BOSSONG – BCR V PLUS
(SİSMİK)

Kimyasal Dübel Belgeleri

EK 1 – KATALOG

sistemi di fissaggio
BOSSONG®
www.bossong.com

SCHEDA TECNICA
TECHNICAL DATA SHEET
FICHE TECHNIQUE
TECHNISCHES DATENBLATT

MANUFACTURED BY BOSSONG — RESIN MADE IN — SINCE 1993

V-PLUS

Prodotto per uso strutturale in accordo a NTC 2018
Product for structural applications
Produit pour applications structurelles
Produkt für strukturelle Anwendung

EAD 330499-01-0601 / ETA - 09/0140	ETAG 001, Annex E EOTA TR049 / SEISMIC	EAD 330499-01-0601 / REBAR as ANCHOR	EAD 330087-00-0601 / ETA - 09/0246
Option 1 - Option 7	TR049 - C1 C2	Rebar	Post-Installed Rebar

FIXING IN SEISMIC
Annex E - EOTA TR049
C1 C2

FIXING IN SEISMIC
POST INSTALLED REBAR
EAD 331522-00-0601

BCR-825 ⚠ V-PLUS
Cartuccia shuttle
Shuttle cartridge
Cartouche Shuttle
Shuttlekartusche
825 ml
cod. 747285
6

BCR-400 V-PLUS
Cartuccia coassiale
Coaxial cartridge
Cartouche coaxial
Koaxialkartusche
400 ml
cod. 747280
12

BCR-345 V-PLUS
Cartuccia shuttle
Shuttle cartridge
Cartouche Shuttle
Shuttlekartusche
345 ml
cod. 747270
15

BCR-300 V-PLUS
Cartuccia sacchetto
Foil cartridge
Cartouche avec sachet
Schlauchfolienkartusche
300 ml
cod. 747260
15

BCR-165 V-PLUS
Cartuccia sacchetto
Foil cartridge
Cartouche avec sachet
Schlauchfolienkartusche
165 ml
cod. 747250
15

⚠ Su richiesta > On demand > Sur demande > Auf Wunsch

+30°C
+5°C
STOCCAGGIO E CONSERVAZIONE
STORAGE AND CONSERVATION
STOCKAGE ET CONSERVATION
LAGERUNG UND AUFBEWAHRUNG

PP
CARTUCCIA
CARTRIDGE
CARTOUCHE
KARTUSCHE

STOP 12 — 300 ml / 165 ml
DURATA (mesi)
EXPIRY (months)
ECHEANCHE (mois)
HALTBARKEIT (Monate)

STOP 16 — 825 ml / 400 ml / 345 ml
DURATA (mesi)
EXPIRY (months)
ECHEANCHE (mois)
HALTBARKEIT (Monate)

kN

SCHEDA TECNICA
TECHNICAL DATA SHEET
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TECHNISCHES DATENBLATT

sistemi di fissaggio BOSSONG®
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V-PLUS

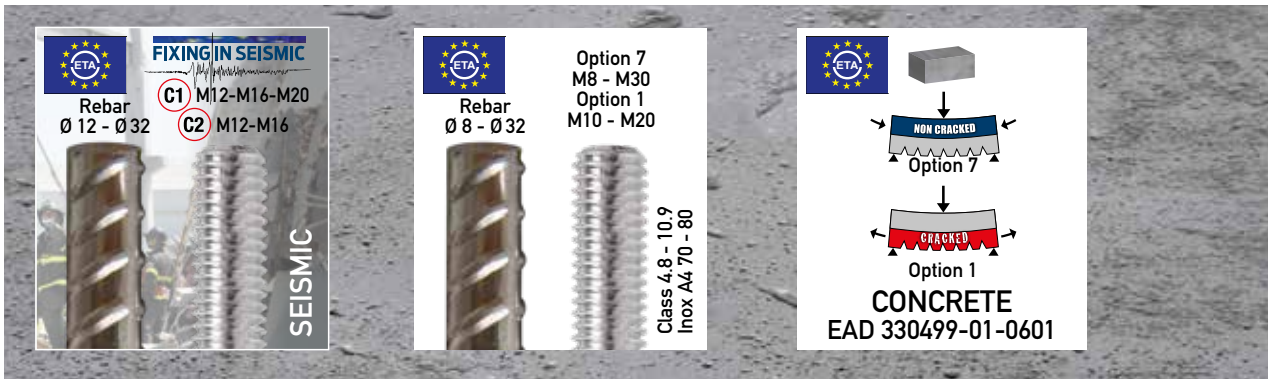
RESINA VINILESTERE SENZA STIRENE | VINYLESTER RESIN STYRENE FREE
RÉSINE VINYLESTER SANS STYRÈNE | VINYLESTERHARZ STYROLFREI

V-PLUS

BOSSONG GLASS CONSTRUCTION APPROVED
LSL
Labor für Stahl- und Leichtmetallbau GmbH
Chemical anchor for glass construction, safety barrier glazing and glass railings
Certification according to ONORM B3716-3 and DIN 18008-4. Impact pendulum test

BETA
The BETA registration means that we can verify that this product meets agreed properties criteria regarding properties hazardous to the environment and health. See www.bastaonline.se

Ministry of Construction of Russia
МИНСТРОЙ РОССИИ
Eurasian Economic Community
FCC
Federal Center for standardization and technical assessment of conformity in construction



IT. ANCORANTE CHIMICO BI-COMPONENTE VINILESTERE SENZA STIRENE PER CARICHI PESANTI/STRUTTURALI, MARCATO CE E QUALIFICATO ETA PER FISSAGGI IN CALCESTRUZZO.

ETA (European Technical Assessment) aggiornati in accordo al Regolamento Prodotti da Costruzione 305/2011. ETA-09/0140: Qualifica in accordo a EAD-330499 per calcestruzzo non fessurato, Opzione 7, diametri da M8 a M30 e per barre ad aderenza migliorata da Ø8mm a Ø32mm. Performance per calcestruzzo fessurato, Opzione 1, per barre M10-M12-M16-M20. Qualifica sismica in accordo al nuovo Technical Report EOTA TR049. Il prodotto è qualificato in categoria sismica C1 per diametri M12-M16-M20 e categoria sismica C2 per diametri M12-M16. Il prodotto è omologato per fisaggi con una profondità variabile di ancoraggio, per dare al progettista un'elevata flessibilità. Massima profondità di ancoraggio fino a venti volte il diametro nominale della barra filettata. Le temperature di esercizio certificate sono negli intervalli: -40ºC/+40ºC (Tº max lungo periodo = 24ºC) ,-40ºC/+80ºC (Tº max lungo periodo = 50ºC) and -40ºC/+120ºC (Tº max lungo periodo = 72ºC). ETA-09/0246: Qualifica in accordo a EAD-330087 per connessioni post-installate in calcestruzzo armato diametri da Ø8 mm a Ø32 mm. Profondità di posa minima in accordo a Eurocodice 2 sia per calcestruzzo fessurato che non fessurato. Performance di resistenza al fuoco, fino ad un massimo di R240. Qualifica sismica per la realizzazione di connessioni post-installate secondo il nuovo EAD 331522 per diametri da Ø12 mm a Ø32 mm. Temperature di esercizio certificate nell' intervallo: --40ºC/+80ºC (Tº max lungo periodo = +50ºC). Categoria calcestruzzo Cl 0,4 max.
Installazione certificata dell'ancoraggio tramite punte aspiranti. Questa modalità di installazione permette di evitare la procedura di rimozione della polvere tramite pompa soffiante e scovolino metallico, e riduce dunque in modo significativo la velocità di installazione. Possibilità di utilizzare il prodotto in calcestruzzo asciutto,umido e con foro allagato (foro allagato solo barre filettate). La reazione di indurimento del prodotto avviene anche in presenza di acqua. Disponibili in versione V-PLUS "Winter" con tempo di indurimento accelerato e "Tropical" con tempo di indurimento decelerato.
Adatto anche per fissaggi su muratura piena e forata, legno.
Temperature del supporto (calcestruzzo, muratura ecc...) per l'installazione comprese tra -10ºC e +40ºC.
Qualifica VOC in accordo al Decreto francese nr. 2011-321 ed in conformità alla Norma ISO 16000/EN 16516.

EN. ETA BI-COMPONENT VINYLESTER STYRENE FREE CHEMICAL ANCHOR FOR STRUCTURAL/HIGH LOADS, CE MARKED AND ETA ASSESSED FOR USE IN CONCRETE.

ETA (European Technical Assessments) updated according to the Construction Product Regulation 305/2011.
ETA-09/0140: Assessment according to EAD-330499 for uncracked concrete, Option 7, for diameters from M8 to M30 and for rebars from Ø8 mm to Ø32 mm. Performace for cracked concrete, Option 1, with rod M10-M12-M16-M20.
Seismic qualification according to EOTA Technical Report TR049. The product is qualified in seismic category C1 for diameters M12-M16-M20 and seismic category C2 for diameters M12-M16. The product is homologated for fixings with a variable anchorage depth, to give the designer a high degree of flexibility. Maximum anchoring depth up to twenty times the nominal diameter of the threaded rod. Certified service temperatures are in the ranges: -40ºC/+40ºC (Tº max long period = +24ºC) ,-40ºC/+80ºC (Tº max long period = +50ºC) and -40ºC/+120ºC (Tº max long period = +72ºC).
ETA-09/0246: Assessment according to EAD-330087 for post-installed rebar connections in reinforced concrete for diameters from Ø8 mm to Ø32 mm. Minimum anchorage depth according to Eurocode 2 in case of uncracked and cracked concrete. Fire resistance, up to a maximum of R240. Assessment for seismic condition according to the EAD 331522 for diameters from Ø12 mm to Ø32 mm. Certified service temperatures are in the range: -40ºC/+80ºC (Tº max long period = +50ºC). Concrete category Cl 0,4 max.
Possibility of installing the anchor using hollow drill bits. This installation mode avoids the dust removal procedure by means of a blower pump and a metal brush, and thus significantly reduces the installation time. Possibility to use the product in dry, wet concrete and with flooded hole (flooded hole only with threaded bars). The product hardening reaction also takes place in the presence of water. Available in "Winter" V-PLUS version with accelerated reaction and "Tropical" version with decelerated hardening time.
Base material temperature (concrete, bricks, etc...) for installation between -10ºC and +40ºC.
Suitable also for base material like solid and hollow masonry, wood.
VOC according to the French Decree 2011-321 and according to the standard ISO 16000/EN 16516.

GREEN LIFE

LEED TESTED

ÉMISSIONS DANS L'AIR INTÉRIEUR* A+

STYRENE FREE
CLP Classification

Tiefbauamt Graubünden / Abt. Kunstbauten
Liste genehmigter Ankerkleber

AIT Asian Institute of Technology

SASO
SAUDI STANDARDS METROLOGYAND QUALITY ORGANIZATION

MANUFACTURED BY BOSSONG
RESIN MADE IN ITALY
SINCE 1983

CARTUCCIA > CARTRIDGE
CARTOUCHE > KARTUSCHE
300 - 165 ml:
Sistema di apertura sacchetto
Plastic foil opening system
Système d'ouverture à sachet
Plastik Folien Öffnungssystem

FR. ANCRAGE CHIMIQUE BI COMPOSANT VINYL ESTER SANS STYRÈNE POUR CHARGES LOURDES/STRUCTURELLES, MARQUAGE CE ET ÉVALUATION ETA POUR ANCRAGE DANS LE BÉTON.

ETA (ÉvaluationTechnique Européenne) mise à jour conformément au Règlement sur les Produits de Construction 305/2011. ETA-09/0140 : Évaluation conformément au Documentation d'Évaluation Européen EAD-330499 pour béton non fissuré, Option 7, pour diamètres de M8 à M30 et barres d'armature de diamètres allant de Ø8 mm à Ø32 mm. Performance pour béton fissuré, Option 1, avec tiges filetées M10-M12-M16-M20. Homologation sismique selon le rapport technique de l'Organisation Européenne pour l'Agrément Technique EOTA TR049. Le produit est certifié en catégorie sismique C1 pour les diamètres M12-M16-M20 et en catégorie sismique C2 pour les diamètres M12-M16. Le produit est homologué pour des scellements avec des profondeurs d'ancrage variables, afin de procurer au concepteur une grande flexibilité. Profondeur d'ancrage maximale jusqu'à vingt fois le diamètre nominal de la tige filetée. Les températures de service certifiées se situent dans l'intervalle suivant : -40ºC/+40ºC (Tº max longue période = +24ºC) ,-40ºC/+80ºC (Tº max longue période = +50ºC) et -40ºC/+120ºC (Tº max longue période = +72ºC). ETA-09/0246 : Évaluation conformément au Documentation d'Évaluation Européen EAD-330087 pour les assemblages de barres d'armature post-installés en béton armé pour des diamètres de Ø8 mm à Ø32 mm. Profondeur d'ancrage minimale selon Eurocode 2 pour le béton non fissuré et fissuré. Résistance au feu, jusqu'à un maximum de R240. Évaluation sous sollicitations sismiques conformément au Documentation d'Évaluation Européen EAD 331522 pour des diamètres de Ø12 mm à Ø32 mm. Les températures de service certifiées se situent dans l'intervalle : -40ºC/+80ºC (Tº max longue période = +50ºC). Catégorie béton Cl 0,4 max. Possibilité de poser l'ancrage à l'aide de forets creux. Ce mode d'installation évite de devoir procéder au dépoussiérage au moyen d'une pompe soufflante et d'une brosse métallique et permet donc de réduire considérablement le temps d'installation. Possibilité d'utiliser le produit dans du béton sec, humide et avec trou inondé (trou inondé qualifié uniquement pour les barres filetées). La réaction de durcissement du produit se produit également en présence d'eau. Disponible en version V-PLUS « Winter » avec réaction accélérée et en version « Tropical » à temps de durcissement ralenti. Température du matériau de construction (béton, briques, etc.) pour une installation entre-10ºC et +40ºC. Convient également aux matériaux de construction tels que la maçonnerie pleine et creuse, le bois. COV selon le décret français 2011-321 et selon la norme ISO 16000/EN16516.

DE. ZWEIKOMPONENTEN VYNILESTERHARZ, STYROLFREI, CHEMISCHER ANKER FÜR STRUKTURALE/HOHE BELASTUNGEN, MIT CE-KENNZEICHNUNG VERSEHEN UND FÜR DEN EINSATZ IN BETON GEPRÜFT.

ETA (European Technical Assessments) gemäß der Bauprodukteverordnung 305/2011 aktualisiert. ETA-09/0140: Bewertung gemäß EAD-330499 für ungerissenen Beton, Option 7, für Durchmesser von M8 bis M30 und für Bewehrungsstäbe von Ø8 mm bis Ø32 mm. Ausführung für gerissenen Beton, Option 1, mit Gewindestange M10-M12-M16-M20.
Seismische Qualifizierung gemäß EOTA Technical Report TR049. Das Produkt ist in der seismischen Kategorie C1 für Durchmesser M12-M16-M20 und seismische Kategorie C2 für Durchmesser M12-M16 qualifiziert. Das Produkt ist für Befestigungen mit variabler Verankerungstiefe homologiert, um dem Konstrukteur ein hohes Maß an Flexibilität zu ermöglichen. Maximale Verankerungstiefe bis zum Zwanzigfachen des Nenndurchmessers der Gewindestange. Die zertifizierten Betriebstemperaturen liegen in den Bereichen: -40ºC/+40ºC (Langzeit-Tºmax = +24ºC) ,-40ºC/+80ºC (Langzeit-Tºmax = +50ºC) und -40ºC/+120ºC (Langzeit-Tºmax = +72ºC).
ETA-09/0246: Bewertung gemäß EAD-330087 für nachmontierte Bewehrungsanschlüsse in Stahlbeton für Durchmesser von Ø8 mm bis Ø32 mm. Minimale Verankerungstiefe gemäß Eurocode 2 bei ungerissenem und gerissenem Beton. Feuerwiderstand bis maximal R240. Bewertung der seismischen Bedingungen gemäß EAD 331522 für Durchmesser von Ø12 mm bis Ø32 mm. Die zertifizierten Betriebstemperaturen liegen im Bereich: -40ºC/+80ºC (Langzeit-Tº-max. = +50ºC). Betonkategorie Cl 0,4 max.
Möglichkeit der Installation des Ankers mit Hohlbohrern. Dieser Installationsmodus vermeidet die Staubentfernung mittels einer Gebläsepumpe und einer Metallbürste und reduziert somit die Installationszeit erheblich. Möglichkeit, das Produkt in trockenem, nassem Beton und mit geflutetem Loch einzusetzen (geflutetes Loch nur mit Gewindestangen). Die Produkthärtungsreaktion findet auch in Gegenwart von Wasser statt. Erhältlich als "Winter" V-PLUS-Version mit beschleunigter Reaktionszeit und "Tropical" -Version mit verlangsamter Aushärtezeit. Grundwerkstofftemperatur (Beton, Ziegelsteine usw.) für den Einbau zwischen -10º und + +40ºC.
Geeignet auch für Grundmaterial wie Voll- und Hohlmauerwerk, Holz.
VOC gemäß dem französischen Erlass 2011-321 und gemäß der Norm ISO 16000 / EN 16516.

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WINTER V-PLUS

MANUFACTURED BY BOSSONG – RESIN MADE IN – SINCE 1993

EAD 330499-01-0601 – ETA - 09/0140 – Option 1 - Option 7

ETAG 001 Annex E EOTA TR049 – SEISMIC – TR049 - C1 C2

EAD 330499-01-0601 – REBAR as ANCHOR – Rebar

EAD 330087-00-0601 – ETA - 09/0246 – Post-Installed Rebar

WINTER V-PLUS

FIXING IN SEISMIC – Annex E - EOTA TR049 – C1 C2

FIXING IN SEISMIC – POST INSTALLED REBAR – EAD 331522-00-0601

-20°

Temperatura materiale base
Base material temperature
Temperature material de base
Grundmaterial-temperatur

BCR-400 V-PLUS WINTER

Cartuccia coassiale
Coaxial cartridge
Cartouche coaxiale
Koaxialkartusche
400 ml
cod. 747274

12

+30°C
+5°C

STOCCAGGIO E CONSERVAZIONE
STORAGE AND CONSERVATION
STOCKAGE ET CONSERVATION
LAGERUNG UND AUFBEWAHRUNG

PP

CARTUCCIA
CARTRIDGE
CARTOUCHE
KARTUSCHE

STOP 16

DURATA (mesi)
EXPIRY (months)
ECHEANCHE (mois)
HALTBARKEIT (Monate)

PER CARATTERISTICHE, DATI TECNICI E DI CARICO, VEDERE BCR V-PLUS
FOR CHARACTERISTICS, TECHNICAL AND LOAD DATA, SEE BCR V-PLUS
POUR CARACTÉRISTIQUES, DONNÉES TECHNIQUES ET DE CHARGE, VOIR BCR V-PLUS
FÜR EIGENSCHAFTEN, TECHNISCHE ANGABEN UND LASTDATEN, SIEHE BCR V-PLUS

TROPICAL V-PLUS

MANUFACTURED BY BOSSONG — RESIN MADE IN — SINCE 1993

EAD 330499-01-0601 — ETA - 09/0140 — Option 1 - Option 7

ETAG 001 Annex E EOTA TR049 — SEISMIC — TR049 - C1 C2

EAD 330499-01-0601 — REBAR as ANCHOR — Rebar

EAD 330087-00-0601 — ETA - 09/0246 — Post-Installed Rebar

TROPICAL V-PLUS

FIXING IN SEISMIC — Annex E - EOTA TR049 — C1 C2

FIXING IN SEISMIC — POST INSTALLED REBAR — EAD 331522-00-0601

+50°

Temperatura materiale base
Base material temperature
Temperature material de base
Grundmaterial-temperatur

BCR-400 V-PLUS TROPICAL

Cartuccia coassiale
Coaxial cartridge
Cartouche coaxiale
Koaxialkartusche
400 ml
cod. 747276

12

+30°C
+5°C

STOCCAGGIO E CONSERVAZIONE
STORAGE AND CONSERVATION
STOCKAGE ET CONSERVATION
LAGERUNG UND AUFBEWAHRUNG

PP

CARTUCCIA
CARTRIDGE
CARTOUCHE
KARTUSCHE

STOP 16

DURATA (mesi)
EXPIRY (months)
ECHEANCHE (mois)
HALTBARKEIT (Monate)

PER CARATTERISTICHE, DATI TECNICI E DI CARICO, VEDERE BCR V-PLUS
FOR CHARACTERISTICS, TECHNICAL AND LOAD DATA, SEE BCR V-PLUS
POUR CARACTÉRISTIQUES, DONNÉES TECHNIQUES ET DE CHARGE, VOIR BCR V-PLUS
FÜR EIGENSCHAFTEN, TECHNISCHE ANGABEN UND LASTDATEN, SIEHE BCR V-PLUS

! PRODOTTO SU RICHIESTA, ORDINI PROGRAMMATI LEGATI A QUANTITÀ MINIME

ON DEMAND PRODUCT; ORDER PLANNING REQUIRED IN CONNECTION WITH SPECIFIC QUANTITIES.

PRODUIT SUR REQUÊTE; PLANIFICATION DES COMMANDE NÉCESSAIRE DANS LE CADRE DE QUANTITÉS SPÉCIFIQUES

ON DEMAND-PRODUKT; AUFTRAGSPLANUNG ERFORDERLICH IN VERBINDUNG MIT SPEZIFISCHEN MENGEN.

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Tempi di posa | Setting times | Temps d'installation | Verlegungszeit

V-PLUS

01 C	02	03 Kg
40 ºC	1 min	20 min
35 ºC	2 min	25 min
30 ºC	3 min	30 min
25 ºC	5 min	35 min
20 ºC	7' 30"	40 min
15 ºC	11' 30"	45 min
10 ºC	16 min	1 hour
5 ºC	25 min	1 h 30'
0 ºC	45 min	7 hours
-5 ºC *	65 min	14 hours
-10 ºC *	1 h 45'	24 hours

+40°C
-10°C
FAST CURING TIME

+5ºC
Temperatura minima del prodotto per l'applicazione
Minimum product temperature for application
Température minimal de la cartouche pour l'application
Min Kartouchetemperatur für die Anwendung

ASCIUTTO | DRY | SEC | TROCKENEM

V-PLUS

01 C	02	03 Kg
40 ºC	1 min	40 min
35 ºC	2 min	50 min
30 ºC	3 min	1 hour
25 ºC	5 min	1 h 10'
20 ºC	7' 30"	1 h 20'
15 ºC	11' 30"	1 h 30'
10 ºC	16 min	2 hours
5 ºC	25 min	3 hours
0 ºC	45 min	14 hours
-5 ºC *	65 min	28 hours
-10 ºC *	1 h 45'	48 hours

+5ºC
Temperatura minima del prodotto per l'applicazione
Minimum product temperature for application
Température minimal de la cartouche pour l'application
Min Kartouchetemperatur für die Anwendung

UMIDO | WET | HUMIDE | NASSEM
FORO ALLAGATO | FLOODED HOLE
TROU INONDÉ | WASSER GEFÜLLTEN BOHRLÖCHER

WINTER

01 C	02	03 Kg
20ºC	5 min	30 min
15ºC	7 min	35 min
10ºC	10 min	50 min
5ºC	15 min	1 h 10'
0ºC	25 min	1 h 40'
-5ºC *	40 min	5 h 15'
-10ºC *	1 hour	15 hours
-15ºC *	1h 30'	25 hours
-20ºC *	2 hours	48 hours

+5ºC
Temperatura minima del prodotto per l'applicazione
Minimum product temperature for application
Température minimal de la cartouche pour l'application
Min Kartouchetemperatur für die Anwendung

Per foro allagato e umido, raddoppiare il tempo di messa in carico
For wet and flooded hole, double curing time
Pour trou inondé et humide, doublés les temps avant l'application de charge
Doppel Bauzeit mit nassembeton und mit Wasser gefüllten Bhorlöchern

ASCIUTTO | DRY | SEC | TROCKENEM

TROPICAL

01 C	02	03 Kg
50ºC	2 min	20 min
45ºC	3 min	20 min
40ºC	4 min	20 min
35ºC	6 min	30 min
30ºC	8 min	40 min
25ºC	11 min	50 min
20ºC	14 min	1 hour

+30ºC
Temperatura massima del prodotto per l'applicazione
Maximum product temperature for application
Température maxime de la cartouche pour l'application
Max Kartouchetemperatur für die Anwendung

Per foro allagato e umido, raddoppiare il tempo di messa in carico
For wet and flooded hole, double curing time
Pour trou inondé et humide, doublés les temps avant l'application de charge
Doppel Bauzeit mit nassembeton und mit Wasser gefüllten Bhorlöchern

ASCIUTTO | DRY | SEC | TROCKENEM

01 Temperatura supporto > Base material temperature
Temperature material de base > Grundmaterial-temperatur

02 Tempo di lavorabilità > Open time
Temps de manipulation > Verarbeitungszeit

03 Attesa per la messa in carico > Curing time
Temps avant l'application de charge > Bauzeit

*Per temperature del supporto < 0ºC la temperatura della cartuccia deve essere di almeno +15ºC
*Minimum cartridge temperature of +15 ºC for application where concrete temperature is below 0ºC
* Pour les températures du support de < 0ºC, la température de la cartouche doit être d'au moins +15ºC
* Bei Temperaturen < 0ºC muss die Kartuschentemperatur mindestens +15ºC betragen

Gamma prodotti | Product's range | Gamme produits | Warenangebot

	CODICE > CODE NUMMER	ARTICOLO > ITEM TYPE > ARTIKEL	DESCRIZIONE > DESCRIPTION DESCRIPTION > BESCHREIBUNG	Nr.
	CE	V-PLUS		
	747285	BCR 825 V-PLUS ⚠	Cartuccia da > Cartridge of > Cartouche de > Kartusche von 825 ml & Mixer	5
	747280	BCR 400 V-PLUS	Cartuccia da > Cartridge of > Cartouche de > Kartusche von 400 ml & Mixer	12
	747274	BCR 400 V-PLUS WINTER	Cartuccia da > Cartridge of > Cartouche de > Kartusche von 400 ml & Mixer	12
	747276	BCR 400 V-PLUS TROPICAL ⚠	Cartuccia da > Cartridge of > Cartouche de > Kartusche von 400 ml & Mixer	12
	747270	BCR 345 V-PLUS	Cartuccia da > Cartridge of > Cartouche de > Kartusche von 345 ml & Mixer	15
	747260	BCR 300 V-PLUS	Cartuccia da > Cartridge of > Cartouche de > Kartusche von 300 ml & Mixer	15
	747245	TERMO 165 V-PLUS	Confezionamento con foglio termico > Thermo foil packed Emballage avec feuil thermique > Thermo- Folienverpackung	12
	747302	OSR 400 V-PLUS SECCHIO	12 x cartucce, 1 x pompa, 24 x mixers 12 x cartridges, 1 x gun, 24 x mixers	1
	747591	OSR 400 WINTER SECCHIO	12 x cartucce, 1 x pompa, 24 x mixers 12 x cartridges, 1 x gun, 24 x mixers	1
	747301	OSR 345 V-PLUS SECCHIO	15 x cartouches, 1 x pompe, 30 x mixers 15 x Kartuschen, 1 x Auspresspistole, 30 x Mischer	1
	747300	OSR 300 V-PLUS SECCHIO	18 x cartucce, 1 x pompa, 36 x mixers 18 x cartridges, 1 x gun, 36 x mixers	1
	747305	OSR 400 V-PLUS SECCHIO NP-2M	12 x cartucce, 24 x mixers > 12 x cartridges, 24 x mixers 12 x cartouches, 24 x mixers > 12 x Kartuschen, 24 x Mischer	1
	747592	OSR 400 WINTER SECCHIO NP-2M	12 x cartouches, 24 x mixers 12 x Kartuschen, 24 x Mischer	1
	747304	OSR 345 V-PLUS SECCHIO NP-2M	15 x cartucce, 30 x mixers > 15 x cartridges, 30 x mixers 15 x cartouches, 30 x mixers > 15 x Kartuschen, 30 x Mischer	1
	747303	OSR 300 V-PLUS SECCHIO NP-2M	18 x cartucce, 36 x mixers > 18 x cartridges, 36 x mixers 18 x cartouches, 36 x mixers > 18 x Kartuschen, 36 x Mischer	1
	747310	BOX 400 V-PLUS	20 x cartucce, 40 x mixers > 20 x cartridges, 40 x mixers 20 x cartouches, 40 x mixers > 20 x Kartuschen, 40 x Mischer	1
	747593	BOX 400 WINTER	20 x cartucce, 40 x mixers > 20 x cartridges, 40 x mixers 20 x cartouches, 40 x mixers > 20 x Kartuschen, 40 x Mischer	1
	747309	BOX 345 V-PLUS	25 x cartucce, 50 x mixers > 25 x cartridges, 50 x mixers 25 x cartouches, 50 x mixers > 25 x Kartuschen, 50 x Mischer	1
	747308	BOX 300 V-PLUS	30 x cartucce, 60 x mixers > 30 x cartridges, 60 x mixers 30 x cartouches, 60 x mixers > 30 x Kartuschen, 60 x Mischer	1

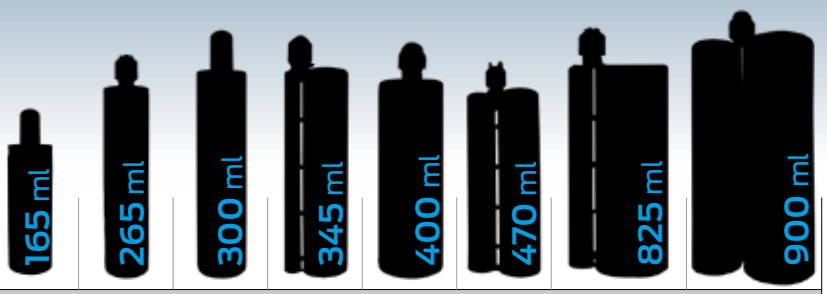
Secondo mixer > Additional mixer
Deuxieme mixer > Doppelmischer

CODICE CARTUCCIA > CODE CARTRIDGE
CODE CARTOUCHE > KARTUSCHE NUMMER
000000AX

⚠ Su richiesta > On demand > Sur demande > Auf Wunsch

Nr. FIXINGS

NUMERO FISSAGGI | NUMBER OF FIXINGS
NOMBRE DE FIXATIONS | ANZAHL DER BEFESTIGUNGEN



	DIAMETRO BARRA ROD DIAMETER DIAMÈTRE DE LA BARRE STANGEDURCHMESSER	DIAMETRO FORO HOLE DIAMETER DIAMÈTRE DU TROU BOHRLOCH-DURCHMESSER	PROFONDITÀ EFFETTIVA ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH PROFONDEUR EFFECTIVE D'ANCRAGE EFFEKTIVE VERANKERUNGSTIEFE								
	d [mm]	d_0 [mm]	h_{ef} [mm]	Numero di fissaggi per cartuccia > Numebr of fixing per cartridge > Nombre de fixations por cartouche > Anzahl der Befestigungen fur kartusche							
FISSAGGI NEI MATERIALI PIENI > FIXINGS IN SOLID MATERIALS > FIXATIONS DANS MATERIAUX PLEINS > BEFESTIGUNGEN IN VOLLSTEINEN											
	M8	10	80	± 31,0	± 50,0	± 57,0	± 65,5	± 75,5	± 89,0	± 156,0	± 170,5
	M10	12	90	± 21,5	± 34,0	± 38,5	± 44,5	± 51,5	± 60,5	± 106,5	± 116,0
	M12	14	110	± 14,0	± 22,5	± 25,5	± 29,5	± 34,0	± 40,0	± 70,0	± 76,5
	M14	16	115	± 11,0	± 17,5	± 20,0	± 23,0	± 26,5	± 31,0	± 55,0	± 60,0
	M16	18	125	± 8,5	± 14,0	± 16,0	± 18,5	± 21,0	± 25,0	± 43,5	± 47,5
	M18	20	150	± 6,0	± 9,5	± 11,0	± 12,5	± 14,5	± 17,5	± 30,5	± 33,0
	M20	24	170	± 3,0	± 5,0	± 5,5	± 6,5	± 7,5	± 9,0	± 15,5	± 17,0
	M22	26	190	± 2,5	± 4,0	± 4,5	± 5,5	± 6,0	± 7,0	± 12,5	± 14,0
	M24	28	210	± 2,0	± 3,0	± 3,5	± 4,0	± 5,0	± 5,5	± 10,0	± 11,0
	M27	30	240	± 2,0	± 3,0	± 3,5	± 4,0	± 4,5	± 5,5	± 9,5	± 10,0
	M30	35	270	± 1,0	± 1,5	± 2,0	± 2,0	± 2,5	± 3,0	± 5,0	± 5,5
	M33	37	300	± 1,0	± 1,5	± 2,0	± 2,0	± 2,5	± 3,0	± 5,0	± 5,5
	M36	40	330	± 1,0	± 1,0	± 1,5	± 1,5	± 2,0	± 2,0	± 4,0	± 4,0
	M39	42	360	± 1,0	± 1,0	± 1,5	± 1,5	± 2,0	± 2,0	± 4,0	± 4,0
FISSAGGI NEI MATERIALI PIENI > FIXINGS IN SOLID MATERIALS > FIXATIONS DANS MATERIAUX PLEINS > BEFESTIGUNGEN IN VOLLSTEINEN											
	Ø8	12	80	± 19,5	± 31,0	± 35,0	± 40,5	± 47,0	± 55,0	± 96,5	± 105,5
	Ø10	14	100	± 13,0	± 20,5	± 23,5	± 27,0	± 31,0	± 36,5	± 64,5	± 70,5
	Ø12	16	120	± 9,0	± 14,5	± 16,5	± 19,0	± 22,5	± 26,0	± 46,0	± 50,0
	Ø14	18	140	± 7,0	± 11,0	± 12,5	± 14,5	± 16,5	± 19,5	± 34,5	± 37,5
	Ø16	20	160	± 5,5	± 8,5	± 9,5	± 11,0	± 13,0	± 15,0	± 26,5	± 29,0
	Ø18	22	180	± 4,0	± 7,0	± 7,5	± 9,0	± 10,0	± 12,0	± 21,0	± 23,0
	Ø20	25	200	± 3,0	± 4,5	± 5,0	± 6,0	± 6,5	± 8,0	± 14,0	± 15,0
	Ø22	26	220	± 3,0	± 4,5	± 5,0	± 6,0	± 7,0	± 8,0	± 14,0	± 15,5
	Ø24	28	240	± 2,5	± 4,0	± 4,5	± 5,0	± 6,0	± 7,0	± 12,0	± 13,0
	Ø25	30	250	± 2,0	± 3,0	± 3,0	± 3,5	± 4,5	± 5,0	± 9,0	± 9,5
	Ø26	32	260	± 1,5	± 2,0	± 2,5	± 3,0	± 3,5	± 4,0	± 7,0	± 7,5
	Ø28	35	280	± 1,0	± 1,5	± 2,0	± 2,0	± 2,5	± 3,0	± 5,0	± 5,5
	Ø30	35	300	± 1,0	± 2,0	± 2,5	± 2,5	± 3,0	± 3,5	± 6,0	± 7,0
	Ø32	40	320	± 0,5	± 1,0	± 1,5	± 1,5	± 1,5	± 2,0	± 3,5	± 4,0
FISSAGGI NEI MATERIALI FORATI > FIXINGS IN HOLLOW MATERIALS > FIXATIONS DANS MATERIAUX CREUX > BEFESTIGUNGEN IN LOCHSTEINEN											
	M8	12	50	± 23,5	± 37,5	± 42,5	± 49,0	± 56,5	± 66,5	± 116,5	± 127,5
	M8	12	60	± 19,5	± 31,0	± 35,5	± 40,5	± 47,0	± 55,5	± 97,5	± 106,0
	M8	12	80	± 14,5	± 23,5	± 26,5	± 30,5	± 35,5	± 41,5	± 73,0	± 79,5
	M10	15	85	± 9,0	± 14,0	± 16,0	± 18,5	± 21,5	± 25,0	± 44,0	± 48,0
	M10	15	100	± 7,5	± 12,0	± 13,5	± 15,5	± 18,0	± 21,5	± 37,5	± 40,5
	M10	15	135	± 5,5	± 9,0	± 10,0	± 11,5	± 13,5	± 16,0	± 27,5	± 30,0
	M10	15	140	± 5,5	± 8,5	± 9,5	± 11,0	± 13,0	± 15,0	± 26,5	± 29,0
	M12	20	85	± 5,0	± 8,0	± 9,0	± 10,5	± 12,0	± 14,0	± 24,5	± 27,0
	M14	20	130	± 3,0	± 5,0	± 6,0	± 7,0	± 8,0	± 9,0	± 16,0	± 17,5
	M16	22	150	± 2,5	± 3,5	± 4,0	± 5,0	± 5,5	± 6,5	± 11,5	± 12,5
	M16	22	200	± 1,5	± 3,0	± 3,0	± 3,5	± 4,0	± 5,0	± 8,5	± 9,5
	M20	30	250	± 0,5	± 1,0	± 1,5	± 1,5	± 2,0	± 2,0	± 3,5	± 4,0

> NOTA: Il numero di fissaggi sopra specificato è stato determinato conteggiando esclusivamente il volume teorico di prodotto necessario al riempimento del foro (o gabbietta) escluso il volume della barra inserita. Pur essendo incluso nel calcolo teorico uno spreco standard, il reale quantitativo di prodotto potrà differire da questo in funzione della effettiva modalità di posa in opera adottata.

> WARNING: The number of fixings above mentioned has been calculated according to the theoretical volume needed to fill the hole (or sleeve) excluded the volume of the inserted metal rod. In the theoretical volume it is included a standard extra quantity but the real quantity of the product may be different than it in function of the real application of the product.

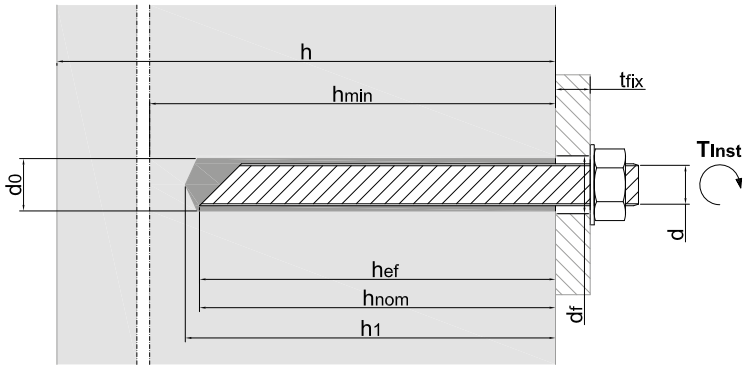
> NOTE: Le numéro des fixations sur mentionné a été déterminé en calculant exclusivement le volume théorique de produit nécessaire au remplissage du trou (ou tamis), exclu le volume de la tige filetée. Bien si dans le calcule théorique est inclue une quantité standard de matériel extra, la quantité réelle de produit peut être différente, en fonction des effectives modes d'application du produit.

> ANMERKUNG: Die obengenannte Anzahl der Befestigungen wurde nach dem theoretischen Volumen für die Bohrlochfüllung (oder Siebhülse-Füllung) minus dem Volumen der Gewindestange berechnet. Im theoretischen Volumen wird eine Standard-Extra-Menge einkalkuliert, aber die wirkliche Produktmenge kann anders sein, abhängig von der wirklichen Anwendung des Produktes.

Dati installazione | Installation data | Données d'installation | Installationsangaben

LEGEND	
	Materiale > Material > Matériel > Material
d [mm]	Diametro barra > Rod diameter > Diamètre de la barre > Stangedurchmesser
	Tipologia di barra > Type of rod > Classe de la barre > Stange-Klasse
h_{min} [mm]	Spessore minimo del supporto > Minimum thickness of base material Épaisseur minimal du material de base > Mindesbauteildicke
d_0 [mm]	Diametro foro > Hole diameter > Diamètre du trou > Bohrloch-Durchmesser
h_1 [mm]	Profondità del foro > Hole depth > Profondeur du trou > Bohrlochtiefe
h_{nom} [mm]	Profondità di inserimento > Embedment depth Profondeur d'insertion > Setztiefe
h_{ef} [mm]	Profondità effettiva ancoraggio > Effective anchorage depth Profondeur effective d'ancrage > Effektive Verankerungstiefe

LEGEND	
S_{cr} [mm]	Interasse caratteristico > Characteristic spacing Entraxe Caracteristique > Charakteristischrachsabstand
C_{cr} [mm]	Distanza dal bordo caratteristica > Characteristic edge distance Distance du bord caracteristique > Charakteristischrandabstand
S_{min} [mm]	Interasse minimo > Minimum allowable spacing Entraxe minimale > Minimaler Achsabstand
C_{min} [mm]	Distanza minima dal bordo > Minimum allowable edge distance Distance du bord minimale > Minimaler Randabstand
t_{fix} [mm]	Spessore fissabile > Fixture thickness Épaisseur fixable > Anbauteildicke
d_f [mm]	Diametro foro spessore fissabile > Diameter of clearence hole in the fixture Diamètre du trou dans l'épaisseur fixable > Bohrloch-Durchmesser im Anbauteil
S_w [mm]	Chiave > Key > Clef > Schlüsselweite
T_{inst} [Nm]	Coppia di serraggio > Installation torque Couple de serrage > Drehmoment Beim Verankern



> **NOTA:** Prima dell'installazione del prodotto consultare la presente sezione e la procedura di installazione completa riportata nelle pagine successive. Si declina ogni responsabilità per l'uso improprio del prodotto.

> **WARNING:** IBefore use see this section and the complete procedure of installation reported in the next pages. We assume no liability for the not correct use of the product.

> **NOTE:**avant l'installation du produit nous vous prions de lire cette section et la procédure d'installation complète que Vous trouvez dans les pages suivantes. Nous n'assumons pas de responsabilité pour une utilisation incorrecte du produit.

> **ANMERKUNG:**vor der Installation des Produktes bitte diesen Abschnitt und das komplette Installationsverfahren in den folgenden Seiten lesen. Wir übernehmen keine Haftung für die inkorrekte Anwendung des Produktes.

EAD 330499-01-0601
ETA - 09/0140

Opzione > Option 1
M10 ... M20

Opzione > Option 7
M8 ... M30

MATERIALE MATERIAL	DIAMETRO BARRA ROD DIAMETER	TIPOLOGIA DI BARRA TYPE OF ROD	SPESSORE MIN. DEL SUPPORTO MIN. THICKNESS BASE MATERIAL			DIAMETRO FORO HOLE DIAMETER	PROFONDITÀ DEL FORO HOLE DEPTH			PROFONDITÀ DI INSERIMENTO EMBEDMENT DEPTH			PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH			INTERASSE CARATTERISTICO CHARACTERISTIC SPACING			DISTANZA DAL BORDO CARATTERISTICA CHARACTERISTIC EDGE DISTANCE		
	d [mm]		h_{min} [mm]			d_0 [mm]	h_1 [mm]			h_{nom} [mm]			h_{ef} [mm]			$S_{cr,N}$ [mm]			$C_{cr,N}$ [mm]		
			min	med	max		min	med	max	min	med	max	min	med	max	min	med	max	min	med	max
M8-M30 Calcestruzzo non fessurato Non cracked Concrete	M8	≥ 5.8 - A4/70	100	110	190	10	65	85	165	60	80	160	60	80	160	180	230	230	90	115	115
	M10	≥ 5.8 - A4/70	100	120	230	12	75	95	205	70	90	200	70	90	200	210	248	248	105	124	124
M10-M20 Calcestruzzo fessurato Cracked Concrete	M12	≥ 5.8 - A4/70	110	140	270	14	85	115	245	80	110	240	80	110	240	240	297	297	120	149	149
	M16	≥ 5.8 - A4/70	136	161	356	18	105	130	325	100	125	320	100	125	320	300	375	396	150	188	198
	M20	≥ 5.8 - A4/70	168	218	448	24	125	175	405	120	170	400	120	170	400	360	450	450	180	225	225
	M24	≥ 5.8 - A4/70	201	266	536	28	150	215	485	145	210	480	145	210	480	435	540	540	218	270	270
	M27	≥ 5.8 - A4/70	205	300	600	30	150	245	545	145	240	540	145	240	540	435	624	624	218	312	312
	M30	≥ 5.8 - A4/70	215	340	670	35	150	275	605	145	270	600	145	270	600	435	693	693	218	346	346

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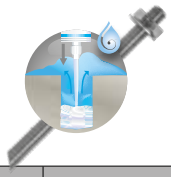
Opzione > Option 1 — M10 ... M20

Opzione > Option 7 — M8 ... M30

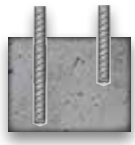


MATERIALE MATERIAL	DIAMETRO BARRA ROD DIAMETER	TIPOLOGIA DI BARRA TYPE OF ROD	INTERASSE MIN. ALLOWABLE SPACING	DISTANZA MIN. DAL BORDO MIN. ALLOWABLE EDGE DISTANCE	SPESS. FISSABILE FIXTURE THICKNESS	DIAMETRO FORO SPESS. FISSABILE DIAMETER OF CLEARENCE HOLE IN THE FIXTURE	CHIAVE KEY	COPPIA DI SERRAGGIO INSTALLATION TORQUE
	d [mm]		S_{min} [mm]	C_{min} [mm]	t_{fix} [mm]	d_f [mm]	S_w [mm]	T_{inst} [Nm]
					min ÷ max			
M8-M30 Calcestruzzo non fessurato Non cracked Concrete	M8	⩾ 5.8 - A4-70	40	40	0 ÷ 1500	9	13	10
	M10	⩾ 5.8 - A4-70	50	50	0 ÷ 1500	12	17	20
M10-M20 Calcestruzzo fessurato Cracked Concrete	M12	⩾ 5.8 - A4-70	60	60	0 ÷ 1500	14	19	40
	M16	⩾ 5.8 - A4-70	75	75	0 ÷ 1500	18	24	80
	M20	⩾ 5.8 - A4-70	100	100	0 ÷ 1500	22	30	130
	M24	⩾ 5.8 - A4-70	115	115	0 ÷ 1500	26	36	200
	M27	⩾ 5.8 - A4-70	120	120	0 ÷ 1500	29	41	250
	M30	⩾ 5.8 - A4-70	140	140	0 ÷ 1500	33	46	280

> Per evitare una possibile rottura per splitting, lo spessore del supporto in calcestruzzo dovrà essere h ⩾ $2h_{ef}$
> To avoid splitting failure, the thickness of the concrete member shall be h ⩾ $2h_{ef}$
> Pour eviter une possible rupture par splitting, l'epaisseur du support en béton devrait être h ⩾ $2h_{ef}$
> Um einen splittingbedingten Bruch zu verhindern, die Dicke der Unterlage aus Beton muss h ⩾ $2h_{ef}$ sein

EAD 330087-00-0601
ETA - 09/0246

Ø 8 ... 32 mm



MATERIALE MATERIAL	DIAMETRO BARRA ROD DIAMETER	TIPOLOGIA DI BARRA TYPE OF ROD	DIAMETRO FORO HOLE DIAMETER	LUNGHEZZA DI ANCORAGGIO (°) ANCHORAGE LENGTH			INTERASSE MIN. MIN. ALLOWABLE SPACING	DISTANZA MIN. DAL BORDO MIN. ALLOWABLE EDGE DISTANCE		
	d [mm]		d_0 [mm]	lv [mm]			S_{min} [mm]	C_{min} [mm]		
				MIN lb	MIN lo	MAX lb		MIN lb	MIN lo	MAX lb
C20/25 Calcestruzzo Concrete Beton Beton	Ø 8	Rebar (*)	10** - 12	115	200	400	40	37	42	54
	Ø 10	Rebar (*)	12** - 14	145	200	500	40	39	42	60
	Ø 12	Rebar (*)	14** - 16	170	200	600	48	40	42	66
	Ø 14	Rebar (*)	18	200	210	700	56	42	43	72
	Ø 16	Rebar (*)	20	230	240	800	64	44	45	78
	Ø 20	Rebar (*)	25	285	300	1000	80	47	48	90
	Ø 22	Rebar (*)	26	315	330	1000	88	49	50	90
	Ø 24	Rebar (*)	30	340	360	1000	96	51	52	90
	Ø 25	Rebar (*)	30	355	375	1000	100	61	63	100
	Ø 28	Rebar (*)	35	400	420	1000	112	64	65	100
	Ø 30	Rebar (*)	35	425	450	1000	120	66	67	100
	Ø 32	Rebar (*)	40	455	480	1000	128	67	69	100

(*) Rebar = FeB44k; B450C; BST 500

(**) Perforazione con diametro ridotto consigliata fino ad una lunghezza di 250mm
Perforation with reduced hole is suggested for setting depth up to 250mm
Une perforation avec trou réduit est recommandée pour une profondeur de réglage allant jusqu'à 250 mm
Zum Einstellen der Tiefe bis zu 250 mm wird eine Lochung mit reduziertem Loch empfohlen

(°) Lunghezza di ancoraggio in accordo a EC2 e TR023. lb = lunghezza di ancoraggio lo = lunghezza di sovrappozione
Anchorage lengths according to EC2 and TR023. lb = anchorage length lo = overlap joint length
Longueurs d'ancrage en accord avec EC2 et TR023. lb = longueurs d'ancrage lo = longer sousplacées
Verankerung Länge einigung mit EC2 und TR023. lb = Verankerung Länge lo = Überlagerung Länge

EAD 330499-01-0601
ETA - 09/0140

Opzione > Option 7

Ø 8 ... 32 mm

MATERIALE MATERIAL	DIAMETRO BARRA ROD DIAMETER	TIPOLOGIA DI BARRA TYPE OF ROD		SPESSORE MIN. DEL SUPPORTO MIN. THICKNESS BASE MATERIAL			DIAMETRO FORO HOLE DIAMETER	PROFONDITÀ DEL FORO HOLE DEPTH			PROFONDITÀ DI INSERIMENTO EMBEDMENT DEPTH			PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH			INTERASSE CARATTERISTICO CHARACTERISTIC SPACING			DISTANZA DAL BORDO CARATTERISTICA CHARACTERISTIC EDGE DISTANCE			INTERASSE MIN. ALLOWABLE SPACING	DISTANZA MIN. DAL BORDO MIN. ALLOWABLE EDGE DISTANCE
	d [mm]			h_{min} [mm]			d_0 [mm]	h_1 [mm]			h_{nom} [mm]			h_{ef} [mm]			S_{cr} [mm]			C_{cr} [mm]			S_{min} [mm]	C_{min} [mm]
				min	med	max		min	med	max	min	med	max	min	med	max	min	med	max	min	med	max		
Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	Ø 8	Rebar (*)		100	110	190	10**-12	65	85	165	60	80	160	60	80	160	180	240	480	90	120	240	50	50
	Ø 10	Rebar (*)		100	120	230	12**-14	65	95	205	70	90	200	70	90	200	210	270	600	105	135	300	60	60
	Ø 12	Rebar (*)		112	142	275	14**-16	75	115	245	80	110	240	80	110	240	240	330	720	120	165	360	65	65
	Ø 14	Rebar (*)		116	161	316	18	85	130	285	80	125	280	80	125	280	240	375	840	120	188	420	75	75
	Ø 16	Rebar (*)		140	180	360	20	85	145	325	100	140	320	100	140	320	300	420	960	150	210	480	80	80
	Ø 20	Rebar (*)		170	220	450	25	95	175	405	120	170	400	120	170	400	360	510	1200	180	255	600	100	100
	Ø 25	Rebar (*)		210	270	560	30	105	215	505	150	210	500	150	210	500	450	630	1500	225	315	750	120	120
	Ø 28	Rebar (*)		250	340	630	35	117	275	565	180	270	560	180	270	560	540	810	1680	270	405	840	140	140
	Ø 32	Rebar (*)		280	380	720	40	133	305	645	200	300	640	200	300	640	600	900	1920	300	450	960	160	160

(*) Rebar = B450C; BST 500

(**) Perforazione con diametro ridotto consigliata fino ad una lunghezza di 250mm
Perforation with reduced hole is suggested for setting depth up to 250mm
Une perforation avec trou réduit est recommandée pour une profondeur de réglage allant jusqu'à 250 mm
Zum Einstellen der Tiefe bis zu 250 mm wird eine Lochung mit reduziertem Loch empfohlen

> Parametri d'installazione validi per applicazioni in accordo alla teoria dell'ancoraggio
> Installation parameters suitable for application according to the anchors theory
> Paramètres d'installation en conformité avec la théorie de l'ancrage
> Installationsparameter in Übereinstimmung mit der Verankerungstheorie

MATERIALE MATERIAL	DIAMETRO BARRA ROD DIAMETER	TIPOLOGIA DI BARRA TYPE OF ROD	SPESSORE MIN. DEL SUPPORTO MIN. THICKNESS BASE MATERIAL	DIAMETRO FORO HOLE DIAMETER	PROFONDITÀ DEL FORO HOLE DEPTH	PROFONDITÀ DI INSERIMENTO EMBEDMENT DEPTH	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	INTERASSE CARATTERISTICO CHARACTERISTIC SPACING	DISTANZA DAL BORDO CARATTERISTICA CHARACTERISTIC EDGE DISTANCE	INTERASSE MIN. ALLOWABLE SPACING	DISTANZA MIN. DAL BORDO MIN. ALLOWABLE EDGE DISTANCE	SPESS. FISSABILE MAX FIXTURE THICKNESS	DIAMETRO FORO SPESS. FISSABILE DIAMETER OF CLEARENCE HOLE IN THE FIXTURE	CHIAVE KEY	COPPIA DI SERRAGGIO INSTALLATION TORQUE
	d [mm]		h_{min} [mm]	d_0 [mm]	h_1 [mm]	h_{nom} [mm]	h_{ef} [mm]	S_{cr} [mm]	C_{cr} [mm]	S_{min} [mm]	C_{min} [mm]	t_{fix} [mm]	d_f [mm]	S_w [mm]	T_{inst} [Nm]
Mattone pieno Solid Brick Brique pleine Vollmauerwerk	M8	⩾ 4.6 A2-70 A4-70	200	10	85	80	80	160	200	100	100	10	9	13	7
	M10	⩾ 4.6 A2-70 A4-70	250	12	90	85	85	200	200	100	100	20	12	17	15
	M12	⩾ 4.6 A2-70 A4-70	300	14	100	95	95	240	200	100	100	30	14	19	25
	M16	⩾ 4.6 A2-70 A4-70	350	18	130	125	125	320	200	100	100	35	18	24	30

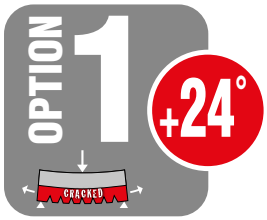
MATERIALE MATERIAL V-PLUS	DIAMETRO BARRA ROD DIAMETER	TIPOLOGIA DI BARRA TYPE OF ROD	GABBIETTA PLASTIC SLEEVE	SPESSORE MIN. DEL SUPPORTO MIN. THICKNESS BASE MATERIAL	DIAMETRO FORO HOLE DIAMETER	PROFONDITÀ DEL FORO HOLE DEPTH	PROFONDITÀ DI INSERIMENTO EMBEDMENT DEPTH	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	INTERASSE CARATTERISTICO CHARACTERISTIC SPACING	DISTANZA DAL BORDO CARATTERISTICA CHARACTERISTIC EDGE DISTANCE	INTERASSE MIN. ALLOWABLE SPACING	DISTANZA MIN. DAL BORDO MIN. ALLOWABLE EDGE DISTANCE	SPESS. FISSABILE FIXTURE THICKNESS	DIAMETRO FORO SPESS. FISSABILE DIAMETER OF CLEARENCE HOLE IN THE FIXTURE	CHIAVE KEY	COPPIA DI SERRAGGIO INSTALLATION TORQUE
	d [mm]		(*)	h_{min} [mm]	d_0 [mm]	h_1 [mm]	h_{nom} [mm]	h_{ef} [mm]	S_{cr} [mm]	C_{cr} [mm]	S_{min} [mm]	C_{min} [mm]	t_{fix} [mm]	d_f [mm]	S_w [mm]	T_{inst} [Nm]
Mattone forato Hollow Brick Brique creux Lochziegeln	M8	⩾ 4.6 A2-70 A4-70	GC 12x80	100	12	85	80	80	$l_{unit,max}$	0,5 x $l_{unit,max}$	100	100	10	9	13	3
	M10	⩾ 4.6 A2-70 A4-70	GC 15x85	100	16	90	85	85	$l_{unit,max}$	0,5 x $l_{unit,max}$	100	100	20	12	17	4
	M12	⩾ 4.6 A2-70 A4-70	GC 20x85	100	20	90	85	85	$l_{unit,max}$	0,5 x $l_{unit,max}$	120	120	30	14	19	6

(*) Altre lunghezze disponibili, vedi catalogo > Other lenghts available see catalogue

$l_{unit,max}$ = Massima dimensione del blocco di muratura > Max length of masonry unit > Dimension maximale du bloc de maçonnerie > Maximale Größe des Ziegelsteins

MATERIALE MATERIAL V-PLUS	DIAMETRO BARRA ROD DIAMETER	TIPOLOGIA DI BARRA TYPE OF ROD	SPESSORE MIN. DEL SUPPORTO MIN. THICKNESS BASE MATERIAL	DIAMETRO FORO HOLE DIAMETER	PROFONDITÀ DEL FORO HOLE DEPTH	PROFONDITÀ DI INSERIMENTO EMBEDMENT DEPTH	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	INTERASSE CARATTERISTICO CHARACTERISTIC SPACING	DISTANZA DAL BORDO CARATTERISTICA CHARACTERISTIC EDGE DISTANCE	INTERASSE MIN. ALLOWABLE SPACING	DISTANZA MIN. DAL BORDO MIN. ALLOWABLE EDGE DISTANCE	SPESS. FISSABILE MAX FIXTURE THICKNESS	DIAMETRO FORO SPESS. FISSABILE DIAMETER OF CLEARENCE HOLE IN THE FIXTURE	CHIAVE KEY	COPPIA DI SERRAGGIO INSTALLATION TORQUE
	d [mm]		h_{min} [mm]	d_0 [mm]	h_1 [mm]	h_{nom} [mm]	h_{ef} [mm]	S_{cr} [mm]	C_{cr} [mm]	S_{min} [mm]	C_{min} [mm]	t_{fix} [mm]	d_f [mm]	S_w [mm]	T_{inst} [Nm]
Legno lamellare Laminated Timber Holz	M8	⩾ 4.6 A2-70 A4-70	160	10	85	80	80	100	80	50	50	10	9	13	7
	M10	⩾ 4.6 A2-70 A4-70	200	12	105	100	100	125	100	50	50	20	12	17	15
	M12	⩾ 4.6 A2-70 A4-70	240	14	125	120	120	150	120	60	60	30	14	19	25
	M16	⩾ 4.6 A2-70 A4-70	320	18	165	160	160	200	160	80	80	35	18	24	30

Dati carico | Load data | Données de charge | Lastdaten



LEGEND		
	N_{Rum} [kN]	Carico ultimo medio a trazione > Average ultimate tension load > Charge maximum moyenne de traction Durchschnittliche maximale Zuglast
	V_{Rum} [kN]	Carico ultimo medio a taglio > Average ultimate shear load > Charge maximum moyenne de cisaillement Durchschnittliche maximale Querlast
	N_{RK} [kN]	Carico caratteristico a trazione > Characteristic tension load > Charge caracteristique de traction Charakteristiche Zuglast
	V_{RK} [kN]	Carico caratteristico a taglio > Characteristic shear load > Charge caracteristique de cisaillement Charakteristiche Querlast
	N_{rec} [kN]	Carico ammissibile a trazione > Admissible tensile load > Charge admissible de traction > Zulässige Zuglast
	V_{rec} [kN]	Carico ammissibile a taglio > Admissible shear load > Charge admissible de cisaillement > Zulässige Querlast

> Carichi validi per singolo ancorante senza influenza di interasse e distanza dal bordo e h ≥ 2hef
> Loads for single anchor with no influence of spacing and edge distance and with h ≥ 2hef
> Charges valables pour chaque ancrage sans influence d'interaxe et distance du bord et h ≥ 2hef
> Passende Ringe für den einzelnen Veranker, ohne Achsenabstandseinfluss und des Randabstands und h ≥ 2hef

> 1kN = 100 Kg
> ψ_{fsus} = 1,0

> Azione di taglio non diretta verso il bordo
> Shear directed away from the edge
> Action de cisaillement pas dirigée vers le bord
> Queraktion nicht an den Rand gerichtet

> Coefficiente di sicurezza globale incluso
> General safety factor included
> Coefficient de sécurité generale inclu
> Generelle Sicherheitskoeffizient inbegriffen

> Coefficiente lato carichi utilizzato = 1,4
> Load increasing safety coefficient used = 1,4
> Coefficient côté charge utilisé = 1,4
> Verwendeter Lasterhöhungssicherheitskoeffizient = 1,4

Con foro allagato, riduzione del carico consigliato del 20%
With flooded hole, reduction of the recommended load of 20%

MIN

Dati di carico con profondità effettiva ancoraggio MINIMA > Load data with MINIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MINIMALE > Lastdaten mit MINIMALER effektiven Verankerungstiefe

SERVICE +24°C +40°C -40°C

V-PLUS MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	≥ 5.8	M 10	70	27,8	18,1	19,1	15,1	9,1	8,6
	≥ 5.8	M 12	80	33,9	26,3	25,8	21,9	12,2	12,5
C20/25 ≥ 5.8	≥ 5.8	M 16	100	47,5	48,9	36,0	40,8	17,1	23,3
	≥ 5.8	M 20	120	62,4	76,2	47,3	63,5	22,5	34,3

MED

Dati di carico con profondità effettiva ancoraggio MEDIA > Load data with MEDIUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MOYENNE > Lastdaten mit MITTLERER effektiven Verankerungstiefe

SERVICE +24°C +40°C -40°C

V-PLUS MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	≥ 5.8	M 10	90	30,2	18,1	24,6	15,1	11,7	8,6
	≥ 5.8	M 12	110	43,8	26,3	37,5	21,9	17,8	12,5
C20/25 ≥ 5.8	≥ 5.8	M 16	125	66,3	48,9	50,3	40,8	23,9	23,3
	≥ 5.8	M 20	170	104,4	76,2	71,0	63,5	33,8	36,2

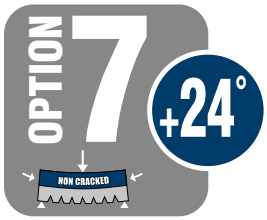
MAX

Dati di carico con profondità effettiva ancoraggio MASSIMO > Load data with MAXIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MAXIMUM > Lastdaten mit MAXIMALER effektiven Verankerungstiefe

SERVICE +24°C +40°C -40°C

V-PLUS MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	8.8	M 10	200	46,4	27,8	46,4	23,2	22,1	13,2
	8.8	M 12	240	67,4	40,4	67,4	33,7	32,1	19,2
C20/25 8.8	8.8	M 16	320	125,0	75,0	125,0	62,5	59,5	35,7
	8.8	M 20	400	203,0	121,8	167,0	101,5	79,5	58,0

Dati carico | Load data | Données de charge | Lastdaten



LEGEND

N_{Rum} [kN]	Carico ultimo medio a trazione > Average ultimate tension load > Charge maximum moyenne de traction Durchschnittliche maximale Zuglast
V_{Rum} [kN]	Carico ultimo medio a taglio > Average ultimate shear load > Charge maximum moyenne de cisaillement Durchschnittliche maximale Querlast
N_{RK} [kN]	Carico caratteristico a trazione > Characteristic tension load > Charge caracteristique de traction Charakteristische Zuglast
V_{RK} [kN]	Carico caratteristico a taglio > Characteristic shear load > Charge caracteristique de cisaillement Charakteristische Querlast
N_{rec} [kN]	Carico ammissibile a trazione > Admissible tensile load > Charge admissible de traction > Zulässige Zuglast
V_{rec} [kN]	Carico ammissibile a taglio > Admissible shear load > Charge admissible de cisaillement > Zulässige Querlast

> Carichi validi per singolo ancorante senza influenza di interasse e distanza dal bordo e h ≥ 2hef
> Loads for single anchor with no influence of spacing and edge distance and with h ≥ 2hef
> Charges valables pour chaque ancrage sans influence d'interaxe et distance du bord et h ≥ 2hef
> Passende Ringe für den einzelnen Veranker, ohne Achsenabstandseinfluss und des Randabstands und h ≥ 2hef

> 1kN = 100 Kg
> ψ_{fsus} = 1,0

> Azione di taglio non diretta verso il bordo
> Shear directed away from the edge
> Action de cisaillement pas dirigée vers le bord
> Queraktion nicht an den Rand gerichtet

> Coefficiente di sicurezza globale incluso
> General safety factor included
> Coefficient de sécurité generale inclu
> Generelle Sicherheitskoeffizient inbegriffen

> Coefficiente lato carichi utilizzato = 1,4
> Load increasing safety coefficient used = 1,4
> Coefficient côté charge utilisé = 1,4
> Verwendeter Lasterhöhungssicherheitskoeffizient = 1,4

Con foro allagato, riduzione del carico consigliato del 20%
With flooded hole, reduction of the recommended load of 20%

MIN

Dati di carico con profondità effettiva ancoraggio MINIMA > Load data with MINIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MINIMALE > Lastdaten mit MINIMALER effektiven Verankerungstiefe

SERVICE +24°C +40°C -40°C

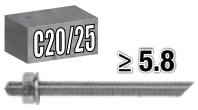
MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Béton non fissuré Ungerissener Beton	≥ 5.8	M 8	60	19,0	11,4	19,0	9,5	9,0	5,4
	≥ 5.8	M 10	70	30,2	18,1	25,2	15,1	12,0	8,6
	≥ 5.8	M 12	80	43,8	26,3	35,7	21,9	17,0	12,5
	≥ 5.8	M 16	100	67,5	48,9	50,5	40,8	24,0	23,3
	≥ 5.8	M 20	120	88,7	76,2	66,3	63,5	31,6	36,3
	≥ 5.8	M 24	145	117,8	110,4	88,1	92,0	41,9	52,5
	≥ 5.8	M 27	145	117,8	143,4	88,1	119,5	42,0	68,2
	≥ 5.8	M 30	145	117,8	175,2	88,1	146,0	42,0	83,4

MED

Dati di carico con profondità effettiva ancoraggio MEDIA > Load data with MEDIUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MOYENNE > Lastdaten mit MITTLERER effektiven Verankerungstiefe

SERVICE +24°C +40°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Béton non fissuré Ungerissener Beton	≥ 5.8	M 8	80	19,0	11,4	19,0	9,5	9,0	5,4
	≥ 5.8	M 10	90	30,2	18,1	30,2	15,1	14,3	8,6
	≥ 5.8	M 12	110	43,8	26,3	43,8	21,9	20,8	12,5
	≥ 5.8	M 16	125	81,6	48,9	70,5	40,8	33,6	23,3
	≥ 5.8	M 20	170	127,0	76,2	104,7	63,5	49,8	36,3
	≥ 5.8	M 24	210	184,0	110,4	153,2	92,0	72,9	52,5
	≥ 5.8	M 27	240	221,3	143,4	168,6	119,5	80,3	68,2
	≥ 5.8	M 30	270	271,8	175,2	208,4	146,0	99,2	83,4



MAX

Dati di carico con profondità effettiva ancoraggio MASSIMO > Load data with MAXIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MAXIMUM > Lastdaten mit MAXIMALER effektiven Verankerungstiefe

SERVICE +24°C +40°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Béton non fissuré Ungerissener Beton	8.8	M 8	160	29,2	17,5	29,2	14,6	13,9	8,3
	8.8	M 10	200	46,4	27,8	46,4	23,2	22,1	13,2
	8.8	M 12	240	67,4	40,4	67,4	33,7	32,1	19,2
	8.8	M 16	320	125,0	75,0	125,0	62,5	59,5	35,7
	8.8	M 20	400	203,0	121,8	203,0	101,5	96,6	58,0
	8.8	M 24	480	293,0	175,8	293,0	146,5	139,5	83,7
	8.8	M 27	540	381,0	228,6	379,2	190,5	180,6	108,8
	8.8	M 30	600	466,0	279,6	463,1	233,0	220,5	133,1

Dati carico | Load data | Données de charge | Lastdaten

LEGEND		
	N_{Rum} [kN]	Carico ultimo medio a trazione > Average ultimate tension load > Charge maximum moyenne de traction Durchschnittliche maximale Zuglast
	V_{Rum} [kN]	Carico ultimo medio a taglio > Average ultimate shear load > Charge maximum moyenne de cisaillement Durchschnittliche maximale Querlast
	N_{RK} [kN]	Carico caratteristico a trazione > Characteristic tension load > Charge caracteristique de traction Charakteristische Zuglast
	V_{RK} [kN]	Carico caratteristico a taglio > Characteristic shear load > Charge caracteristique de cisaillement Charakteristische Querlast
	N_{rec} [kN]	Carico ammissibile a trazione > Admissible tensile load > Charge admissible de traction > Zulässige Zuglast
	V_{rec} [kN]	Carico ammissibile a taglio > Admissible shear load > Charge admissible de cisaillement > Zulässige Querlast

> Carichi validi per singolo ancorante senza influenza di interasse e distanza dal bordo e h ≥ 2hef
> Loads for single anchor with no influence of spacing and edge distance and with h ≥ 2hef
> Charges valables pour chaque ancrage sans influence d'interaxe et distance du bord et h ≥ 2hef
> Passende Ringe für den einzelnen Veranker, ohne Achsenabstandseinfluss und des Randabstands und h ≥ 2hef

> 1kN = 100 Kg
> ψ_{fsus} = 1,0

> Azione di taglio non diretta verso il bordo
> Shear directed away from the edge
> Action de cisaillement pas dirigée vers le bord
> Queraktion nicht an den Rand gerichtet

> Coefficiente di sicurezza globale incluso
> General safety factor included
> Coefficient de sécurité generale inclu
> Generelle Sicherheitskoeffizient inbegriffen

> Coefficiente lato carichi utilizzato = 1,4
> Load increasing safety coefficient used = 1,4
> Coefficient côté charge utilisé = 1,4
> Verwendeter Lasterhöhungssicherheitskoeffizient = 1,4

Con foro allagato, riduzione del carico consigliato del 20%
With flooded hole, reduction of the recommended load of 20%

MIN

Dati di carico con profondità effettiva ancoraggio MINIMA > Load data with MINIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MINIMALE > Lastdaten mit MINIMALER effektiven Verankerungstiefe

SERVICE 1 +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	≥ 5.8	M 10	70	27,8	18,1	13,8	15,1	6,5	8,6
	≥ 5.8	M 12	80	33,9	26,3	19,6	21,9	9,3	12,5
	≥ 5.8	M 16	100	47,5	48,9	29,5	40,8	14,0	23,3
	≥ 5.8	M 20	120	62,4	76,2	36,0	63,5	17,1	34,3

MED

Dati di carico con profondità effettiva ancoraggio MEDIA > Load data with MEDIUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MOYENNE > Lastdaten mit MITTLERER effektiven Verankerungstiefe

SERVICE 1 +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	≥ 5.8	M 10	90	30,2	18,1	17,7	15,1	8,4	8,6
	≥ 5.8	M 12	110	43,8	26,3	27,0	21,9	12,8	12,5
	≥ 5.8	M 16	125	66,3	48,9	36,9	40,8	17,6	23,3
	≥ 5.8	M 20	170	104,4	76,2	51,1	63,5	24,3	36,2

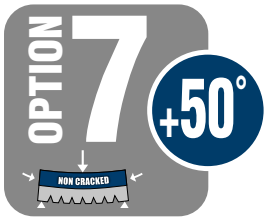
MAX

Dati di carico con profondità effettiva ancoraggio MASSIMO > Load data with MAXIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MAXIMUM > Lastdaten mit MAXIMALER effektiven Verankerungstiefe

SERVICE 1 +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	8.8	M 10	200	46,4	27,8	39,4	23,2	18,7	13,2
	8.8	M 12	240	67,4	40,4	58,9	33,7	28,0	19,2
	8.8	M 16	320	125,0	75,0	94,6	62,5	45,0	35,7
	8.8	M 20	400	203,0	121,8	120,2	101,5	57,2	58,0

Dati carico | Load data | Données de charge | Lastdaten



LEGEND

N_{Rum} [kN]	Carico ultimo medio a trazione > Average ultimate tension load > Charge maximum moyenne de traction Durchschnittliche maximale Zuglast
V_{Rum} [kN]	Carico ultimo medio a taglio > Average ultimate shear load > Charge maximum moyenne de cisaillement Durchschnittliche maximale Querlast
N_{RK} [kN]	Carico caratteristico a trazione > Characteristic tension load > Charge caracteristique de traction Charakteristische Zuglast
V_{RK} [kN]	Carico caratteristico a taglio > Characteristic shear load > Charge caracteristique de cisaillement Charakteristische Querlast
N_{rec} [kN]	Carico ammissibile a trazione > Admissible tensile load > Charge admissible de traction > Zulässige Zuglast
V_{rec} [kN]	Carico ammissibile a taglio > Admissible shear load > Charge admissible de cisaillement > Zulässige Querlast

> Carichi validi per singolo ancorante senza influenza di interasse e distanza dal bordo e h ⩾ 2hef
> Loads for single anchor with no influence of spacing and edge distance and with h ⩾ 2hef
> Charges valables pour chaque ancrage sans influence d'interaxe et distance du bord et h ⩾ 2hef
> Passende Ringe für den einzelnen Veranker, ohne Achsenabstandseinfluss und des Randabstands und h ⩾ 2hef

> 1kN = 100 Kg
> ψ_{fsus} = 1,0

> Azione di taglio non diretta verso il bordo
> Shear directed away from the edge
> Action de cisaillement pas dirigée vers le bord
> Queraktion nicht an den Rand gerichtet

> Coefficiente di sicurezza globale incluso
> General safety factor included
> Coefficient de sécurité generale inclu
> Generelle Sicherheitskoeffizient inbegriffen

> Coefficiente lato carichi utilizzato = 1,4
> Load increasing safety coefficient used = 1,4
> Coefficient côté charge utilisé = 1,4
> Verwendeter Lasterhöhungssicherheitskoeffizient = 1,4

Con foro allagato, riduzione del carico consigliato del 20%
With flooded hole, reduction of the recommended load of 20%

MIN

Dati di carico con profondità effettiva ancoraggio MINIMA > Load data with MINIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MINIMALE > Lastdaten mit MINIMALER effektiven Verankerungstiefe

SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	⩾ 5.8	M 8	60	19,0	11,4	17,2	9,5	8,2	5,4
	⩾ 5.8	M 10	70	30,2	18,1	18,1	15,1	8,6	8,6
	⩾ 5.8	M 12	80	43,8	26,3	25,7	21,9	12,2	12,5
	⩾ 5.8	M 16	100	67,5	48,9	42,6	40,8	20,3	23,3
	⩾ 5.8	M 20	120	88,7	76,2	53,2	63,5	25,3	36,3
	⩾ 5.8	M 24	145	117,8	110,4	76,1	92,0	36,2	52,5
	⩾ 5.8	M 27	145	117,8	143,4	78,9	119,5	37,6	68,2
	⩾ 5.8	M 30	145	117,8	175,2	86,2	146,0	41,0	83,4

MED

Dati di carico con profondità effettiva ancoraggio MEDIA > Load data with MEDIUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MOYENNE > Lastdaten mit MITTLERER effektiven Verankerungstiefe

SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	⩾ 5.8	M 8	80	19,0	11,4	19,0	9,5	9,0	5,4
	⩾ 5.8	M 10	90	30,2	18,1	23,3	15,1	11,1	8,6
	⩾ 5.8	M 12	110	43,8	26,3	35,4	21,9	16,8	12,5
	⩾ 5.8	M 16	125	81,6	48,9	53,3	40,8	25,3	23,3
	⩾ 5.8	M 20	170	127,0	76,2	75,3	63,5	35,9	36,3
	⩾ 5.8	M 24	210	184,0	110,4	110,3	92,0	52,5	52,5
	⩾ 5.8	M 27	240	221,3	143,4	130,6	119,5	62,3	68,2
	⩾ 5.8	M 30	270	271,8	195,2	160,5	146,0	76,3	83,4

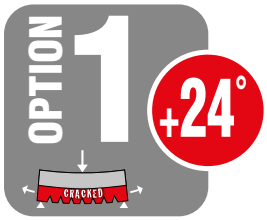
MAX

Dati di carico con profondità effettiva ancoraggio MASSIMO > Load data with MAXIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MAXIMUM > Lastdaten mit MAXIMALER effektiven Verankerungstiefe

SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	8.8	M 8	160	29,2	17,5	29,2	14,6	13,9	8,3
	8.8	M 10	200	46,4	27,8	46,4	23,2	22,1	13,2
	8.8	M 12	240	67,4	40,4	67,4	33,7	32,1	19,2
	8.8	M 16	320	125,0	75,0	125,0	62,5	59,5	35,7
	8.8	M 20	400	203,0	121,8	177,3	101,5	84,4	58,0
	8.8	M 24	480	293,0	175,8	252,1	146,5	120,0	83,7
	8.8	M 27	540	381,3	228,6	293,8	190,5	139,9	108,8
	8.8	M 30	600	466,0	279,6	356,6	233,0	169,8	133,1

Dati carico | Load data | Données de charge | Lastdaten



LEGEND		
	N_{Rum} [kN]	Carico ultimo medio a trazione > Average ultimate tension load > Charge maximum moyenne de traction Durchschnittliche maximale Zuglast
	V_{Rum} [kN]	Carico ultimo medio a taglio > Average ultimate shear load > Charge maximum moyenne de cisaillement Durchschnittliche maximale Querlast
	N_{RK} [kN]	Carico caratteristico a trazione > Characteristic tension load > Charge caracteristique de traction Charakteristische Zuglast
	V_{RK} [kN]	Carico caratteristico a taglio > Characteristic shear load > Charge caracteristique de cisaillement Charakteristische Querlast
	N_{rec} [kN]	Carico ammissibile a trazione > Admissible tensile load > Charge admissible de traction > Zulässige Zuglast
	V_{rec} [kN]	Carico ammissibile a taglio > Admissible shear load > Charge admissible de cisaillement > Zulässige Querlast

> Carichi validi per singolo ancorante senza influenza di interasse e distanza dal bordo e h ≥ 2hef
> Loads for single anchor with no influence of spacing and edge distance and with h ≥ 2hef
> Charges valables pour chaque ancrage sans influence d'interaxe et distance du bord et h ≥ 2hef
> Passende Ringe für den einzelnen Veranker, ohne Achsenabstandseinfluss und des Randabstands und h ≥ 2hef

> 1kN = 100 Kg
> ψ_{fsus} = 1,0

> Azione di taglio non diretta verso il bordo
> Shear directed away from the edge
> Action de cisaillement pas dirigée vers le bord
> Queraktion nicht an den Rand gerichtet

> Coefficiente di sicurezza globale incluso
> General safety factor included
> Coefficient de sécurité generale inclu
> Generelle Sicherheitskoeffizient inbegriffen

> Coefficiente lato carichi utilizzato = 1,4
> Load increasing safety coefficient used = 1,4
> Coefficient côté charge utilisé = 1,4
> Verwendeter Lasterhöhungssicherheitskoeffizient = 1,4

Con foro allagato, riduzione del carico consigliato del 20%
With flooded hole, reduction of the recommended load of 20%

MIN

Dati di carico con profondità effettiva ancoraggio MINIMA > Load data with MINIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MINIMALE > Lastdaten mit MINIMALER effektiven Verankerungstiefe

SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	A4-70	M10	70	27,8	24,3	19,1	20,3	9,1	9,2
	A4-70	M12	80	33,9	35,4	25,7	29,5	12,2	13,5
	A4-70	M16	100	47,5	65,9	36,0	54,9	17,1	25,1
	A4-70	M20	120	62,4	102,9	47,3	72,1	22,5	34,3

MED

Dati di carico con profondità effettiva ancoraggio MEDIA > Load data with MEDIUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MOYENNE > Lastdaten mit MITTLERER effektiven Verankerungstiefe

SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	A4-70	M10	90	40,5	24,3	24,6	20,3	11,7	9,2
	A4-70	M12	110	54,8	35,4	37,5	29,5	17,8	13,5
	A4-70	M16	125	66,3	65,9	50,3	54,9	23,9	25,1
	A4-70	M20	170	104,4	102,9	71,0	85,7	33,8	39,2

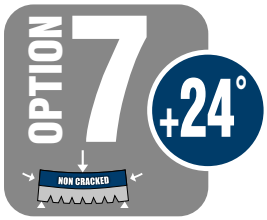
MAX

Dati di carico con profondità effettiva ancoraggio MASSIMO > Load data with MAXIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MAXIMUM > Lastdaten mit MAXIMALER effektiven Verankerungstiefe

SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	A4-70	M10	200	40,6	24,3	40,6	20,3	15,5	9,2
	A4-70	M12	240	59,0	35,4	59,0	29,5	22,5	13,5
	A4-70	M16	320	109,9	65,9	109,9	54,9	41,9	25,1
	A4-70	M20	400	171,5	102,9	167,0	85,7	65,5	39,2

Dati carico | Load data | Données de charge | Lastdaten



LEGEND

N_{Rum} [kN]	Carico ultimo medio a trazione > Average ultimate tension load > Charge maximum moyenne de traction Durchschnittliche maximale Zuglast
V_{Rum} [kN]	Carico ultimo medio a taglio > Average ultimate shear load > Charge maximum moyenne de cisaillement Durchschnittliche maximale Querlast
N_{RK} [kN]	Carico caratteristico a trazione > Characteristic tension load > Charge caracteristique de traction Charakteristische Zuglast
V_{RK} [kN]	Carico caratteristico a taglio > Characteristic shear load > Charge caracteristique de cisaillement Charakteristische Querlast
N_{rec} [kN]	Carico ammissibile a trazione > Admissible tensile load > Charge admissible de traction > Zulässige Zuglast
V_{rec} [kN]	Carico ammissibile a taglio > Admissible shear load > Charge admissible de cisaillement > Zulässige Querlast

> Carichi validi per singolo ancorante senza influenza di interasse e distanza dal bordo e h ≥ 2hef
> Loads for single anchor with no influence of spacing and edge distance and with h ≥ 2hef
> Charges valables pour chaque ancrage sans influence d'interaxe et distance du bord et h ≥ 2hef
> Passende Ringe für den einzelnen Veranker, ohne Achsenabstandseinfluss und des Randabstands und h ≥ 2hef

> 1kN = 100 Kg
> ψ_{fsus} = 1,0

> Azione di taglio non diretta verso il bordo
> Shear directed away from the edge
> Action de cisaillement pas dirigée vers le bord
> Queraktion nicht an den Rand gerichtet

> Coefficiente di sicurezza globale incluso
> General safety factor included
> Coefficient de sécurité generale inclu
> Generelle Sicherheitskoeffizient inbegriffen

> Coefficiente lato carichi utilizzato = 1,4
> Load increasing safety coefficient used = 1,4
> Coefficient côté charge utilisé = 1,4
> Verwendeter Lasterhöhungssicherheitskoeffizient = 1,4

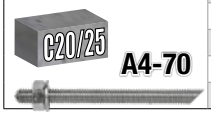
Con foro allagato, riduzione del carico consigliato del 20%
With flooded hole, reduction of the recommended load of 20%

MIN

Dati di carico con profondità effettiva ancoraggio MINIMA > Load data with MINIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MINIMALE > Lastdaten mit MINIMALER effektiven Verankerungstiefe

SERVICE +24°C +40°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{RK} [kN]	V_{RK} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Béton non fissuré Ungerissener Beton	A4-70	M8	60	25,6	15,3	23,4	12,8	9,7	5,8
	A4-70	M10	70	37,5	24,3	25,2	20,3	12,0	9,2
	A4-70	M12	80	45,3	35,4	35,7	29,5	17,0	13,5
	A4-70	M16	100	67,5	65,9	50,5	54,9	24,0	25,1
	A4-70	M20	120	88,7	102,9	66,3	85,7	31,6	39,2
	A4-70	M24	145	117,8	148,2	88,1	123,5	41,9	56,5
	A4-70	M27	145	117,8	160,6	88,1	160,6	41,9	73,5
	A4-70	M30	145	117,8	196,4	88,1	176,2	41,9	83,9



MED

Dati di carico con profondità effettiva ancoraggio MEDIA > Load data with MEDIUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MOYENNE > Lastdaten mit MITTLERER effektiven Verankerungstiefe

SERVICE +24°C +40°C -40°C

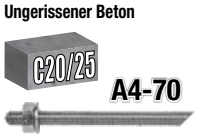
MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{RK} [kN]	V_{RK} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Béton non fissuré Ungerissener Beton	A4-70	M8	80	25,6	15,3	25,6	12,8	9,7	5,8
	A4-70	M10	90	40,6	24,3	32,4	20,3	15,4	9,2
	A4-70	M12	110	59,0	35,4	49,1	29,5	22,5	13,5
	A4-70	M16	125	87,5	65,9	70,5	54,9	33,6	25,1
	A4-70	M20	170	130,6	102,9	104,6	85,7	49,8	39,2
	A4-70	M24	210	196,1	148,2	153,1	123,5	72,9	56,5
	A4-70	M27	240	221,3	160,6	166,9	160,6	79,5	73,5
	A4-70	M30	270	271,7	196,3	205,0	196,3	97,6	89,9

MAX

Dati di carico con profondità effettiva ancoraggio MASSIMO > Load data with MAXIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MAXIMUM > Lastdaten mit MAXIMALER effektiven Verankerungstiefe

SERVICE +24°C +40°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{RK} [kN]	V_{RK} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Béton non fissuré Ungerissener Beton	A4-70	M8	160	25,6	15,3	25,6	12,8	9,7	5,8
	A4-70	M10	200	40,6	24,3	40,6	20,3	15,5	9,2
	A4-70	M12	240	59,0	35,4	59,0	29,5	22,5	13,5
	A4-70	M16	320	109,9	65,9	109,9	54,9	41,9	25,1
	A4-70	M20	400	171,5	102,9	171,5	85,7	65,5	39,2
	A4-70	M24	480	247,1	148,2	247,1	123,5	94,3	56,5
	A4-70	M27	540	321,3	160,6	321,3	160,6	122,7	73,5
	A4-70	M30	600	392,7	235,6	392,7	196,3	150,0	89,9



Dati carico | Load data | Données de charge | Lastdaten

LEGEND		
	N_{Rum} [kN]	Carico ultimo medio a trazione > Average ultimate tension load > Charge maximum moyenne de traction Durchschnittliche maximale Zuglast
	V_{Rum} [kN]	Carico ultimo medio a taglio > Average ultimate shear load > Charge maximum moyenne de cisaillement Durchschnittliche maximale Querlast
	N_{RK} [kN]	Carico caratteristico a trazione > Characteristic tension load > Charge caracteristique de traction Charakteristiche Zuglast
	V_{RK} [kN]	Carico caratteristico a taglio > Characteristic shear load > Charge caracteristique de cisaillement Charakteristiche Querlast
	N_{rec} [kN]	Carico ammissibile a trazione > Admissible tensile load > Charge admissible de traction > Zulässige Zuglast
	V_{rec} [kN]	Carico ammissibile a taglio > Admissible shear load > Charge admissible de cisaillement > Zulässige Querlast

> Carichi validi per singolo ancorante senza influenza di interasse e distanza dal bordo e h ≥ 2hef
> Loads for single anchor with no influence of spacing and edge distance and with h ≥ 2hef
> Charges valables pour chaque ancrage sans influence d'interaxe et distance du bord et h ≥ 2hef
> Passende Ringe für den einzelnen Veranker, ohne Achsenabstandseinfluss und des Randabstands und h ≥ 2hef

> 1kN = 100 Kg
> ψ_{fsus} = 1,0

> Azione di taglio non diretta verso il bordo
> Shear directed away from the edge
> Action de cisaillement pas dirigée vers le bord
> Queraktion nicht an den Rand gerichtet

> Coefficiente di sicurezza globale incluso
> General safety factor included
> Coefficient de sécurité generale inclu
> Generelle Sicherheitskoeffizient inbegriffen

> Coefficiente lato carichi utilizzato = 1,4
> Load increasing safety coefficient used = 1,4
> Coefficient côté charge utilisé = 1,4
> Verwendeter Lasterhöhungssicherheitskoeffizient = 1,4

Con foro allagato, riduzione del carico consigliato del 20%
With flooded hole, reduction of the recommended load of 20%

MIN

Dati di carico con profondità effettiva ancoraggio MINIMA > Load data with MINIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MINIMALE > Lastdaten mit MINIMALER effektiven Verankerungstiefe

SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	A4-70	M10	70	27,8	24,3	13,8	20,3	6,5	9,2
	A4-70	M12	80	33,9	35,4	19,6	29,5	9,3	13,5
	A4-70	M16	100	47,5	65,9	29,5	54,9	14,0	25,1
	A4-70	M20	120	62,4	102,9	36,0	72,1	17,1	34,3

MED

Dati di carico con profondità effettiva ancoraggio MEDIA > Load data with MEDIUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MOYENNE > Lastdaten mit MITTLERER effektiven Verankerungstiefe

SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	A4-70	M10	90	40,5	24,3	17,7	20,3	8,4	9,2
	A4-70	M12	110	54,8	35,4	27,0	29,5	12,8	13,5
	A4-70	M16	125	66,3	65,9	36,9	54,9	17,6	25,1
	A4-70	M20	170	104,4	102,9	51,1	85,7	24,3	39,2

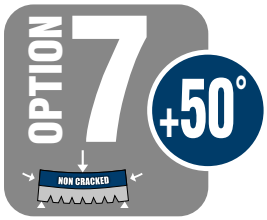
MAX

Dati di carico con profondità effettiva ancoraggio MASSIMO > Load data with MAXIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MAXIMUM > Lastdaten mit MAXIMALER effektiven Verankerungstiefe

SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo fessurato Cracked Concrete Beton fissuré Gerissener Beton	A4-70	M10	200	40,6	24,3	39,4	20,3	15,5	9,2
	A4-70	M12	240	59,0	35,4	58,9	29,5	22,5	13,5
	A4-70	M16	320	109,9	65,9	94,6	54,9	41,9	25,1
	A4-70	M20	400	171,5	102,9	120,2	85,7	57,2	39,2

Dati carico | Load data | Données de charge | Lastdaten



LEGEND

N_{Rum} [kN]	Carico ultimo medio a trazione > Average ultimate tension load > Charge maximum moyenne de traction Durchschnittliche maximale Zuglast
V_{Rum} [kN]	Carico ultimo medio a taglio > Average ultimate shear load > Charge maximum moyenne de cisaillement Durchschnittliche maximale Querlast
N_{RK} [kN]	Carico caratteristico a trazione > Characteristic tension load > Charge caracteristique de traction Charakteristiche Zuglast
V_{RK} [kN]	Carico caratteristico a taglio > Characteristic shear load > Charge caracteristique de cisaillement Charakteristiche Querlast
N_{rec} [kN]	Carico ammissibile a trazione > Admissible tensile load > Charge admissible de traction > Zulässige Zuglast
V_{rec} [kN]	Carico ammissibile a taglio > Admissible shear load > Charge admissible de cisaillement > Zulässige Querlast

> Carichi validi per singolo ancorante senza influenza di interasse e distanza dal bordo e h ⩾ 2hef
> Loads for single anchor with no influence of spacing and edge distance and with h ⩾ 2hef
> Charges valables pour chaque ancrage sans influence d'interaxe et distance du bord et h ⩾ 2hef
> Passende Ringe für den einzelnen Veranker, ohne Achsenabstandseinfluss und des Randabstands und h ⩾ 2hef

> 1kN = 100 Kg
> ψ_{fsus} = 1,0

> Azione di taglio non diretta verso il bordo
> Shear directed away from the edge
> Action de cisaillement pas dirigée vers le bord
> Queraktion nicht an den Rand gerichtet

> Coefficiente di sicurezza globale incluso
> General safety factor included
> Coefficient de sécurité generale inclu
> Generelle Sicherheitskoeffizient inbegriffen

> Coefficiente lato carichi utilizzato = 1,4
> Load increasing safety coefficient used = 1,4
> Coefficient côté charge utilisé = 1,4
> Verwendeter Lasterhöhungssicherheitskoeffizient = 1,4

Con foro allagato, riduzione del carico consigliato del 20%
With flooded hole, reduction of the recommended load of 20%

MIN

Dati di carico con profondità effettiva ancoraggio MINIMA > Load data with MINIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MINIMALE > Lastdaten mit MINIMALER effektiven Verankerungstiefe

SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	A4-70	M8	60	25,6	15,3	17,2	12,8	8,2	5,8
	A4-70	M10	70	37,5	24,3	18,1	20,3	8,6	9,2
	A4-70	M12	80	45,3	35,4	25,7	29,5	12,2	13,5
	A4-70	M16	100	67,5	65,9	42,6	54,9	20,3	25,1
	A4-70	M20	120	88,7	102,9	53,2	85,7	25,3	39,2
	A4-70	M24	145	117,8	148,2	76,1	123,5	36,2	56,5
	A4-70	M27	145	117,8	160,6	73,3	146,6	34,9	69,8
	A4-70	M30	145	117,8	196,4	80,6	161,1	38,4	76,7

MED

Dati di carico con profondità effettiva ancoraggio MEDIA > Load data with MEDIUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MOYENNE > Lastdaten mit MITTLERER effektiven Verankerungstiefe

SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	A4-70	M8	80	25,6	15,3	23,0	12,8	9,7	5,8
	A4-70	M10	90	40,6	24,3	23,3	20,3	11,1	9,2
	A4-70	M12	110	59,0	35,4	35,4	29,5	16,8	13,5
	A4-70	M16	125	87,5	65,9	53,3	54,9	25,3	25,1
	A4-70	M20	170	130,6	102,9	75,3	85,7	35,8	39,2
	A4-70	M24	210	196,1	148,2	110,3	123,5	52,5	56,5
	A4-70	M27	240	221,3	160,6	121,3	160,6	57,7	73,5
	A4-70	M30	270	271,7	196,3	150,0	196,3	71,5	89,9

MAX

Dati di carico con profondità effettiva ancoraggio MASSIMO > Load data with MAXIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MAXIMUM > Lastdaten mit MAXIMALER effektiven Verankerungstiefe

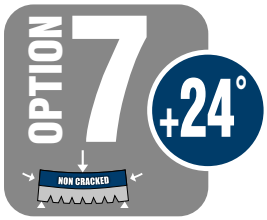
SERVICE +50°C +80°C -40°C

MATERIALE MATERIAL	BARRA ROD	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	A4-70	M8	160	25,6	15,3	25,6	12,8	9,7	5,8
	A4-70	M10	200	40,6	24,3	40,6	20,3	15,5	9,2
	A4-70	M12	240	59,0	35,4	59,0	29,5	22,5	13,5
	A4-70	M16	320	109,9	65,9	109,9	54,9	41,9	25,1
	A4-70	M20	400	171,5	102,9	171,5	85,7	65,5	39,2
	A4-70	M24	480	247,1	148,2	247,1	123,5	94,3	56,5
	A4-70	M27	540	321,3	160,6	272,9	160,6	122,7	73,5
	A4-70	M30	600	392,7	235,6	333,4	196,3	150,0	89,9

Dati carico | Load data | Données de charge | Lastdaten

LEGEND		
	N_{Rum} [kN]	Carico ultimo medio a trazione > Average ultimate tension load > Charge maximum moyenne de traction Durchschnittliche maximale Zuglast
	V_{Rum} [kN]	Carico ultimo medio a taglio > Average ultimate shear load > Charge maximum moyenne de cisaillement Durchschnittliche maximale Querlast
	N_{RK} [kN]	Carico caratteristico a trazione > Characteristic tension load > Charge caracteristique de traction Charakteristische Zuglast
	V_{RK} [kN]	Carico caratteristico a taglio > Characteristic shear load > Charge caracteristique de cisaillement Charakteristische Querlast
	N_{rec} [kN]	Carico ammissibile a trazione > Admissible tensile load > Charge admissible de traction > Zulässige Zuglast
	V_{rec} [kN]	Carico ammissibile a taglio > Admissible shear load > Charge admissible de cisaillement > Zulässige Querlast

> Applicazioni in accordo alla teoria dell'ancoraggio
> Application according to the anchors theory
> Application en conformité avec la théorie de l'ancrage
> Anwendung in Übereinstimmung mit der Verankerungstheorie



> Carichi validi per singolo ancorante senza influenza di interasse e distanza dal bordo e h ≥ 2hef
> Loads for single anchor with no influence of spacing and edge distance and with h ≥ 2hef
> Charges valables pour chaque ancrage sans influence d'interaxe et distance du bord et h ≥ 2hef
> Passende Ringe für den einzelnen Veranker, ohne Achsenabstandseinfluss und des Randabstands und h ≥ 2hef

> 1kN = 100 Kg
> ψ_{fsus} = 1,0

> Azione di taglio non diretta verso il bordo
> Shear directed away from the edge
> Action de cisaillement pas dirigée vers le bord
> Queraktion nicht an den Rand gerichtet

> Coefficiente di sicurezza globale incluso
> General safety factor included
> Coefficient de sécurité generale inclu
> Generelle Sicherheitskoeffizient inbegriffen

> Coefficiente lato carichi utilizzato = 1,4
> Load increasing safety coefficient used = 1,4
> Coefficient côté charge utilisé = 1,4
> Verwendeter Lasterhöhungssicherheitskoeffizient = 1,4

Con foro allagato, riduzione del carico consigliato del 20%
With flooded hole, reduction of the recommended load of 20%

MIN

Dati di carico con profondità effettiva ancoraggio MINIMA > Load data with MINIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MINIMALE > Lastdaten mit MINIMALER effektiven Verankerungstiefe

MATERIALE MATERIAL	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
	d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	Ø8	60	24,7	16,2	21,1	13,6	10,1	7,8
	Ø10	70	33,1	25,4	28,3	21,2	13,5	12,1
	Ø12	80	41,0	36,6	36,1	30,5	17,2	17,4
	Ø14	80	46,2	49,8	36,1	41,6	17,2	23,8
	Ø16	100	64,1	65,1	50,5	54,3	24,0	31,0
Rebar B450C BST500	Ø20	120	88,7	101,0	66,4	84,8	31,6	48,5
	Ø25	150	124,0	159,0	92,8	132,5	44,2	75,7
	Ø28	180	163,0	199,5	122,0	166,3	58,1	95,0
	Ø32	200	185,4	260,5	142,8	217,1	68,0	124,1

MED

Dati di carico con profondità effettiva ancoraggio MEDIA > Load data with MEDIUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MOYENNE > Lastdaten mit MITTLERER effektiven Verankerungstiefe

MATERIALE MATERIAL	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
	d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	Ø8	80	27,1	16,2	27,1	13,6	12,9	7,8
	Ø10	90	42,4	25,4	36,3	21,2	17,3	12,1
	Ø12	110	56,4	36,6	52,1	30,5	24,8	17,4
	Ø14	125	72,1	49,8	66,6	41,6	31,7	23,8
	Ø16	140	89,8	65,1	73,8	54,3	35,1	31,0
Rebar B450C BST500	Ø20	170	126,7	101,0	104,1	84,8	49,6	48,5
	Ø25	210	197,3	159,0	153,7	132,5	73,2	75,7
	Ø28	270	250,3	199,5	205,7	166,3	97,9	95,0
	Ø32	300	278,1	260,5	228,5	217,1	108,8	124,1

MAX

Dati di carico con profondità effettiva ancoraggio MASSIMO > Load data with MAXIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MAXIMUM > Lastdaten mit MAXIMALER effektiven Verankerungstiefe

MATERIALE MATERIAL	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
	d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	Ø8	160	27,1	16,2	27,1	13,6	12,9	7,8
	Ø10	200	42,4	25,4	42,4	21,2	20,2	12,1
	Ø12	240	61,1	36,6	61,1	30,5	29,1	17,4
	Ø14	280	83,1	49,8	83,1	41,6	39,6	23,8
	Ø16	320	108,6	65,1	108,6	54,3	51,7	31,0
Rebar B450C BST500	Ø20	400	169,6	101,0	169,6	84,8	80,8	48,5
	Ø25	500	265,1	159,0	265,1	132,5	126,2	75,7
	Ø28	560	332,5	199,5	332,5	166,3	158,3	95,0
	Ø32	640	434,3	260,5	434,3	217,1	206,8	124,1

Dati carico | Load data | Données de charge | Lastdaten

LEGEND

N_{Rum} [kN]	Carico ultimo medio a trazione > Average ultimate tension load > Charge maximum moyenne de traction Durchschnittliche maximale Zuglast
V_{Rum} [kN]	Carico ultimo medio a taglio > Average ultimate shear load > Charge maximum moyenne de cisaillement Durchschnittliche maximale Querlast
N_{RK} [kN]	Carico caratteristico a trazione > Characteristic tension load > Charge caracteristique de traction Charakteristische Zuglast
V_{RK} [kN]	Carico caratteristico a taglio > Characteristic shear load > Charge caracteristique de cisaillement Charakteristische Querlast
N_{rec} [kN]	Carico ammissibile a trazione > Admissible tensile load > Charge admissible de traction > Zulässige Zuglast
V_{rec} [kN]	Carico ammissibile a taglio > Admissible shear load > Charge admissible de cisaillement > Zulässige Querlast

> Applicazioni in accordo alla teoria dell'ancoraggio
> Application according to the anchors theory
> Application en conformité avec la théorie de l'ancrage
> Anwendung in Übereinstimmung mit der Verankerungstheorie

OPTION 7 +50° NON CRACKED

PROJECT ACCORDING TO TR029 EOTA TECHNICAL REPORT

> Carichi validi per singolo ancorante senza influenza di interasse e distanza dal bordo e h ⩾ 2hef
> Loads for single anchor with no influence of spacing and edge distance and with h ⩾ 2hef
> Charges valables pour chaque ancrage sans influence d'interaxe et distance du bord et h ⩾ 2hef
> Passende Ringe für den einzelnen Veranker, ohne Achsenabstandseinfluss und des Randabstands und h ⩾ 2hef

> 1kN = 100 Kg

> Azione di taglio non diretta verso il bordo
> Shear directed away from the edge
> Action de cisaillement pas dirigée vers le bord
> Queraktion nicht an den Rand gerichtet

> Coefficiente di sicurezza globale incluso
> General safety factor included
> Coefficient de sécurité generale inclu
> Generelle Sicherheitskoeffizient inbegriffen

> Coefficiente lato carichi utilizzato = 1,4
> Load increasing safety coefficient used = 1,4
> Coefficient côté charge utilisé = 1,4
> Verwendeter Lasterhöhungssicherheitskoeffizient = 1,4

Con foro allagato, riduzione del carico consigliato del 20%
With flooded hole, reduction of the recommended load of 20%

FLOODED HOLE

SERVICE 0 +50°C +80°C -40°C

MIN

Dati di carico con profondità effettiva ancoraggio MINIMA > Load data with MINIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MINIMALE > Lastdaten mit MINIMALER effektiven Verankerungstiefe

V-PLUS

MATERIALE MATERIAL	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
	d [mm]	$h_{ef\ MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	Ø8	60	24,7	16,2	21,1	13,6	7,2	7,8
	Ø10	70	33,1	25,4	28,3	21,2	9,7	12,1
	Ø12	80	41,0	36,6	36,1	30,5	13,0	17,4
	Ø14	80	46,2	49,8	36,1	41,6	14,6	23,8
	Ø16	100	64,1	65,1	50,5	54,3	18,1	31,0
C20/25 Rebar B450C BST500	Ø20	120	88,7	101,0	66,4	84,8	25,2	48,5
	Ø25	150	124,0	159,0	92,8	132,5	41,3	75,7
	Ø28	180	163,0	199,5	122,0	166,3	47,2	95,0
	Ø32	200	185,4	260,5	142,8	217,1	52,2	124,1

MED

Dati di carico con profondità effettiva ancoraggio MEDIA > Load data with MEDIUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MOYENNE > Lastdaten mit MITTLERER effektiven Verankerungstiefe

SERVICE 0 +50°C +80°C -40°C

V-PLUS

MATERIALE MATERIAL	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
	d [mm]	$h_{ef\ MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	Ø8	80	27,1	16,2	27,1	13,6	9,7	7,8
	Ø10	90	42,4	25,4	36,3	21,2	12,5	12,1
	Ø12	110	56,4	36,6	52,1	30,5	17,9	17,4
	Ø14	125	72,1	49,8	66,6	41,6	20,3	23,8
	Ø16	140	89,8	65,1	73,8	54,3	25,3	31,0
C20/25 Rebar B450C BST500	Ø20	170	126,7	101,0	104,1	84,8	35,7	48,5
	Ø25	210	197,3	159,0	153,7	132,5	57,8	75,7
	Ø28	270	250,3	199,5	205,7	166,3	70,9	95,0
	Ø32	300	278,1	260,5	228,5	217,1	78,3	124,1

MAX

Dati di carico con profondità effettiva ancoraggio MASSIMO > Load data with MAXIMUM effective anchorage depth
Donnes de charge avec profondeur efficace d'ancrage MAXIMUM > Lastdaten mit MAXIMALER effektiven Verankerungstiefe

SERVICE 0 +50°C +80°C -40°C

V-PLUS

MATERIALE MATERIAL	DIAMETRO BARRA ROD DIAMETER	PROFONDITÀ EFF. ANCORAGGIO EFFECTIVE ANCHORAGE DEPTH	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO CARATTERISTICO A TRAZIONE CHARACTERISTIC TENSILE LOAD	CARICO CARATTERISTICO A TAGLIO CHARACTERISTIC SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
	d [mm]	$h_{ef\ MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Calcestruzzo non fessurato Non cracked Concrete Beton non fissuré Ungerissener Beton	Ø8	160	27,1	16,2	27,1	13,6	12,9	7,8
	Ø10	200	42,4	25,4	42,4	21,2	20,2	12,1
	Ø12	240	61,1	36,6	61,1	30,5	29,1	17,4
	Ø14	280	83,1	49,8	83,1	41,6	39,6	23,8
	Ø16	320	108,6	65,1	108,6	54,3	51,7	31,0
C20/25 Rebar B450C BST500	Ø20	400	169,6	101,0	169,6	84,8	80,8	48,5
	Ø25	500	265,1	159,0	265,1	132,5	126,2	75,7
	Ø28	560	332,5	199,5	332,5	166,3	158,3	95,0
	Ø32	640	434,3	260,5	434,3	217,1	206,8	124,1

CONNESSIONI POST-INSTALLATE DI BARRE AD ADERENZA MIGLIORATA
POST-INSTALLED REBAR CONNECTIONS
SCELLEMENT D'ARMATURES RAPPORTÉES (FERS À BÉTON)
NACHTRÄGLICHE BEWEHRUNGSANSCHÜSSE

REBAR EC2 +50°

BOSSONG REB

Perforazione con trapano > Hammer drilled holes
Perçage avec perforateur > Durchbohrung mit Bohrmaschine

SERVICE +50°C +80°C -40°C

V-PLUS MATERIALE MATERIAL	TIPOLOGIA DI BARRA TYPE OF ROD	DIAMETRO BARRA ROD DIAMETER	TENSIONE DI ADERENZA fbd [N/mm²] > BOND RESISTANCE fbd [N/mm²]								
		d [mm]	C 12/15	C 16/20	C 20/25	C 25/30	C 30/37	C 35/45	C 40/50	C 45/55	C 50/60
Calcestruzzo	Rebar (*)	Ø 8	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
Concrete	Rebar (*)	Ø 10	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
Beton	Rebar (*)	Ø 12	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
Beton	Rebar (*)	Ø 14	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
	Rebar (*)	Ø 16	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,0
	Rebar (*)	Ø 20	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,0
	Rebar (*)	Ø 22	1,6	2,0	2,3	2,7	3,0	3,4	3,7	3,7	4,0
	Rebar (*)	Ø 24	1,6	2,0	2,3	2,7	3,0	3,4	3,7	3,7	3,7
	Rebar (*)	Ø 25	1,6	2,0	2,3	2,7	3,0	3,4	3,7	3,7	3,7
	Rebar (*)	Ø 28	1,6	2,0	2,3	2,7	3,0	3,4	3,4	3,4	3,4
	Rebar (*)	Ø 30	1,6	2,0	2,3	2,7	2,7	2,7	2,7	2,7	2,7
(*) Rebar = B450C; BST 500	Rebar (*)	Ø 32	1,6	2,0	2,3	2,7	2,7	2,7	2,7	2,7	2,7

EAD 330087-00-0601
ETA - 09/0246

Dati di tensione di aderenza fbd validi per tutte le lunghezze di ancoraggio > Design value of bond strength fbd suitable for all anchorage lengths
Donnés de tension et d'adhérence fbd valables pour toutes les longueurs d'ancrage > Bemessungswert der Verbundspannung fbd Gültig für alle Ankerungslänge

FIXING IN SEISMIC
POST INSTALLED REBAR
EAD 331522-00-0601

REBAR EC8 +50°

BOSSONG REB

Perforazione con trapano > Hammer drilled holes
Perçage avec perforateur > Durchbohrung mit Bohrmaschine

SERVICE +50°C +80°C -40°C

V-PLUS MATERIALE MATERIAL	TIPOLOGIA DI BARRA TYPE OF ROD	DIAMETRO BARRA ROD DIAMETER								
		d [mm]	C 16/20	C 20/25	C 25/30	C 30/37	C 35/45	C 40/50	C 45/55	C 50/60
	Rebar (*)	Ø 12	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	Ø 14	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	Ø 16	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	Ø 20	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	Ø 22	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	Ø 24	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	Ø 25	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	Ø 28	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0
	Rebar (*)	Ø 30	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0
(*) Rebar = B450C; BST 500	Rebar (*)	Ø 32	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0

Dati di tensione di aderenza fbd validi per tutte le lunghezze di ancoraggio > Design value of bond strength fbd suitable for all anchorage lengths
Donnés de tension et d'adhérence fbd valables pour toutes les longueurs d'ancrage > Bemessungswert der Verbundspannung fbd Gültig für alle Ankerungslänge

MASONRY & WOOD

MATERIALE MATERIAL	TIPOLOGIA DI BARRA TYPE OF ROD	DIAMETRO BARRA ROD DIAMETER	CARICO ULTIMO MEDIO A TRAZIONE ULTIMATE TENSION LOAD	CARICO ULTIMO MEDIO A TAGLIO ULTIMATE SHEAR LOAD	CARICO AMMISSIBILE A TRAZIONE ADMISSIBLE TENSILE LOAD	CARICO AMMISSIBILE A TAGLIO ADMISSIBLE SHEAR LOAD
		d [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{rec} [kN]	V_{rec} [kN]
Mattone pieno **Solid Brick** **Brique pleine** **Vollmauerwerk** **≥ 4.6 / A2-70 / A4-70**	≥ 4.6 A2-70 A4 -70	M8			2,0	3,0
	≥ 4.6 A2-70 A4 -70	M10			2,6	3,4
	≥ 4.6 A2-70 A4 -70	M12			2,8	3,9
	≥ 4.6 A2-70 A4 -70	M16			4,0	4,2
Materiale forato **Hollow Material** **Material creuse** **Lochziegeln** **≥ 4.6 / A2-70 / A4-70**	≥ 4.6 A2-70 A4 -70	M8			0,9	2,0
	≥ 4.6 A2-70 A4 -70	M10			0,9	2,0
	≥ 4.6 A2-70 A4 -70	M12			0,9	2,5
Legno lamellare **Laminated Timber** **Timber** **Holz** **≥ 4.6 / A2-70 / A4-70**	≥ 4.6 A2-70 A4 -70	M8			3,2	
	≥ 4.6 A2-70 A4 -70	M10			4,2	
	≥ 4.6 A2-70 A4 -70	M12			6,1	
	≥ 4.6 A2-70 A4 -70	M16			10,7	

> Dati di carico raccomandati per applicazioni su materiali base di medie caratteristiche meccaniche. Vista la varietà dei substrati in muratura e/o legno per applicazioni su supporti differenti da quelli considerati, i valori di carico dovranno essere ricavati tramite opportune prove in situ.

> Recommended loads for applications on base materials with medium strength characteristics. For different masonry and/or wood base materials, load values must be obtained with in situ tests.

> Per valori a taglio riferirsi alle istruzioni CNR-DT 206/2007 (7.10.2.3)

> For shear loads refer to CNR-DT 206/2007 (7.10.2.3)

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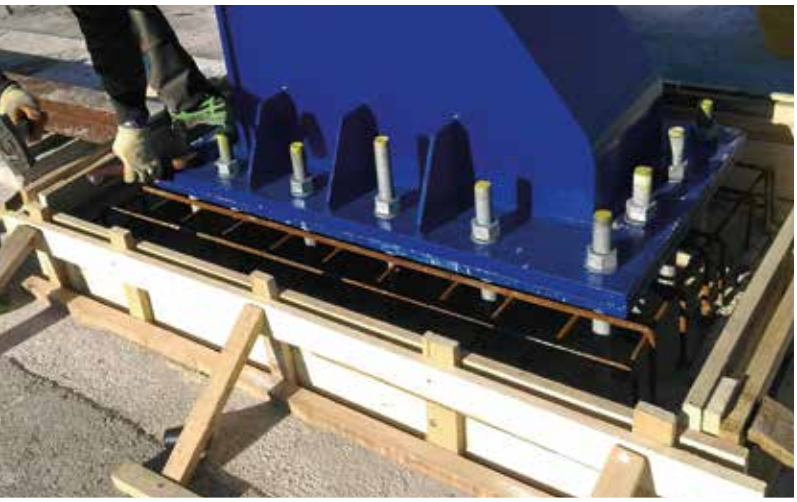
SCHEDA TECNICA
TECHNICAL DATA SHEET
FICHE TECHNIQUE
TECHNISCHES DATENBLATT

HIGH LOAD CHEMICAL ANCHOR FOR CONCRETE

Ancorante chimico ad alte prestazioni per calcestruzzo > Ancrage chimique à hautes performances pour béton > Hochleistungsfähige chemische verankerung für beton

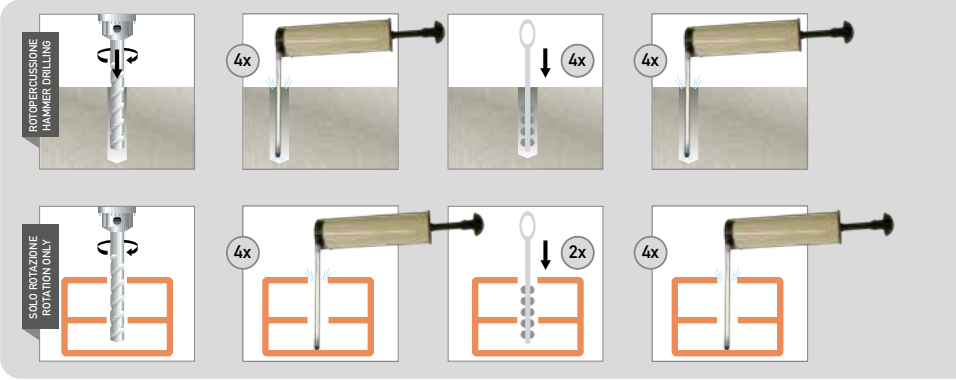


INSTALLATION

PROCEDURA DI INSTALLAZIONE
INSTALLATION PROCEDURE
PROCÉDURE D'INSTALLATION
INSTALLATIONSVERFAHREN

01 PULIZIA | CLEANING | NETTOYAGE | REINIGUNG

SDS-HDB
Se utilizzata non necessita di pompa soffiante/aria compressa per la rimozione della polvere dal foro
If used no need to use blower pump/compressed air to remove the dust from the hole



Eseguire il foro controllandone la perpendicolarità. Soffiare il foro con apposita pompa soffiante (o aria compressa), eseguire operazione di pulizia della superficie laterale del foro con apposito scovolino metallico, soffiare nuovamente il foro fino a che non fuoriesca più polvere e/o altro materiale residuo. Si raccomanda un'attenta pulizia della superficie laterale del foro con scovolino metallico.

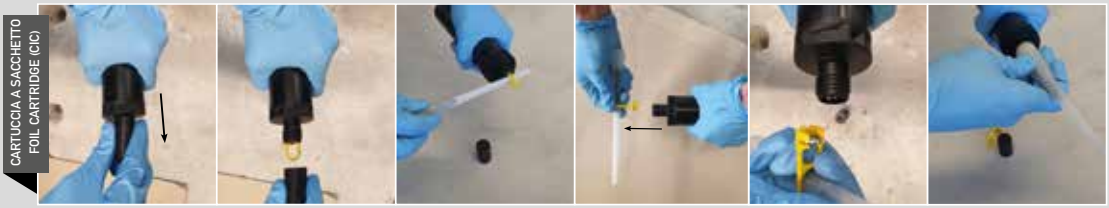
Drill the hole and check it's perpendicularity. Blow the hole with an appropriate pump blower (or compression air), clean the lateral surface of the hole with an appropriate steel brush, blow again in the hole until there is no dust and/or any residual material inside. We strongly recommend use of the steel brush to clean hole sides.

Réaliser le trou en en contrôlant la perpendicularité. Souffler dans le trou avec la pompe soufflante prévue (ou de l'air comprimé), effectuer l'opération de nettoyage de la surface latérale du trou avec un écouvillon metallique, souffler à nouveau dans le trou jusqu'à ce qu'il n'en sorte plus de poussière et/ou d'autres matières résiduelles. Nous recommandons l'utilisation d'écouvillon métallique pour le nettoyage de la surface latérale du trou.

Stellen Sie die Bohrlochung unter Kontrolle der Rechtwinkligkeit her. Blasen Sie die Bohrlochung mit einer entsprechenden Pumpe (oder Druckluft) durch, nehmen Sie eine Reinigung der seitlichen Oberflächen der Bohrlochung mit einer Bürste von Metall vor, blasen Sie die Bohrlochung erneut durch, bis kein Pulver und / oder andere Materialrückstände mehr austreten. Inbesondere ist die Benutzung der Metallbürste für die Reinigung der seitlichen Oberfläche der Bohrlochung notwendig.

02 APERTURA | OPENING | OUVERTURE | ÖFFUNG

BCR 300
BCR 165



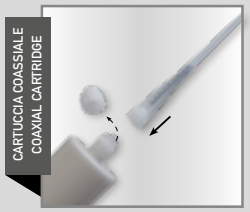
Togliere il tappo a pressione, avvitare il miscelatore e inserire la cartuccia nella pompa usando protezioni per mani e viso. Nei formati 300 ml e 165 ml svitare il tappo, estrarre la clip metallica secondo le seguenti operazioni: 1) Inserire il miscelatore nell'asola dell'estrattore in plastica. 2) Tirare l'estrattore per sfilare la clip metallica di chiusura del sacchetto. Dopodiché avvitare il miscelatore, inserire la cartuccia nella pompa usando protezioni per mani e viso.

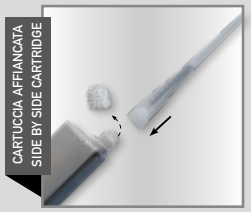
Remove the pressure cup, screw on the mixer and insert the cartridge in the gun. Use protections for hands and face. With the size 300 ml and 165 ml, unscrew the front cup, pull-out the steel closing clip according to the following operations: 1) Insert the mixer in the eye of the plastic extractor. 2) Pull the extractor to unhook the steel closing clip of the foil.
After that, screw on the mixer and insert the cartridge in the gun. Use protections for hands and face.

Retirer le bouchon de pression, visser le mélangeur et insérer la cartouche dans la pompe en utilisant les protections pour les mains et le visage. Pour les formats 300 ml et 165 ml, dévisser le bouchon, extraire le clip métallique selon les opérations suivantes: 1) Insérer le mélangeur dans la fente de l'extracteur en plastique. 2) Tirer l'extracteur pour défaire le clip métallique de fermeture du sachet. Après cela, visser le mélangeur, insérer la cartouche dans la pompe en utilisant les protections pour les mains et le visage.

Entfernen Sie die Druckkappe, schrauben Sie den Mischer an und bringen Sie den Einsatz in der Pumpe unter Verwendung von Schutzmitteln für Hände und Gesicht an. Lösen Sie bei den Formaten zu 300 ml und 165 ml den Verschluss und ziehen Sie die Metallklemme entsprechend folgender Vorgehensweise heraus: 1) Fügen Sie den Mischer in das Langloch der Ausziehvorrichtung aus Kunststoff ein. 2) Ziehen Sie die Ausziehvorrichtung heraus, um die Metallklemme zum Verschließen des Beutels zu entfernen. Schrauben Sie dann den Mischer fest und fügen Sie den Einsatz in die Pumpe unter Verwendung von Schutzmitteln für Hände und Gesicht ein.

BCR 900 / BCR 825 / BCR 470 / BCR 400 / BCR 345 / BCR 265





NOTA. Dati tecnici, di installazione e di carico possono essere oggetto di revisione. Per una versione aggiornata consultare le schede tecniche sul sito www.bossong.com o contattare il nostro Ufficio Tecnico.

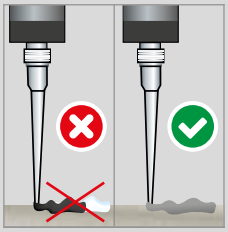
WARNING. Installation and loads technical data can be modified by us. For update technical data sheet see www.bossong.com or be in contact with our Technical Office.

NOTE. Données techniques, d'installation et de charge peuvent être objet de révision. Pour une version mise à jour, consulter les fiches techniques dans le site internet www.bossong.com ou contacter notre Bureau Technique.

ANMERKUNG. Technische Daten, Installationsangaben und Lastdaten können modifiziert werden. Für die aktualisierte Version sind die technischen Blätter auf der Webseite www.bossong.com nachzuschauen, oder unser Technisches Büro soll konsultiert werden.

03 PREPARAZIONE DELLA CARTUCCIA | CARTRIDGE PREPARATION PREPARATION DE LA CARTOUCHE | KARTUSCHE VORBEREITUNG

Utilizzare dispenser appropriato
Use the correct dispenser
Utiliser un distributeur approprié
Verwenden Sie einen geeigneten Spender



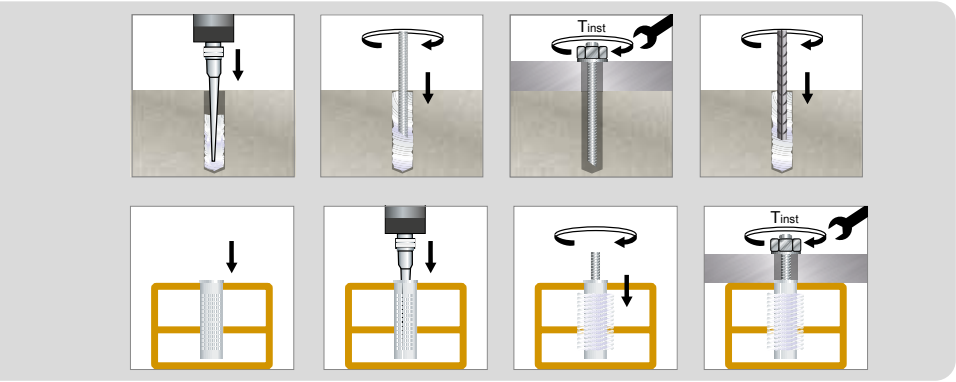
Estrudere una prima parte del prodotto assicurandosi che: 1) Attraverso il mixer (trasparente) il flusso di prodotto sia composto dalla parte A (colore bianco) e dalla parte B (colore nero). 2) I due componenti si siano completamente miscelati. La completa miscelazione è raggiunta quando dal miscelatore il prodotto, ottenuto dall'unione dei due componenti, fuoriesce con colore uniforme. Solo allora la cartuccia è pronta per l'uso.

Before starting to use the cartridge, eject a first part of the product, being sure that: 1) Trough the mixer (transparent) see that the flux of product is compound of the part A (white colour) end of part B (black colour). 2) The two components are completely mixed. The complete mixing is reached only after that the product, obtained by mixing the two component, comes out from the mixer with an uniform colour. Now the cartridge is ready to be used.

Extruder une première partie du produit en s'assurant que: 1) Travers le mélangeur (transparent) le flux de produit est composé par les composants A (blanc) et B (noir). 2) Les deux composants soient complètement mélangés. Le mélange complet est atteint quand le produit obtenu par l'union des deux composants sort du mélangeur avec une couleur uniforme. Alors seulement, la cartouche est prête à l'emploi.

Ziehen Sie einen ersten Teil des Produktes heraus und prüfen Sie dass: 1) Durch den Mischer (transparent) ist der Fluss des Produktes aus Teil A (weiße Farbe) und Teil B (schwarze Farbe) zusammengesetzt. 2) Die zwei Teilen werden völlig gemischt. Die komplette Mischung erfolgt als vom Mischer das Produkt, sich ergebend von den zwei Teilen, mit gleichmäßiger Farbe entweicht. Da ist die Kartusche fertig für die Anwendung.

04 INIEZIONE | INJECTION | INJECTION | INJEKTION



1) Estrudere la resina nel foro fino a riempirlo per 2/3. In caso di materiale forato inserire la gabbietta di plastica e poi estrudere nella gabbietta. 2) Prima di inserire la barra verificare che la superficie della stessa sia asciutta, priva di olio ed altri agenti contaminanti. Inserire la barra con un movimento rotatorio per la fuoriuscita delle bolle d'aria. 3) Per l'installazione della barra e la successiva messa in carico rispettare i relativi tempi di posa specificati sia nella scheda tecnica che sull'etichetta del prodotto. 4) Prima della messa in carico verificare l'indurimento del prodotto. 5) La cartuccia può essere riutilizzata successivamente sostituendo il mixer con uno nuovo. Ricordarsi sempre di estrudere una parte del prodotto vedi punto 3.

1) Inject resin into the hole up to fill it 2/3rds. In hollow bricks use the plastic sleeve and inject the resin inside. 2) Before insert the rod, verify that the element is dry and free oil and other contaminants. Insert threaded stud turning back and forth to avoid presence of air in the fitted hole. 3) For the installation and the following anchor load phase, respect the open time and curing time detailed in the technical data sheet and in the label of the product. 4) Before to load the anchor, check the hardened of the product. 5) The cartridge can be used again screwing the cup and replacing the mixer. Remember to eject a first part of the product, see point 3.

1) Extruder la résine dans le trou jusqu'à le remplir aux 2/3. En cas de matériel troué, insérer la forme en plastique et ensuite extruder dans la forme. 2) Avant d'insérer la barre, verifier que la surface est sèche, sans rest de huile ou d'autres agents contaminants. Insérer la barre avec un mouvement de rotation pour faire sortir les bulles d'air. 3) Pour l'installation de la barre et le suivant chargement de l'ancrage, respecter les temps de prise indiqués sur la fiche technique et sur la cartouche. 4) Avant de charger l'ancrage, verifier le durcissement du produit. 5) La cartouche peut être réutilisée par la suite en remplaçant le mixer par un nouveau. Se rappeler de toujours extruder une partie du produit voir point 3.

1) Pressen Sie das Harz in das Bohrloch bis diese zu 2/3 gefüllt ist. Bei Lochmaterialen muss der Siebhülse eingefügt und dann in die Hülse gepresst werden. 2) Vor dem Einstecken des Gewindestabes prüfen dass seine Flache trocken, ohne Öl und andere verunreinigende Wirkstoffe ist. Fügen Sie den Stab mit einer Drehbewegung ein, um die Luftblasen austreten zu lassen. 3) Warten Sie die Aushärtezeit und Verladungszeit ab, die im technischen Datenblatt und auf dem Etikett des Produktes angegeben sind. 4) Vor der Verladung überprüfen dass das Produkt verhärtet ist. 5) Der Einsatz kann später wiederverwendet werden, indem der Mischer durch einen neuen ersetzt wird. Vergessen Sie nicht, immer einen Teil des Produktes herauszupressen, siehe Punkt 3.

CONSUMPTION CALCULATOR

www.bossong.com/area-tecnica.html Oppure per consumi resina vedere pag. 8

www.bossong.co.uk/technical-area.html or for resin quantity consumption see pag. 8

www.bossong.fr/section-technique.html ou pour la consommation de résine, voir pag. 8

www.bossong-befestigungssysteme.de/technische-abteilung.html oder für Harzkonsum siehe S. 8

EK 3 – KALİTE BELGELERİ

EK 3.a – ETA (Europen Technical Approved)

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European Technical Assessment

ETA-09/0140 of 17/05/2019

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T
Product family to which the construction product belongs	Bonded fasteners for use in concrete
Manufacturer	BOSSONG S.p.A. Via Enrico Fermi, 49/51, IT-24050 Grassobbio (Bg), Italy www.bossong.com
Manufacturing plant	BOSSONG S.p.A. Via Enrico Fermi, 49/51, IT-24050 Grassobbio (Bg), Italy
This European Technical Assessment contains	29 pages including 3 Annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	European Assessment Document EAD 330499-01-0601 „Bonded fasteners for use in concrete”
This version replaces	ETA-09/0140 issued on 25/02/2014

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Specific Part

1 Technical description of the product

The BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T are bonded fasteners (injection type) consisting of an injection mortar cartridge using an applicator gun equipped with a special mixing nozzle and steel element: commercial threaded rod of the sizes M8 to M30 with hexagon nut and washer or reinforcing bar (rebar) from Ø8 to Ø32 mm.
The steel element is placed into a drilled hole previously injected (using an applicator gun) with a mortar with a slow and slight twisting motion. The steel element is anchored by the bond between steel element, mortar and concrete.

An illustration and the description of the products are given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

The performances given in clause 3 are only valid if the anchors are used in compliance with the specifications and conditions given in Annex B.

The performances given in this European Technical Assessment are based on an assumed working life of the anchor of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Performance of the product

3.1.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance to tension load and shear load (static and quasi static loading), displacements	See Annex C1 to C7
Characteristic resistance for seismic performance category C1	See Annex C8
Characteristic resistance for seismic performance category C2	See Annex C9

3.1.2 Hygiene, health and the environment (BWR 3)

No performance assessed.

3.2 Methods used for the assessment

The assessment of the product has been made in accordance with the EAD 330499-01-0601 „Bonded fasteners for use in concrete”.

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to Decision 96/582/EC of the European Commission the system 1 of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) applies.

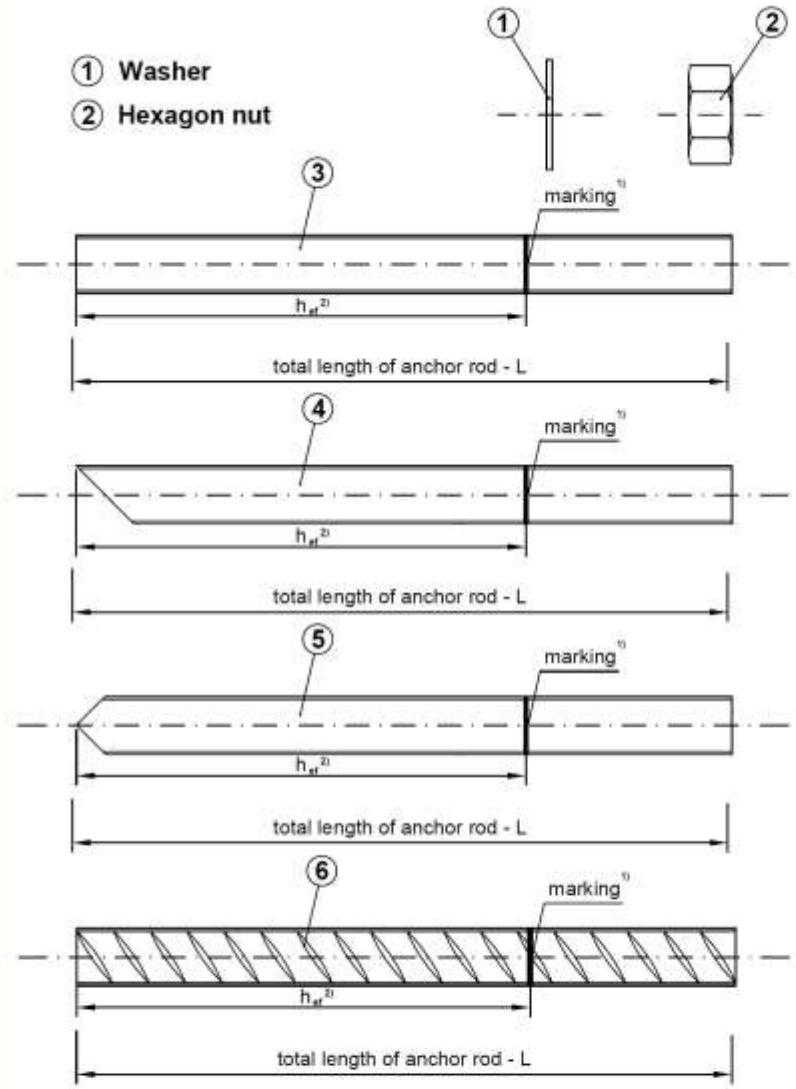
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document (EAD)

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Instytut Techniki Budowlanej.

For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 17/05/2019 by Instytut Techniki Budowlanej

Krzysztof Kuczński, PhD
Deputy Director of ITB



③ Version 1 - rod with flat end with marking on h_{ef}
④ Version 2 - rod with 45° cutted end with marking on h_{ef}
⑤ Version 3 - rod with V shape end with marking on h_{ef}
⑥ Rebar - Deformed reinforcing bar with marking on h_{ef}

1) Marking according to clause 1.1 of EAD 330499-01-0601
2) Effective anchorage depth according to Table B1 and B2 (Annex B2 and B3)

BOSSONG BCR V PLUS, **BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T**	**Annex A1** of European Technical Assessment ETA-09/0140
Product description Steel elements	

Table A1: Threaded rods

Designation	Material				
Steel, zinc plated **electroplated ≥ 5 µm acc. to EN ISO 4042** **hot-dip galvanized ≥ 40 µm acc. to EN ISO 1461**					
Threaded rod	**Property class**	**Characteristic steel ultimate strength**	**Characteristic steel yield strength**	**Fracture elongation**	
	4.8	f_{uk} ≥ 400 N/mm^2	f_{yk} ≥ 320 N/mm^2	A_5 > 8%[1)]	EN ISO 898-1
	5.8	f_{uk} ≥ 500 N/mm^2	f_{yk} ≥ 400 N/mm^2	A_5 > 8%[1)]	
	8.8	f_{uk} ≥ 800 N/mm^2	f_{yk} ≥ 640 N/mm^2	A_5 ≥ 12%[1)]	
	10.9	f_{uk} ≥ 1000 N/mm^2	f_{yk} ≥ 900 N/mm^2	A_5 > 9%[1)]	
Hexagon nut	4	for class 4.8 rods			EN 898-2
	5	for class 5.8 rods			
	8	for class 8.8 rods			
	10	for class 10.9 rods			
Washer	Steel, according to EN ISO 7089; corresponding to anchor rod material				
Stainless steel A2	**(Materials) 1.4301, 1.4307, 1.4567, 1.4541**				
Stainless steel A4	**(Materials) 1.4401, 1.4404, 1.4571, 1.4362,1.4578**				
High corrosion resistance stainless steel (HCR)	**(Materials) 1.4529, 1.4565**				
Threaded rod	**Property class**	**Characteristic steel ultimate strength**	**Characteristic steel yield strength**	**Fracture elongation**	
	50	f_{uk} ≥ 500 N/mm^2	f_{yk} ≥ 210 N/mm^2	A_5 > 8%[1)]	EN 10088 EN ISO 3506
	70	f_{uk} ≥ 700 N/mm^2	f_{yk} ≥ 450 N/mm^2	A_5 ≥ 12%[1)]	
	80	f_{uk} ≥ 800 N/mm^2	f_{yk} ≥ 600 N/mm^2	A_5 ≥ 12%[1)]	
Hexagon nut	50	for class 50 rods			EN 10088 EN ISO 3506
	70	for class 70 rods			
	80	for class 80 rods			
Washer	Steel, according to EN 10088; corresponding to anchor rod material				

[1)] For seismic performance category C1 and C2, A_5 > 19%

Commercial standard threaded rods may be used, with:

- material and mechanical properties according to Table A3,
- confirmation of material and mechanical properties by inspection certificate 3.1 according to EN-10204:2004,
- marking of the threaded rod with the embedment depth.

Note: Commercial standard threaded rods made of galvanized steel with property class above 8.8 are not permitted in some Member States.

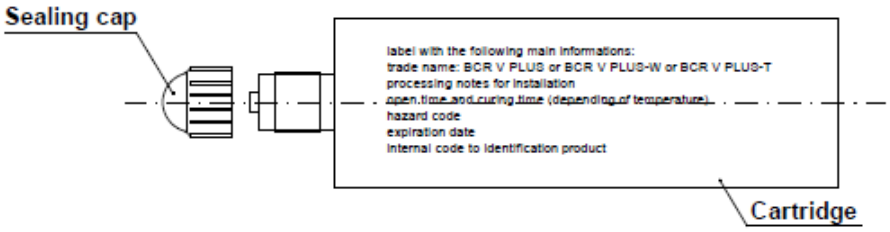
Table A2: Reinforcing bars (Rebar)

Designation	Material
Rebar according to EN 1992-1-1:2004+AC:2010	Bars and de-coiled rods Class B or C With f_{yk} and k according to EN 1992-1-1:2004+AC:2010 $f_{uk} = f_{tk} = k \times f_{yk}$ Rib height of the bar (h) in the range 0,05d ≤ h ≤ 0,07d

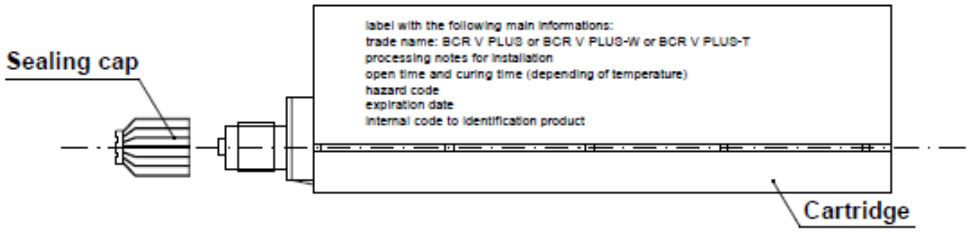
Table A3: Injection mortars

Product	Composition
BOSSONG BCR V PLUS BOSSONG BCR V PLUS-W BOSSONG BCR V PLUS-T (two component injection mortars)	Additive: quartz Bonding agent: vinyl ester resin styrene free Hardener: dibenzoyl peroxide

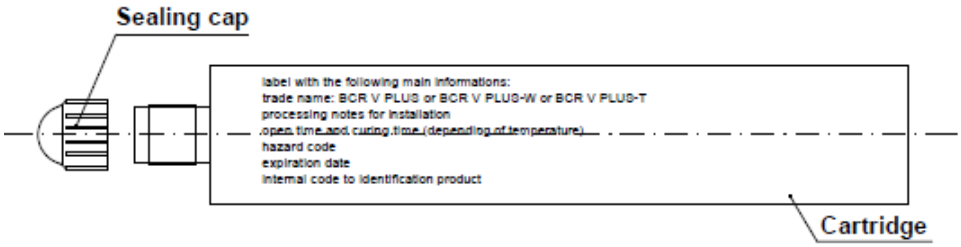
coaxial cartridge - sizes from 75 ml to 420 ml



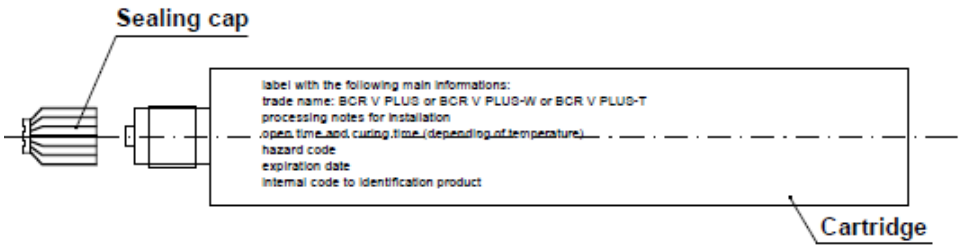
side by side cartridge - sizes from 345 ml to 825 ml



CIC foil cartridge - sizes from 165 ml to 300 ml



coaxial peeler cartridge - size of 280 ml



MIXER - the mixer is suitable for each type of cartridge

1) Variable length from 380 mm up to 1000 mm

BOSSONG BCR V PLUS, **BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T**	**Annex A4** of European Technical Assessment ETA-09/0140
Product description Cartridge types and sizes	

Specifications of intended use

Use:

The anchors are intended to be used for anchorages for which requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirement 1 (EU) 305/2011 shall be fulfilled and failure of anchorages made with these products would compromise the stability of the works, cause risk to human life and/or lead to considerable economic consequences.

Anchors subject to:

Static and quasi-static loads: sizes from M8 to M30 and from Ø8 to Ø32.

Seismic performance category C1: sizes from M12 to M20, rods with $f_{uk} \leq 800$ N/mm^2 and fracture elongation $A_5 \geq 19\%$.

Seismic performance category C2: sizes M12 and M16, rods with $f_{uk} \leq 800$ N/mm^2 and fracture elongation $A_5 \geq 19\%$.

Base material:

- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum to C50/60 at maximum according to EN 206-1206-1:2013+A1:2016.
- Non-cracked concrete: sizes from M8 to M30 and from Ø8 to Ø32.
- Cracked concrete: sizes from M10 to M20.

Temperature range:

The anchors may be used in the following temperature range:

- -40°C to +40°C (max. short term temperature +40°C and max. long term temperature +24°C).
- -40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°C).
- -40°C to +120°C (max. short term temperature +120°C and max. long term temperature +72°C).

Use conditions (environmental conditions):

- X1: Structures subject to dry internal conditions: Elements made of galvanized steel (zinc plated or hot dip galvanized) and stainless steel A2, A4 or high corrosion resistance steel (HCR).
- X2: Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist: Elements made of stainless steel A4 or high corrosion resistance steel (HCR).
- X3: Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if other particular aggressive conditions exist. Such particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used): Elements made of high corrosion resistant steel (HCR).

Installation:

- Dry or wet concrete (use category I1): sizes from M8 to M30 and from Ø8 to Ø32.
- Flooded holes with the exception of seawater (use category I2): sizes from M8 to M30 and from Ø8 to Ø32.
- Installation direction D3 (downward and horizontal and upwards installation): sizes from M8 to M30 and from Ø8 to Ø32.
- The anchors are suitable for hammer drilled holes (HD), for hollow drill bit (HDB) and for compressed air drill (CA): sizes from M8 to M30 and from Ø8 to Ø32.

Design methods:

- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e. g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Anchorages under static or quasi-static loads are designed in accordance to EN 1992-4:2018 and Technical Report TR 055.
- Anchorages under seismic actions are designed in accordance to EN 1992-4:2018 and Technical Report TR 045.

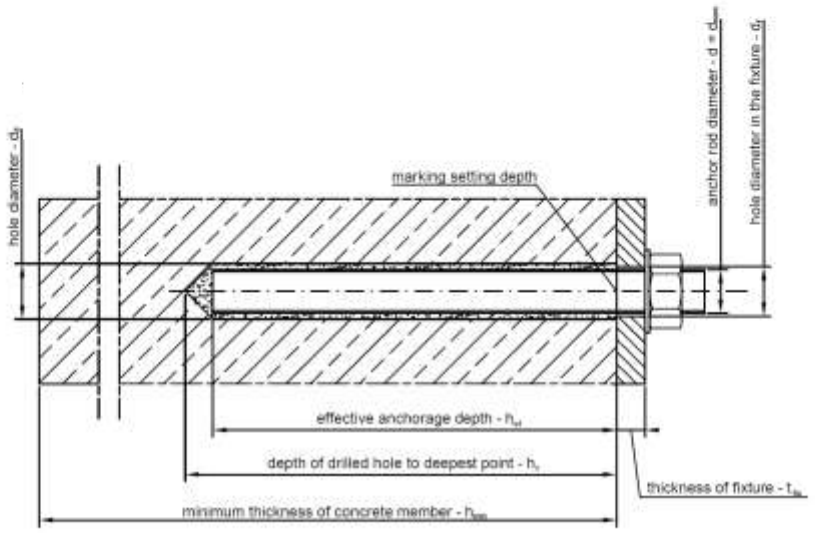


Table B1: Installation data for threaded rods

Size		**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Nominal drilling diameter	d_0 [mm]	10	12	14	18	24	28	30	35
Maximum diameter hole in the fixture	d_{fix} [mm]	9	12	14	18	22	26	30	33
Effective embedment depth	$h_{ef,min}$ [mm]	60	70	80	100	120	145	145	145
	$h_{ef,max}$ [mm]	160	200	240	320	400	480	540	600
Depth of the drilling hole	h_1 [mm]	h_{ef} + 5 mm							
Minimum thickness of the concrete slab	h_{min} [mm]	h_{ef} + 30 mm; ≥ 100 mm				$h_{ef} + 2d_0$			
Maximum setting torque moment	T_{fix} [N·m]	10	20	40	80	130	200	250	280
Thickness to be fixed	$t_{fix,min}$ [mm]	> 0							
	$t_{fix,max}$ [mm]	< 1500							
Minimum spacing	s_{min} [mm]	40	50	60	75	100	115	120	140
Minimum edge distance	c_{min} [mm]	40	50	60	75	100	115	120	140

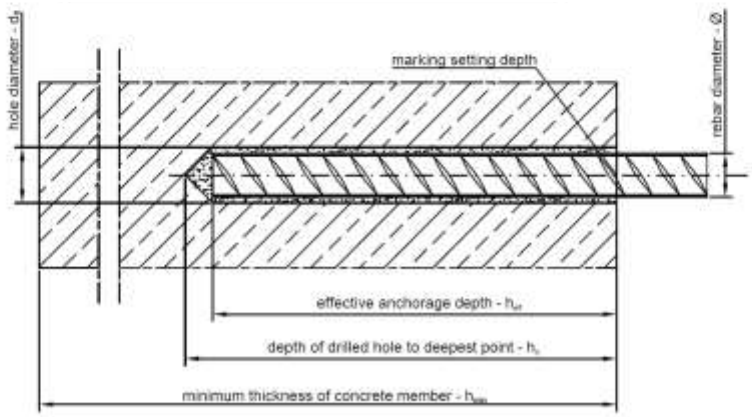


Table B2: Installation data for rebars

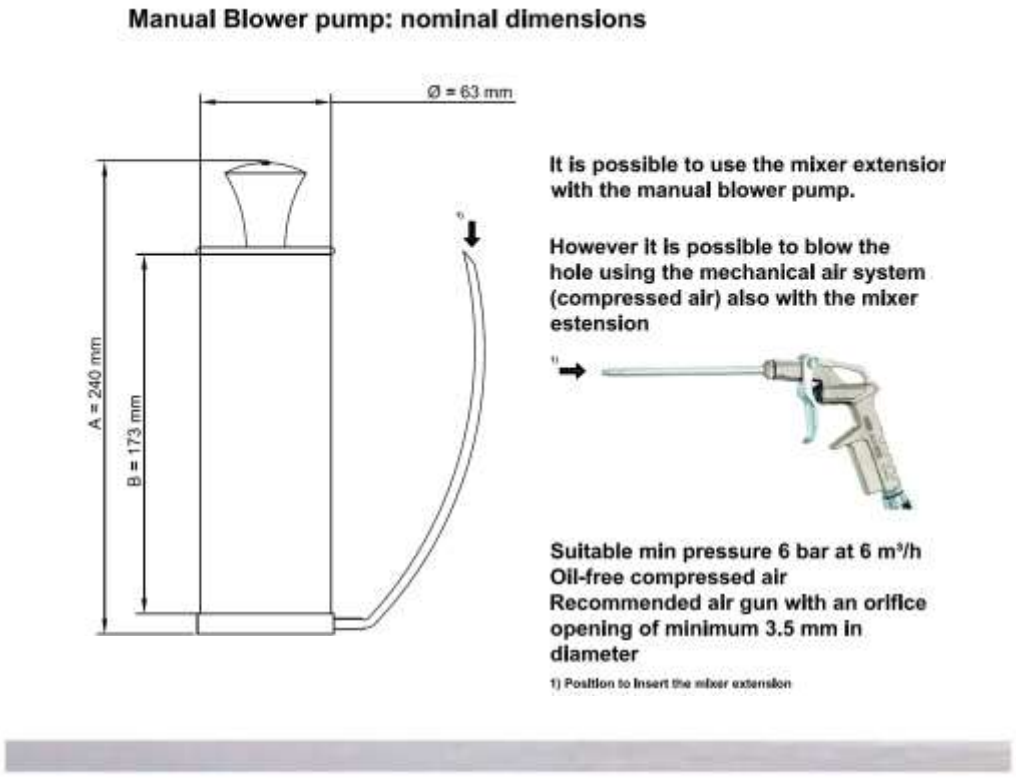
Size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**
Nominal drilling diameter	d_0 [mm]	10[1)] 12[1)]	12[1)] 14[1)]	14[1)] 16[1)]	18	20	25	30	35	40
Effective embedment depth	$h_{ef,min}$ [mm]	60	70	80	80	100	120	150	180	200
	$h_{ef,max}$ [mm]	160	200	240	280	320	400	500	560	640
Depth of the drilling hole	h_1 [mm]	h_{ef} + 5 mm								
Minimum thickness of the concrete slab	h_{min} [mm]	h_{ef} + 30 mm; ≥ 100 mm		$h_{ef} + 2d_0$						
Minimum spacing	s_{min} [mm]	50	60	65	75	80	100	120	140	160
Minimum edge distance	c_{min} [mm]	50	60	65	75	80	100	120	140	160

[1)] Each of two given values can be used

Table B3: Maximum processing time and minimum curing time

BOSSONG BCR V PLUS (standard version)		
Concrete temperature [C°]	**Processing time [min.]**	**Minimum curing time[1)] [min.]**
-10	105	1440
-5	65	840
0	45	420
+5	25	90
+10	16	60
+15	11,5	45
+20	7,5	40
+25	5	35
+30	3	30
+35	2	25
+40	1	20
BOSSONG BCR V PLUS-W (version for winter season)		
Concrete temperature [C°]	**Processing time [min.]**	**Minimum curing time[1)] [min.]**
-20	120	2880
-15	90	1500
-10	60	900
-5	40	315
0	25	100
+5	15	70
+10	10	50
+15	7	35
+20	5	30
BOSSONG BCR V PLUS-T (version for summer season)		
Concrete temperature [C°]	**Processing time [min.]**	**Minimum curing time[1)] [min.]**
+20	14	60
+25	11	50
+30	8	40
+35	6	30
+40	4	20

[1)] The minimum time from the end of the mixing to the time when the anchor may be torque or loaded (whichever is longer). Cartridge temperature from +5°C to +30°C. Minimum cartridge temperature of +15°C for application where the concrete temperature is below 0°C.
For wet condition and flooded holes the curing time must be double.



Mixer extension (from 380 mm to 1000 mm) with nominal diameter 8 or 10 mm

BOSSONG BCR V PLUS, **BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T**	**Annex B5** of European Technical Assessment ETA-09/0140
Intended use Cleaning tools (1)	

Table B4: Standard brush diameter for threaded rods

Threaded rod diameter		M8	M10	M12	M16	M20	M24	M27	M30
d_0	Nominal drill hole [mm]	10	12	14	18	24	28	30	35
d_b	Brush diameter [mm]	12	14	16	20	26	30	35	37

Table B5: Standard brush diameter for rebar

Rebar diameter		Ø8		Ø10		Ø12		Ø14
d_0	Nominal drill hole [mm]	10[1)]	12[1)]	12[1)]	14[1)]	14[1)]	16[1)]	18
d_b	Brush diameter [mm]	12	14	14	16	16	18	20

[1)] Each of two given values can be used

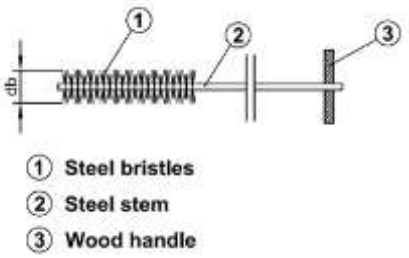
Table B6: Special brush diameter (mechanical brush) for threaded rods

Threaded rod diameter		M16	M20	M24	M27	M30
d_0	Nominal drill hole [mm]	18	24	28	30	35
d_b	Brush diameter [mm]	20	26	30	32	37

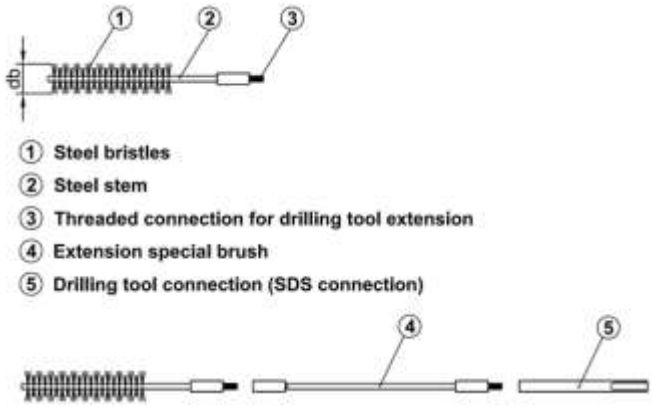
Table B7: Special brush diameter (mechanical brush) for rebar

Threaded rod diameter		Ø8		Ø10		Ø12		Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
d_0	Nominal drill hole [mm]	10[1)]	12[1)]	12[1)]	14[1)]	14[1)]	16[1)]	18	20	25	30	35	40
d_b	Brush diameter [mm]	12	14	14	16	16	18	20	22	27	32	37	42

[1)] Each of two given values can be used



Standard brush



Special (mechanical) brush

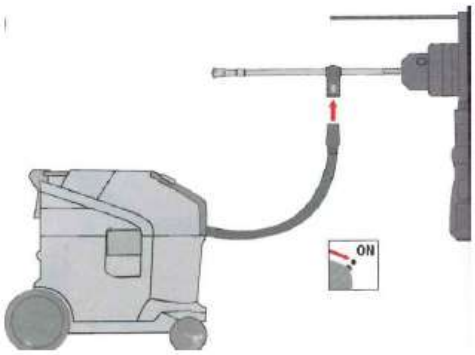
BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T	**Annex B6** of European Technical Assessment ETA-09/0140
Intended use Cleaning tools (2)	

Hollow Drill Bit (HDB)

This drilling method is a hammer drilling method.

This drilling system removes the dust and cleans the bore hole during the drilling operation when used in accordance with the user's manual.

This drilling system include a vacuum cleaner. A suitable dust extraction system must be used.
e.g. Bosch GAS 35 M AFC or a comparable dust extraction system with equivalent performance data.



Switch-on the vacuum cleaner before to drill

Table B8: HDB perforation diameter for threaded rods

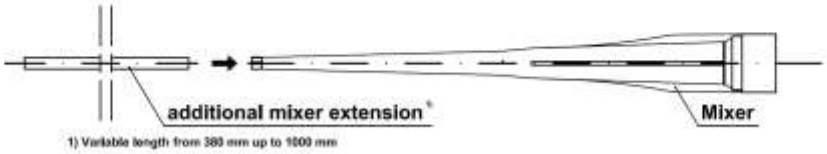
Threaded rod diameter		M8	M10	M12	M16	M20	M24	M27	M30
d_0	Nominal drill hole [mm]	10	12	14	18	24	28	30	35

Table B9: HDB perforation diameter for rebar

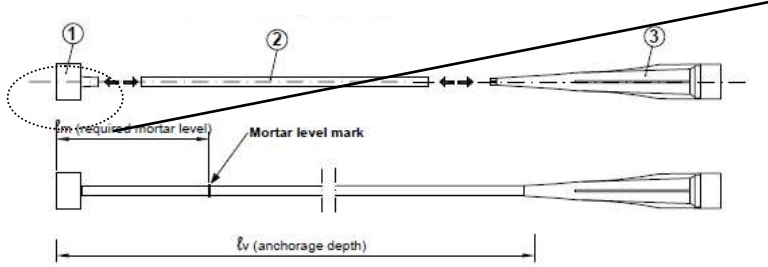
Rebar diameter		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28
d_0	Nominal drill hole [mm]	10[1)] 12[1)]	12[1)] 14[1)]	14[1)] 16[1)]	18	20	25	30	35

[1)] Each of two given values can be used

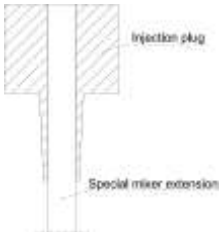
Use the mixer extension (assembled on the standard mixer) for the injection up to 300 mm if necessary.



Use this system for special conditions.



Insert the special mixer extension in the inner diameter of the injection plug up to reach the top of the plug



① Injection plug (nominal diameter according to the nominal diameter of drilled hole)

② Special mixer extension (variable length with external diameter 10 mm)

Mark the required mortar level ℓ_m and embedment depth ℓ_v with tape or marker on the injection extension. Quick estimation: $\ell_m = 1/3 \cdot \ell_v$
Continue injection until the mortar level mark ℓ_m becomes visible.

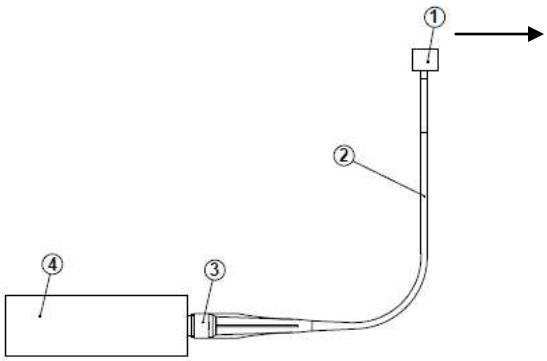
③ Mixer (suitable for all size of cartridge)

These tools allow the application in special conditions:
- installation with anchorage depth greater than 300 mm;
- overhead installation.

For these applications it is recommanded the use of pneumatic or battery dispenser.

System assembled

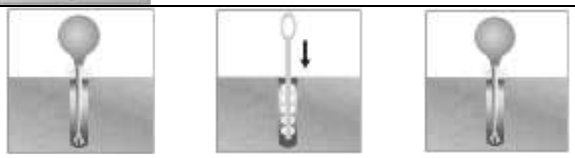
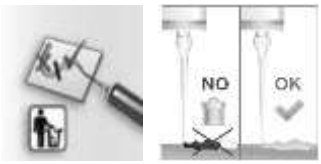
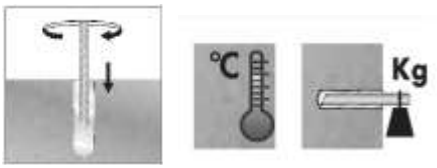
① Injection plug
② Special mixer extension
③ Mixer
④ Cartridge
⑤ Sample of dispenser



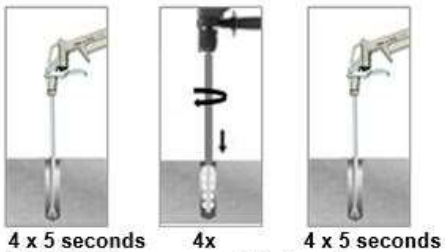
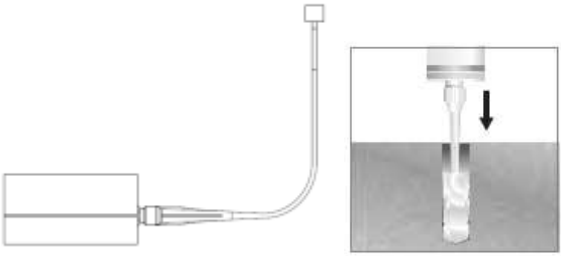
BOSSONG BCR V PLUS, **BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T**	**Annex B8** of European Technical Assessment ETA-09/0140
Intended use Tools for installation (1)	

Table B10: Mortar injection pumps

Pumps (injection dispensers)	Cartridges	Types
Manual	420 ml 400 ml 380 ml	Manual (up to 300 mm anchorage depth)
Manual	345 ml 300 ml 280 ml 165 ml	Manual (up to 300 mm anchorage depth)
Manual	300 ml 280 ml 165 ml	Manual (up to 300 mm anchorage depth)
Pneumatic	825 ml	Pneumatic (up to 640 mm anchorage depth)
Pneumatic	420 ml 400 ml 380 ml	Pneumatic (up to 640 mm anchorage depth)
Battery	420 ml 400 ml 380 ml 345 ml 300 ml	Battery (up to 640 mm anchorage depth)

1		Drill the hole with the correct diameter and depth using a rotary percussive machine. Check the perpendicularity of the hole during the drilling operation. **In case of use of hollow drill bit (Annex B7) proceed directly to the clause 3.**
2	 **4x blower manual pump** **4x standard brush** **4x blower manual pump** **if necessary use a mixer extension for the blower operation (see Annex B5)**	Clean the hole from drilling dust: the hole shall be cleaned by at least 4 blowing operations, by at least 4 brushing operations followed again by at least 4 blowing operations; before brushing clean the brush and check (see Annex B6, standard brush) if the brush diameter is sufficient. For the blower tools see Annex B5.
3		For coaxial, peeler and side by side cartridges unscrew the front cup, screw on the mixer and insert the cartridge into the gun. For CIC sizes, unscrew the front cup, pull-out the steel closing clip according to the following operation: 1) Insert the mixer in the eye of the plastic extractor; 2) Pull the extractor to unhook the steel closing clip of the foil. In the version without the extractor cut the foil pack. After that screw on the mixer and insert the cartridge in the gun.
4		Before starting to use the cartridge, eject a first part of the product, being sure that the two components are completely mixed. The complete mixing is reached only after that the product, obtained by mixing the two components, comes out from the mixer with a uniform colour.
5	 **if necessary, use a mixer extension for the injection (see Annex B8)**	Fill the drilled hole uniformly starting from the drilled hole bottom, in order to avoid entrapment of the air; remove the mixer slowly bit by bit during pressing-out; filling the drill hole with a quantity of the injection mortar corresponding to 2/3 of the drill hole depth.
6	 **ATTENTION: Steel elements dry and free oil and other contaminants**	Insert immediately the steel element (threaded rod or rebar), marked according to the proper anchorage depth, slowly and with a slight twisting motion, removing excess of injection mortar around the steel element. Observe the processing time according Annex B4. Wait the curing time according Annex B4.

BOSSONG BCR V PLUS, **BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T**	**Annex B10** of European Technical Assessment ETA-09/0140
Intended use Installation instruction up to 300 mm depth	

1	**See clause 1 Annex B10.** In case of use of hollow drill bit (HDB) proceed directly to the clause 3.	
2		Clean the hole from drilling dust: the hole shall be cleaned by at least 4 blowing operations (5 seconds for single operation) with compressed air, by at least 4 brushing operations with special brush followed again by at least 4 blowing operations (5 seconds for single operation) with compressed air. Before brushing clean the brush and check if the brush diameter is sufficient.
3	**See clause 3 Annex B10**	
4	**See clause 4 Annex B10**	
5		Before starting the injection, assemble the system according to Annex B8. After that, fill the drilled hole uniformly from the drilled hole bottom, in order to avoid entrapment of the air; remove the special mixer extension with injection plug slowly bit by bit during pressing-out; filling the drill hole with a quantity of the injection mortar corresponding to 2/3 of the drill hole depth. Procedure for overhead installation are detailed in Annex B12.
6	**See clause 6 Annex B10**	

BOSSONG BCR V PLUS, **BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T**	**Annex B11** of European Technical Assessment ETA-09/0140
Intended use Installation instruction up to 640 mm depth	

Overhead installation procedure

In addition to standard procedure, for overhead installation, following the below procedure

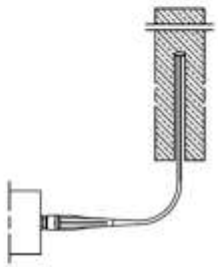
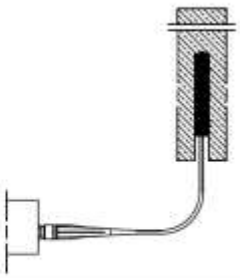
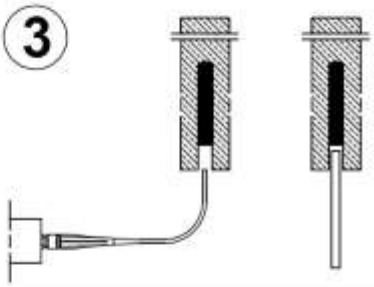
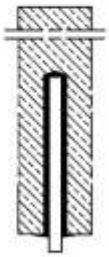
1 	**1 - Start injection** Inject from the bottom of the hole. Use battery or pneumatic dispenser if the anchorage depth is grater than 200 mm.
2 	**2 - Injection phase** Inject the product about 2/3 of the hole depth. Remove the mixer extension slowly bit by bit during pressing-out.
3 	**3 - End injection** Remove the mixer extension. Insert immediately the steel element (turn the steel element during the insertion).
4 	**4 - End installation** To avoid the slipping of the steel element during the open time of the product (due to the steel element own weigth) use a temporary interlocking element (for ex. wedge of wood)

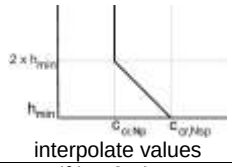
Table C1: Characteristic values for steel tension resistance and steel shear resistance – threaded rods.

Size			M8	M10	M12	M16	M20	M24	M27	M30
Steel failure – characteristic tension resistance										
Steel class 4.8	$N_{Rk,s}$	[kN]	15	23	34	63	98	141	183	224
Steel class 5.8	$N_{Rk,s}$	[kN]	18	29	42	78	122	176	229	280
Steel class 8.8	$N_{Rk,s}$	[kN]	29	46	67	126	196	282	367	449
Steel class 10.9	$N_{Rk,s}$	[kN]	37	58	84	157	245	353	459	561
Stainless steel A2, A4, HCR class 50	$N_{Rk,s}$	[kN]	18	29	42	78	122	176	229	280
Stainless steel A2, A4, HCR class 70	$N_{Rk,s}$	[kN]	26	41	59	110	171	247	321	392
Stainless steel A4, HCR class 80	$N_{Rk,s}$	[kN]	29	46	67	126	196	282	367	449
Steel failure – characteristic tension resistance – partial factor										
Steel class 4.8	$\gamma_{Ms,N}$ [1)]	[-]	1,50							
Steel class 5.8	$\gamma_{Ms,N}$ [1)]	[-]	1,50							
Steel class 8.8	$\gamma_{Ms,N}$ [1)]	[-]	1,50							
Steel class 10.9	$\gamma_{Ms,N}$ [1)]	[-]	1,40							
Stainless steel A2, A4, HCR class 50	$\gamma_{Ms,N}$ [1)]	[-]	2,86							
Stainless steel A2, A4, HCR class 70	$\gamma_{Ms,N}$ [1)]	[-]	1,87							
Stainless steel A4, HCR class 80	$\gamma_{Ms,N}$ [1)]	[-]	1,60							
Steel failure – characteristic shear resistance without lever arm										
Steel class 4.8	$V^0_{Rk,s}$	[kN]	7	12	17	31	49	71	92	112
Steel class 5.8	$V^0_{Rk,s}$	[kN]	9	14	21	39	61	88	115	140
Steel class 8.8	$V^0_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224
Steel class 10.9	$V^0_{Rk,s}$	[kN]	18	29	42	78	122	176	230	280
Stainless steel A2, A4, HCR class 50	$V^0_{Rk,s}$	[kN]	9	14	21	39	61	88	115	140
Stainless steel A2, A4, HCR class 70	$V^0_{Rk,s}$	[kN]	13	20	29	55	86	124	160	196
Stainless steel A4, HCR class 80	$V^0_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224
Steel failure – characteristic shear resistance with lever arm										
Steel class 4.8	$M^0_{Rk,s}$	[Nm]	15	30	52	133	260	449	666	900
Steel class 5.8	$M^0_{Rk,s}$	[Nm]	19	37	65	166	324	561	832	1125
Steel class 8.8	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519	898	1331	1799
Steel class 10.9	$M^0_{Rk,s}$	[Nm]	37	75	131	333	649	1123	1664	2249
Stainless steel A2, A4, HCR class 50	$M^0_{Rk,s}$	[Nm]	19	37	66	166	324	561	832	1124
Stainless steel A2, A4, HCR class 70	$M^0_{Rk,s}$	[Nm]	26	52	92	233	454	786	1165	1574
Stainless steel A4, HCR class 80	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519	898	1331	1799
Steel failure – characteristic shear resistance – partial factor										
Steel class 4.8	$\gamma_{Ms,V}$ [1)]	[-]	1,25							
Steel class 5.8	$\gamma_{Ms,V}$ [1)]	[-]	1,25							
Steel class 8.8	$\gamma_{Ms,V}$ [1)]	[-]	1,25							
Steel class 10.9	$\gamma_{Ms,V}$ [1)]	[-]	1,50							
Stainless steel A2, A4, HCR class 50	$\gamma_{Ms,V}$ [1)]	[-]	2,38							
Stainless steel A2, A4, HCR class 70	$\gamma_{Ms,V}$ [1)]	[-]	1,56							
Stainless steel A4, HCR class 80	$\gamma_{Ms,V}$ [1)]	[-]	1,33							

Fracture elongation threaded rod for seismic category C1 and C2 must be $A_5 \geq 19\%$.
Steel classes 10.9 are not covered for seismic application.

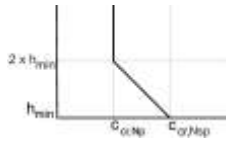
[1)] In the absence of national regulation

Table C2: Characteristic values tension resistance load in non-cracked concrete for threaded rod under static and quasi-static loads

Size			M8	M10	M12	M16	M20	M24	M27	M30
Steel failure										
Characteristic resistance	$N_{Rk,s}$	[kN]	See Annex C1 – Table C1							
Partial factor	$\gamma_{Ms,N}$ [1)]	[-]	See Annex C1 – Table C1							
Combined pull-out and concrete cone failure in non-cracked concrete C20/25										
Characteristic bond resistance temperature range -40°C / +40°C	$\tau_{Rk,ucr}$	[N/mm²]	16,0	12,0	12,0	12,0	9,5	9,5	8,0	8,0
Characteristic bond resistance temperature range -40°C / +80°C	$\tau_{Rk,ucr}$	[N/mm²]	11,0	8,5	8,5	8,5	7,0	7,0	6,0	6,0
Characteristic bond resistance temperature range -40°C / +120°C	$\tau_{Rk,ucr}$	[N/mm²]	6,0	4,5	4,5	4,5	4,0	4,0	3,0	3,0
Increasing factor for C30/37	ψ_c	[-]	1,12							
Increasing factor for C40/50			1,23							
Increasing factor for C50/60			1,30							
Concrete cone failure										
Factor for non-cracked concrete	$k_{ucr,N}$	[-]	11,0							
Edge distance	$C_{cr,N}$	[mm]	1,5 h_{ef}							
Spacing	$S_{cr,N}$	[mm]	3,0 h_{ef}							
Splitting failure										
Edge distance	$C_{cr,Nsp}$	[mm]	If $h = h_{min}$							
			$2{,}5 \cdot h_{ef}$		$2{,}0 \cdot h_{ef}$		$1{,}5 \cdot h_{ef}$			
			If $h_{min} < h < 2 \cdot h_{min}$							
			 interpolate values							
			if $h \geq 2 \cdot h_{min}$							
			$C_{cr,Np}$							
Spacing	$S_{cr,Nsp}$	[mm]	$2 \cdot C_{cr,sp}$							
Installation factor for combined pull-out, concrete cone and splitting failure										
Installation factors for category I1[1)]	γ_{inst}	[-]	1,0							
Installation factors for category I2[1)]			1,2							

[1)] In the absence of national regulation

Table C3: Characteristic values tension resistance load in cracked concrete for threaded rod under static and quasi-static loads

Size			M10	M12	M16	M20
Steel failure						
Characteristic resistance	$N_{Rk,s}$	[kN]	See Annex C1 – Table C1			
Partial factor	$\gamma_{Ms,N}$ [1)]	[-]	See Annex C1 – Table C1			
Combined pull-out and concrete cone failure in cracked concrete C20/25						
Characteristic bond resistance temperature range -40°C / +40°C	$\tau_{Rk,cr}$	[N/mm²]	9,0	9,0	9,0	6,5
Characteristic bond resistance temperature range -40°C / +80°C	$\tau_{Rk,cr}$	[N/mm²]	6,5	6,5	6,5	4,5
Characteristic bond resistance temperature range -40°C / +120°C	$\tau_{Rk,cr}$	[N/mm²]	3,5	3,5	3,5	2,5
Increasing factor for C30/37	ψ_c	[-]	1,12			
Increasing factor for C40/50			1,23			
Increasing factor for C50/60			1,30			
Concrete cone failure						
Factor for cracked concrete	$k_{cr,N}$	[-]	7,7			
Edge distance	$C_{cr,N}$	[mm]	1,5 h_{ef}			
Spacing	$S_{cr,N}$	[mm]	3,0 h_{ef}			
Splitting failure						
Edge distance	$C_{cr,Nsp}$	[mm]	If $h = h_{min}$			
			$2{,}5 \cdot h_{ef}$	$2{,}0 \cdot h_{ef}$		$1{,}5 \cdot h_{ef}$
			If $h_{min} < h < 2 \cdot h_{min}$			
			 interpolate values			
			if $h \geq 2 \cdot h_{min}$			
			$C_{cr,Np}$			
Spacing	$S_{cr,Nsp}$	[mm]	$2 \cdot C_{cr,sp}$			
Installation factor for combined pull-out, concrete cone and splitting failure						
Installation factors for category I1 [1)]	γ_{inst}	[-]	1,0			
Installation factors for category I2 [1)]			1,2			

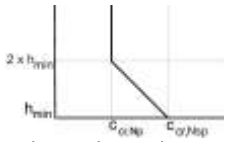
[1)] In the absence of other national regulation

Table C4: Characteristic values shear resistance load – non-cracked and cracked concrete for threaded rod under static and quasi-static loads.

Size			M8	M10	M12	M16	M20	M24	M27	M30
Steel failure without lever arm										
Characteristic resistance	$V^0_{Rk,s}$	[kN]	See Annex C1 – Table C1							
Partial factor	$\gamma_{Ms,V}$ [1)]	[-]	See Annex C1 – Table C1							
Ductility factor	k_7	[-]	1,0							
Steel failure with lever arm										
Characteristic resistance	$M^0_{Rk,s}$	[kN]	See Annex C1 – Table C1							
Partial factor	$\gamma_{Ms,V}$ [1)]	[-]	See Annex C1 – Table C1							
Concrete pry out failure										
Factor	k_8	[-]	2,0							
Installation factor	γ_{inst}	[-]	1,0							
Concrete edge failure										
Effective length of anchor under shear loading	l_f	[-]	$l_f = h_{ef}$ and $\leq 12\ d_{nom}$						$l_f = h_{ef}$ and $\leq$ max (8 $d_{nom;}$, 300 mm)	
Installation factor	γ_{inst}	[-]	1,0							

[1)] In the absence of other national regulation

Table C5: Characteristic values tension resistance load in non-cracked concrete for rebar under static and quasi-static loads.

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Steel failure											
Characteristic resistance	$N_{Rk,s}$	[kN]	A_s x f_{uk} [2)]								
Cross section area	A_s	[mm²]	50	79	113	154	201	314	491	616	804
Partial factor	$\gamma_{Ms,N}$ [1)]	[-]	1,4								
Combined pull-out and concrete cone failure in non cracked concrete C20/25											
Characteristic bond resistance temperature range -40°C / +40°C	$\tau_{Rk,ucr}$	[N/mm²]	14,0	13,0	13,0	12,0	10,0	9,5	9,5	8,5	7,5
Characteristic bond resistance temperature range -40°C / +80°C	$\tau_{Rk,ucr}$	[N/mm²]	10,0	9,5	9,0	9,0	7,5	7,0	7,0	6,0	5,5
Characteristic bond resistance temperature range -40°C / +120°C	$\tau_{Rk,ucr}$	[N/mm²]	5,5	5,0	5,0	5,0	4,0	4,0	4,0	3,5	3,0
Increasing factor for C30/37	ψ_c	[-]	1,12								
Increasing factor for C40/50	ψ_c	[-]	1,23								
Increasing factor for C50/60	ψ_c	[-]	1,30								
Concrete cone failure											
Factor for non-cracked concrete	$k_{ucr,N}$	[-]	11,0								
Edge distance	$C_{cr,N}$	[mm]	1,5 h_{ef}								
Spacing	$S_{cr,N}$	[mm]	3,0 h_{ef}								
Splitting failure											
Edge distance	$C_{cr,Nsp}$	[mm]	If $h = h_{min}$								
			2,5 · h_{ef}		2,0 · h_{ef}			1,5 · h_{ef}			
			If $h_{min} < h < 2 \cdot h_{min}$								
			 interpolate values								
			if $h \geq 2 \cdot h_{min}$								
			$C_{cr,Np}$								
Spacing	$S_{cr,Nsp}$	[mm]	2 · $C_{cr,sp}$								
Installation factor for combined pull-out, concrete cone and splitting failure											
Installation factors for category I1[1)]	γ_{inst}	[-]	1,0								
Installation factors for category I2[1)]	γ_{inst}	[-]	1,2								

[1)] In the absence of other national regulation

[2)] f_{uk} shall be taken from the specifications of reinforcing bars

Table C6: Characteristic values shear resistance load – non-cracked concrete for rebar under static and quasi-static loads.

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Steel failure without lever arm											
Characteristic resistance	$V^0_{Rk,s}$	[kN]	0,5 x A_s x f_{uk} [2)]								
Partial factor	$\gamma_{Ms,V}$ [1)]	[-]	1,5								
Cross section area	A_s	[mm²]	50	79	113	154	201	314	491	616	804
Ductility factor	k_7	[-]	1,0								
Steel failure with lever arm											
Characteristic resistance	$M^0_{Rk,s}$	[kN]	1,2 x W_{el} x f_{uk} [2)]								
Elastic section modulus	W_{el}	[mm³]	50	98	170	269	402	785	1534	2155	3217
Partial factor	$\gamma_{Ms,V}$ [1)]	[-]	1,5								
Concrete pry out failure											
Factor	k_8	[-]	2,0								
Installation factor	γ_{inst}	[-]	1,0								
Concrete edge failure											
Effective length of anchor under shear loading	l_f	[-]	$l_f = h_{ef}$ and $\leq 12\ d_{nom}$						$l_f = h_{ef}$ and $\leq$ max (8 d_{nom}; 300 mm)		
Installation factor	γ_{inst}	[-]	1,0								

[1)] In the absence of other national regulation

[2)] f_{uk} shall be taken from the specifications of reinforcing bars

Table C7. Displacement under tension loads for non-cracked concrete – threaded rods under static and quasi-static loads.

Size			M8	M10	M12	M16	M20	M24	M27	M30
Characteristic displacement in non-cracked concrete C20/25 to C50/60 under tension loads										
Service load [1)]	F	[kN]	9,6	10,8	14,3	23,8	29,6	42,4	40,4	44,4
Displacement	δ_{N0}	[mm]	0,30	0,30	0,35	0,35	0,35	0,40	0,40	0,45
	$\delta_{N\infty}$	[mm]	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85

Table C8: Displacement under tension loads for non-cracked concrete – threaded rods under static and quasi-static loads.

Size			M10	M12	M16	M20
Characteristic displacement in cracked concrete C20/25 to C50/60 under tension loads						
Service load [1)]	F	[kN]	9,5	14,3	21,4	23,8
Displacement	δ_{N0}	[mm]	0,50	0,50	0,70	0,60
	$\delta_{N\infty}$	[mm]	0,85	0,85	0,85	0,85

Table C9: Displacement under shear loads for non-cracked and cracked concrete – threaded rods under static and quasi-static loads.

Size			M8	M10	M12	M16	M20	M24	M27	M30
Characteristic displacement in cracked and non-cracked concrete C20/25 to C50/60 under shear loads										
Service load [1)]	F	[kN]	3,7	5,8	8,4	15,7	24,5	35,3	45,5	55,6
Displacement	δ_{V0}	[mm]	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0
	$\delta_{V\infty}$	[mm]	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0

Table C10: Displacement under tension loads for non-cracked concrete – rebar under static and quasi-static loads.

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Characteristic displacement in non-cracked concrete C20/25 to C50/60 under tension loads											
Service load [1)]	F	[kN]	10,1	13,6	17,2	20,1	23,9	41,2	53,3	64,1	67,3
Displacement	δ_{N0}	[mm]	0,33	0,33	0,40	0,41	0,42	0,45	0,45	0,47	0,48
	$\delta_{N\infty}$	[mm]	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85

Table C11: Displacement under shear loads for non-cracked concrete – rebar under static and quasi-static loads.

Size			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Characteristic displacement in non-cracked concrete C20/25 to C50/60 under shear loads											
Service load [1)]	F	[kN]	13,2	20,6	29,6	40,3	52,7	82,3	128,6	161,3	210,6
Displacement	δ_{V0}	[mm]	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0
	$\delta_{V\infty}$	[mm]	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0

[1)] These values are suitable for each temperature range and categories specified in Annex B1

Table C12: Characteristic values tension resistance load for threaded rod for seismic performance category C1.

Size			M12	M16	M20
Steel failure					
Characteristic resistance	$N_{Rk,s,eq,C1}$	[kN]	1,0 x $N_{Rk,s}$		
Partial factor [1)]	$\gamma_{Ms,N}$ [1)]	[-]	See Annex C1 – Table C1		
Combined pull-out and concrete cone failure					
Characteristic bond resistance temperature range -40°C / +40°C	$\tau_{Rk,C1}$	[N/mm²]	4,2	3,7	3,7
Characteristic bond resistance temperature range -40°C / +80°C	$\tau_{Rk,C1}$	[N/mm²]	3,0	2,7	2,7
Characteristic bond resistance temperature range -40°C / +120°C	$\tau_{Rk,C1}$	[N/mm²]	1,6	1,4	1,4
Increasing factor for C30/37	ψ_c	[-]	1,0		
Increasing factor for C40/50					
Increasing factor for C50/60					
Installation factors for category I1[1)]	γ_{inst}	[-]	1,0		
Installation factors for category I2[1)]			1,2		

[1)] In the absence of other national regulation

Table C13: Characteristic values shear resistance load for threaded rod for seismic performance category C1.

Size			M12	M16	M20
Steel failure					
Characteristic resistance	$V_{Rk,s,eq,C1}$	[kN]	0,7 x $V^0_{Rk,s}$		
Partial factor [1)]	$\gamma_{Ms,V}$ [1)]	[-]	See Annex C1 – Table C1		

[1)] In the absence of other national regulation

Table C14: Reduction factor for annular gap.

Reduction factor for annular gap			
Without annular gap filling	α_{gap}	[-]	0,5
With annular gap filling	α_{gap}	[-]	1,0

Table C15: Characteristic values tension resistance load for threaded rod for seismic performance category C2.

Size			M12	M16
Steel failure				
Characteristic resistance	$N_{Rk,s,eq,C2}$	[kN]	1,0 x $N_{Rk,s}$	
Partial factor [1)]	$\gamma_{Ms,N}$ [1)]	[-]	See Annex C1 – Table C1	
Combined pull-out and concrete cone failure				
Characteristic bond resistance temperature range -40°C / +40°C	$\tau_{Rk,eq,C2}$	[N/mm²]	1,6	1,7
Characteristic bond resistance temperature range -40°C / +80°C	$\tau_{Rk,eq,C2}$	[N/mm²]	1,2	1,2
Characteristic bond resistance temperature range -40°C / +120°C	$\tau_{Rk,eq,C2}$	[N/mm²]	0,6	0,7
Increasing factor for C30/37	ψ_c	[-]	1,0	
Increasing factor for C40/50				
Increasing factor for C50/60				
Installation factors for category I1[1)]	γ_{inst}	[-]	1,0	
Installation factors for category I2[1)]			1,2	

[1)] In the absence of other national regulation

Table C16: Characteristic values shear resistance load for threaded rod for seismic performance category C2.

Size			M12	M16
Steel failure				
Characteristic shear resistance	$V_{Rk,s,eq,C2}$	[kN]	0,53 x $V^0_{Rk,s}$	0,46 x $V^0_{Rk,s}$
Partial factor [1)]	$\gamma_{Ms,V}$ [1)]	[-]	See Annex C1 – Table C1	

[1)] In the absence of other national regulation

Table C17: Reduction factor for annular gap.

Reduction factor for annular gap			
Without annular gap filling	α_{gap}	[-]	0,5
With annular gap filling	α_{gap}	[-]	1,0

Table C18: Displacements for tensile and shear load for seismic performance category C2 - threaded rod.

Size			M12	M16
Displacements for tensile and shear load for seismic performance category C2				
Displacement in tensile at damage limitation states	$\delta_{N,eq,seis\ (DLS)}$	[mm]	0,20	0,23
Displacement in tensile at ultimate limit state	$\delta_{N,eq,seis\ (ULS)}$	[mm]	0,33	1,04
Displacement in shear at damage limitation states	$\delta_{V,eq,seis\ (DLS)}$	[mm]	2,01	0,70
Displacement in shear at ultimate limit state	$\delta_{V,eq,seis\ (ULS)}$	[mm]	4,68	2,12

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European Technical Assessment

ETA-09/0246 of 20/05/2019

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	Injection system BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T for rebar connections
Product family to which the construction product belongs	Post-installed rebar connections with BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T injection mortar
Manufacturer	BOSSONG S.p.A. Via Enrico Fermi, 49/51, IT-24050 Grassobbio (Bg), Italy www.bossong.com
Manufacturing plant	BOSSONG S.p.A. Via Enrico Fermi, 49/51, IT-24050 Grassobbio (Bg), Italy
This European Technical Assessment contains	23 pages including 3 Annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	EAD 331522-00-0601 „Post-installed rebar with mortar under seismic action”
This version replaces	ETA-09/0246 issued on 06/03/2014

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Specific Part

1 Technical description of the product

The subject of this assessment are the post-installed connections, by anchoring or overlap connection joint of steel reinforcing bars (rebar) in existing structures made of normal weight concrete, using injection mortars BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T in accordance with the regulations for reinforced concrete construction.

Reinforcing bars made of steel with diameter from 8 to 32 mm and BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W or BOSSONG BCR V PLUS-T injection mortars are used for the post-installed rebar connections. The steel element is placed into a drilled hole previously filled with an injection mortar and is anchored by the bond between embedded element, injection mortar and concrete.

An illustration and the description of the products are given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

The performances given in clause 3 are only valid if the post-installed connections are used in the compliance with the specifications and conditions given in Annex B.

The performances given in this European Technical Assessment are based on an assumed working life of the anchor of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or the Technical Assessment Body, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Performance of the product

3.1.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance under static and quasi static loading	See Annex C1
Characteristic resistance under seismic loading	See Annex C2

3.1.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Resistance to fire	See Annex C3

3.2 Methods used for the assessment

The assessment of the post-installed rebar connections has been made has been made in accordance with EAD 331522-00-0601 „Post-installed rebar with mortar under seismic action".

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to Decision 96/582/EC of the European Commission the system 1 of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) applies.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document (EAD)

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Instytut Techniki Budowlanej.

For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary initial type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 20/05/2019 by Instytut Techniki Budowlanej

Anna Panek, MSc
Deputy Director of ITB

Examples of post-installed rebar connections

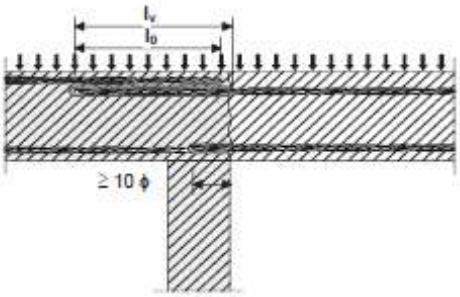


Figure 1.1 Overlap joint for rebar connections of slabs and beams

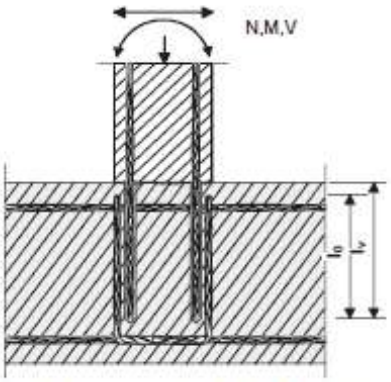


Figure 1.2 Overlap joint at a foundation of a column or wall where the rebar is stressed in tension

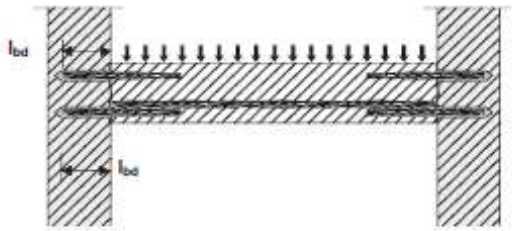


Figure 1.3 End anchoring of slabs or beams, designed as simply supported

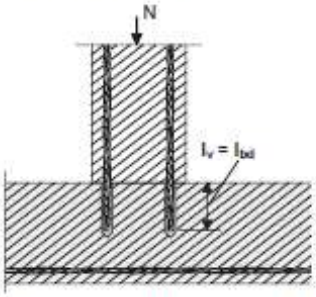
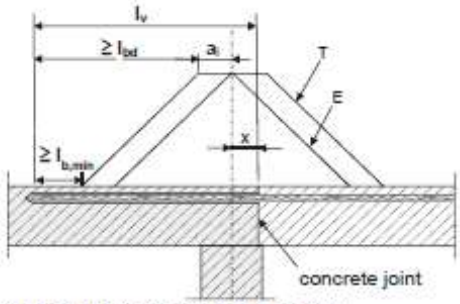


Figure 1.4 rebar connection for components stressed primarily in compression; rebar is stressed in compression



(only post-installed rebar is plotted)

Key to Figure 1.5

T acting tensile force

E envelope of $M_{ed}/z + N_{ed}$ (see EN 1992-1-1, Figure 9.2)

x distance between the theoretical point of support and concrete joint

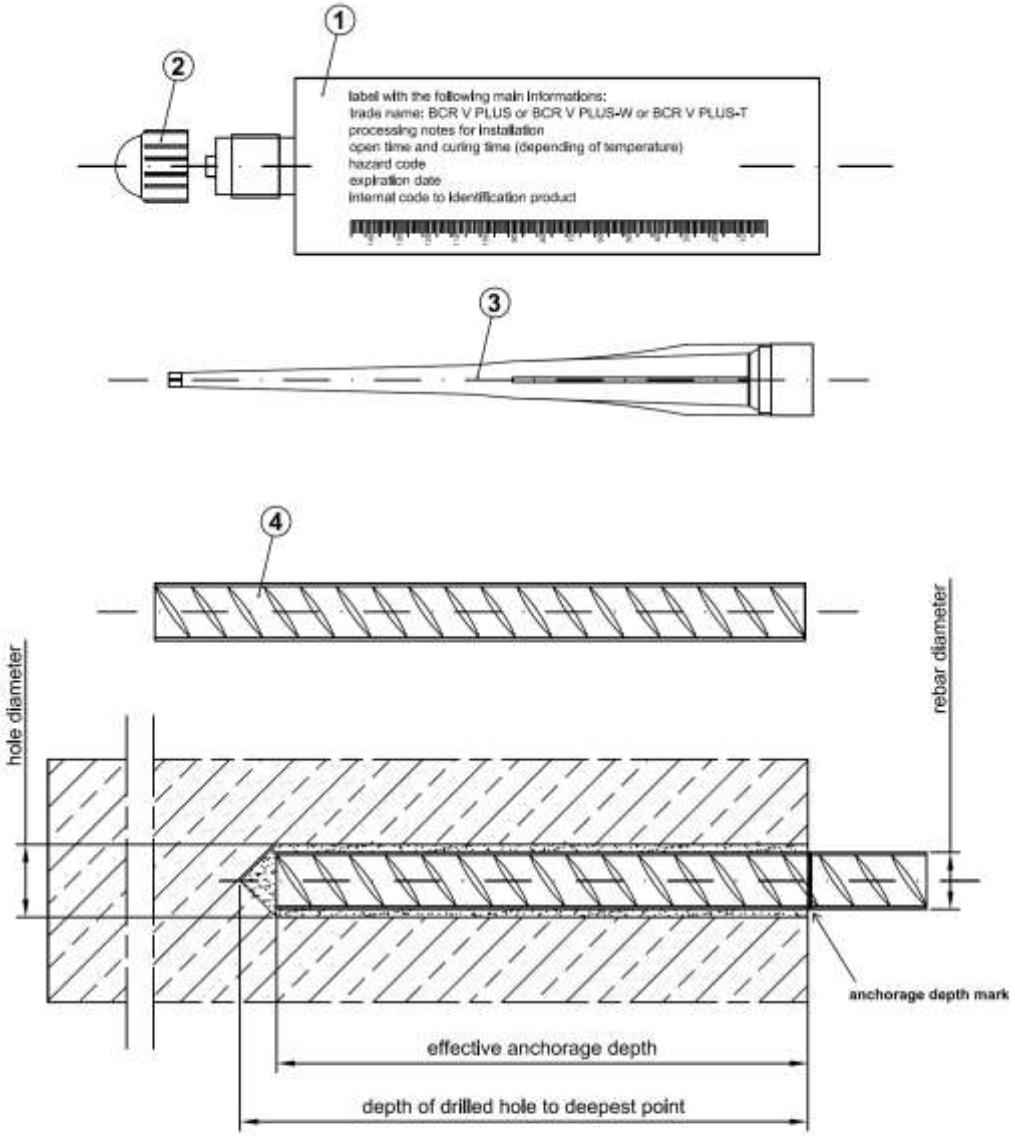
Note to Figure 1.1 to 1.5:

In the Figures no transverse reinforcement is plotted, the transverse reinforcement as required by EN 1992-1-1 shall be present.

The shear transfer between old and new concrete shall be designed according to EN 1992-1-1.

Figure 1.5 Anchoring of reinforcement to cover the line of acting tensile force

Injection system BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T for rebar connections	**Annex A1** of European Technical Assessment ETA-09/0246
Product description Application examples of post-installed rebar	



① **Cartridge**
② **Sealing cap**
③ **Mixer**
④ **Rebar - Reinforced bar**

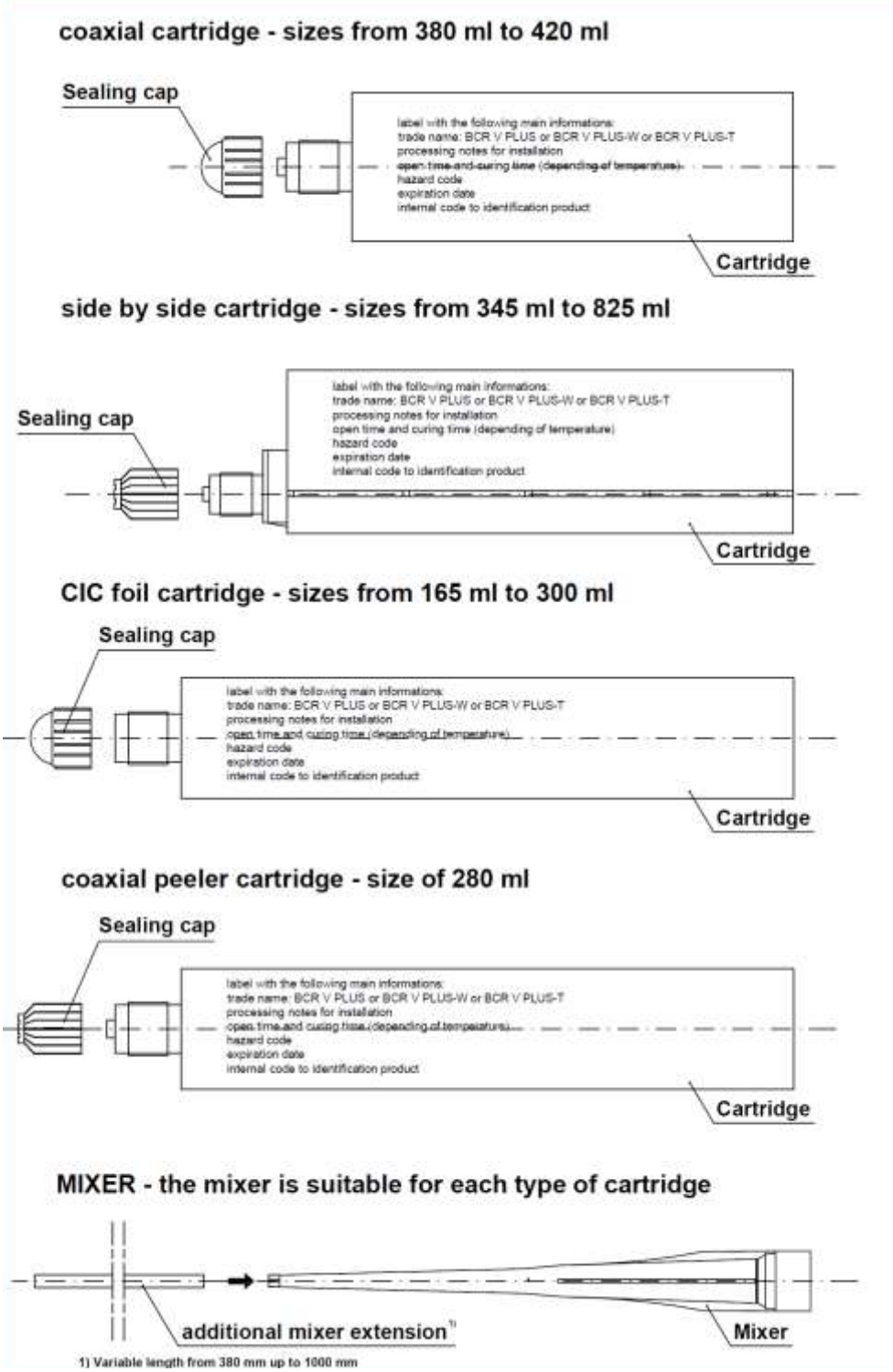
Injection system BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T for rebar connections	**Annex A2** of European Technical Assessment ETA-09/0246
Product description Injection system	

Table A1: Reinforcing bars (Rebar)

Designation	Material
Rebar according to EN 1992-1-1:2004+AC:2010	Bars and de-coiled rods Class B or C With f_{yk} and k according to EN 1992-1-1:2004+AC:2010 $f_{uk} = f_{tk} = k \times f_{yk}$ The rib height h: h ≤ 0,07 Ø

Table A2: Injection mortars

Product	Composition
BOSSONG BCR V PLUS BOSSONG BCR V PLUS-W BOSSONG BCR V PLUS-T (two component injection mortars)	Additive: quartz Bonding agent: vinyl ester resin styrene free Hardener: dibenzoyl peroxide



Injection system BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T for rebar connections	**Annex A4** of European Technical Assessment ETA-09/0246
Product description Cartridge types	

SPECIFICATION OF INTENDED USE

Anchorages subject to:

Static and quasi-static load: from Ø8 to Ø32 mm
Seismic load: from Ø12 to Ø32 mm
Fire exposure: from Ø8 to Ø32 mm

Base material:

- Reinforced or unreinforced normal weight concrete of strength class C12/15 at minimum to C50/60 at maximum according to EN 206-1:2013+A1:2016 for static and quasi-static load and for fire exposure.
- Reinforced or unreinforced normal weight concrete of strength class C16/20 at minimum to C50/60 at maximum according to EN 206-1:2013+A1:2016 for seismic load.
- Maximum chloride content of 0,40% (Cl 0,40) related to the cement content according to EN 206-1:2013+A1:2016.
- Non-carbonated concrete.
  Note: In case of a carbonated surface of the existing concrete structure the carbonate layer shall be removed in the area of the post-installed rebar connection with a diameter of d_s + 60 mm prior to the installation of the new rebar. The depth of concrete to be removed shall correspond to at least the minimum concrete cover according to EN 1992-1-1:2004+AC:2010.
  The above may be neglected if building components are new and not carbonated and if building components are in dry conditions.

Temperature range:

The products may be used in the following temperature range:

- -40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°C).

Temperature of the base material according to Annex B4.

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking into account of the forces to be transmitted.
- Design according to EN 1992-1-1:2004+AC:2010 for static and quasi-static condition (see also Annex B2).
- Design according to EN 1998-1:2004+AC:2009 for seismic condition (see also Annex B2).
- The actual position of the reinforcement in the existing structure shall be determined on the basis of the construction documentation and taken into account when designing.

Installation:

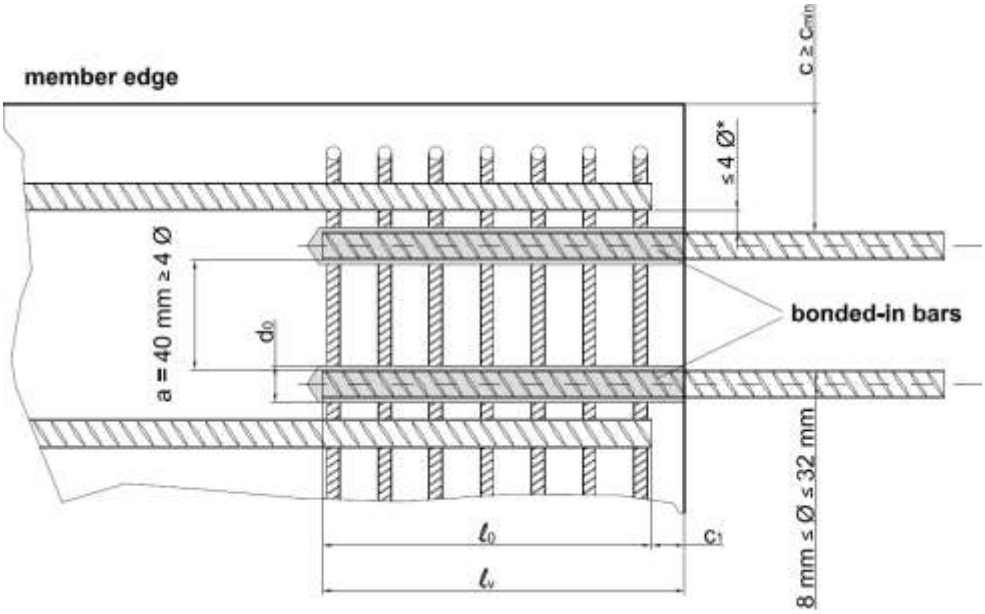
- Dry or wet concrete.
- It must not be installed in flooded holes.
- Overhead installation is permissible.
- Hole drilling by hammer drill (HD), hollow drill bit (HDB) or compressed air drill (CA).
- Installation of the post-installed rebar shall be done only by suitable trained installer and under supervision on the site.
- Check the position of the existing rebar (if the position of existing rebar in not known it shall be determined using a rebar detector suitable for this purpose as well as on the basis of the construction documentation and then marked on the building component for the overlap joint).

General design rules of construction for post-installed rebar

Post installed rebar may be designed for tension forces only.

The transfer of shear forces between new concrete and existing structure shall be designed additionally according to EN 1992-1-1:2004+AC:2010.

The joints for concreting must be roughened to at least such an extended that aggregate protrude.



* If the clear distance between overlapping rebar is greater than 4·Ø the overlap length shall be enlarged by the difference between the clear distance and 4·Ø.

l_0	lap length according to EN 1992-1-1:2004+AC:2010 for static and quasi-static loading or EN 1998-1:2004+AC:2009 for seismic loading.
l_v	effective embedment depth; $l_v \geq l_0 + c_1$
c	concrete cover of post-installed rebar
c_{min}	minimum concrete cover acc. to Annex B3 and EN 1992-1-1:2004+AC:2010
c_1	concrete cover at end-face of existing rebar
d_0	nominal drill bit diameter acc. to Annex B3
Ø	rebar diameter (d_s)

Injection system BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T for rebar connections	**Annex B2** of European Technical Assessment ETA-09/0246
Intended use General construction rules for post-installed rebars	

Table B1-1: Installation data for static and quasi static loading

Rebar diameter [mm]	Ø8		Ø10		Ø12		Ø14	Ø16	Ø20	Ø22	Ø25	Ø28	Ø30	Ø32
Drill bit diameter [mm]	10[1)]	12[1)]	12[1)]	14[1)]	14[1)]	16[1)]	18	20	25	26	30	35	35	40
Brush diameter [mm]	12	14	14	16	16	18	20	22	27	27	32	37	37	42
Maximum embedment depth $l_{v,\ max}$ [mm]	250	400	250	500	250	600	700	800	1000	1000	1000	1000	1000	1000

[1)] Each of two given values can be used

Table B1-2: Installation data for seismic loading

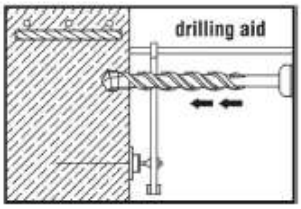
Rebar diameter [mm]	Ø12	Ø14	Ø16	Ø20	Ø22	Ø25	Ø28	Ø30	Ø32
Drill bit diameter [mm]	16	18	20	25	26	30	35	35	40
Brush diameter [mm]	18	20	22	27	27	32	37	37	42
Maximum embedment depth $l_{v,\ max}$ [mm]	600	700	800	1000	1000	1000	1000	1000	1000

Table B2: Minimum concrete cover c_{min} without drilling aid

Drilling method	Rebar diameter Ø	c_{min}
Hammer drilling (HD) Hollow drill bit (HDB)	< 25mm	30 mm + 0,06 x l_v ≥ 2ϕ
	≥ 25mm	40 mm + 0,06 x l_v ≥ 2ϕ
Compressed air drilling (CA)	< 25mm	50 mm + 0,08 x l_v
	≥ 25mm	60 mm + 0,08 x l_v ≥ 2ϕ

Table B3: Minimum concrete cover c_{min} when using a drilling aid

Drilling method	Rebar diameter Ø	c_{min}
Hammer drilling (HD) Hollow drill bit (HDB)	< 25mm	30 mm + 0,02 x l_v ≥ 2ϕ
	≥ 25mm	40 mm + 0,02 x l_v ≥ 2ϕ
Compressed air drilling (CA)	< 25mm	50 mm + 0,02 x l_v
	≥ 25mm	60 mm + 0,02 x l_v ≥ 2ϕ



Example of drilling aid

The minimum concrete cover according to 1992-1-1:2004+AC:2010 shall be observed.

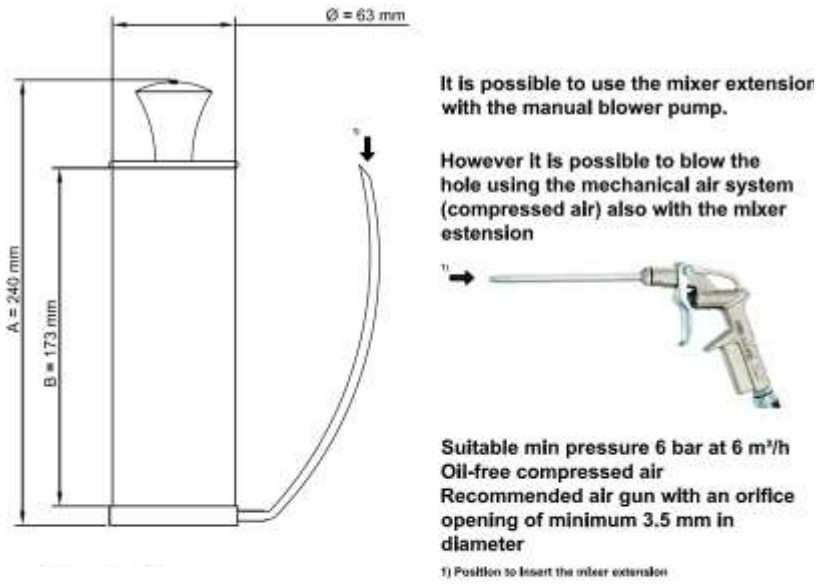
Minimum clear spacing between two post-installed rebar:
a = 40 mm ≥ 4 x Ø

Table B4: Maximum processing time and minimum curing time

BOSSONG BCR V PLUS (standard version)		
Concrete temperature [C°]	**Processing time [min.]**	**Minimum curing time[1)][min.]**
-5	65	780
0	45	420
+5	25	90
+10	16	60
+15	11,5	45
+20	7,5	40
+25	5	35
+30	3	30
+35	2	25
+40	1	20
BOSSONG BCR V PLUS-W (version for winter season)		
Concrete temperature [C°]	**Processing time [min.]**	**Minimum curing time[1)] [min.]**
-5	40	210
0	25	100
+5	15	70
+10	10	50
+15	7	35
+20	5	30
BOSSONG BCR V PLUS-T (version for summer season)		
Concrete temperature [C°]	**Processing time [min.]**	**Minimum curing time[1)] [min.]**
+20	14	60
+25	11	50
+30	8	40
+35	6	30
+40	4	20

[1)] The minimum time from the end of the mixing to the time when the rebar may be loaded. Minimum resin temperature for installation +5°C. Maximum resin temperature for installation +30°C. For wet condition the curing time must be double.

Manual Blower pump: nominal dimensions



Mixer extension (from 380 mm to 1000 mm) with nominal diameter 8 or 10 mm

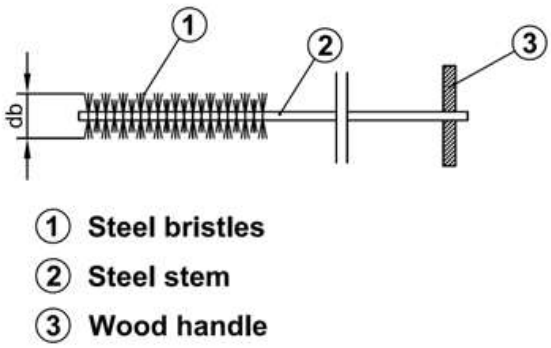
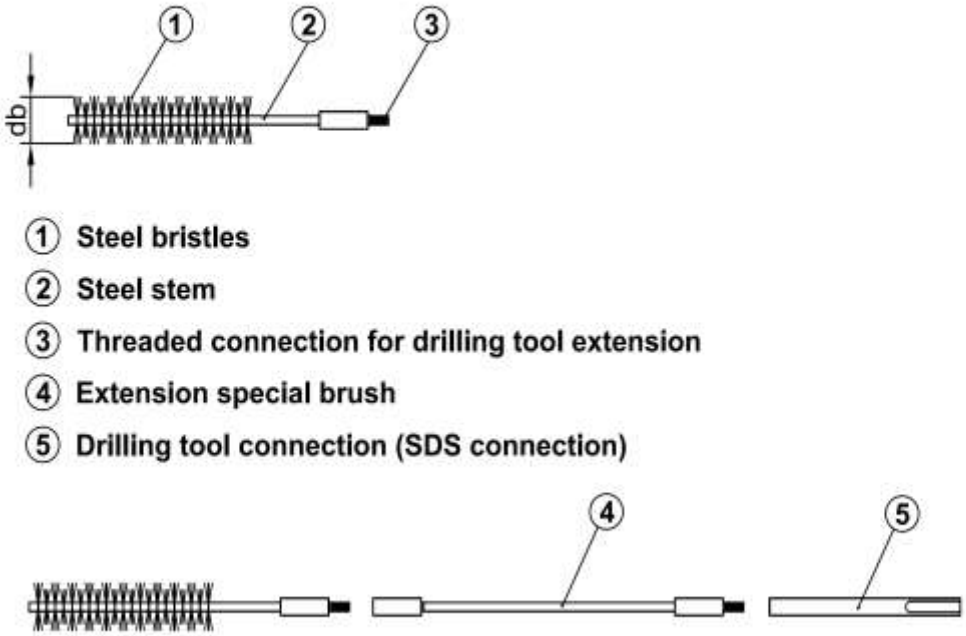


Table B5: Standard brush details (manual brush)

Rebar diameter [mm]		Ø8		Ø10		Ø12		Ø14	Ø16
d_0	Nominal drill hole [mm]	10[1)]	12[1)]	12[1)]	14[1)]	14[1)]	16[1)]	18	20
d_b	Brush diameter [mm]	12	14	14	16	16	18	20	22

[1)] Each of two given values can be used

Injection system BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T for rebar connections	**Annex B5** of European Technical Assessment ETA-09/0246
Intended use Cleaning tools (1)	



① Steel bristles
② Steel stem
③ Threaded connection for drilling tool extension
④ Extension special brush
⑤ Drilling tool connection (SDS connection)

Table B6: Special brush details (mechanical brush)

Rebar diameter [mm]		Ø8		Ø10		Ø12		Ø14	Ø16	Ø20	Ø22	Ø25	Ø28	Ø30	Ø32
d_0	Nominal drill hole [mm]	10[1)]	12[1)]	12[1)]	14[1)]	14[1)]	16[1)]	18	20	25	26	30	35	35	40
d_b	Brush diameter [mm]	12	14	14	16	16	18	20	22	27	27	32	37	37	42

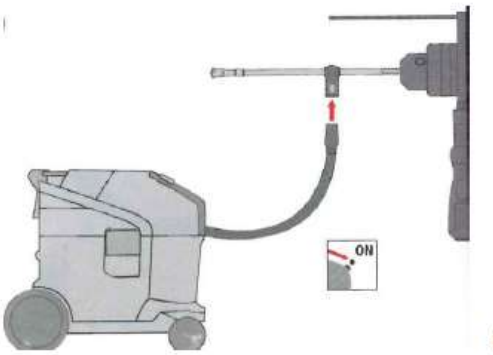
[1)] Each of two given values can be used

Installation with hollow drill bit (HDB)

This drilling method is a hammer drilling method.

This drilling system removes the dust and cleans the bore hole during the drilling operation when used in accordance with the user's manual.

This drilling system include a vacuum cleaner. A suitable dust extraction system must be used.
e.g. Bosch GAS 35 M AFC or a comparable dust extraction system with equivalent performance data.



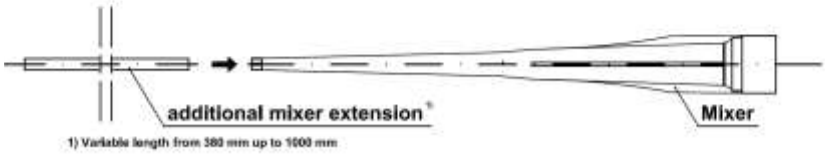
Switch-on the vacuum cleaner before to drill

Table B7: HDB installation diameters

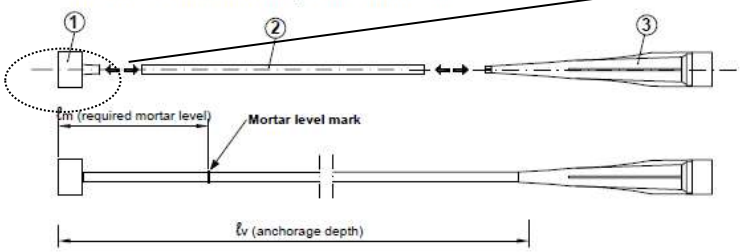
Rebar diameter [mm]		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø30
d_0	Nominal drill hole [mm]	10[1)] 12[1)]	12[1)] 14[1)]	14[1)] 16[1)]	18	20	25	30	35	35

[1)] Each of two given values can be used

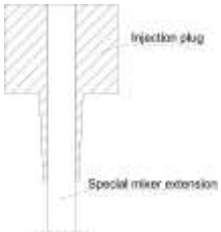
Use the mixer extension (assembled on the standard mixer) for the injection up to 300 mm if necessary.



Use this system for special conditions.



Insert the special mixer extension in the inner diameter of the injection plug up to reach the top of the plug



① Injection plug (nominal diameter according to the nominal diameter of drilled hole)

② Special mixer extension (variable length with external diameter 10 mm)

Mark the required mortar level ℓ_m and embedment depth ℓ_v with tape or marker on the injection extension. Quick estimation: $\ell_m = 1/3 \cdot \ell_v$

Continue injection until the mortar level mark ℓ_m becomes visible.

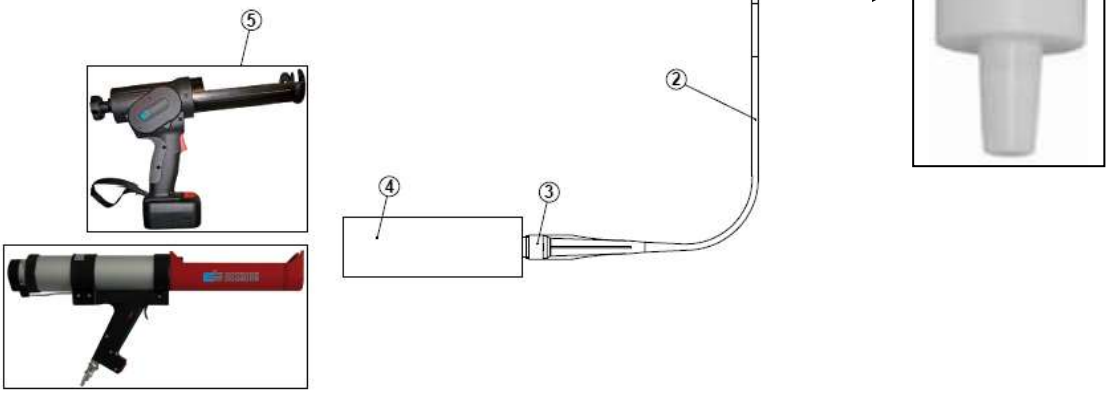
③ Mixer (suitable for all size of cartridge)

These tools allow the application in special conditions:
- installation with anchorage depth greater than 300 mm;
- overhead installation.

For these applications it is recommanded the use of pneumatic or battery dispenser.

System assembled

① Injection plug
② Special mixer extension
③ Mixer
④ Cartridge
⑤ Sample of dispenser

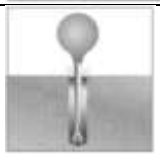
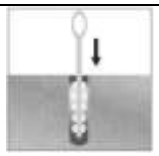
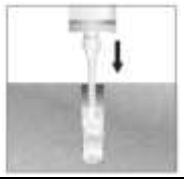
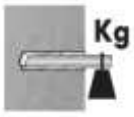


Injection system BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T for rebar connections	**Annex B8** of European Technical Assessment ETA-09/0246
Intended use Tools for installation (1)	

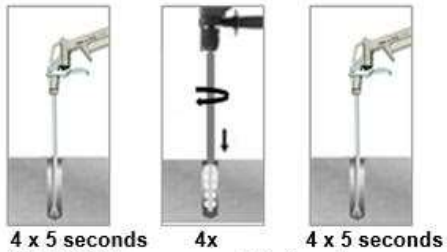
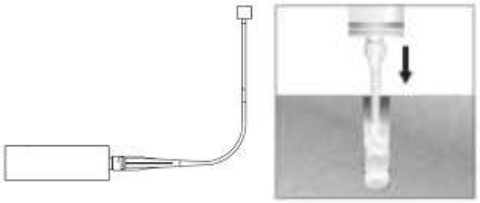
Table B8: Mortar injection pumps

Pumps (injection dispensers)	Cartridges	Clean hole tools	Depth of the drill hole
Manual	420 ml 400 ml 380 ml	Blower pump or compressed air and standard brush or special brush or HDB	to 300 mm
Manual	345 ml 300 ml 280 ml 165 ml	Blower pump or compressed air and standard brush or special brush or HDB	to 300 mm
Manual	300 ml 280 ml 165 ml	Blower pump or compressed air and standard brush or special brush or HDB	to 300 mm
Pneumatic	825 ml	Compressed air and special brush or HDB	300 mm to 1000 mm*
Pneumatic	420 ml 400 ml 380 ml	Compressed air and special brush or HDB	300 mm to 1000 mm*
Battery	420 ml 400 ml 380 ml 345 ml	Compressed air and special brush or HDB	300 mm to 1000 mm*

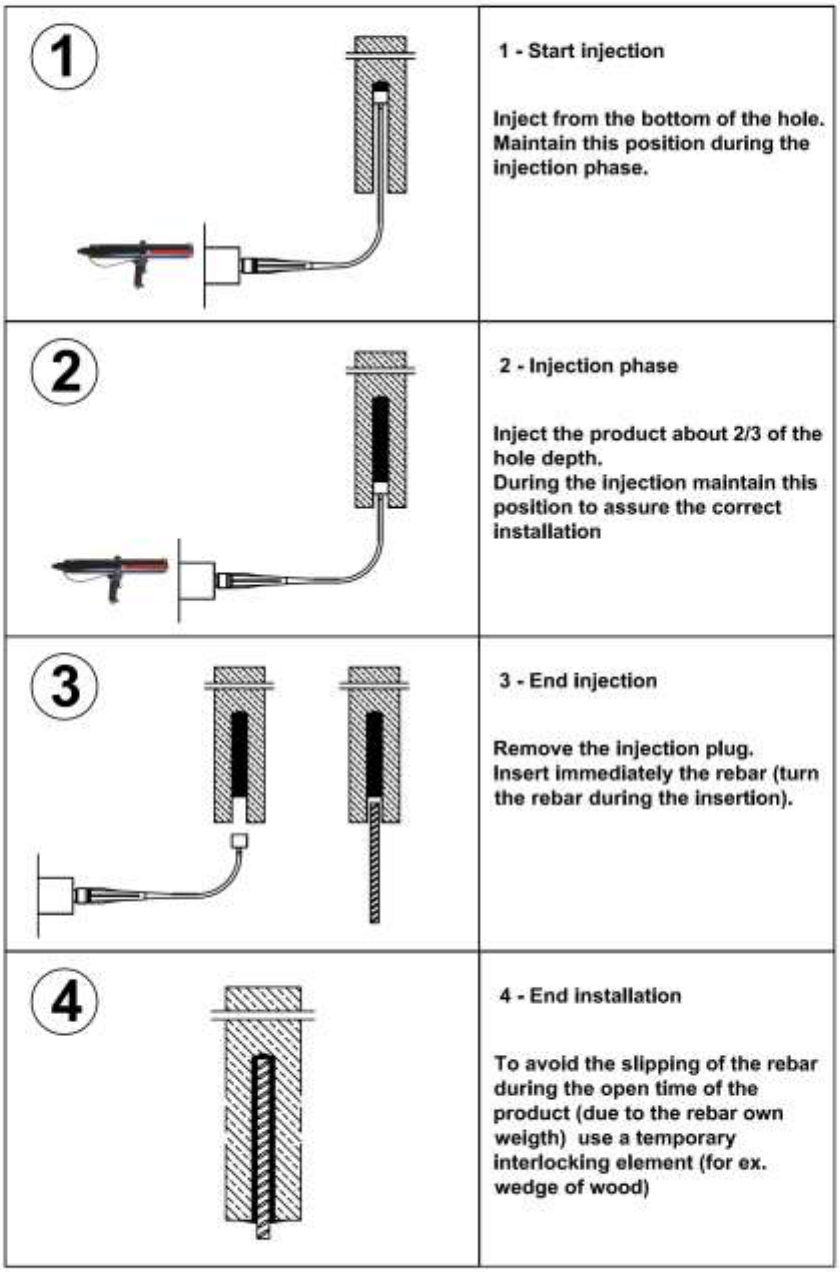
* Note: use the mixer extension described in Annex B8 for the injection of the mortar

1		Drill the hole with the correct diameter and depth using a rotary percussive machine. Check the perpendicularity of the hole during the drilling operation. **In case of use of hollow drill bit (Annex B7) proceed directly to the point 3**
2	  **4x blower manual pump** **4x standard brush** **4x blower manual pump** **if necessary use a mixer extension for the blower operation (see Annex B8)**	Clean the hole from drilling dust: the hole shall be cleaned by at least 4 blowing operations, by at least 4 brushing operations followed again by at least 4 blowing operations; before brushing clean the brush and check (see Annex B5, standard brush) if the brush diameter is sufficient. For the blower tools see Annex B5.
3	 	For coaxial, peeler and side by side cartridges unscrew the front cup, screw on the mixer and insert the cartridge into the gun. For CIC sizes, unscrew the front cup, pull-out the steel closing clip according to the following operation: 1) Insert the mixer in the eye of the plastic extractor; 2) Pull the extractor to unhook the steel closing clip of the foil. In the version without the extractor cut the foil pack. After that screw on the mixer and insert the cartridge in the gun.
4		Before starting to use the cartridge, eject a first part of the product, being sure that the two components are completely mixed. The complete mixing is reached only after that the product, obtained by mixing the two components, comes out from the mixer with a uniform colour.
5	 **if necessary, use a mixer extension for the injection (see Annex B8)**	Fill the drilled hole uniformly starting from the drilled hole bottom, in order to avoid entrapment of the air; remove the mixer slowly bit by bit during pressing-out; filling the drill hole with a quantity of the injection mortar corresponding to 2/3 of the drill hole depth.
6	 **ATTENTION** **Use rebars dry and free oil and other contaminants**	Insert immediately the rebar, marked according to the proper anchorage depth, slowly and with a slight twisting motion, removing excess of injection mortar around the rebar. Observe the processing time according Annex B4. Wait the curing time according Annex B4.

Injection system BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T for rebar connections	**Annex B10** of European Technical Assessment ETA-09/0246
Intended use Installation instruction up to 300 mm depth	

1	See point 1 Annex B10. In case of use of hollow drill bit (HDB) proceed directly to the point 3.	
2		Clean the hole from drilling dust: the hole shall be cleaned by at least 4 blowing operations (5 seconds for single operation) with compressed air, by at least 4 brushing operations with special brush followed again by at least 4 blowing operations (5 seconds for single operation) with compressed air. Before brushing clean the brush and check if the brush diameter is sufficient (see Annex B6).
3	See point 3 Annex B10	
4	See point 4 Annex B10	
5		Before starting the injection, assemble the system according to Annex B8. After that, fill the drilled hole uniformly from the drilled hole bottom, in order to avoid entrapment of the air; remove the special mixer extension with injection plug slowly bit by bit during pressing-out; filling the drill hole with a quantity of the injection mortar corresponding to 2/3 of the drill hole depth.
6	See point 6 Annex B10	

Injection system BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T for rebar connections	**Annex B11** of European Technical Assessment ETA-09/0246
Intended use Installation instruction up to 1000 mm depth	



Injection system BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T for rebar connections	**Annex B12** of European Technical Assessment ETA-09/0246
Intended use Overhead installation instruction	

Minimum anchorage length and minimum lap length under static loading

The minimum anchorage length $l_{b,min}$ and the minimum lap length $l_{0,min}$ according to EN 1992-1-1:2004+AC:2010 shall be multiplied by the relevant amplification factor α_{lb} given in Table C1.
The design bond strength $f_{bd,PIR}$ is given in Table C3. It is obtained by multiplying the bond strength f_{bd} according to EN1992-1-1:2004+AC:2010 with the factor k_b according to Table C2.

Table C1: Amplification factor α_{lb} related to the concrete class and drilling method

Concrete class	Drilling method	Bar size	Amplification factor α_{lb}
C12/15 to C50/60	Hammer drilling (HD), hollow drill bit (HDB) and compressed air drill (CA)	8 mm to 32 mm	1,0

Table C2: Bond efficiency factor k_b related to concrete class and drilling method

k_b for perforation with hammer drill (HD), hollow drill bit (HDB) and compressed air drill (CA)	Concrete class								
	C12/15	C16/20	20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Ø8 to Ø14	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Ø16 to Ø20	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,93
Ø22	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,92	0,93
Ø24 to Ø25	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,92	0,86
Ø28	1,00	1,00	1,00	1,00	1,00	1,00	0,91	0,84	0,79
Ø30 to Ø32	1,00	1,00	1,00	1,00	0,89	0,80	0,73	0,67	0,63

Table C3. Design values of the ultimate bond resistance $f_{bd,PIR}$[1)] according to EN 1992-1-1:2004+AC:2010for hammer drilling (HD), hollow drill bit (HDB) and compressed air drill (CA)

Rebar diameter [mm]	Design values of the ultimate bond resistance $f_{bd,PIR}$ [N/mm^2]								
	C12/15	C16/20	20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Ø8 to Ø14	1,60	2,00	2,30	2,70	3,00	3,40	3,70	4,00	4,30
Ø16 to Ø20	1,60	2,00	2,30	2,70	3,00	3,40	3,70	4,00	4,00
Ø22	1,60	2,00	2,30	2,70	3,00	3,40	3,70	3,70	4,00
Ø24 to Ø25	1,60	2,00	2,30	2,70	3,00	3,40	3,70	3,70	3,70
Ø28	1,60	2,00	2,30	2,70	3,00	3,40	3,40	3,40	3,40
Ø30 to Ø32	1,60	2,00	2,30	2,70	2,70	2,70	2,70	2,70	2,70

1) The values given are valid for good bond condition according to EN 1992-1-1:2004+AC:2010.
For all other bond conditions multiply the value by 0,7.

Minimum anchor length and minimum lap length under seismic loading

The minimum anchorage length $l_{b,min}$ and the minimum lap length $l_{0,min}$ according to EN 1992-1-1:2004+AC:2010 shall be multiplied by the relevant amplification factor α_{lb} given in Table C1.
The design bond strength $f_{bd,seis}$ is given in Table C5. It is obtained by multiplying the bond strength f_{bd} according to EN 1992-1-1:2004+AC:2010 with the factor $k_{b,seis}$ according to Table C4.
The minimum concrete cover according to Annex B3 and $c_{min,seis}$ = 2 Ø applies.

Table C4: Bond efficiency factor $k_{b,seis}$ related to concrete class and drilling method

$k_{b,seis}$ for perforation with hammer drill (HD), hollow drill bit (HDB) and compressed air drill (CA)	Concrete class							
	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Ø12 to Ø25	1,00	1,00	0,85	0,77	0,68	0,62	0,58	0,53
Ø28 to Ø32	1,00	0,87	0,74	0,67	0,59	0,54	0,50	0,47

Table C5: Design values of the ultimate bond resistance $f_{bd,seis}$[1)] for hammer drilling (HD), hollow drill bit (HDB) and compressed air drill (CA)

Rebar diameter [mm]	Design values of the ultimate bond resistance $f_{bd,seis}$ [N/mm²]							
	C16/20	20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Ø12 to Ø25	2,00	2,30	2,30	2,30	2,30	2,30	2,30	2,30
Ø28 to Ø32	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00

[1)] The values given are valid for good bond condition according to EN 1992-1-1:2004.
For all other bond conditions multiply the value by 0,7.

Design value of the ultimate bond stress $f_{bd,fi}$ under fire exposure for concrete classes C12/15 to C50/60, (all drilling methods):

The design value of the bond strength $f_{bd,fi}$ under fire exposure has to be calculated by the following equation:

$$f_{bd,fi}(\theta) = k_{fi}(\theta) \cdot f_{bd,PIR} \cdot \frac{\gamma_c}{\gamma_{M,fi}}$$

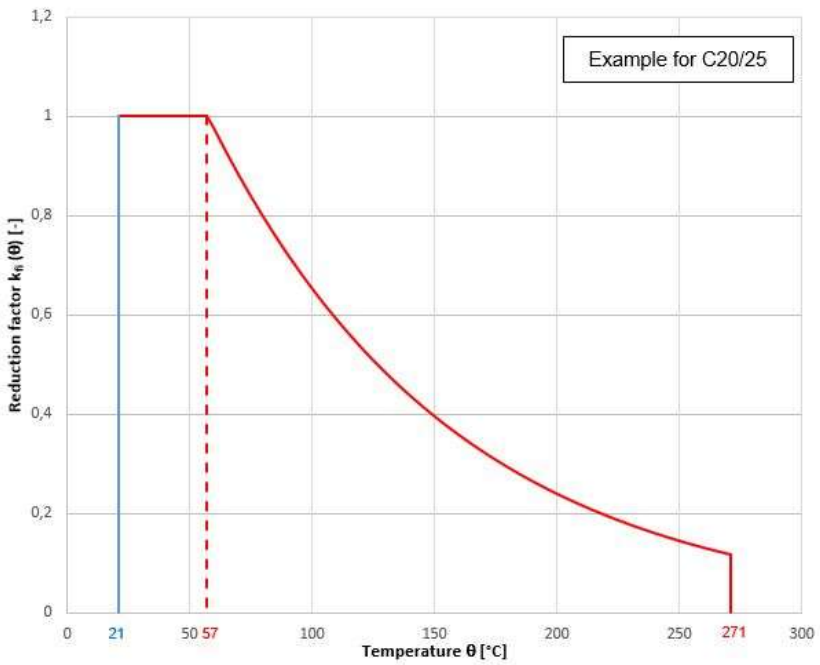
If 21°C ≤ θ ≤ 271°C: $\boldsymbol{k_{fi}(\theta) = \frac{17{,}563 \cdot e^{-0.01\theta}}{f_{bd,PIR} \cdot 4{,}3} \leq 1{,}0}$

If θ > 271°C: $k_{fi}(\theta) = 0$

$f_{bd,fi}(\theta)$ = Design value of the ultimate bond stress in case of fire exposure in N/mm²
(θ) = Temperature in °C in the mortar layer
$k_{fi}(\theta)$ = Reduction factor under fire exposure
$f_{bd,PIR}$ = Design value of the ultimate bond stress in N/mm², according to Table C3 considering the concrete class, the rebar diameter, the drilling method and the bond conditions according to EN 1992-1-1
γ_c = Partial safety factor according to EN 1992-1-1:2004+AC:2010
$\gamma_{M,fi}$ = Partial safety factor according to EN 1992-1-2:2004+AC:2008

For evidence under fire exposure the anchorage length shall be calculated according to EN 1992-1-1:2004+AC:2010, Equation 8.3 using the temperature-dependent ultimate bond stress $f_{bd,fi}$.

Figure C1: Example graph of reduction factor $k_{fi}(\theta)$ for concrete classes C20/25 for good bond conditions:



Injection system BOSSONG BCR V PLUS, BOSSONG BCR V PLUS-W and BOSSONG BCR V PLUS-T for rebar connections	**Annex C3** of European Technical Assessment ETA-09/0246
Performances Design values of bond strength $f_{bd,fi}(\theta)$ under fire exposure with temperature reduction factor $k_{fi}(\theta)$	

EK 3 – KALİTE BELGELERİ

EK 3.b – CE / DOP (Declaration Of Performance)

sistemi di fissaggio BOSSONG®
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FASTENING SYSTEMS SYSTEMES DE FIXATION BEFESTIGUNGSSYSTEME SISTEMAS DE FIJACIÒN

DICHIARAZIONE DI PRESTAZIONE
In accordo a Regolamento Prodotti da Costruzione n° 305/2011

DoP N°09/0246

1. Unique identification code of the product-type:

BCR V PLUS / BCR V PLUS-W / BCR V PLUS-T

2. Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4):

BCR + contenuto in ml + V PLUS. Esempio BCR 400 V PLUS

3. Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

Generic type and use		**Generic type and use**											
Size covered		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32
lv [mm]	**min**	according to EN 1992-1-1 and EAD330087-00-0601											
	max	250*-400	250*-500	250*-600	700	800	1000	1000	1000	1000	1000	1000	1000
		Intermediate depths are included * Valid lengths for drilling with reduced diameter											
Base material and strength class		Normal weight concrete of a minimum grade C12/15 and maximum grade C50/60 according to EN 206-1.											
Base material condition		Cracked and non-cracked concrete.											
Anchor metal material and corresponding environmental exposure		Straight reinforced bars category B or C according to Annex C of EN 199-1-1 table C1 and C2N. Exposure category from X0 to XA according to EN 206-1.											
Type of loading		Static or quasi static load and fire resistance											
Service temperature range		-40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°C).											
Use category		Dry and wet concrete, not flooded hole. Non-carbonated concrete with the allowable chloride content of 0,40% (Cl 0,40) related to the cement content according to EN 206-1. Overhead installation is allowed. Perforation with hammer drilling machine or hollow drill bit.											

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11(5):

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5. Where applicable, name and contact address of the authorized representative whose mandate covers the tasks specified in Article 12(2):

Not applicable

6. System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:
System 1

7. In case of the declaration of performance concerning a construction product covered by a harmonized standard:
Not applicable

8. In case of the declaration of performance concerning a construction product for which a European Technical Assessment has been issued:
ITB issued ETA-09/0246 on the basis of EAD 331522-00-0601. ITB (n°1488) performed: the determination of the product type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product; the initial inspection of the factory and of the factory production control; the continuous surveillance; assessment and approval of the factory production control; under system 1 and issue the certificate of conformity n° 1488-CPR-0123/W.

9. Declared performance:

HARMONIZED TECHNICAL SPECIFICATION: EAD330087-00-0601												
ESSENTIAL CHARACTERISTICS	**PERFORMANCE ACCORDING TO ETA-09/0246**											
Installation parameters	**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø22**	**Ø24**	**Ø25**	**Ø28**	**Ø30**	**Ø32**
Ø [mm]	8	10	12	14	16	20	22	24	25	28	30	32
d_0 [mm]	10**-12	12**-14	14**-16	18	20	25	26	30	30	35	35	40
a [mm]	40 mm ≥ 4·Ø											
C_{min} [mm]	30 + 0,06 l_v ≥ 2·Ø per Ø<25 mm 40 + 0,06 l_v ≥ 2·Ø per Ø≥25 mm (the minimum concrete cover according to EN 1992-1-1 must be observed)											
Setting depth	**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø22**	**Ø24**	**Ø25**	**Ø28**	**Ø30**	**Ø32**
$l_{b,min}$ [mm] under tensile	max {0,3 · $l_{b,rqd}$; 10 Ø; 100 mm}											
$l_{b,min}$ [mm] under compression	max {0,6 · $l_{b,rqd}$; 10 Ø; 100 mm}											
$l_{0,min}$ [mm]	max {0,3 α_6 $l_{b,rqd}$; 15 Ø; 200 mm}											
$l_{b,rqd}$ [mm]	according to EN 1992-1-1 point 8.4.3											
Amplification factor for concrete class C12/15 a C50/60	**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø22**	**Ø24**	**Ø25**	**Ø28**	**Ø30**	**Ø32**
α_{lb}	1,0											

Efficiency factor k_b	**C12/15**	**C16/20**	**20/25**	**C25/30**	**C30/37**	**C35/45**	**C40/50**	**C45/55**	**C50/60**
Ø8 a Ø14	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Ø16 a Ø20	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,93
Ø22	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,92	0,93
Ø24 a Ø25	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,92	0,86
Ø28	1,00	1,00	1,00	1,00	1,00	1,00	0,91	0,84	0,79
Ø30 a Ø32	1,00	1,00	1,00	1,00	0,89	0,80	0,73	0,67	0,63

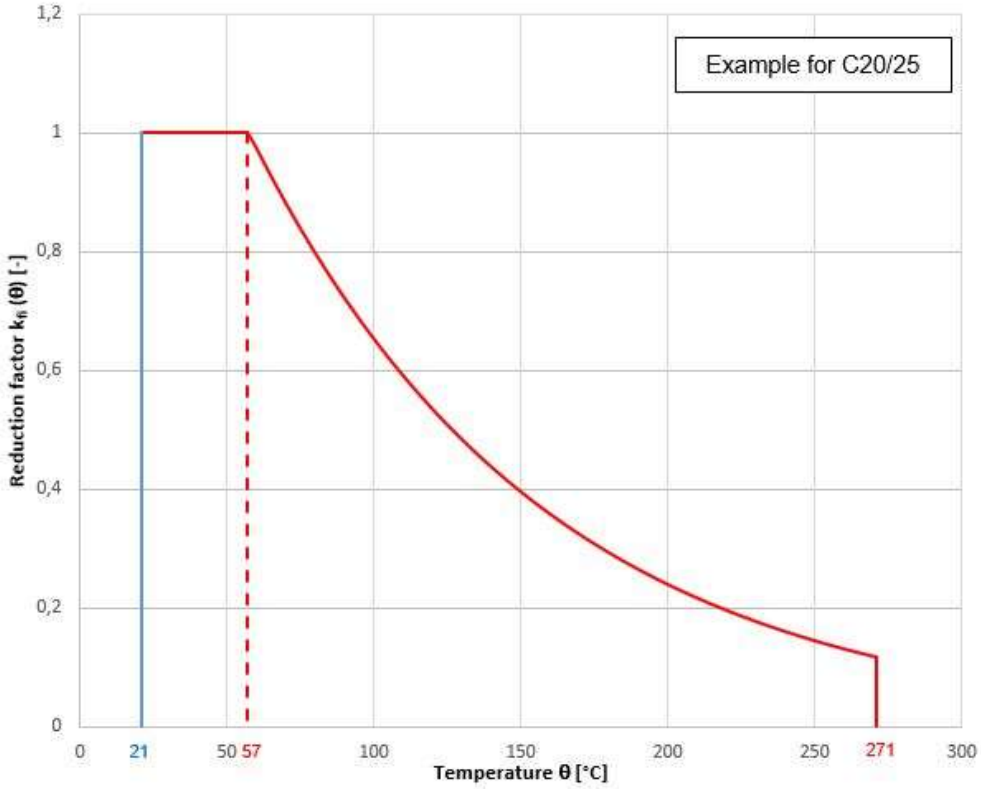
** Valid for drilling with reduced diameter

HARMONIZED TECHNICAL SPECIFICATION: EAD330087-00-0601									
ESSENTIAL CHARACTERISTICS	**PERFORMANCE ACCORDING TO ETA-09/0246**								
*** Design bond strength $f_{bd,PIR}$ according to EN 1992-1-1 [N/mm²]**	**C12/15**	**C16/20**	**20/25**	**C25/30**	**C30/37**	**C35/45**	**C40/50**	**C45/55**	**C50/60**
Ø8 a Ø14	1,60	2,00	2,30	2,70	3,00	3,40	3,70	4,00	4,30
Ø16 a Ø20	1,60	2,00	2,30	2,70	3,00	3,40	3,70	4,00	4,00
Ø22	1,60	2,00	2,30	2,70	3,00	3,40	3,70	3,70	4,00
Ø24 a Ø25	1,60	2,00	2,30	2,70	3,00	3,40	3,70	3,70	3,70
Ø28	1,60	2,00	2,30	2,70	3,00	3,40	3,40	3,40	3,40
Ø30 a Ø32	1,60	2,00	2,30	2,70	2,70	2,70	2,70	2,70	2,70

* Values valid only for good bond condition according to EN 1992-1-1. For other bond conditions multiply the values for 0,7

HARMONIZED TECHNICAL SPECIFICATION: EAD331522-00-0601 – SEISMIC PERFORMANCE									
ESSENTIAL CHARACTERISTICS	**PERFORMANCE ACCORDING TO ETA-09/0246**								
*** Design bond strength $f_{bd,Seis}$ according to EN 1992-1-1 [N/mm²]**	**C12/15**	**C16/20**	**20/25**	**C25/30**	**C30/37**	**C35/45**	**C40/50**	**C45/55**	**C50/60**
Ø12 a Ø25	-	2,00	2,30	2,30	2,30	2,30	2,30	2,30	2,30
Ø25 a Ø32	-	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00

HARMONIZED TECHNICAL SPECIFICATION: EAD330087-00-0601	
ESSENTIAL CHARACTERISTICS	**PERFORMANCE**
Reaction to fire	In the final application the thickness of the mortar layer is about 1 to 2 mm and most of the mortar is material classified class A1 according to EC Decision 96/603/EC. Therefore it may be assumed that the bonding material (synthetic mortar or a mixture of synthetic mortar and cementitious mortar) in connection with the metal anchor in the end use application do not make any contribution to fire growth or to the fully developed fire and they have no influence to the smoke hazard.

HARMONIZED TECHNICAL SPECIFICATION: EAD330087-00-0601	
ESSENTIAL CHARACTERISTICS	**PERFORMANCE ACCORDING TO ETA-09/0246**
Reduction factor under fire exposure $k_{fi}(\theta)$	For 21°C ≤ θ ≤ 271°C $k_{fi}(\theta) = \frac{17{,}563 \cdot e^{-0.01\theta}}{f_{bd,PIR} \cdot 4{,}3} \leq 1{,}0$ For θ > 271°C $k_{fi}(\theta) = 0$ 
*** Values of the adhesion tension of project $f_{bd,fi}$ for exposure to fire**	$fbd,fi(\theta) = kfi(\theta) \cdot fbd,PIR \cdot \frac{\gamma_c}{\gamma M,fi}$

TERMINOLOGY AND SYMBOLS	
Ø	Nominal diameter of the reinforced bar
d_0	Drill hole diameter
lv	Setting depth
a	Minimum clear spacing between two post-installed rebar
C_{min}	Minimum concrete cover
$l_{b,min}$	Minimum anchorage length
$l_{0,min}$	Minimum overlap joint length
$l_{b,rqd}$	Required basic anchorage length
α_{lb}	Amplification factor
k_b	Efficiency factor
γ_c	Safety installation coefficient
$\gamma_{M,fi}$	Safety installation coefficient for exceptional actions
$f_{bd,PIR}$	Design values of bond adhesion
θ	Temperature
$k_{fi}(\theta)$	Reduction factor under fire exposure
$f_{bd,fi}$	Design value of the ultimate bond stress in case of fire

Regulamentation REACH n°1907/2006

Estimate customer,
We inform you that in the REACH supply chain our company is classified as DU: Downstream-user.
About the product detailed in the point 1 we confirm you that we don't use in our production substances classified as SVHC according to the Candidate List published on ECHA site web:
http://echa.europa.eu/chem_data/candidate_list_table_en.asp.

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10. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9.
This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.
Signed for and on behalf of the manufacturer by:

Name and function	Place and date of issue	Signature
Andrea Taddei **General Manager**	**Grassobbio (Bg) - Italy** **23.05.2019**	

Nota: questa DoP sostituisce la versione precedente datata 18.02.2014.