



REPIKIT VE 40 SEISMIC

STYRENE-FREE VINYLESTER-BASED CHEMICAL ANCHOR IN CARTRIDGE FOR QUICK FIXINGS. DESIGNED TO WITHSTAND SEISMIC ACTIONS (CLASS C2)

A two-component adhesive formulation based on vinylester resin, suitable for rapid fixing to all building materials, especially concrete and brick.

REPIKIT VE 40 SEISMIC is ETA 23/0081 certified: Option 1 certification for use on cracked and non-cracked concrete and performance class C2 for seismic actions with threaded bar, on non-cracked concrete with improved adhesion bars.

REPIKIT VE 40 SEISMIC is certified for reaction to fire and also complies with LEED® requirements, IEQ credit 4.1, is suitable for contact with potable water and has an A+ classification for volatile organic compound (VOC) emissions in inhabited areas.

Areas of use

REPIKIT VE40 is used to:

- Fix bolts, connectors, threaded and tension rods to any building material: bricks, perforated blocks, full bricks, concrete and stone;
- Fixing of electric and hydraulic plants in metal structural work, window and door frame installations, plates, shelves, reinforcing rod anchorage, cramps and any type of fitting;
- Fix road barriers or guardrails to concrete.

Features

REPIKIT VE40 enables you to quickly make reliable fixings with no risk of wrong dosage because the two components, resin and catalyst, are pre-weighed.

The two are blended outside the cartridge using a static mixer when the product is extruded: thanks to outside mixing the cartridge can be partially used in different moments by simply replacing the nozzle of the mixer.

Resin and catalyst have two different colours for visual control during mixture; after the first 10 ml of extruded product an evenly coloured material is achieved. It ensures an even product and constant quality during fixing.

The cartridge has a gradual scale which enables you to measure the injected amount.

REPIKIT VE 40 SEISMIC has high mechanical and chemical resistance, is easy to use, and cures quickly, typical of polyester resins.

- It ensures strong fasteners, even in the presence of inorganic chemicals (acids and alkalis) and solvents;
- It is also suitable for low-temperature applications and enables fastening even in damp (not wet) holes;
- The product's reactivity increases with temperature.

How to use

Preparation of the support

Make a regular size hole and clean it with a pipe cleaner and compressed air to eliminate fragments and dust; do not use water for cleaning. If fixing is made on bricks or stone masonry. Insert the screened bush with restraint ring.

Preparation of the product

Screw the static mixer on the head of the cartridge and extrude its contents using the appropriate coaxial gun (manual or pneumatic) eliminating the first 10 ml of material until the colour of the paste gets homogeneous.

Application

Inject REPIKIT VE 40 SEISMIC, starting from the bottom of the hole until you fill in approx. 2/3 of the volume. Insert the fixing element (rod, bolt, etc.) rotating it and moving it with the fingers to get rid of air bubbles to improve adherence to resin. The operation is done correctly when a small amount of material comes out from the hole.

Remove the excess of REPIKIT VE 40 SEISMIC from the hole.

If, once the work is finished, the cartridge had not been completely used, unscrew and eliminate the static mixer which cannot be used again and close using the appropriate screw cap.

Note

To reuse a partially used cartridge you need to remove the tap of hardened material, screw a new mixer and repeat the procedure.

You must respect workability times between fixings to prevent the product from hardening in the static mixer.

Do not expose REPIKIT VE40 cartridges to the sun or heat sources before use to avoid reducing workability times.

Best results are achieved when anchorage is done on homogenous materials with high mechanical resistance.

Do not use in wet holes.

Technical characteristics

USE ON NON-CRACKED AND CRACKED CONCRETE WITH THREADED BARS

Setting parameters

| | U.M. | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|------------------------------|--------------------------|----------------------------|-----|-----|-----------------------------------|-----|-----|-----|-----|
| Hole diameter | d ₀ (mm) | 10 | 12 | 14 | 18 | 22 | 26 | 30 | 35 |
| Hole depth h | h _{ef,min} (mm) | 64 | 80 | 96 | 128 | 160 | 192 | 216 | 240 |
| | h _{ef,max} (mm) | 160 | 200 | 240 | 320 | 400 | 480 | 540 | 600 |
| Minimum spacing | S _{min} (mm) | | | | h _{ef} / 2 | | | | |
| Minimum edge distance | C _{min} (mm) | | | | h _{ef} / 2 | | | | |
| Min. base material thickness | h _{min} (mm) | h _{ef} + 30 ≥ 100 | | | h _{ef} + 2d ₀ | | | | |
| Tightening torque | T _{inst} (Nm) | 10 | 20 | 40 | 80 | 150 | 200 | 240 | 275 |

Strength data

For installation on dry or wet concrete and work temperature I (minimum temperature -40 °C, maximum short term temperature +40 °C; long term +24 °C).

Valid for a single anchor far from the edges, on a thick concrete member of class C20/25 with sparse reinforcing.

• **Threaded bars on non-cracked concrete**

Characteristic resistance of resin (kN)

At standard embedment depth

| Bar size (mm) | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|------------------------|---------------|-----------|-----------|------------|------------|------------|------------|------------|------------|
| Embedment depth | h_{ef} (mm) | 80 | 90 | 110 | 128 | 170 | 210 | 240 | 270 |
| Tension | N_{Rd} (kN) | 17,1 | 28,3 | 39,4 | 57,9 | 90,8 | 126,7 | 132,3 | 140,0 |

Design resistance (kN)

At standard embedment depth, for threaded bars in steel class 5.8 and 8.8.

| Bar size (mm) | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|------------------------|---------------|-------------|--------------|--------------|--------------|--------------|---------------|---------------|----------------|
| Embedment depth | h_{ef} (mm) | 80 | 90 | 110 | 128 | 170 | 210 | 240 | 270 |
| Tension | N_{Rd} (kN) | 9,5 | 15,7 | 21,9 | 32,2 | 50,4 | 70,4 | 63,0 | 66,6 |
| Shear | V_{Rd} (kN) | 7,3 11,7 | 11,6 18,6 | 16,9 27,0 | 31,4 50,2 | 49,0 78,4 | 70,6 113,0 | 91,8 146,9 | 112,2 179,5 |

Recommended load (kN)

At standard embedment depth, for threaded bars in steel class 5.8 and 8.8.

| Bar size (mm) | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|------------------------|----------------|------------|-------------|--------------|--------------|--------------|--------------|---------------|---------------|
| Embedment depth | h_{ef} (mm) | 80 | 90 | 110 | 128 | 170 | 210 | 240 | 270 |
| Tension | N_{rec} (kN) | 6,8 | 11,2 | 15,6 | 23,0 | 36,0 | 50,3 | 45,0 | 47,6 |
| Shear | V_{rec} (kN) | 5,2 8,4 | 8,3 13,3 | 12,0 19,3 | 22,4 35,9 | 35,0 56,0 | 50,4 80,7 | 65,6 104,9 | 80,1 128,2 |

1 kN ≈ 100 kg,

Steel failure class 5.8 – Steel failure class 8.8.

• **Threaded bars on cracked concrete**

Characteristic resistance of resin (kN)

At standard embedment depth

| Bar size (mm) | | M10 | M12 | M16 | M20 | M24 |
|------------------------|---------------|-----------|------------|------------|------------|------------|
| Embedment depth | h_{ef} (mm) | 90 | 110 | 128 | 170 | 210 |
| Tension | N_{Rd} (kN) | 14,1 | 18,7 | 29,0 | 48,1 | 71,3 |

Design resistance (kN)

At standard embedment depth, for threaded bars in steel class 5.8 and 8.8.

| Bar size (mm) | | M10 | M12 | M16 | M20 | M24 |
|------------------------|---------------|--------------|--------------|--------------|--------------|--------------|
| Embedment depth | h_{ef} (mm) | 90 | 110 | 128 | 170 | 210 |
| Tension | N_{Rd} (kN) | 7,9 | 10,4 | 16,1 | 26,7 | 39,6 |
| Shear | V_{Rd} (kN) | 11,6 18,6 | 16,8 24,9 | 31,2 38,6 | 48,8 64,1 | 70,4 95,0 |

Recommended load (kN)

At standard embedment depth, for threaded bars in steel class 5.8 and 8.8.

| Bar size (mm) | | M10 | M12 | M16 | M20 | M24 |
|------------------------|----------------|-------------|--------------|--------------|--------------|--------------|
| Embedment depth | h_{ef} (mm) | 90 | 110 | 128 | 170 | 210 |
| Tension | N_{rec} (kN) | 5,6 | 7,4 | 11,5 | 19,1 | 28,3 |
| Shear | V_{rec} (kN) | 8,3 13,3 | 12,0 17,8 | 22,3 27,6 | 34,9 45,8 | 50,3 67,9 |

1 kN ≈ 100 kg,

Steel failure class 5.8 – Steel failure class 8.8.

- Threaded bars under seismic actions, performance category C1**

Characteristic resistance of resin (kN)

At standard embedment depth

| Bar size (mm) | | M10 | M12 | M16 | M20 | M24 |
|------------------------|---------------|-----------|------------|------------|------------|------------|
| Embedment depth | h_{ef} (mm) | 90 | 110 | 128 | 170 | 210 |
| Tension | N_{Rd} (kN) | 8,8 | 15,3 | 23,8 | 39,5 | 60,2 |

Design resistance (kN)

At standard embedment depth, for threaded bars in steel class 5.8 and 8.8.

| Bar size (mm) | | M10 | M12 | M16 | M20 | M24 |
|------------------------|---------------|------------|------------|--------------|--------------|--------------|
| Embedment depth | h_{ef} (mm) | 90 | 110 | 128 | 170 | 210 |
| Tension | N_{Rd} (kN) | 4,9 | 8,5 | 13,2 | 22,0 | 33,4 |
| Shear | V_{Rd} (kN) | 4,1 5,0 | 5,9 8,7 | 11,0 13,5 | 17,2 22,4 | 24,7 34,1 |

Recommended load (kN)

At standard embedment depth, for threaded bars in steel class 5.8 and 8.8.

| Bar size (mm) | | M10 | M12 | M16 | M20 | M24 |
|------------------------|----------------|------------|------------|------------|--------------|--------------|
| Embedment depth | h_{ef} (mm) | 90 | 110 | 128 | 170 | 210 |
| Tension | N_{rec} (kN) | 3,5 | 6,1 | 9,4 | 15,7 | 23,9 |
| Shear | V_{rec} (kN) | 2,9 3,5 | 4,2 6,2 | 7,9 9,6 | 12,3 16,0 | 17,7 24,4 |

1 kN \approx 100 kg,

Steel failure class 5.8 – Steel failure class 8.8.

- Threaded bars under seismic actions, performance category C2**

Characteristic resistance of resin (kN)

At standard embedment depth

| Bar size (mm) | | M12 | M16 | M20 |
|------------------------|---------------|------------|------------|------------|
| Embedment depth | h_{ef} (mm) | 110 | 128 | 170 |
| Tension | N_{Rd} (kN) | 4,6 | 8,4 | 16,0 |

Design resistance (kN)

At standard embedment depth, for threaded bars in steel class 5.8 and 8.8.

| Bar size (mm) | | M12 | M16 | M20 |
|------------------------|---------------|------------|------------|------------|
| Embedment depth | h_{ef} (mm) | 110 | 128 | 170 |
| Tension | N_{Rd} (kN) | 2,5 | 4,6 | 8,9 |
| Shear | V_{Rd} (kN) | 2,6 | 4,7 | 9,1 |

Recommended load (kN)

At standard embedment depth, for threaded bars in steel class 5.8 and 8.8.

| Bar size (mm) | | M12 | M16 | M20 |
|------------------------|----------------|------------|------------|------------|
| Embedment depth | h_{ef} (mm) | 110 | 128 | 170 |
| Tension | N_{rec} (kN) | 1,8 | 3,3 | 6,4 |
| Shear | V_{rec} (kN) | 1,8 | 3,4 | 6,5 |

1 kN \approx 100 kg,

Steel failure class 5.8 – Steel failure class 8.8.

USE ON NON-CRACKED CONCRETE WITH REINFORCING BARS (USED AS ANCHORS)

Setting parameters

| | U.M. | Ø8 | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
|-------------------------------------|--------------------------|----------------------------|-----|-----|-----------------------------------|-----|-----|-----|
| Hole diameter | d ₀ (mm) | 10 | 12 | 14 | 18 | 22 | 26 | 30 |
| Hole depth h | h _{ef,min} (mm) | 64 | 80 | 96 | 128 | 160 | 200 | 256 |
| | h _{ef,max} (mm) | 160 | 200 | 240 | 320 | 400 | 500 | 640 |
| Minimum spacing | s _{min} (mm) | | | | h _{ef} / 2 | | | |
| Minimum edge distance | c _{min} (mm) | | | | h _{ef} / 2 | | | |
| Min. base material thickness | h _{min} (mm) | h _{ef} + 30 ≥ 100 | | | h _{ef} + 2d ₀ | | | |

Strength data

For installation on dry or wet concrete and work temperature I (minimum temperature -40 °C, maximum short term temperature +40 °C; long term +24 °C).

Valid for a single anchor far from the edges, on a thick concrete member of class C20/25 with sparse reinforcing.

• Reinforcing bars on non-cracked concrete

Characteristic resistance of resin (kN)

At standard embedment depth

| Bar size (mm) | | Ø8 | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
|------------------------|----------------------|-----------|-----------|------------|------------|------------|------------|------------|
| Embedment depth | h _{ef} (mm) | 80 | 90 | 110 | 145 | 170 | 210 | 300 |
| Tension | N _{Rd} (kN) | 17,1 | 28,3 | 41,5 | 65,6 | 96,1 | 148,4 | 165,9 |

Design resistance (kN)

At standard embedment depth, for reinforcing bars with f_{uk} = 550 N/mm²

| Bar size (mm) | | Ø8 | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
|------------------------|----------------------|-----------|-----------|------------|------------|------------|------------|------------|
| Embedment depth | h _{ef} (mm) | 80 | 90 | 110 | 145 | 170 | 210 | 300 |
| Tension | N _{Rd} (kN) | 9,5 | 15,7 | 23,0 | 36,4 | 53,4 | 82,5 | 92,2 |
| Shear | V _{Rd} (kN) | 9,2 | 14,4 | 20,7 | 36,9 | 57,6 | 90,0 | 147,4 |

Recommended load (kN)

At standard embedment depth, for reinforcing bars with f_{uk} = 550 N/mm²

| Bar size (mm) | | Ø8 | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
|------------------------|-----------------------|-----------|-----------|------------|------------|------------|------------|------------|
| Embedment depth | h _{ef} (mm) | 80 | 90 | 110 | 145 | 170 | 210 | 300 |
| Tension | N _{rec} (kN) | 6,8 | 11,2 | 16,5 | 26,0 | 38,1 | 58,9 | 65,8 |
| Shear | V _{rec} (kN) | 6,6 | 10,3 | 14,8 | 26,3 | 41,1 | 64,3 | 105,3 |

1 kN ≈ 100 kg,
Steel failure.

Load values derive from parameters certified in European Technical Assessment ETA 23/0081. Characteristic resistance N_{Rk} refers uniquely to the resin resistance to failure due to pull-out and concrete cone. Design resistances N_{Rd} and V_{Rd} refer to all failure modes and include partial safety factors on strengths. Recommended loads N_{rec} and V_{rec} include the further 1.4 safety factor.

For the design of fixing with reduced spacing, near the edge or on concrete with increased resistance, reduced thickness or dense reinforcement refer to ETA 23/0081 or to Declaration of Performance DoP_4210_RK VE 40 SE_EN_002FD and use the design method outlined in EN 1992-4. In the same way, for anchors installed in flooded holes and for different working temperatures (II, between -40 and +80 °C) refer to ETA.

Use and hardening time

Dry or wet concrete

Flooded holes on concrete (bars M8 to M16 and Ø8 to Ø16)

Dry masonry, installation in dry or wet substrate

Cartridge temperature: between +5 and +20 °C

Installation temperature: between -10 and +30 °C

Work temperature:

- I. between -40 and +40 °C (maximum short term temperature +40 °C; long term +24 °C);
- II. between -40 and +80 °C (maximum short term temperature +80 °C; long term +50 °C).

The table shows working and fixing times (clamping or load application – full curing).

| Temperature of base material | Working time | Full curing Dry base material | Full curing Wet base material |
|------------------------------|--------------|-------------------------------|-------------------------------|
| -10 ÷ +4 °C * | 20 min * | 24 h * | 48 h * |
| +5 ÷ +9 °C | 10 min | 145 min | 290 min |
| +10 ÷ +19 °C | 6 min | 85 min | 170 min |
| +20 ÷ +29 °C | 4 min | 50 min | 100 min |
| +30 °C | 4 min | 40 min | 80 min |

* Usage not covered by certification.

Cartridge temperature must be between +5 and +20 °C.

Consumption

The table shows consumption rates for fixing on concrete and should be considered as indicative. For brick or stone masonry, consumption rates are typically two to three times higher.

| Bar size [mm] | Hole diameter [mm] | Hole depth [mm] | 410 mℓ cartridge Fasteners no. |
|---------------|--------------------|-----------------|--------------------------------|
| 8 | 10 | 80 | 60 |
| 10 | 12 | 90 | 50 |
| 12 | 14 | 110 | 26 |
| 16 | 20 | 125 | 16 |
| 20 | 24 | 170 | 8 |
| 24 | 28 | 210 | 4 |

Packaging and storage

The product is available in boxes containing 12 cartridges of 410 mℓ each, along with corresponding static mixers.

The product will remain unchanged for 18 months if stored in its original, unopened packaging in a dry environment at a temperature between 5 and 25°C.

Avoid exposing to heat sources or open flames.

Cleaning of tools and health precautions

Always refer to the safety data sheet before handling the product

To clean tools use solvents such as RESISOLV 111, RESISOLV 196 or alcohol.

Polyester resins may cause irritations: please avoid any contact with the skin and spray in the eyes. It is recommended to wear protective glasses and gloves.

Avoid inhaling styrene vapours release by the product during use: ensure proper ventilation during use and wear a protective mask to protect your respiratory tract.

In case of contact with the skin, immediately clean with a cloth soaked in denatured alcohol and wash with water or neutral soap or handwash paste. Then use a nourishing cream.

In case of contact with eyes or mucosa, do not use alcohol. Rinse immediately with running water and neutral soap for 10/15 minutes, then seek medical advice.

Do not rinse with solvents.

The information supplied in this sheet is the result of the best practical and laboratory experiences of RESIMIX, which guarantees its products when used according to the instructions supplied. It is nonetheless up to the customer to ensure the product is suitable for the intended use. The manufacturer declines any responsibility for incorrect use or uses beyond his control. RESIMIX reserves the right to make changes to the data. For any request, please contact the RESIMIX Technical Assistance Office.