# Pattex CF 900

## Technical information

**Reaction resin mortar, vinyl-ester-based styrene-free**

Henkel – A Brand Like a Friend

Zertifiziertes Qualitätsmanagementsystem AGQS DIN EN ISO 9001:2000

## CONCRETE / SOLID STONE

| USAGE | USAGE INSTRUCTIONS |
|---|---|
| **1. AREAS OF APPLICATION** | **UNDERSURFACE: Concrete, solid stone** |

- Heavy load-carrying attachments in solid stone, concrete, porous concrete and light concrete
- Suitable for attachment points close to the edge, since anchoring is free of expansion forces
- Also suitable as repair mortar or adhesive mortar for concrete components
- Attachment of anchor rods, threaded collars, reinforcement bars, profiles etc.

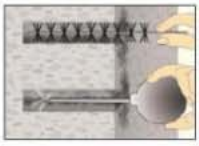
### 2. BENEFITS

- Can be used in various solid stones
- Cartridge can be used up to the end of the validity date by replacing the static mixer or resealing cartridge with the sealing cap
- Water-impermeable joint, i.e. no water can penetrate into the hole at the side of the adhesive compound
- Galvanised steel, stainless steel, high-corrosion-resistant steel

### 3. PROPERTIES

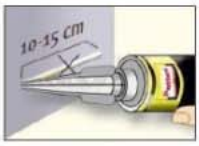
- For use with special application gun and static mixers
- Temperature resistant up to 80 °C; for short periods up to 120 °C
- Application temperature of the cartridge should be at least 20 °C
- High chemical resistance
- Storage temperature from 5 °C up to max. 25 °C
- Storage life: 12 months

1. Drill hole with percussion drill

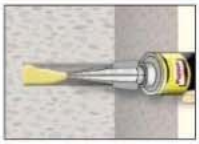


2. Clean drill hole (blow out: 4x, brush out: 4x, blow out: 4x )

3. Screw mixer to cartridge

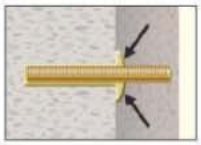



4. Squeeze out and discard approx. 10 cm of compound before use



5. Starting from the back end, fill hole completely with mortar

6. Push anchor up to base of hole whilst turning it slightly



7. Visual check of mortar filling


8. Observe hardening time

9. Install component, apply torque

Feuerwiderstandsklasse F 120

Europäische Technische Zulassung - Option 7 für ungerissenen Beton

- ETA-05/0133
- ETA-05/0134
- ETA-05/0135

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# HOLLOW BRICK

## USAGE

### 1. AREAS OF APPLICATION

- Used for medium-load applications
- The injection plug can be used in
  hollow brick Hlz 4 to DIN 105,
  sand-lime hollow brick KSL 4 to DIN 106,
  hollow light concrete brick Hbl 2 to DIN 18 151 and
  hollow concrete brick Hbn 4 to DIN 18 153
- Suitable for attachment of façades, projecting roofs, wooden constructions, metal constructions, metal profiles, consoles, railings, grills, sanitary fittings, pipe connections, cable runs etc.

### 2. BENEFITS

- Secure anchoring in hollow brick; high load-bearing capacity
- No expansion effect, allowing attachment points to be placed close to edges etc.
- Cartridge can be used up to the end of the validity date by re-placing the static mixer or resealing cartridge with the sealing cap

### 3. PROPERTIES

- Anchoring by composite form-fitting between injection mortar, sleeve collar, anchor rod and anchoring surface
- Galvanised steel, stainless steel, high-corrosion-resistant steel

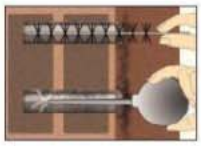
Mit allgemeiner bauaufsichtlicher Zulassung
Henkel KGaA
Z-21.3-1800
Institut für Massivbau Technische Universität Darmstadt

## Reaction characteristics

| Underground Temperature | Curing start | Curing end dry underground | Curing end wet underground |
|---|---|---|---|
| - 5° C | 90 Min. | 360 Min. | 720 Min. |
| 0° C | 45 Min. | 180 Min. | 360 Min. |
| + 5° C | 25 Min. | 120 Min. | 240 Min. |
| + 10° C | 15 Min. | 80 Min. | 160 Min. |
| + 20° C | 6 Min. | 45 Min. | 90 Min. |
| + 30° C | 4 Min. | 25 Min. | 50 Min. |
| + 35° C | 2 Min. | 20 Min. | 40 Min. |

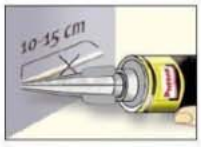
## USAGE INSTRUCTIONS

1. Drill hole without percussion drill



2. Clean drill hole (blow out: 2x, brush out: 2x, blow out: 2x )

3. Screw mixer to cartridge

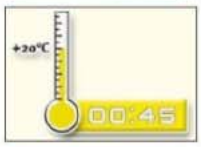



4. Squeeze out and discard approx. 10 cm of compound before use

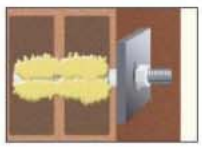
5. Insert perforated sleeve

6. Starting from the back end, fill perforated sleeve with mortar

7. Push anchor up to base of sleeve whilst turning it slightly




8. Observe hardening time



9. Install component, apply torque

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Europäische Technische Zulassung - Option 7 für ungerissenen Beton

- ETA-05/0133
- ETA-05/0134
- ETA-05/0135

## PERFORMANCE DATA / APPROVED APPLICATION IN CONCRETE

| *design values* | | | | | | |
|---|---|---|---|---|---|---|
| * *Attend approvals ETA-05/0133; ETA-05/0134 and ETA-05/0135!* | | | | M 10 | M 12 | M 16 |
| *pull out and concrete cone failure* | C20/25 (50°C / 80°C) | $N^0_{Rk,c}$ | [kN] | 20,0 | 25,0 | 35,0 |
| | | $N_{Rk,p}$ | [kN] | | | |
| | C20/25 (72°C / 120°C) | $N^0_{Rk,c}$ | [kN] | 16,0 | 20,0 | 30,0 |
| | | $N_{Rk,p}$ | [kN] | | | |
| *increasing factors for concrete* | C30/37 | $\Psi_c$ | | 1,22 | | |
| | C40/50 | $\Psi_c$ | | 1,41 | | |
| | C50/60 | $\Psi_c$ | | 1,55 | | |
| *safety factor for tension loads 1,8 acc. to ETAG* | | | | | | |
| *steel failure without lever arm* | *quality 5.8* | $V_{Rk,s}$ | [kN] | 15,0 | 22,0 | 41,0 |
| | *safety factor* | $\gamma_{Ms}$ | | 1,30 | | |
| | *quality A4; HC* | $V_{Rk,s}$ | [kN] | 20,0 | 30,0 | 55,0 |
| | *safety factor* | $\gamma_{Ms}$ | | 1,56 | | |
| *steel failure with lever arm* | *quality 5.8* | $M^0_{Rk,s}$ | [Nm] | 39,0 | 68,0 | 173,0 |
| | *safety factor* | $\gamma_{Ms}$ | | 1,30 | | |
| | *quality A4; HC* | $M^0_{Rk,s}$ | [Nm] | 52,0 | 92,0 | 233,0 |
| | *safety factor* | $\gamma_{Ms}$ | | 1,56 | | |

| *installation parameters* | | | | | |
|---|---|---|---|---|---|
| *edge distance* | $c_{cr,N}$ | [mm] | 90 | 110 | 125 |
| *min. edge distance* | $c_{min}$ | [mm] | 45 | 55 | 62,5 |
| *axial distance* | $s_{cr,N}$ | [mm] | 180 | 220 | 250 |
| *min. axial distance* | $s_{min}$ | [mm] | 90 | 110 | 125 |
| *anchorage depth* | $h_{ef}$ | [mm] | 90 | 110 | 125 |
| *minimum partthickness* | $h_{min}$ | [mm] | 130 | 160 | 160 |
| *thread diameter* | d | [mm] | 10 | 12 | 16 |
| *drill diameter* | $d_B$ | [mm] | 12 | 14 | 18 |
| *brush diameter* | $d_{brush}$ | [mm] | 14 | 16 | 20 |
| *hole diameter in part* | $d_{part}$ | [mm] | 12 | 14 | 18 |
| *tightening torgue* | $T_{inst.}$ | [Nm] | 20 | 40 | 60 |

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## PERFORMANCE DATA / STANDARD APPLICATION IN CONCRETE

| design values | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| design values | Concrete | | | M 8 | M 10 | M 12 | M 16 | M 20 |
| vinyl-ester | ≧ C20/25 | $N_{Rk}$ | [kN] | 15,9 | 25,0 | 34,9 | 49,9 | 74,6 |
| | | $N_{Rd}$ | [kN] | 8,8 | 13,9 | 19,4 | 27,7 | 41,5 |
| safety factor for tension loads 1,8 acc. to ETAG | | | | | | | | |
| vinyl-ester | steel quality 5.8 | $V_{Rk}$ | [kN] | 8,3 | 12,9 | 18,9 | 35,3 | 55,1 |
| | | $V_{Rd}$ | [kN] | 5,3 | 8,3 | 12,1 | 22,6 | 35,3 |
| | | rec. torque | | 12,9 | 25,6 | 44,8 | 113,7 | 222,9 |
| vinyl-ester | steel quality A4 | $V_{Rk}$ | [kN] | 9,2 | 14,5 | 21,1 | 39,3 | 61,3 |
| | | $V_{Rd}$ | [kN] | 5,9 | 9,3 | 13,5 | 25,2 | 39,3 |
| | | rec. torque | | 12 | 23,9 | 41,9 | 106,7 | 207,9 |
| safety factor for share loads 1,56 acc. to ETAG | | | | | | | | |

| recommended loads | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| resin | Concrete | | | M 8 | M 10 | M 12 | M 16 | M 20 |
| vinyl-ester | ≧ C20/25 | $F_{rec.}$ | [kN] | 6,3 | 9,9 | 13,9 | 19,8 | 29,6 |

| installation parameters | | | | | | | |
|---|---|---|---|---|---|---|---|
| edge distance | $c_{cr,N}$ | [mm] | 80 | 90 | 110 | 130 | 170 |
| min. edge distance | $c_{min}$ | [mm] | 40 | 50 | 60 | 70 | 90 |
| axial distance | $s_{cr,N}$ | [mm] | 160 | 180 | 220 | 250 | 340 |
| min. axial distance | $s_{min}$ | [mm] | 80 | 90 | 110 | 125 | 170 |
| anchorage depth | $h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 |
| minimum partthickness | $h_{min}$ | [mm] | 130 | 140 | 160 | 175 | 220 |
| thread diameter | d | [mm] | 8 | 10 | 12 | 16 | 20 |
| drill diameter | $d_B$ | [mm] | 10 | 12 | 14 | 18 | 24 |
| hole diameter in part | $d_{Bau}$ | [mm] | 9 | 11 | 13,5 | 17,5 | 22 |
| tightening torgue | $T_{inst.}$ | [Nm] | 10 | 20 | 40 | 60 | 120 |

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Mit allgemeiner bauaufsichtlicher Zulassung – Henkel KGaA – Z-21.3-1800 – Institut für Massivbau Technische Universität Darmstadt

## PERFORMANCE DATA / HOLLOW BRICK

| recommended loads | | | | standard sleeve | | | | approved sleeve* | |
|---|---|---|---|---|---|---|---|---|---|
| stone | strength class | | | M 6 | M 8 | M 10 | M 12 | M 8 | M 10 |
| hollow brick | Hlz 4 | $F_{rec.}$ | [kN] | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| | Hlz 6 | $F_{rec.}$ | [kN] | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| | Hlz 12 | $F_{rec.}$ | [kN] | 0,7 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| sand-lime hollow brick | KSL 4 | $F_{rec.}$ | [kN] | 0,3 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| | KSL 6 | $F_{rec.}$ | [kN] | 0,4 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 |
| | KSL 12 | $F_{rec.}$ | [kN] | 0,7 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| sand-lime solid brick | KS 12 | $F_{rec.}$ | [kN] | 0,5 | 1,7 | 1,7 | 1,7 | 1,7 | 1,7 |
| solid brick | Mz 12 | $F_{rec.}$ | [kN] | 0,5 | 1,7 | 1,7 | 1,7 | 1,7 | 1,7 |
| light concrete hollow brick | Hbl 2 | $F_{rec.}$ | [kN] | 0,3 | 0,3 | 0,3 | 0,3 | - | - |
| | Hbl 4 | $F_{rec.}$ | [kN] | 0,5 | 0,6 | 0,6 | 0,6 | - | - |
| concrete hollow brick | Hbn 4 | $F_{rec.}$ | [kN] | 0,5 | 0,6 | 0,6 | 0,6 | - | - |
| standard sleeve | 12x50 | [mm] | | x | | | | | |
| | 15x85 | [mm] | | | x | x | x | | |
| | 15x130 | [mm] | | | | x | x | | |
| approved sleeve | SH 13x100 | [mm] | | | | | | x | |
| | SH 15x100 | [mm] | | | | | | | x |

| installation parameters | | | standard sleeve | | | | approved sleeve* | |
|---|---|---|---|---|---|---|---|---|
| axial distance plug group | $s_{cr,N}$ | [mm] | Hlz, KSL , Mz, KS = 100<br>Hbl, Hbn = 200 | | | | 100 | |
| min. axial distance plug group | min s | [mm] | Hlz, KSL , Mz, KS = 50<br>Hbl, Hbn = 200 | | | | 50 | |
| axial distance between singel plugs | $s_{singl.}$ | [mm] | 250 | | | | 250 | |
| edge distance | $c_{cr,N}$ | [mm] | 250 | | | | 200 | 250 |
| min. edge distance | min c | [mm] | 250 | | | | 50 | 60 |
| drilling depth | $h_{ef}$ | [mm] | 55 | 90 | 90 | 90 | 105 | 105 |
| drilling depth without sleeve | $h_{ef}$ | [mm] | 65 | 85 | 95 | 100 | 85 | 95 |
| minimum partthickness | h min | [mm] | 110 | | | | 110 | |
| drill diameter | $d_B$ | [mm] | 13 | 16 | 16 | 16 | 14 | 16 |
| hole diameter in part | $d_{Bau}$ | [mm] | 7 | 9 | 12 | 14 | 9 | 12 |
| tightening torgue | $T_{inst.}$ | [Nm] | 3 | 8 | 8 | 8 | 2 | 2 |

*see approval Z-21.3-1800

# CF 900

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## FIRE RESISTANCE TIMES

**Fire resistance times**

Fire resistance times of Pattex injection anchors with styrol-free vinyl-ester in combination with anchor rods of sizes M8 to M20 of galvanised steel, in relation to maximum centric tension

| resin | resistance class | | M 8 | M 10 | M 12 | M 16 | M 20 |
|---|---|---|---|---|---|---|---|
| vinyl-ester (valid for standard and approved applications) | F30 | $F_{fire}$ [kN] | ≦ 1,90 | ≦ 4,50 | ≦ 6,00 | ≦ 11,00 | ≦ 16,00 |
| | F60 | $F_{fire}$ [kN] | ≦ 0,85 | ≦ 2,10 | ≦ 3,00 | ≦ 6,60 | ≦ 9,00 |
| | F90 | $F_{fire}$ [kN] | ≦ 0,55 | ≦ 1,35 | ≦ 2,00 | ≦ 4,90 | ≦ 6,40 |
| | F120 | $F_{fire}$ [kN] | ≦ 0,40 | ≦ 1,00 | ≦ 1,50 | ≦ 4,00 | ≦ 5,00 |

Materialprüfanstalt f. d. Bauwesen MPA BS 3 Braunschweig

Feuerwiderstandsklasse F 120

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## Technical information

### Reaction resin mortar, vinyl-ester-based styrene-free

## CHARACTERISTIC PROPERTIES

as established by MPA Nordrhein-Westfalen

**Bending tensile strength and compression strength**

Sample preparation and testing carried out in accordance with EN 196 Part 1; strength determination

Bending tensile strength and compression strength were tested on three samples, size 40 x 40 x 160 mm.

Load increase to test bending tensile strength: (50 ± 10) N/s

Load increase to test compression strength: (2400 ± 200) N/s

The results are shown in Table 1 below.

**Table 1: Bending tensile strength and compression strength**

| Sample no. | Age of sample on day of testing | Raw density | Bending tensile strength | Compression strength | |
|---|---|---|---|---|---|
| | | [Kg/dm³] | [N/mm²] | [N/mm²] | |
| 1 | 24 hours | 1,66 | 36 | 103 | 116 |
| 2 | 24 hours | 1,66 | 38 | 98 | 105 |
| 3 | 24 hours | 1,66 | 37 | 99 | 97 |
| Mean value | | 1,66 | 37 | 103 | |

**Dynamic elasticity module**

The dynamic elasticity module was determined on the basis of the resin proportion over the sound duration. The results are shown in Table 2 below.

**Table 2: Dynamic elasticity module of samples 40 x 40 x 160 mm**

| Sample | Raw density [Kg/dm³] | Edyn after 24 hours [N/mm²] |
|---|---|---|
| 1 | 1,61 | 1150 |
| 2 | 1,61 | 1200 |
| 3 | 1,61 | 1190 |
| | | |
| Mean value | 1,61 | 1200 |

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### Reaction resin mortar, vinyl-ester-based styrene-free

## CHARACTERISTIC PROPERTIES

as established by MPA Nordrhein-Westfalen

**Energy at break**

Sample preparation and testing carried out in accordance with EN 196 Part 1; strength determination.

Bending tensile strength and compression strength were tested on five samples, while at the same time determining the energy at break at the relevant maximum load.

Sample size 40 x 40 x 160 mm.

Test speed, in variance to DIN EN 196: 1 mm/min.

The results are shown in Table 3 below.

**Table 3: Bending tensile strength and compression strength, energy at break**

| Age of sample at testing | Properties | Extreme values | | Average value | Variation co-efficient % |
|---|---|---|---|---|---|
| 24 hours | Bending tensile [N/mm²] | 23,30 | 38,00 | 32,20 | 22,70 |
| | Energy at break at maximum force in bending trial [Nm] | 1,85 | 6,62 | 4,11 | 50,40 |
| | Compression [N/mm²] | 87,90 | 101,80 | 94,80 | 5,93 |
| | Energy at break at maximum force in compression trial [Nm] | 90,40 | 193,70 | 138,30 | 33,00 |

Materialprüfanstalt f. d. Bauwesen
MPA NRW
Nordrhein-Westfalen