from the building support with the appropriate LEDAN RALAC plastering mixture (also available in dough ready for use in the appropriate tube with spout, in a 1-kg pack).
- 3) If possible wet the surfaces that have to be handled with repeated water's applications.
- 4) Add water to the LEDAN RI.STAT EXTRA, mixing energetically by electrical drill at low speed for about 6-8 minutes.
- 5) Keep the mixture shaken before to inject, by syringes not equipped with needle  $\varnothing < 6$  mm
- 6) Inject uninterruptedly to avoid occlusions and obtain the maximum filling up.

## LIMITS FOR THE USE

LEDAN RI.STAT EXTRA is lime based mixture, therefore avoid application in periods of extreme cold (with minimum temperatures less than 5° C) or extreme heat (with maximum temperatures over 35°C). Avoid moreover the application on supports that have presence of soluble salts.

◆ Mixture for Injection

◆ EQUIPMENTS FOR USING

LEDAN RI.STAT EXTRA application usually occurs with common syringes. It's recommend the use of veterinary-style not equipped with needle (having a diameter of exit over 6 mm).

PHYSICAL - CHEMICAL FEATURES					
SPECIFIC WEIGHT	0,75 Kg/Dm <sup>3</sup>	LOW	ADHESION	1 N/ mm <sup>2</sup>	GOOD
INITIAL SETTING	5 HOURS	LOW	EXUDATION	NONE	EXCELLENT
FINAL SETTING	10 HOURS	LONG	STEAM PERMEABILITY	7 μ	GOOD
WORKABILITY	30 Minutes	HIGH	ELASTIC MODULE	7000 N/ mm <sup>2</sup>	MEDIUM
COMPRESSION STRENGTH	6 N/mm <sup>2</sup>	MEDIUM	WATER RETENTION	>89	EXCELLENT
BENDING STRENGTH	1,9 N/mm <sup>2</sup> (28 gg)	MEDIUM	EXPANSION	+2 %	GOOD

N.B. The material was characterized bearing in mind its own application modalities. The numerical values refer to averages revealed on laboratory supports reproducing problems inherent in building structures.

◆ EFFLORESCENCE

To evaluate if possible soluble salts present in a mortar may cause undesired chemical and chromatic alteration phenomena, it is possible to carry out a test according to the RAL 544/3 regulations in the laboratory. The formulation LEDAN RI.STAT EXTRA undergoing such a test does not cause efflorescence phenomena.

◆ EXPERIMENTATIONS CARRIED OUT IN YARDS CHECKED BY THE MINISTRY FOR CULTURAL HERITAGE AND ACTIVITIES

The product is the result of a State Research born by a protocol of agreement between the Ministry for Cultural Heritage and the M.I.U.R. for the consolidation of frescoed plasters in the phase of detachment from the masonry supports. Studied in an high qualified laboratory, was experimented in yards, under the supervision of the competent Authorities. Was used by the Opificio delle Pietre Dure (Factory of the Hard Stones) of Florence in the consolidation of the frescoed plasters of the Church of Santa Croce in Florence.

◆ DURABILITY

Some LEDAN RI.STAT EXTRA samples undergoing an accelerated aging cycle, simulating a natural ageing of around 20 years, have demonstrated a performance drop of under 4%.

◆ SPECIFICATION ENTRY

Injections for re-adherence and filling up with very low content of soluble salts carried out with pre-mix named LEDAN RI.STAT EXTRA. As for the product used, its principal chemical-physical features, the places and date of occurred testing must be declared. The producer must also supply the papers relating to the performed research activity, ratified by the Public Organ responsible for control thereof.

◆ STORAGE

If conserved in a dry place and closed containers the product is conserved for 24 months.

◆ PACKAGES

Buckets of: 10 Kg

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Mixture for injections for consolidation and re-adherence of frescoed plaster to the masonry support (micro-cracks).

## ◆ PARTICULAR FEATURES

Excellent penetration in the masonries without preliminary support wetting; easy leakage cleaning, chemical-mechanical compatibility with lime and pozzolana, low mechanic resistance, absence of efflorescence even in very wet environments

## ◆ COMPOSITION OF FORMULATION

It is made up of natural limes and special hydraulic binders (C30) chemically stable and with very low soluble salt contents, natural lime combined with pozzolana, very pure quartzes granulometrically impalpable and a special combination of fluidifying, retentive, airing additives.

The special formulation, produced in 1/10,000 planetary dispersion for a time under 20 minutes, forms a homogenous pre-mix of a white colour. To the mortar can be added micro-fibres to improve its mechanical features in special uses.

## ◆ APPLICATION FIELDS

Produced appropriately formulated to solve problems related to the consolidation of frescoed plasters, in the phase of detachment from the masonry support of structures also vaulted.

The 3 LEDAN RI.STAT products can be used mixed together in order to achieve the best chemical, physical and mechanical performances for the work to be done.

## Ⓐ PREPARATION'S INSTRUCTIONS

Knead energetically, for about three minutes, LEDAN RI.STAT A with demineralised water.

If necessary, and in case of application with tubes of which the diameter is less than 5 mm, filter the grout obtained to eliminate possible lumps formed in the kneading phase.

## RECOMENDED DOSES

USE	LEDAN RI.STAT A	WATER
PRE-CONSOLIDATION OF DECOHERED SURFACES	1 Kg	1,25 lt
READHESION OF PLASTERS ALSO VAULTED	1 Kg	0,8 lt

## INSTRUCTIONS FOR USE

- 1) Plaster well the product's possible outlets from the building support with the appropriate LEDAN RALAC plastering mixture (also available in dough ready for use in the appropriate tube with spout, in a 1-kg pack).
- 2) Carry out puncturing of plaster, stuccoes etc (the punctures' position shall be fixed by the restorer case by case). Puncture diameter minimum 2 mm. Max distance between punctures not over 20 cm.
- 3) Clean thoroughly the puncture, blowing and inhaling air.
- 4) Inject with syringe equipped with needle or tube.

\* If the puncturing and clearing operations are carried out correctly, the LEDAN RI.STAT A, even without preliminary support wetting and applying a very low pressure, will flow right inside the masonry, spreading uniformly. Whenever this doesn't happen, check again the carried-out punctures' potential receptiveness.

## LIMITS FOR THE USE

LEDAN RI.STAT A is lime based mixture, therefore avoid application in periods of extreme cold (with minimum temperatures less than 5° C) or extreme heat (with maximum temperatures over 35°C).

**Mixture for Injection**

**EQUIPMENTS FOR USING**

LEDAN RI.STAT A application usually occurs with common syringes. It's recommend the use of veterinary-style needles (having a diameter over 2 mm). In case of large surface to consolidate the application can occurs with cochlea systems, compression air, pistons, both manual and electrical.

PHYSICAL - CHEMICAL FEATURES					
SPECIFIC WEIGHT	0,96 Kg/Dm <sup>3</sup>	LOW	ADHESION	1,0 N/ mm <sup>2</sup>	EXCELLENT
INITIAL SETTING	8 HOURS	MEDIUM	EXUDATION	NONE	EXCELLENT
FINAL SETTING	10 HOURS	MEDIUM	STEAM PERMEABILITY	9 μ	GOOD
WORKABILITY	2,5 HOURS	MEDIUM	ELASTIC MODULE	6000 N/ mm <sup>2</sup>	EXCELLENT
COMPRESSION STRENGTH	5 N/mm <sup>2</sup>	LOW	WATER RETENTION	>83%	EXCELLENT
BENDING STRENGTH	1,5 N/mm <sup>2</sup> (28 gg)	HIGH	SHRINKAGE	3 % IN WEIGHT	EXCELLENT

N.B. The material was characterized bearing in mind its own application modalities. The numerical values refer to averages revealed on laboratory supports reproducing problems inherent in building structures.

**EFFLORESCENCE**

To evaluate if possible soluble salts present in a mortar may cause undesired chemical and chromatic alteration phenomena, it is possible to carry out a test according to the RAL 544/3 regulations in the laboratory. The formulation LEDAN RI.STAT A undergoing such a test does not cause efflorescence phenomena.

**EXPERIMENTATIONS CARRIED OUT IN YARDS CHECKED BY THE MINISTRY FOR CULTURAL HERITAGE AND ACTIVITIES**

The product is the result of a State Research born by a protocol of agreement between the Ministry for Cultural Heritage and the M.I.U.R. for the consolidation of frescoed plasters in the phase of detachment from the masonry supports. Studied in an high qualified laboratory, was experimented in yards, under the supervision of the competent Authorities. Was used by the Opificio delle Pietre Dure (Factory of the Hard Stones) of Florence in the consolidation of the frescoed plasters of the Church of Santa Croce in Florence.

**DURABILITY**

Some LEDAN RI.STAT A samples undergoing an accelerated aging cycle, simulating a natural ageing of around 20 years, have demonstrated a performance drop of under 3%.

**SPECIFICATION ENTRY**

Injections for the consolidation of frescoed plaster to masonry support, also in the intrados of the vaults, carried out using a premix composed by special hydraulic binders (C 30), chemically stable and with very low soluble salt content, natural lime combined with pozzolana, quartzes in combination with iperfluidifying additives. Because of the application peculiarity the premixed must be tested and applied in yards carried out under the supervision of the BB.AA.CC Ministry. As for the product used, its principal chemical-physical features, the places and date of occurred testing must be declared.

**STORAGE**

If conserved in a dry place and closed containers the product is conserved for 24 months.

**PACKAGES**

Buckets of: 15 Kg

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Very low specific weight injection mortar for the consolidation and filling of cavities

Cracks width up to 15mm

## PARTICULAR FEATURES

Pre-mix suitable to carry out the filling up of voids present among plaster's layers (till 15 mm), sealing of superficial cracks and re-gluing of plaster's parts degraded and friable. As well as a specific weight particularly limited the formulation presents suitable mechanical resistances.

## COMPOSITION OF FORMULATION

It is made up of natural limes and special hydraulic binders (C30), chemically stable and with very low soluble salt contents, pozzolana, ventilated perlite and a special combination of fluidifying, retentive, airing additives. The special formulation, produced in 1/10,000 planetary dispersion for a time under 20 minutes, forms a homogenous pre-mix of a white colour. To the mortar can be added micro-fibres to improve its mechanical features in special uses.

## APPLICATION FIELDS

The product, considering the low specific weight and the low mechanical resistances, results suitable to carry out re-adherence of elements lacking of static functions and not possible to be made heavy. Particularly the LEDAN RI.STAT B is especially suitable for the re-adherence of plasters in the intrados of frescoed vaults and mosaic surfaces.

The 3 LEDAN RI.STAT products can be used mixed together in order to achieve the best chemical, physical and mechanical performances for the work to be done.

## PREPARATION'S INSTRUCTIONS

Knead energetically, for about three minutes, LEDAN RI.STAT B with demineralised water. If necessary, and in case of application with tubes of which the diameter is less than 5 mm, filter the grout obtained to eliminate possible lumps formed in the kneading phase.

RECOMENDED DOSES		
USE	LEDAN RI.STAT A	WATER
FILLING UP OF CRACKS AND HOLLOWES	1 Kg	1 l
INJECTIONS OF BIG HOLLOWES (carried out with syringes having a diameter over 6 mm)	1 Kg	1,2 l

## INSTRUCTIONS FOR USE

- 1) Before to execute the plasters, remove well friable and incoherent parts and apply only on previously desalinated and reinforced supports.
- 2) Plaster well the product's possible outlets from the building support with the appropriate LEDAN RALAC plastering mixture (also available in dough ready for use in the appropriate tube with spout, in a 1-kg pack).
- 3) If possible wet the surfaces that have to be handled with repeated water's applications.
- 4) Add water to the LEDAN RI.STAT B, mixing energetically by electrical drill at low speed for about 6-8 minutes.
- 5) Keep the mixture shaken before to inject, by syringes not equipped with needle  $\varnothing < 6$  mm
- 6) Inject uninterruptedly to avoid occlusions and obtain the maximum filling up.

## LIMITS FOR THE USE

LEDAN RI.STAT B is lime based mixture, therefore avoid application in periods of extreme cold (with minimum temperatures less than 5°C) or extreme heat (with maximum temperatures over 35°C). Avoid moreover the application on supports that have presence of soluble salts.

**Mixture for Injection**

**EQUIPMENTS FOR USING**

LEDAN RI.STAT B application usually occurs with common syringes. It's recommend the use of veterinary-style not equipped with needle (having a diameter of exit over 6 mm).

PHYSICAL - CHEMICAL FEATURES					
SPECIFIC WEIGHT	0,91 Kg/Dm <sup>3</sup>	LOW	ADHESION	0,9 N/ mm <sup>2</sup>	GOOD
INITIAL SETTING	18 HOURS	LOW	EXUDATION	NONE	EXCELLENT
FINAL SETTING	44 HOURS	LONG	STEAM PERMEABILITY	3 μ	GOOD
WORKABILITY	3 HOURS	HIGH	ELASTIC MODULE	4000 N/ mm <sup>2</sup>	MEDIUM
COMPRESSION STRENGTH	3 N/mm <sup>2</sup>	MEDIUM	WATER RETENTION	>85%	EXCELLENT
BENDING STRENGTH	1,2 N/mm <sup>2</sup> (28 gg)	MEDIUM	SHRINKAGE	0,4 - 1,2 % μm	EXCELLENT

N.B. The material was characterized bearing in mind its own application modalities. The numerical values refer to averages revealed on laboratory supports reproducing problems inherent in building structures.

**EFFLORESCENCE**

To evaluate if possible soluble salts present in a mortar may cause undesired chemical and chromatic alteration phenomena, it is possible to carry out a test according to the RAL 544/3 regulations in the laboratory. The formulation LEDAN RI.STAT B undergoing such a test does not cause efflorescence phenomena.

**DURABILITY**

Some LEDAN RI.STAT B samples undergoing an accelerated aging cycle, simulating a natural ageing of around 20 years, have demonstrated a performance drop of under 4%.

**STORAGE**

If conserved in a dry place and closed containers the product is conserved for 24 months.

**PACKAGES**

Buckets of: 10 Kg

**EXPERIMENTATIONS CARRIED OUT IN YARDS CHECKED BY THE MINISTRY FOR CULTURAL HERITAGE AND ACTIVITIES**

The product is the result of a State Research born by a protocol of agreement between the Ministry for Cultural Heritage and the M.I.U.R. for the consolidation of frescoed plasters in the phase of detachment from the masonry supports. Studied in an high qualified laboratory, was experimented in yards, under the supervision of the competent Authorities. Was used by the Opificio delle Pietre Dure (Factory of the Hard Stones) of Florence in the consolidation of the frescoed plasters of the Church of Santa Croce in Florence.

**SPECIFICATION ENTRY**

Injections for re-adherence and filling up with very low content of soluble salts carried out with pre-mix named LEDAN RI.STAT B. As for the product used, its principal chemical-physical features, the places and date of occurred testing must be declared. The producer must also supply the papers relating to the performed research activity, ratified by the Public Organ responsible for control thereof.

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