DOP 4 - 043 - 240647 - 2024/01
Injection System EJOT Multifix Hybrid / SORMAT ITH
Hybrid for rebar connection

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Leistungserklärung

Nr.: **4 - 043 - 240647 - 2024/01** **DE**

1.) Eindeutiger Kenncode des Produkttyps:

Injektionssystem EJOT Multifix Hybrid / SORMAT ITH Hybrid für Bewehrungsanschlüsse

2.) Verwendungszweck:

(033) Nachträglich eingemörtelte Bewehrungsanschlüsse mit verbessertem Verbund- und Spaltversagen bei statischer Belastung

3.) Hersteller:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) System zur Bewertung und Überprüfung der Leistungsbeständigkeit:

System 1

5.)

Europäisches Bewertungsdokument	**EAD 332402-00-0601**
Europäisch Technische Bewertung:	**ETA-24/0647**
Technische Bewertungsstelle:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Notifizierte Stelle:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Erklärte Leitung(en):

a) Mechanische Festigkeit und Standsicherheit (BWR 1) und Sicherheit bei der Nutzung (BWR 4)

Wesentliche Merkmale	Leistungswerte
Charakteristischer Widerstand unter Zugbeanspruchung (statische und quasi-statische Beanspruchung)	Siehe Anhang C1
Charakteristischer Widerstand unter Zugbeanspruchung (statische und quasi-statische Beanspruchung)	Keine Leistung bewertet

Leistungserklärung

Nr.: **4 - 043 - 240647 - 2024/01** **DE**

EJOT®

b) Brandschutz (BWR 2)

Wesentliche Merkmale	Leistungswerte
Brandverhalten	Klasse A1

c) Hygiene, Gesundheit und Umweltschutz (BWR 3)

Wesentliche Merkmale	Leistungswerte

d) Schallschutz (BWR 5)

Wesentliche Merkmale	Leistungswerte

e) Energieeinsparung und Wärmeschutz (BWR 6)

Wesentliche Merkmale	Leistungswerte

f) Nachhaltige Nutzung der natürlichen Ressourcen (BWR 7)

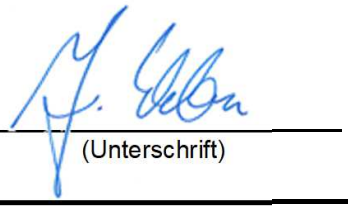
Wesentliche Merkmale	Leistungswerte

Die Leistung des vorstehenden Produkts entspricht der erklärten Leitung/den erklärten Leistungen. Für die Erstellung der Leistungserklärung im Einklang mit der Verordnung (EU) Nr. 305/2011 ist allein der oben genannte Hersteller verantwortlich.

Unterzeichnet für den Hersteller und im Namen des Herstellers von:

Dr. Jens Weber
(Name)

Bad Laasphe, 17.10.2024
(Ort und Datum der Ausstellung)



(Unterschrift)

Declaration of Performance

No **4 - 043 - 240647 - 2024/01** **EN**

1.) Unique identification code of the product-type:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Intended use:

(033) Post-installed reinforcing bar (rebar) connection with improved bond-splitting behaviour under static loading

3.) Manufacturer:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) System of AVCP:

System 1

5.)

European Assesment Document:	**EAD 332402-00-0601**
European Technical Assessment:	**ETA-24/0647**
Technical assessment body:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Notified body:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Declared Performance:

a) Mechanical resistance and stability (BWR 1) and safety and accessibility (BWR 4)

Essential characteristic	Performance
Characteristic resistance to tension load (static and quasi-static loading)	See Annex C1
Characteristic resistance to tension load (seismic loading)	No performance assessed

Declaration of Performance

No **4 - 043 - 240647 - 2024/01** **EN**

EJOT®

b) Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1

c) Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance

d) Protection against noise (BWR 5)

Essential characteristic	Performance

e) Energy economy and heat retention (BWR 6)

Essential characteristic	Performance

f) Sustainable use of natural resources (BWR 7)

Essential characteristic	Performance

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

Dr. Jens Weber
(Name)

Bad Laasphe, 17.10.2024
(Place and date of issue)

(Signature)

ДЕКЛАРАЦИЯ ЗА ЕКСПЛОАТАЦИОННИ ПОКАЗАТЕЛИ

№ **4 - 043 - 240647 - 2024/01** **BG**

1.) Уникален идентификационен код на типа продукт:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Предвидена употреба/употреби:

(033) Свързване на армировъчни пръти (арматура) с подобрено поведение при разкъсване на връзката при статично натоварване

3.) Производител:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Система/системи за оценяване и проверка на постоянството на експлоатационните показатели:

Сиситема 1

5.)

Европейски документ за оценяване:	**EAD 332402-00-0601**
Европейска техническа оценка:	**ETA-24/0647**
Орган за техническа оценка:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Нотифициран орган/органи:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Декларирани експлоатационни показатели:

a) Механична устойчивост и стабилност (BWR 1) и безопасност и достъпност (BWR 4)

Основни характеристики	Показатели
Характерна устойчивост на натоварване на опън (статично и квазистатично натоварване)	Вж. приложение C1
Характерна устойчивост на натоварване на опън (сеизмично натоварване)	Няма оценка на изпълнението

ДЕКЛАРАЦИЯ ЗА ЕКСПЛОАТАЦИОННИ ПОКАЗАТЕЛИ

№ **4 - 043 - 240647 - 2024/01** **BG**

EJOT®

b) Безопасност в случай на пожар (BWR 2)

Основни характеристики	Показатели
Реакция при пожар	Клас A1

c) Хигиена, здраве и околна среда (BWR 3)

Основни характеристики	Показатели

d) Защита от шум (BWR 5)

Основни характеристики	Показатели

e) Икономия на енергия и запазване на топлината (BWR 6)

Основни характеристики	Показатели

f) Устойчиво използване на природните ресурси (BWR 7)

Основни характеристики	Показатели

Експлоатационните показатели на продукта, посочени по-горе, са в съответствие с декларираните експлоатационни показатели. Настоящата декларация за експлоатационни показатели се издава в съответствие с Регламент (ЕС) № 305/2011, като отговорността за нея се носи изцяло от посочения по-горе производител.

Подписано за и от името на производителя от:

Dr. Jens Weber
(Име)

Bad Laasphe, 17.10.2024
(Място и Дата)

(Подпис)

PROHLÁŠENÍ O VLASTNOSTECH

č. **4 - 043 - 240647 - 2024/01** **CZ**

1.) Jedinečný identifikační kód typu výrobku:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Zamýšlené/zamýšlená použití:

(033) Spojení s dodatečně instalovanou výztuží (armovací prut) se zlepšeným chováním při statickém zatížení.

3.) Výrobce:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Systém/systémy POSV:

Systém 1

5.)

Evropský dokument pro posuzování:	**EAD 332402-00-0601**
Evropské technické posouzení:	**ETA-24/0647**
Subjekt pro technické posuzování:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Oznámený subjekt/oznámené subjekty:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Deklarovaná vlastnost/Deklarované vlastnosti:

a) Mechanická odolnost a stabilita (BWR 1) a bezpečnost a dostupnost (BWR 4)

základní charakteristiky	vlastnosti výrobku
Charakteristická odolnost proti zatížení tahem (statické a kvazistatické zatížení)	Viz příloha C1
Charakteristická odolnost proti zatížení tahem (seismické zatížení)	Žádný hodnocený výkon

PROHLÁŠENÍ O VLASTNOSTECH

č. **4 - 043 - 240647 - 2024/01** **CZ**

EJOT®

b) Bezpečnost při požáru (BWR 2)	
základní charakteristiky	vlastnosti výrobku
Reakce na oheň	Třída A1

c) Hygiena, zdraví a životní prostředí (BWR 3)	
základní charakteristiky	vlastnosti výrobku

d) Ochrana proti hluku (BWR 5)	
základní charakteristiky	vlastnosti výrobku

e) Úspora energie a zadržování tepla (BWR 6)	
základní charakteristiky	vlastnosti výrobku

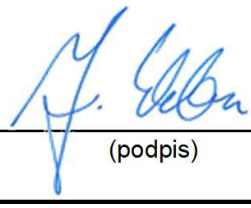
f) Udržitelné využívání přírodních zdrojů (BWR 7)	
základní charakteristiky	vlastnosti výrobku

Vlastnosti výše uvedeného výrobku jsou ve shodě se souborem deklarovaných vlastností. Toto prohlášení o vlastnostech se v souladu s nařízením (EU) č. 305/2011 vydává na výhradní odpovědnost výrobce uvedeného výše.

Podepsáno za výrobce a jeho jménem:

Dr. Jens Weber
(jméno)

Bad Laasphe, 17.10.2024
(místo a datum vydání)



(podpis)

YDEEVNEDEKLARATION

Nr.: **4 - 043 - 240647 - 2024/01** **DK**

1.) Varetypens unikke identifikationskode:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Tilsigtet anvendelse:

(033) Efterinstalleret armeringsjernsforbindelse med forbedret spaltningsadfærd under statisk belastning

3.) Fabrikant:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) System eller systemer til vurdering og kontrol af konstansen af ydeevnen:

System 1

5.)

Europæisk vurderingsdokument:	**EAD 332402-00-0601**
Europæisk teknisk vurdering:	**ETA-24/0647**
Teknisk vurderingsorgan:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Notificeret organ/notificerede organer:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Deklareret ydeevne/deklarerede ydeevner:

a) Mekanisk modstand og stabilitet (BWR 1) og sikkerhed og tilgængelighed (BWR 4)

Væsentlige egenskaber	Ydelse
Karakteristisk modstandsdygtighed over for trækbelastning (statisk og kvasistatisk belastning)	Se bilag C1
Karakteristisk modstandsdygtighed over for trækbelastning (seismisk belastning)	Ingen ydeevne vurderet

YDEEVNEDEKLARATION

Nr.: **4 - 043 - 240647 - 2024/01** **DK**

b) Sikkerhed ved brand (BWR 2)

Væsentlige egenskaber	Ydelse
Reaktioner på brand	Klasse A1

c) Hygiejne, sundhed og miljø (BWR 3)

Væsentlige egenskaber	Ydelse

d) Beskyttelse mod støj (BWR 5)

Væsentlige egenskaber	Ydelse

e) Energibesparelser og varmebinding (BWR 6)

Væsentlige egenskaber	Ydelse

f) Bæredygtig udnyttelse af naturressourcer (BWR 7)

Væsentlige egenskaber	Ydelse

Ydeevnen for den vare, der er anført ovenfor, er i overensstemmelse med den deklarerede ydeevne. Denne ydeevnedeklaration er udarbejdet i overensstemmelse med forordning (EU) nr. 305/2011 på eneansvar af den fabrikant, der er anført ovenfor.

Underskrevet for fabrikanten og på dennes vegne af:

Dr. Jens Weber
(navn)

Bad Laasphe, 17.10.2024
(sted og dato for udstedelse)

(underskrift)

TOIMIVUSDEKLARATSIOON

nr **4 - 043 - 240647 - 2024/01** **EE**

1.) Tootetüübi kordumatu identifitseerimiskood:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Kavandatud kasutusala(d):

(033) Paigaldamisjärgne sarrusvarda (armatuurraud) ühendus, millel on parandatud sideme lõhenemisega seotud käitumine staatilise koormuse korral

3.) Tootja:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Toimivuse püsivuse hindamise ja kontrolli süsteem:

Süsteem 1

5.)

Euroopa hindamisdokument:	**EAD 332402-00-0601**
Euroopa tehniline hinnang:	**ETA-24/0647**
Tehnilise hindamise asutus:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Teavitatud asutus(ed):	**2873 - IFSW - Technische Universität Darmstadt**

6.) Deklareeritud toimivus:

a) Mehaaniline vastupidavus ja stabiilsus (BWR 1) ning ohutus ja juurdepääsetavus (BWR 4)

Põhiomadused	Toimivus
iseloomulik vastupidavus pingekoormusele (staatiline ja kvaasistaatiline koormus)	Vt lisa C1
Iseloomulik vastupidavus pingekoormusele (seismiline koormus)	Tulemuslikkust ei ole hinnatud

TOIMIVUSDEKLARATSIOON

nr **4 - 043 - 240647 - 2024/01** **EE**

EJOT®

b) Ohutus tulekahju korral (BWR 2)

Põhiomadused	Toimivus
Reaktsioon tulekahjule	Klass A1

c) Hügieen, tervis ja keskkond (BWR 3)

Põhiomadused	Toimivus

d) Kaitse müra eest (BWR 5)

Põhiomadused	Toimivus

e) Energiasääst ja soojapidavus (BWR 6)

Põhiomadused	Toimivus

f) Loodusvarade säästev kasutamine (BWR 7)

Põhiomadused	Toimivus

Eespool kirjeldatud toote toimivus vastab deklareeritud toimivusele. Käesolev toimivusdeklaratsioon on välja antud kooskõlas määrusega (EL) nr 305/2011 eespool nimetatud tootja ainuvastutusel.

Tootja poolt ja nimel allkirjastanud:

Dr. Jens Weber
(Nimi)

Bad Laasphe, 17.10.2024
(Koht ja kuupäev)

(Allkiri)

DECLARACIÓN DE PRESTACIONES

no **4 - 043 - 240647 - 2024/01** **ES**

1.) Código de identificación única del producto tipo:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Usos previstos:

(033) Unión de barras de refuerzo postinstaladas con mejor comportamiento de rotura de adherencia bajo carga estática

3.) Fabricante:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Sistemas de evaluación y verificación de la constancia de las prestaciones (EVCP):

Sistema 1

5.)

Documento de evaluación europeo:	**EAD 332402-00-0601**
Evaluación técnica europea:	**ETA-24/0647**
Organismo de evaluación técnica:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Organismos notificados:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Prestaciones declaradas:

a) Resistencia mecánica y estabilidad (BWR 1) y seguridad y accesibilidad (BWR 4)

Características esenciales	Prestaciones
Resistencia característica a la carga de tracción (carga estática y cuasiestática)	Véase el anexo C1
Resistencia característica a la carga de tracción (carga sísmica)	No se ha evaluado el rendimiento

DECLARACIÓN DE PRESTACIONES

no **4 - 043 - 240647 - 2024/01** **ES**

b) Seguridad en caso de incendio (BWR 2)

Características esenciales	Prestaciones
Reacción al fuego	Clase A1

c) Higiene, salud y medio ambiente (BWR 3)

Características esenciales	Prestaciones

d) Protección contra el ruido (BWR 5)

Características esenciales	Prestaciones

e) Ahorro de energía y retención del calor (BWR 6)

Características esenciales	Prestaciones

f) Uso sostenible de los recursos naturales (BWR 7)

Características esenciales	Prestaciones

Las prestaciones del producto identificado anteriormente son conformes con el conjunto de prestaciones declaradas. La presente declaración de prestaciones se emite, de conformidad con el Reglamento (UE) no 305/2011, bajo la sola responsabilidad del fabricante arriba identificado.

Firmado por y en nombre del fabricante por:

Dr. Jens Weber
(nombre)

Bad Laasphe, 17.10.2024
(lugar y fecha de emisión)

(firma)

SUORITUSTASOILMOITUS

Nro **4 - 043 - 240647 - 2024/01** **FI**

1.) Tuotetyypin yksilöllinen tunniste:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Aiottu käyttötarkoitus (aiotut käyttötarkoitukset):

(033) Jälkiasennettu raudoitustankoliitos, jossa on parannettu liitoksen halkeamiskäyttäytymistä staattisessa kuormituksessa.

3.) Valmistaja:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Suoritustason pysyvyyden arvioinnissa ja varmentamisessa käytetty järjestelmä/käytetyt järjestelmät:

Järjestelmä 1

5.)

Eurooppalainen arviointiasiakirja:	**EAD 332402-00-0601**
Eurooppalainen tekninen arviointi:	**ETA-24/0647**
Teknisestä arvioinnista vastaava laitos:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Ilmoitettu laitos/ilmoitetut laitokset:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Ilmoitettu suoritustaso/ilmoitetut suoritustasot:

a) Mekaaninen kestävyys ja vakavuus (BWR 1) sekä turvallisuus ja saavutettavuus (BWR 4)

Perusominaisuudet	Tuotteen suoritustaso
Jännityskestävyys (staattinen ja kvasistaattinen kuormitus)	Katso liite C1
Jännityskuorman ominaiskestävyys (seismisessä kuormituksessa)	Suorituskykyä ei ole arvioitu

SUORITUSTASOILMOITUS

Nro **4 - 043 - 240647 - 2024/01** **FI**

EJOT®

b) Turvallisuus tulipalon sattuessa (BWR 2)

Perusominaisuudet	Tuotteen suoritustaso
Reagointi tulipaloon	Luokka A1

c) Hygienia, terveys ja ympäristö (BWR 3)

Perusominaisuudet	Tuotteen suoritustaso

d) Suojaus melua vastaan (BWR 5)

Perusominaisuudet	Tuotteen suoritustaso

e) Energiansäästö ja lämmöntalteenotto (BWR 6)

Perusominaisuudet	Tuotteen suoritustaso

f) Luonnonvarojen kestävä käyttö (BWR 7)

Perusominaisuudet	Tuotteen suoritustaso

Edellä yksilöidyn tuotteen suoritustaso on ilmoitettujen suoritustasojen joukon mukainen. Tämä suoritustasoilmoitus on asetuksen (EU) N:o 305/2011 mukaisesti annettu edellä ilmoitetun valmistajan yksinomaisella vastuulla.

Valmistajan puolesta allekirjoittanut:

Dr. Jens Weber
(nimi)

Bad Laasphe, 17.10.2024
(paikka ja päivämäärä)

(allekirjoitus)

DÉCLARATION DES PERFORMANCES

No **4 - 043 - 240647 - 2024/01** **FR**

1.) Code d'identification unique du produit type:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Usage(s) prévu(s):

(033) Assemblage de barres d'armature post-installées avec un meilleur comportement de rupture d'adhérence sous charge statique

3.) Fabricant:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Système(s) d'évaluation et de vérification de la constance des performances:

Système 1

5.)

Document d'évaluation européen:	**EAD 332402-00-0601**
Évaluation technique européenne:	**ETA-24/0647**
Organisme d'évaluation technique:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Organisme(s) notifié(s):	**2873 - IFSW - Technische Universität Darmstadt**

6.) Performance(s) déclarée(s):

a) Résistance mécanique et stabilité (BWR 1) et sécurité et accessibilité (BWR 4)

Caractéristiques essentielles	Performances du produit
Résistance caractéristique à la traction (charge statique et quasi-statique)	Voir l'annexe C1
Résistance caractéristique à la traction (charge sismique)	Aucune performance évaluée

DÉCLARATION DES PERFORMANCES

No **4 - 043 - 240647 - 2024/01** **FR**

EJOT®

b) Sécurité en cas d'incendie (REB 2)

Caractéristiques essentielles	Performances du produit
Réaction au feu	Classe A1

c) Hygiène, santé et environnement (REB 3)

Caractéristiques essentielles	Performances du produit

d) Protection contre le bruit (REB 5)

Caractéristiques essentielles	Performances du produit

e) Économie d'énergie et rétention de la chaleur (REB 6)

Caractéristiques essentielles	Performances du produit

f) Utilisation durable des ressources naturelles (REB 7)

Caractéristiques essentielles	Performances du produit

Les performances du produit identifié ci-dessus sont conformes aux performances déclarées. Conformément au règlement (UE) no 305/2011, la présente déclaration des performances est établie sous la seule responsabilité du fabricant mentionné ci-dessus.

Signé pour le fabricant et en son nom par:

Dr. Jens Weber
(Nom)

Bad Laasphe, 17.10.2024
(Lieu et date)

(Signature)

ΔΗΛΩΣΗ ΕΠΙΔΟΣΕΩΝ

Αριθ. **4 - 043 - 240647 - 2024/01** **GR**

1.) Μοναδικός κωδικός ταυτοποίησης του τύπου του προϊόντος:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Προβλεπόμενη(-ες) χρήση(-εις):

(033) Σύνδεση ράβδων οπλισμού μετά την τοποθέτηση με βελτιωμένη συμπεριφορά διάσπασης του δεσμού υπό στατική φόρτιση

3.) Κατασκευαστής:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Σύστημα/συστήματα AVCP (αξιολόγηση και επαλήθευση της σταθερότητας της επίδοσης):

σύστημα 1

5.)

Ευρωπαϊκό έγγραφο αξιολόγησης:	**EAD 332402-00-0601**
Ευρωπαϊκή τεχνική αξιολόγηση:	**ETA-24/0647**
Οργανισμός τεχνικής αξιολόγησης:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Κοινοποιημένος(-οι) οργανισμός(-οι):	**2873 - IFSW - Technische Universität Darmstadt**

6.) Δηλωθείσα(-ες) επίδοση(-εις):

a) Μηχανική αντίσταση και σταθερότητα (BWR 1) και ασφάλεια και προσβασιμότητα (BWR 4)

Ουσιώδη χαρακτηριστικά	Απόδοση
Χαρακτηριστική αντοχή σε φορτίο εφελκυσμού (στατική και οιονεί στατική φόρτιση)	Βλέπε παράρτημα Γ1
Χαρακτηριστική αντοχή σε φορτίο εφελκυσμού (σεισμική φόρτιση)	Δεν αξιολογούνται οι επιδόσεις

ΔΗΛΩΣΗ ΕΠΙΔΟΣΕΩΝ

Αριθ. **4 - 043 - 240647 - 2024/01** **GR**

EJOT®

b) Ασφάλεια σε περίπτωση πυρκαγιάς (BWR 2)

Ουσιώδη χαρακτηριστικά	Απόδοση
Αντίδραση στη φωτιά	Κατηγορία A1

c) Υγιεινή, υγεία και περιβάλλον (BWR 3)

Ουσιώδη χαρακτηριστικά	Απόδοση

d) Προστασία από θόρυβο (BWR 5)

Ουσιώδη χαρακτηριστικά	Απόδοση

e) Εξοικονόμηση ενέργειας και συγκράτηση θερμότητας (BWR 6)

Ουσιώδη χαρακτηριστικά	Απόδοση

f) Εξοικονόμηση ενέργειας και συγκράτηση θερμότητας (BWR 7)

Ουσιώδη χαρακτηριστικά	Απόδοση

Η επίδοση του προϊόντος που ταυτοποιείται ανωτέρω είναι σύμφωνη με τη (τις) δηλωθείσα(-ες) επίδοση(-εις). Η δήλωση αυτή των επιδόσεων συντάσσεται, σύμφωνα με τον κανονισμό (ΕΕ) αριθ. 305/2011, με αποκλειστική ευθύνη του κατασκευαστή που ταυτοποιείται ανωτέρω.

Υπογραφή για λογαριασμό και εξ ονόματος του κατασκευαστή από:

Dr. Jens Weber
(όνομα)

Bad Laasphe, 17.10.2024
(τόπος και ημερομηνία έκδοσης)

(υπογραφή)

IZJAVA O SVOJSTVIMA

Br. **4 - 043 - 240647 - 2024/01** **HR**

1.) Jedinstvena identifikacijska oznaka vrste proizvoda:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Namjena/namjene:

(033) Naknadno ugrađena veza armaturne šipke (armature) s poboljšanim ponašanjem pri cijepanju veze pod statičkim opterećenjem

3.) Proizvođač:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Sustav/sustavi za ocjenu i provjeru stalnosti svojstava (AVCP):

Sustav 1

5.)

Europski dokument za ocjenjivanje:	**EAD 332402-00-0601**
Europska tehnička ocjena:	**ETA-24/0647**
Tijelo za tehničko ocjenjivanje:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Prijavljeno tijelo/prijavljena tijela:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Objavljena svojstva:

a) Mehanička otpornost i stabilnost (BWR 1) i sigurnost i pristupačnost (BWR 4)

Bitne karakteristike	Svojstva
Karakteristična otpornost na vlačno opterećenje (statičko i kvazistatičko opterećenje)	Vidi Dodatak C1
Karakteristična otpornost na vlačno opterećenje (seizmičko opterećenje)	Izvedba nije procijenjena

IZJAVA O SVOJSTVIMA

Br. **4 - 043 - 240647 - 2024/01** **HR**

EJOT®

b) Sigurnost u slučaju požara (BWR 2)

Bitne karakteristike	Svojstva
Reakcija na vatru	Razred A1

c) Higijena, zdravlje i okoliš (BWR 3)

Bitne karakteristike	Svojstva

d) Zaštita od buke (BWR 5)

Bitne karakteristike	Svojstva

e) Ušteda energije i zadržavanje topline (BWR 6)

Bitne karakteristike	Svojstva

f) Održivo korištenje prirodnih resursa (BWR 7)

Bitne karakteristike	Svojstva

Prije utvrđeno svojstvo proizvoda u skladu je s objavljenim svojstvima. Ova izjava o svojstvima izdaje se, u skladu s Uredbom (EU) br. 305/2011, pod isključivom odgovornošću prethodno utvrđenog proizvođača.

Za proizvođača i u njegovo ime potpisao:

Dr. Jens Weber
(ime)

Bad Laasphe, 17.10.2024
(Mjesto i datum izdavanja)

(potpis)

TELJESÍTMÉNYNYILATKOZAT

Száma: **4 - 043 - 240647 - 2024/01** **HU**

1.) A terméktípus egyedi azonosító kódja:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Felhasználás célja(i):

(033) Beépítés utáni betonacél (betonacél) csatlakozás, javított kötés-hasadási viselkedéssel statikus terhelés alatt

3.) Gyártó:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Az AVCP-rendszer(ek):

rendszer 1

5.)

Az európai értékelési dokumentum:	**EAD 332402-00-0601**
Európai műszaki értékelés:	**ETA-24/0647**
A műszaki értékelést végző szerv:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Bejelentett szerv(ek):	**2873 - IFSW - Technische Universität Darmstadt**

6.) A nyilatkozatban szereplő teljesítmény(ek):

a) Mechanikai ellenállás és stabilitás (BWR 1), biztonság és elérhetőség (BWR 4)

Lényeges termékjellemzők	Termék teljesítménye
Jellemző ellenállás a húzóterheléssel szemben (statikus és kvázi-statikus terhelés)	Lásd a C1. mellékletet
Jellemző ellenállás a húzóterheléssel szemben (szeizmikus terhelés)	Nincs értékelt teljesítmény

TELJESÍTMÉNYNYILATKOZAT

Száma: **4 - 043 - 240647 - 2024/01** **HU**

EJOT®

b) Biztonság tűz esetén (BWR 2)

Lényeges termékjellemzők	Termék teljesítménye
Tűzre adott reakció	A1 osztály

c) Higiénia, egészség és környezet (BWR 3)

Lényeges termékjellemzők	Termék teljesítménye

d) Zaj elleni védelem (BWR 5)

Lényeges termékjellemzők	Termék teljesítménye

e) Energiatakarékosság és hővisszatartás (BWR 6)

Lényeges termékjellemzők	Termék teljesítménye

f) A természeti erőforrások fenntartható használata (BWR 7)

Lényeges termékjellemzők	Termék teljesítménye

A fent azonosított termék teljesítménye megfelel a bejelentett teljesítmény(ek)nek. A 305/2011/EU rendeletnek megfelelően e teljesítménynyilatkozat kiadásáért kizárólag a fent meghatározott gyártó a felelős.

A gyártó nevében és részéről aláíró személy:

Dr. Jens Weber
(név)

Bad Laasphe, 17.10.2024
(hely és kiállítás dátuma)

(aláírás)

DICHIARAZIONE DI PRESTAZIONE

N. **4 - 043 - 240647 - 2024/01** **IT**

1.) Codice di identificazione unico del prodotto-tipo:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Usi previsti:

(033) Connessione con barre di rinforzo post-installate (rebar) con migliorato comportamento di rottura del legame sotto carico statico

3.) Fabbricante:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Sistemi di VVCP:

Sistema 1

5.)

Documento per la valutazione europea:	**EAD 332402-00-0601**
Valutazione tecnica europea:	**ETA-24/0647**
Organismo di valutazione tecnica:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Organismi notificati:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Prestazioni dichiarate:

a) Resistenza meccanica e stabilità (BWR 1) e sicurezza e accessibilità (BWR 4)

Caratteristiche essenziali	Prestazione
Resistenza caratteristica al carico di trazione (carico statico e quasi statico)	Vedi allegato C1
Resistenza caratteristica al carico di trazione (carico sismico)	Nessuna prestazione valutata

DICHIARAZIONE DI PRESTAZIONE

N. **4 - 043 - 240647 - 2024/01** **IT**

EJOT®

b) Sicurezza in caso di incendio (BWR 2)

Caratteristiche essenziali	Prestazione
Reazione al fuoco	Classe A1

c) Igiene, salute e ambiente (BWR 3)

Caratteristiche essenziali	Prestazione

d) Protezione contro il rumore (BWR 5)

Caratteristiche essenziali	Prestazione

e) Economia energetica e ritenzione di calore (BWR 6)

Caratteristiche essenziali	Prestazione

f) Uso sostenibile delle risorse naturali (BWR 7)

Caratteristiche essenziali	Prestazione

La prestazione del prodotto sopra identificato è conforme all'insieme delle prestazioni dichiarate. La presente dichiarazione di responsabilità viene emessa, in conformità al regolamento (UE) n. 305/2011, sotto la sola responsabilità del fabbricante sopra identificato.

Firmato a nome e per conto del fabbricante da:

Dr. Jens Weber
(nome)

Bad Laasphe, 17.10.2024
(luogo e data del rilascio)

(firma)

EKSPLOATACINIŲ SAVYBIŲ DEKLARACIJA

Nr. **4 - 043 - 240647 - 2024/01** **LT**

1.) Produkto tipo unikalus identifikavimo kodas:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Naudojimo paskirtis (-ys):

(033) Po sumontuoto armatūros strypo (armatūros strypo) jungtis, pasižyminti geresnėmis sukibimo savybėmis veikiant statinei apkrovai

3.) Gamintojas:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Eksploatacinių savybių pastovumo vertinimo ir tikrinimo sistema (-os):

Sistema 1

5.)

Europos vertinimo dokumentas:	**EAD 332402-00-0601**
Europos techninis įvertinimas:	**ETA-24/0647**
Techninio vertinimo įstaiga:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Notifikuotoji (-osios) įstaiga (-os):	**2873 - IFSW - Technische Universität Darmstadt**

6.) Deklaruojama (-os) eksploatacinė (-ės) savybė (-ės):

a) Mechaninis atsparumas ir stabilumas (BWR 1) ir saugumas bei prieinamumas (BWR 4)

Esminės charakteristikos	Eksploatacinės savybės
Charakteristinis atsparumas tempimo apkrovai (statinė ir kvazistatinė apkrova)	Žr. C1 priedą
Charakteristinis atsparumas tempimo apkrovai (seisminė apkrova)	Veiklos rezultatai neįvertinti

EKSPLOATACINIŲ SAVYBIŲ DEKLARACIJA

Nr. **4 - 043 - 240647 - 2024/01** **LT**

b) Sauga gaisro atveju (BWR 2)

Esminės charakteristikos	Eksploatacinės savybės
Reakcija į ugnį	A1 klasė

c) Higiena, sveikata ir aplinka (BWR 3)

Esminės charakteristikos	Eksploatacinės savybės

d) Apsauga nuo triukšmo (BWR 5)

Esminės charakteristikos	Eksploatacinės savybės

e) Energijos taupymas ir šilumos išsaugojimas (BWR 6)

Esminės charakteristikos	Eksploatacinės savybės

f) Tvarus gamtos išteklių naudojimas (BWR 7)

Esminės charakteristikos	Eksploatacinės savybės

Nurodyto produkto eksploatacinės savybės atitinka visas deklaruotas eksploatacines savybes. Ši eksploatacinių savybių deklaracija pateikiama vadovaujantis Reglamentu (ES) Nr. 305/2011, atsakomybė už jos turinį tenka tik joje nurodytam gamintojui.

Pasirašyta (gamintojo ir jo vardu):

Dr. Jens Weber
(vardas)

Bad Laasphe, 17.10.2024
(išdavimo vieta ir data)

(parašas)

EKSPLUATĀCIJAS ĪPAŠĪBU DEKLARĀCIJA

Nr. **4 - 043 - 240647 - 2024/01** **LV**

1.) Unikālais izstrādājuma tipa identifikācijas numurs:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Paredzētais izmantojums:

(033) Armatūras stieņa (armatūras stieņa) savienojums ar uzlabotu saķeres šķelšanos statiskās slodzes apstākļos

3.) Ražotājs:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Ekspluatācijas īpašību noturības novērtējuma un pārbaudes (AVCP) sistēma(-as):

Sistēma 1

5.)

Eiropas novērtējuma dokuments:	**EAD 332402-00-0601**
Eiropas tehniskais novērtējums:	**ETA-24/0647**
Tehniskā novērtējuma iestāde:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Paziņotā(-ās) iestāde(-es):	**2873 - IFSW - Technische Universität Darmstadt**

6.) Deklarētā(-ās) ekspluatācijas īpašība(-as):

a) Mehāniskā izturība un stabilitāte (BWR 1) un drošība un pieejamība (BWR 4)

Būtiskie raksturlielumi	Ekspluatācijas īpašības
Raksturīgā izturība pret stiepes slodzi (statiskā un kvazi-statiskā slodze)	Skatīt C1 pielikumu.
Raksturīgā izturība pret stiepes slodzi (seismiskā slodze)	Veiktspēja nav novērtēta

EKSPLUATĀCIJAS ĪPAŠĪBU DEKLARĀCIJA

Nr. **4 - 043 - 240647 - 2024/01** **LV**

EJOT®

b) Drošība ugunsgrēka gadījumā (BWR 2)

Būtiskie raksturlielumi	Ekspluatācijas īpašības
Reakcija uz ugunsgrēku	A1 klase

c) Higiēna, veselība un vide (BWR 3)

Būtiskie raksturlielumi	Ekspluatācijas īpašības

d) Aizsardzība pret troksni (BWR 5)

Būtiskie raksturlielumi	Ekspluatācijas īpašības

e) Enerģijas ekonomija un siltuma saglabāšana (BWR 6)

Būtiskie raksturlielumi	Ekspluatācijas īpašības

f) Dabas resursu ilgtspējīga izmantošana (BWR 7)

Būtiskie raksturlielumi	Ekspluatācijas īpašības

Iepriekš norādītā izstrādājuma ekspluatācijas īpašības atbilst deklarēto ekspluatācijas īpašību kopumam. Šī ekspluatācijas īpašību deklarācija izdota saskaņā ar Regulu (ES) Nr. 305/2011, un par to ir atbildīgs vienīgi iepriekš norādītais ražotājs.

Parakstīts ražotāja vārdā:

Dr. Jens Weber
(Vārds)

Bad Laasphe, 17.10.2024
(Izsniegšanas vieta un datums)

(Paraksts)

DIKJARAZZJONI TA' PRESTAZZJONI

Nru. **4 - 043 - 240647 - 2024/01** **MT**

1.) Kodiċi uniku ta' identifikazzjoni tat-tip tal-prodott:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Użu/i intenzjonat/i:

(033) Konnessjoni tal-bar tar-rinfurzar (rebar) installata wara b'imġieba mtejba ta' qsim tal-bonds taħt tagħbija statika

3.) Manifattur:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Sistema/i ta' AVCP:

Sistema 1

5.)

Dokument Ewropew ta' Valutazzjoni:	**EAD 332402-00-0601**
Valutazzjoni Teknika Ewropea:	**ETA-24/0647**
Korp tal-Valutazzjoni Teknika:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Korp/i nnotifikat/i:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Prestazzjoni/jiet ddikjarata/i:

a) Mehāniskā pretestība un stabilitāte (BPP 1) un drošība un pieejamība (BPP 4)

Karatteristiċi essenzjali	Prestazzjoni
Reżistenza karatteristika għat-tagħbija tat-tensjoni (tagħbija statika u kważi-statika)	Ara l-Anness C1
Reżistenza karatteristika għat-tagħbija tat-tensjoni (tagħbija sismika)	Ebda prestazzjoni evalwata

DIKJARAZZJONI TA' PRESTAZZJONI

Nru. **4 - 043 - 240647 - 2024/01** **MT**

b) Sigurtà fil-każ ta 'nar (BWR 2)

Karatteristiċi essenzjali	Prestazzjoni
Reazzjoni għan-nar	Klassi A1

c) Iġjene, saħħa u ambjent (BWR 3)

Karatteristiċi essenzjali	Prestazzjoni

d) Protezzjoni kontra l-istorbju (BWR 5)

Karatteristiċi essenzjali	Prestazzjoni

e) Ekonomija tal-enerġija u żamma tas-sħana (BWR 6)

Karatteristiċi essenzjali	Prestazzjoni

f) Użu sostenibbli tar-riżorsi naturali (BWR 7)

Karatteristiċi essenzjali	Prestazzjoni

Il-prestazzjoni tal-prodott identifikat hawn fuq hija konformi mal-prestazzjonijiet iddikjarati. Din id-dikjarazzjoni ta' prestazzjoni hija maħruġa, skont ir-Regolament (UE) Nru 305/2011, taħt ir-responsabbiltà unika tal-manifattur identifikat hawn fuq.

Iffirmat għal u f'isem il-manifattur minn:

Dr. Jens Weber
(isem)

Bad Laasphe, 17.10.2024
(post u data tal-ħruġ)

(firma)

PRESTATIEVERKLARING

Nr. **4 - 043 - 240647 - 2024/01** **NL**

1.) Unieke identificatiecode van het producttype:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Beoogd(e) gebruik(en):

(033) Nagebouwde wapeningsstaafverbinding met verbeterd splijtgedrag onder statische belasting

3.) Fabrikant:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Het systeem of de systemen voor de beoordeling en verificatie van de prestatiebestendigheid:

Systeem 1

5.)

Europees beoordelingsdocument:	**EAD 332402-00-0601**
Europese technische beoordeling:	**ETA-24/0647**
Technische beoordelingsinstantie:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Aangemelde instantie(s):	**2873 - IFSW - Technische Universität Darmstadt**

6.) Aangegeven prestatie(s):

a) Mehāniskā izturība un stabilitāte (BWR 1) un drošība un pieejamība (BWR 4)

Essentiële kenmerken	Prestaties
Karakteristieke weerstand tegen trekbelasting (statische en quasi-statische belasting)	Patrz załącznik C1
Karakteristieke weerstand tegen trekbelasting (seismische belasting)	Geen prestatiebeoordeling

PRESTATIEVERKLARING

Nr. **4 - 043 - 240647 - 2024/01** **NL**

EJOT®

b) Veiligheid in geval van brand (BWR 2)

Essentiële kenmerken	Prestaties
Reactie op vuur	Klasse A1

c) Hygiëne, gezondheid en het milieu (BWR 3)

Essentiële kenmerken	Prestaties

d) Bescherming tegen lawaai (BWR 5)

Essentiële kenmerken	Prestaties

e) Energiebesparing en warmtebehoud (BWR 6)

Essentiële kenmerken	Prestaties

f) Duurzaam gebruik van natuurlijke hulpbronnen (BWR 7)

Essentiële kenmerken	Prestaties

De prestaties van het hierboven omschreven product zijn conform de aangegeven prestaties. Deze prestatieverklaring wordt in overeenstemming met Verordening (EU) nr. 305/2011 onder de exclusieve verantwoordelijkheid van de hierboven vermelde fabrikant verstrekt.

Ondertekend voor en namens de fabrikant door:

Dr. Jens Weber
(naam)

Bad Laasphe, 17.10.2024
(plaats en datum van afgifte)

(handtekening)

DEKLARACJA WŁAŚCIWOŚCI UŻYTKOWYCH

Nr **4 - 043 - 240647 - 2024/01** **PL**

1.) Niepowtarzalny kod identyfikacyjny typu wyrobu:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Zamierzone zastosowanie lub zastosowania:

(033) Zamontowane połączenie prętów zbrojeniowych z ulepszoną charakterystyką rozszczepiania spoiwa pod obciążeniem statycznym

3.) Producent:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) System(-y) oceny i weryfikacji stałości właściwości użytkowych:

system 1

5.)

Europejski Dokument Oceny:	**EAD 332402-00-0601**
Europejska Ocena Techniczna:	**ETA-24/0647**
Jednostka ds. Oceny Technicznej:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Jednostka lub Jednostki Notyfikowane:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Deklarowane właściwości użytkowe:

a) Nośność i stateczność (BWR 1) oraz bezpieczeństwo użytkowania (BWR 4)

Zasadnicze charakterystyki	Właściwości użytkowe
Charakterystyczna odporność na obciążenie rozciągające (obciążenie statyczne i quasi-statyczne)	Patrz załącznik C1
Charakterystyczna odporność na obciążenie rozciągające (obciążenie sejsmiczne)	Brak oceny wyników

DEKLARACJA WŁAŚCIWOŚCI UŻYTKOWYCH

Nr **4 - 043 - 240647 - 2024/01** **PL**

EJOT®

b) Bezpieczeństwo pożarowe (BWR 2)

Zasadnicze charakterystyki	Właściwości użytkowe
Reakcja na ogień	Klasa A1

c) Higiena, zdrowie i środowisko (BWR 3)

Zasadnicze charakterystyki	Właściwości użytkowe

d) Ochrona przed hałasem (BWR 5)

Zasadnicze charakterystyki	Właściwości użytkowe

e) Oszczędność energii i zatrzymywanie ciepła (BWR 6)

Zasadnicze charakterystyki	Właściwości użytkowe

f) Zrównoważone wykorzystanie zasobów naturalnych (BWR 7)

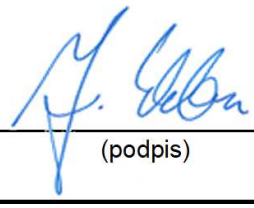
Zasadnicze charakterystyki	Właściwości użytkowe

Właściwości użytkowe określonego powyżej wyrobu są zgodne z zestawem deklarowanych właściwości użytkowych. Niniejsza deklaracja właściwości użytkowych wydana zostaje zgodnie z Rozporządzeniem (UE) nr 305/2011 na wyłączną odpowiedzialność producenta określonego powyżej.

W imieniu producenta podpisał(-a):

dr Jens Weber
(nazwisko)

Bad Laasphe, 17.10.2024
(miejsce i data wydania)



(podpis)

DECLARAÇÃO DE DESEMPENHO

N.o **4 - 043 - 240647 - 2024/01** **PT**

1.) Código de identificação único do produto-tipo:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Utilização(ões) prevista(s)

(033) Ligação de varão de reforço pós-instalado com comportamento melhorado de rutura da ligação sob carga estática

3.) Fabricante:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Sistema(s) de avaliação e verificação da regularidade do desempenho (AVCP):

Sistema 1

5.)

Documento de Avaliação Europeu:	**EAD 332402-00-0601**
Avaliação Técnica Europeia	**ETA-24/0647**
Organismo de Avaliação Técnica:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Organismo(s) notificado (s):	**2873 - IFSW - Technische Universität Darmstadt**

6.) Desempenho(s) declarado(s):

a) Resistência mecânica e estabilidade (BWR 1) e segurança e acessibilidade (BWR 4)

Características essenciais	Desempenho
Resistência caraterística à carga de tração (carga estática e quase estática)	Ver Anexo C1
Resistência caraterística à carga de tração (carga sísmica)	Nenhum desempenho avaliado

DECLARAÇÃO DE DESEMPENHO

N.o **4 - 043 - 240647 - 2024/01** **PT**

EJOT®

b) Segurança em caso de incêndio (BWR 2)

Características essenciais	Desempenho
Reacção ao fogo	Classe A1

c) Higiene, saúde e meio ambiente (BWR 3)

Características essenciais	Desempenho

d) Protecção contra o ruído (BWR 5)

Características essenciais	Desempenho

e) Economia de energia e retenção de calor (BWR 6)

Características essenciais	Desempenho

f) Utilização sustentável dos recursos naturais (BWR 7)

Características essenciais	Desempenho

O desempenho do produto identificado acima está em conformidade com o conjunto de desempenhos declarados. A presente declaração de desempenho é emitida, em conformidade com o Regulamento (UE) n.o 305/2011, sob a exclusiva responsabilidade do fabricante identificado acima.

Assinado por e em nome do fabricante por:

Dr. Jens Weber
(nome)

Bad Laasphe, 17.10.2024
(local e data de emissão)

(assinatura)

DECLARAȚIA DE PERFORMANȚĂ

Nr, **4 - 043 - 240647 - 2024/01** **RO**

1.) Cod unic de identificare al produsului-tip:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Utilizare (utilizări) preconizată (preconizate):

(033) Legătură de bare de armătură postinstalată cu un comportament îmbunătățit de rupere a legăturii sub sarcină statică

3.) Fabricant:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Sistemul (sistemele) de evaluare și de verificare a constanței performanței:

Sistemul 1

5.)

Documentul de evaluare european:	**EAD 332402-00-0601**
Evaluarea tehnică europeană:	**ETA-24/0647**
Organismul de evaluare tehnică:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Organism (organisme) notificat(e):	**2873 - IFSW - Technische Universität Darmstadt**

6.) Performanța (performanțe) declarată (declarate):

a) Rezistența mecanică și stabilitatea (BWR 1) și siguranța și accesibilitatea (BWR 4)

Caracteristici esenţiale	Performanţa produsului
Rezistența caracteristică la sarcină de tracțiune (sarcină statică și cvasi-statică)	A se vedea anexa C1
Rezistența caracteristică la sarcină de tracțiune (sarcină seismică)	Nu se evaluează performanța

DECLARAȚIA DE PERFORMANȚĂ

Nr, **4 - 043 - 240647 - 2024/01** **RO**

EJOT®

b) Siguranța în caz de incendiu (BWR 2)

Caracteristici esenţiale	Performanţa produsului
Reacția la foc	Clasa A1

c) Igiena, sănătatea și mediul (BWR 3)

Caracteristici esenţiale	Performanţa produsului

d) Protecție împotriva zgomotului (BWR 5)

Caracteristici esenţiale	Performanţa produsului

e) Economie de energie și păstrarea căldurii (BWR 6)

Caracteristici esenţiale	Performanţa produsului

f) Utilizarea durabilă a resurselor naturale (BWR 7)

Caracteristici esenţiale	Performanţa produsului

Performanța produsului identificat mai sus este în conformitate cu setul de performanțe declarate. Această declarație de performanță este eliberată în conformitate cu Regulamentul (UE) nr. 305/2011, pe răspunderea exclusivă a fabricantului identificat mai sus.

Semnată pentru și în numele fabricantului de către:

Dr. Jens Weber
(numele)

Bad Laasphe, 17.10.2024
(locul şi data emiterii)

(semnătură)

PRESTANDADEKLARATION

Nr **4 - 043 - 240647 - 2024/01** **SE**

1.) Produkttypens unika identifikationskod:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Avsedd användning/avsedda användningar:

(033) Efterinstallerad armeringsjärnsförbindelse med förbättrat beteende vid sprickbildning under statisk belastning

3.) Tillverkare:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) System för bedömning och fortlöpande kontroll av prestanda:

Systen 1

5.)

Europeiskt bedömningsdokument:	**EAD 332402-00-0601**
Europeisk teknisk bedömning:	**ETA-24/0647**
Tekniskt bedömningsorgan:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Anmält/anmälda organ:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Angiven prestanda:

a) Mekanisk motstånd och stabilitet (BWR 1) och säkerhet och tillgänglighet (BWR 4)

Väsentliga egenskaper	Prestanda
Karakteristiskt motstånd mot dragbelastning (statisk och kvasistatisk belastning)	Se bilaga C1.
Karakteristiskt motstånd mot dragbelastning (seismisk belastning)	Ingen resultatbedömning

PRESTANDADEKLARATION

Nr 4 - 043 - 240647 - 2024/01 SE

EJOT®

b) Säkerhet vid brand (BWR 2)

Väsentliga egenskaper	Prestanda
Reaktion på brand	Klass A1

c) Hygien, hälsa och miljö (BWR 3)

Väsentliga egenskaper	Prestanda

d) Skydd mot buller (BWR 5)

Väsentliga egenskaper	Prestanda

e) Energihushållning och värmehållning (BWR 6)

Väsentliga egenskaper	Prestanda

f) Hållbar användning av naturresurser (BWR 7)

Väsentliga egenskaper	Prestanda

Prestandan för ovanstående produkt överensstämmer med den angivna prestandan. Denna prestandadeklaration har utfärdats i enlighet med förordning (EU) nr 305/2011 på eget ansvar av den tillverkare som anges ovan.

Undertecknad på tillverkarens vägnar av:

Dr. Jens Weber
(namn)

Bad Laasphe, 17.10.2024
(Iplats and datum)

(signatur)

VYHLÁSENIE O PARAMETROCH

č. **4 - 043 - 240647 - 2024/01** **SK**

1.) Jedinečný identifikačný kód typu výrobku:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Zamýšľané použitie/použitia:

(033) Spojenie s dodatočne inštalovanou výstužou (armatúrou) so zlepšeným správaním pri statickom zaťažení

3.) Výrobca:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Systém(-y) posudzovania a overovania nemennosti parametrov:

Systém 1

5.)

Európsky hodnotiaci dokument:	**EAD 332402-00-0601**
Európske technické posúdenie:	**ETA-24/0647**
Orgán technického posudzovania:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Notifikovaný(-é) subjekt(-y):	**2873 - IFSW - Technische Universität Darmstadt**

6.) Deklarované parametre:

a) Mechanická odolnosť a stabilita (BWR 1) a bezpečnosť a dostupnosť (BWR 4)

základné charakteristiky	vlastnosti výrobku
Charakteristická odolnosť voči ťahovému zaťaženiu (statické a kvázi-statické zaťaženie)	Pozri prílohu C1
Charakteristická odolnosť voči ťahovému zaťaženiu (seizmické zaťaženie)	Nehodnotí sa žiadna výkonnosť

VYHLÁSENIE O PARAMETROCH

č. **4 - 043 - 240647 - 2024/01** **SK**

EJOT®

b) Bezpečnosť v prípade požiaru (BWR 2)

základné charakteristiky	vlastnosti výrobku
Reakcia na požiar	Trieda A1

c) Hygiena, zdravie a životné prostredie (BWR 3)

základné charakteristiky	vlastnosti výrobku

d) Ochrana proti hluku (BWR 5)

základné charakteristiky	vlastnosti výrobku

e) Úspora energie a zadržiavanie tepla (BWR 6)

základné charakteristiky	vlastnosti výrobku

f) Udržateľné využívanie prírodných zdrojov (BWR 7)

základné charakteristiky	vlastnosti výrobku

Uvedené parametre výrobku sú v zhode so súborom deklarovaných parametrov. Toto vyhlásenie o parametroch sa v súlade s nariadením (EÚ) č. 305/2011 vydáva na výhradnú zodpovednosť uvedeného výrobcu.

Podpísal(-a) za a v mene výrobcu:

Dr. Jens Weber
(meno)

Bad Laasphe, 17.10.2024
(miesto a dátum na výstava)

(podpis)

IZJAVA O LASTNOSTIH

Št. **4 - 043 - 240647 - 2024/01** **SLO**

1.) Enotna identifikacijska oznaka tipa proizvoda:

Injection System EJOT Multifix Hybrid / SORMAT ITH Hybrid for rebar connection

2.) Predvidena uporaba:

(033) Spoj z naknadno vgrajeno armaturno palico (armatura) z izboljšanim obnašanjem pri statični obremenitvi

3.) Proizvajalec:

EJOT SE & Co. KG, Market Unit Construction, In der Stockwiese 35, 57334 Bad Laasphe - Germany

4.) Sistemi ocenjevanja in preverjanja nespremenljivosti lastnosti:

Sistem 1

5.)

Evropski ocenjevalni dokument:	**EAD 332402-00-0601**
Evropska tehnična ocena:	**ETA-24/0647**
Organ za tehnično ocenjevanje:	**DIBt - Deutsches Institut für Bautechnik, Berlin**
Priglašeni organi:	**2873 - IFSW - Technische Universität Darmstadt**

6.) Navedene lastnosti:

a) Mehanska odpornost in stabilnost (BWR 1) ter varnost in dostopnost (BWR 4)

Glavne značilnosti	Zmogljivost proizvoda
Značilna odpornost proti natezni obremenitvi (statična in kvazistatična obremenitev)	Glej Prilogo C1.
Značilna odpornost proti natezni obremenitvi (seizmična obremenitev)	Uspešnost ni bila ocenjena

IZJAVA O LASTNOSTIH

Št. **4 - 043 - 240647 - 2024/01** **SLO**

EJOT®

b) Varnost v primeru požara (BWR 2)

Glavne značilnosti	Zmogljivost proizvoda
Odziv na ogenj	Razred A1

c) Higiena, zdravje in okolje (BWR 3) \ t

Glavne značilnosti	Zmogljivost proizvoda

d) Zaščita pred hrupom (BWR 5) \ t

Glavne značilnosti	Zmogljivost proizvoda

e) Varčevanje z energijo in ohranjanje toplote (BWR 6) \ t

Glavne značilnosti	Zmogljivost proizvoda

f) Trajnostna raba naravnih virov (BWR 7) \ t

Glavne značilnosti	Zmogljivost proizvoda

Lastnosti proizvoda, navedenega zgoraj, so v skladu z navedenimi lastnostmi. Za izdajo te izjave o lastnostih je v skladu z Uredbo (EU) št. 305/2011 odgovoren izključno proizvajalec, naveden zgoraj.

Podpisal za in v imenu proizvajalca:

Dr. Jens Weber
(Ime)

Bad Laasphe, 17.10.2024
(Kraj in datum izstavitve)

(Podpis)

Table B1: Installation parameters for threaded rod

Threaded rod				M8	M10	M12	M16	M20	M24	M27	M30
Diameter of element		$d = d_{nom}$	[mm]	8	10	12	16	20	24	27	30
Nominal drill hole diameter		d_0	[mm]	10	12	14	18	22	28	30	35
Effective embedment depth		$h_{ef,min}$	[mm]	60	60	70	80	90	96	108	120
		$h_{ef,max}$	[mm]	160	200	240	320	400	480	540	600
Diameter of clearance hole in the fixture	Prepositioned installation	$d_f \leq$	[mm]	9	12	14	18	22	26	30	33
	Push through installation	d_f	[mm]	12	14	16	20	24	30	33	40
Maximum installation torque		max T_{inst}	[Nm]	10	20	40[1]	60	100	170	250	300
Minimum thickness of member		h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm			$h_{ef} + 2d_0$				
Minimum spacing		s_{min}	[mm]	40	50	60	75	95	115	125	140
Minimum edge distance		c_{min}	[mm]	35	40	45	50	60	65	75	80

1) Maximum installation torque for M12 with steel Grade 4.6 is 35 Nm

Table B2: Installation parameters for reinforcing bar

Reinforcing bar			Ø 8[1]	Ø 10[1]	Ø 12[1]	Ø 14	Ø 16	Ø 20	Ø 24[1]	Ø 25[1]	Ø 28	Ø 32	Ø 36	Ø 40
Diameter of element	$d = d_{nom}$	[mm]	8	10	12	14	16	20	24	25	28	32	36	40
Nominal drill hole diameter	d_0	[mm]	10 12	12 14	14 16	18	20	25	30 32	30 32	35	40	45	52/55
Effective embedment depth	$h_{ef,min}$	[mm]	60	60	70	75	80	90	96	100	112	128	144	160
	$h_{ef,max}$	[mm]	160	200	240	280	320	400	480	500	560	640	720	800
Minimum thickness of member	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm			$h_{ef} + 2d_0$								
Minimum spacing	s_{min}	[mm]	40	50	60	70	75	95	120	120	130	150	180	200
Minimum edge distance	c_{min}	[mm]	35	40	45	50	50	60	70	70	75	85	180	200

1) both nominal drill hole diameter can be used

Table B3: Installation parameters for Internal threaded anchor rod

Internal threaded anchor rod				IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Internal diameter of anchor rod	d_2	[mm]		6	8	10	12	16	20
Outer diameter of anchor rod[1]	$d = d_{nom}$	[mm]		10	12	16	20	24	30
Nominal drill hole diameter	d_0	[mm]		12	14	18	22	28	35
Effective embedment depth	$h_{ef,min}$	[mm]		60	70	80	90	96	120
	$h_{ef,max}$	[mm]		200	240	320	400	480	600
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]		7	9	12	14	18	22
Maximum installation torque	max T_{inst}	[Nm]		10	10	20	40	60	100
Thread engagement length min/max	l_{IG}	[mm]		8/20	8/20	10/25	12/30	16/32	20/40
Minimum thickness of member	h_{min}	[mm]		h_{ef} + 30 mm ≥ 100 mm		$h_{ef} + 2d_0$			
Minimum spacing	s_{min}	[mm]		50	60	75	95	115	140
Minimum edge distance	c_{min}	[mm]		40	45	50	60	65	80

1) With metric threads

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete

Intended use
Installation parameters

Annex B 3

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

Threaded rod				M8	M10	M12	M16	M20	M24	M27	M30
Cross section area		A_s	[mm²]	36,6	58	84,3	157	245	353	459	561
Characteristic tension resistance, Steel failure [1]											
Steel, Property class 4.6 and 4.8		$N_{Rk,s}$	[kN]	15 (13)	23 (21)	34	63	98	141	184	224
Steel, Property class 5.6 and 5.8		$N_{Rk,s}$	[kN]	18 (17)	29 (27)	42	78	122	176	230	280
Steel, Property class 8.8		$N_{Rk,s}$	[kN]	29 (27)	46 (43)	67	125	196	282	368	449
Stainless steel A2, A4 and HCR, class 50		$N_{Rk,s}$	[kN]	18	29	42	79	123	177	230	281
Stainless steel A2, A4 and HCR, class 70		$N_{Rk,s}$	[kN]	26	41	59	110	171	247	-[3]	-[3]
Stainless steel A4 and HCR, class 80		$N_{Rk,s}$	[kN]	29	46	67	126	196	282	-[3]	-[3]
Characteristic tension resistance, Partial factor [2]											
Steel, Property class 4.6 and 5.6		$\gamma_{Ms,N}$	[-]	2,0							
Steel, Property class 4.8, 5.8 and 8.8		$\gamma_{Ms,N}$	[-]	1,5							
Stainless steel A2, A4 and HCR, class 50		$\gamma_{Ms,N}$	[-]	2,86							
Stainless steel A2, A4 and HCR, class 70		$\gamma_{Ms,N}$	[-]	1,87							
Stainless steel A4 and HCR, class 80		$\gamma_{Ms,N}$	[-]	1,6							
Characteristic shear resistance, Steel failure [1]											
Without lever arm	Steel, Property class 4.6 and 4.8	$V^0_{Rk,s}$	[kN]	9 (8)	14 (13)	20	38	59	85	110	135
	Steel, Property class 5.6 and 5.8	$V^0_{Rk,s}$	[kN]	11 (10)	17 (16)	25	47	74	106	138	168
	Steel, Property class 8.8	$V^0_{Rk,s}$	[kN]	15 (13)	23 (21)	34	63	98	141	184	224
	Stainless steel A2, A4 and HCR, class 50	$V^0_{Rk,s}$	[kN]	9	15	21	39	61	88	115	140
	Stainless steel A2, A4 and HCR, class 70	$V^0_{Rk,s}$	[kN]	13	20	30	55	86	124	-[3]	-[3]
	Stainless steel A4 and HCR, class 80	$V^0_{Rk,s}$	[kN]	15	23	34	63	98	141	-[3]	-[3]
With lever arm	Steel, Property class 4.6 and 4.8	$M^0_{Rk,s}$	[Nm]	15 (13)	30 (27)	52	133	260	449	666	900
	Steel, Property class 5.6 and 5.8	$M^0_{Rk,s}$	[Nm]	19 (16)	37 (33)	65	166	324	560	833	1123
	Steel, Property class 8.8	$M^0_{Rk,s}$	[Nm]	30 (26)	60 (53)	105	266	519	896	1333	1797
	Stainless steel A2, A4 and HCR, class 50	$M^0_{Rk,s}$	[Nm]	19	37	66	167	325	561	832	1125
	Stainless steel A2, A4 and HCR, class 70	$M^0_{Rk,s}$	[Nm]	26	52	92	232	454	784	-[3]	-[3]
	Stainless steel A4 and HCR, class 80	$M^0_{Rk,s}$	[Nm]	30	59	105	266	519	896	-[3]	-[3]
Characteristic shear resistance, Partial factor [2]											
Steel, Property class 4.6 and 5.6		$\gamma_{Ms,V}$	[-]	1,67							
Steel, Property class 4.8, 5.8 and 8.8		$\gamma_{Ms,V}$	[-]	1,25							
Stainless steel A2, A4 and HCR, class 50		$\gamma_{Ms,V}$	[-]	2,38							
Stainless steel A2, A4 and HCR, class 70		$\gamma_{Ms,V}$	[-]	1,56							
Stainless steel A4 and HCR, class 80		$\gamma_{Ms,V}$	[-]	1,33							

[1] Values are only valid for the given stress area A_s. Values in brackets are valid for undersized threaded rods with smaller stress area A_s for hot-dip galvanised threaded rods according to EN ISO 10684:2004+AC:2009.

[2] in absence of national regulation

[3] Fastener type not part of the ETA

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 1**
Performances Characteristic values for steel tension resistance and steel shear resistance of threaded rods	

Table C2: Characteristic values of tension loads under static and quasi-static action for a working life of 50 and 100 years

Fastener				All Fastener type and sizes
Concrete cone failure				
Uncracked concrete		$k_{ucr,N}$	[-]	11,0
Cracked concrete		$k_{cr,N}$	[-]	7,7
Edge distance		$c_{cr,N}$	[mm]	1,5 h_{ef}
Axial distance		$s_{cr,N}$	[mm]	2 $c_{cr,N}$
Splitting				
Edge distance	$h/h_{ef} \geq 2,0$	$c_{cr,sp}$	[mm]	1,0 h_{ef}
	$2,0 > h/h_{ef} > 1,3$			$2 \cdot h_{ef} \left(2,5 - \frac{h}{h_{ef}} \right)$
	$h/h_{ef} \leq 1,3$			2,4 h_{ef}
Axial distance		$s_{cr,sp}$	[mm]	2 $c_{cr,sp}$

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 2**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 50 and 100 years	

Table C3: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Threaded rod					M8	M10	M12	M16	M20	M24	M27	M30
Steel failure												
Characteristic tension resistance			$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ (or see Table C1)							
Partial factor			$\gamma_{Ms,N}$	[-]	see Table C1							
Combined pull-out and concrete failure												
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes (HD) and compressed air drilled holes (CD)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	20	20	19	19	18	17	16	16
	II: 50°C/72°C				15	15	15	14	13	13	12	12
	III:60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	17	16	16	16	15	14	14	13
	II: 50°C/72°C				14	14	14	13	13	12	12	11
	III:60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
	I: 24°C/40°C	flooded bore hole			16	16	16	15	15	14	14	13
	II: 50°C/72°C				14	14	14	13	13	12	12	11
	III:60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD) , compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,cr}$	[N/mm²]	7,0	7,0	8,5	8,5	8,5	8,5	8,5	8,5
	II: 50°C/72°C				6,0	6,0	7,0	7,0	7,0	7,0	7,0	7,0
	III:60°C/80°C				5,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5
Reduction factor ψ^0_{sus} in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	ψ^0_{sus}	[-]	0,80							
	II: 50°C/72°C				0,68							
	III:60°C/80°C				0,70							
Increasing factors for concrete			ψ_c	[-]	$(f_{ck} / 20)^{0,1}$							
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr}$ =		$\psi_c \cdot \tau_{Rk,ucr,(C20/25)}$							
			$\tau_{Rk,cr}$ =		$\psi_c \cdot \tau_{Rk,cr,(C20/25)}$							
Concrete cone failure												
Relevant parameter					see Table C2							
Splitting												
Relevant parameter					see Table C2							
Installation factor												
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0							
for flooded bore hole (HD; HDB, CD)					1,2							

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete

Performances
Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (threaded rod)

Annex C 3

Table C4: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Threaded rod					M8	M10	M12	M16	M20	M24	M27	M30
Steel failure												
Characteristic tension resistance			$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ (or see Table C1)							
Partial factor			$\gamma_{Ms,N}$	[-]	see Table C1							
Combined pull-out and concrete failure												
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes (HD) and compressed air drilled holes (CD)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	20	20	19	19	18	17	16	16
	II: 50°C/72°C				15	15	15	14	13	13	12	12
	III: 60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)												
Temperaturerange	I: 24°C/40°C	Dry, wet concrete	$\tau_{Rk,ucr,100}$	[N/mm²]	17	16	16	16	15	14	14	13
	II: 50°C/72°C				14	14	14	13	13	12	12	11
	III: 60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
	I: 24°C/40°C	flooded bore hole			16	16	16	15	15	14	14	13
	II: 50°C/72°C				14	14	14	13	13	12	12	11
	III: 60°C/80°C				6,5	6,5	6,5	6,0	6,0	5,5	5,5	5,5
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD) , compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,cr,100}$	[N/mm²]	6,5	6,5	7,5	7,5	7,5	7,5	7,5	7,5
	II: 50°C/72°C				5,5	5,5	6,5	6,5	6,5	6,5	6,5	6,5
	III: 60°C/80°C				5,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5
Reduction factor $\psi^0_{sus,100}$ in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\psi^0_{sus,100}$	[-]	0,80							
	II: 50°C/72°C				0,68							
	III: 60°C/80°C				0,70							
Increasing factors for concrete			ψ_c	[-]	$(f_{ck} / 20)^{0,1}$							
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr,100}$ =		$\psi_c \cdot \tau_{Rk,ucr,100,(C20/25)}$							
			$\tau_{Rk,cr,100}$ =		$\psi_c \cdot \tau_{Rk,cr,100,(C20/25)}$							
Concrete cone failure												
Relevant parameter					see Table C2							
Splitting												
Relevant parameter					see Table C2							
Installation factor												
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0							
for flooded bore hole (HD; HDB, CD)					1,2							

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete

Performances
Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (threaded rod)

Annex C 4

Table C5: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Threaded rod					**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel failure												
Characteristic tension resistance			$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ (or see Table C1)							
Partial factor			$\gamma_{Ms,N}$	[-]	see Table C1							
Combined pull-out and concrete failure												
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	15	14	14	13	12	12	11	11
	II: 50°C/72°C				12	12	11	10	9,5	9,5	9,0	9,0
	III:60°C/80°C				5,5	5,5	5,0	4,5	4,5	4,5	4,0	4,0
Reduction factor ψ^0_{sus} in uncracked concrete C20/25 in diamond drilled holes (DD)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	ψ^0_{sus}	[-]	0,77							
	II: 50°C/72°C				0,72							
	III:60°C/80°C				0,72							
Increasing factors for concrete			ψ_c	[-]	$(f_{ck} / 20)^{0,2}$							
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr}$ =		$\psi_c \cdot \tau_{Rk,ucr,(C20/25)}$							
Concrete cone failure												
Relevant parameter					see Table C2							
Splitting												
Relevant parameter					see Table C2							
Installation factor												
for dry and wet concrete (DD)			γ_{inst}	[-]	1,0							
for flooded bore hole (DD)					1,2			1,4				

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 5**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (threaded rod)	

Table C6: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Threaded rod				M8	M10	M12	M16	M20	M24	M27	M30
Steel failure											
Characteristic tension resistance		$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ (or see Table C1)							
Partial factor		$\gamma_{Ms,N}$	[-]	see Table C1							
Combined pull-out and concrete failure											
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)											
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	15	14	14	13	12	12	11	11
Temperature range II: 50°C/72°C				11	11	10	10	9,5	9,0	8,5	8,5
Temperature range III:60°C/80°C				5,5	5,5	5,0	4,5	4,5	4,5	4,0	4,0
Reduction factor $\psi^0_{sus,100}$ in uncracked concrete C20/25 in diamond drilled holes (DD)											
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\psi^0_{sus,100}$	[-]	0,73							
Temperature range II: 50°C/72°C				0,70							
Temperature range III:60°C/80°C				0,72							
Increasing factors for concrete		Ψ_c	[-]	$(f_{ck} / 20)^{0,2}$							
Characteristic bond resistance depending on the concrete strength class		$\tau_{Rk,ucr,100}$ =		$\Psi_c \cdot \tau_{Rk,ucr,100,(C20/25)}$							
Concrete cone failure											
Relevant parameter				see Table C2							
Splitting											
Relevant parameter				see Table C2							
Installation factor											
for dry and wet concrete (DD)		γ_{inst}	[-]	1,0							
for flooded bore hole (DD)				1,2			1,4				

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete

Performances
Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (threaded rod)

Annex C 6

Table C7: Characteristic values of shear loads under static and quasi-static action for a working life of 50 and 100 years

Threaded rod			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel failure without lever arm										
Characteristic shear resistance Steel, strength class 4.6, 4.8 and 5.6, 5.8	$V^0_{Rk,s}$	[kN]	$0{,}6 \cdot A_s \cdot f_{uk}$ (or see Table C1)							
Characteristic shear resistance Steel, strength class 8.8 Stainless Steel A2, A4 and HCR, all strength classes	$V^0_{Rk,s}$	[kN]	$0{,}5 \cdot A_s \cdot f_{uk}$ (or see Table C1)							
Partial factor	$\gamma_{Ms,V}$	[-]	see Table C1							
Ductility factor	k_7	[-]	1,0							
Steel failure with lever arm										
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	$1{,}2 \cdot W_{el} \cdot f_{uk}$ (or see Table C1)							
Elastic section modulus	W_{el}	[mm³]	31	62	109	277	541	935	1387	1874
Partial factor	$\gamma_{Ms,V}$	[-]	see Table C1							
Concrete pry-out failure										
Factor	k_8	[-]	2,0							
Installation factor	γ_{inst}	[-]	1,0							
Concrete edge failure										
Effective length of fastener	l_f	[mm]	$\min(h_{ef}; 12 \cdot d_{nom})$						$\min(h_{ef}; 300mm)$	
Outside diameter of fastener	d_{nom}	[mm]	8	10	12	16	20	24	27	30
Installation factor	γ_{inst}	[-]	1,0							

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 7**
Performances Characteristic values of shear loads under static and quasi-static action for a working life of 50 and 100 years (threaded rod)	

Table C8: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Internal threaded anchor rods					IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure[1]										
Characteristic tension resistance, Steel, strength class	5.8		$N_{Rk,s}$	[kN]	10	17	29	42	76	123
	8.8		$N_{Rk,s}$	[kN]	16	27	46	67	121	196
Partial factor, strength class 5.8 and 8.8			$\gamma_{Ms,N}$	[-]	1,5					
Characteristic tension resistance, Stainless Steel A4 and HCR, Strength class 70[2]			$N_{Rk,s}$	[kN]	14	26	41	59	110	124
Partial factor			$\gamma_{Ms,N}$	[-]	1,87					2,86
Combined pull-out and concrete cone failure										
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes (HD) and compressed air drilled holes (CD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	20	19	19	18	17	16
	II: 50°C/72°C				15	15	14	13	13	12
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry, wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	16	16	16	15	14	13
	II: 50°C/72°C				14	14	13	13	12	11
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
	I: 24°C/40°C	flooded bore hole			16	16	15	15	14	13
	II: 50°C/72°C				14	14	13	13	12	11
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,cr}$	[N/mm²]	7,0	8,5	8,5	8,5	8,5	8,5
	II: 50°C/72°C				6,0	7,0	7,0	7,0	7,0	7,0
	III:60°C/80°C				5,0	5,0	4,5	4,5	4,5	4,5
Reduction factor ψ^0_{sus} in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	ψ^0_{sus}	[-]	0,80					
	II: 50°C/72°C				0,68					
	III:60°C/80°C				0,70					
Increasing factors for concrete			ψ_c	[-]	$(f_{ck} / 20)^{0,1}$					
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr}$ =		$\psi_c * \tau_{Rk,ucr,(C20/25)}$					
			$\tau_{Rk,cr}$ =		$\psi_c * \tau_{Rk,cr,(C20/25)}$					
Concrete cone failure										
Relevant parameter					see Table C2					
Splitting failure										
Relevant parameter					see Table C2					
Installation factor										
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0					
for flooded bore hole (HD; HDB, CD)					1,2					

1) Fastenings (incl. nut and washer) must comply with the appropriate material and property class of the internal threaded rod. The characteristic tension resistance for steel failure is valid for the internal threaded rod and the fastening element.

2) For IG-M20 strength class 50 is valid

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete

Performances
Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (Internal threaded anchor rod)

Annex C 8

Table C9: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Internal threaded anchor rods					IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure[1]										
Characteristic tension resistance, Steel, strength class	5.8	$N_{Rk,s}$	[kN]		10	17	29	42	76	123
	8.8	$N_{Rk,s}$	[kN]		16	27	46	67	121	196
Partial factor, strength class 5.8 and 8.8		$\gamma_{Ms,N}$	[-]		1,5					
Characteristic tension resistance, Stainless Steel A4 and HCR, Strength class 70[2]		$N_{Rk,s}$	[kN]		14	26	41	59	110	124
Partial factor		$\gamma_{Ms,N}$	[-]		1,87					2,86
Combined pull-out and concrete cone failure										
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes (HD) and compressed air drilled holes (CD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	20	19	19	18	17	16
	II: 50°C/72°C				15	15	14	13	13	12
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry, wet concrete	$\tau_{Rk,ucr,100}$	[N/mm²]	16	16	16	15	14	13
	II: 50°C/72°C				14	14	13	13	12	11
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
	I: 24°C/40°C	flooded bore hole			16	16	15	15	14	13
	II: 50°C/72°C				14	14	13	13	12	11
	III:60°C/80°C				6,5	6,5	6,0	6,0	5,5	5,5
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,cr,100}$	[N/mm²]	6,5	7,5	7,5	7,5	7,5	7,5
	II: 50°C/72°C				5,5	6,5	6,5	6,5	6,5	6,5
	III:60°C/80°C				5,0	5,0	4,5	4,5	4,5	4,5
Reduction factor $\psi^0_{sus,100}$ in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)										
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\psi^0_{sus,100}$	[-]	0,80					
	II: 50°C/72°C				0,68					
	III:60°C/80°C				0,70					
Increasing factors for concrete		ψ_c	[-]		$(f_{ck} / 20)^{0,1}$					
Characteristic bond resistance depending on the concrete strength class		$\tau_{Rk,ucr,100}$ =			$\psi_c * \tau_{Rk,ucr,100,(C20/25)}$					
		$\tau_{Rk,cr,100}$ =			$\psi_c * \tau_{Rk,cr,100,(C20/25)}$					
Concrete cone failure										
Relevant parameter					see Table C2					
Splitting failure										
Relevant parameter					see Table C2					
Installation factor										
for dry and wet concrete (HD; HDB, CD)		γ_{inst}	[-]		1,0					
for flooded bore hole (HD; HDB, CD)					1,2					

1) Fastenings (incl. nut and washer) must comply with the appropriate material and property class of the internal threaded rod. The characteristic tension resistance for steel failure is valid for the internal threaded rod and the fastening element.

2) For IG-M20 strength class 50 is valid

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete

Performances
Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (Internal threaded anchor rod)

Annex C 9

Table C10: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Internal threaded anchor rods					IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure[1]										
Characteristic tension resistance, Steel, strength class	5.8		$N_{Rk,s}$	[kN]	10	17	29	42	76	123
	8.8		$N_{Rk,s}$	[kN]	16	27	46	67	121	196
Partial factor, strength class 5.8 and 8.8			$\gamma_{Ms,N}$	[-]	1,5					
Characteristic tension resistance, Stainless Steel A4 and HCR, Strength class 70[2]			$N_{Rk,s}$	[kN]	14	26	41	59	110	124
Partial factor			$\gamma_{Ms,N}$	[-]	1,87					2,86
Combined pull-out and concrete cone failure										
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	14	14	13	12	12	11
	II: 50°C/72°C				12	11	10	9,5	9,5	9,0
	III:60°C/80°C				5,5	5,0	4,5	4,5	4,5	4,0
Reduction factor ψ^0_{sus} in uncracked concrete C20/25 in diamond drilled holes (DD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	ψ^0_{sus}	[-]	0,77					
	II: 50°C/72°C				0,72					
	III:60°C/80°C				0,72					
Increasing factors for concrete			ψ_c	[-]	$(f_{ck} / 20)^{0,2}$					
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr}$ =		$\psi_c * \tau_{Rk,ucr,(C20/25)}$					
Concrete cone failure										
Relevant parameter					see Table C2					
Splitting failure										
Relevant parameter					see Table C2					
Installation factor										
for dry and wet concrete (DD)			γ_{inst}	[-]	1,0					
for flooded bore hole (DD)					1,2		1,4			

1) Fastenings (incl. nut and washer) must comply with the appropriate material and property class of the internal threaded rod. The characteristic tension resistance for steel failure is valid for the internal threaded rod and the fastening element.

2) For IG-M20 strength class 50 is valid

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete

Performances
Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (Internal threaded anchor rod)

Annex C 10

Table C11: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Internal threaded anchor rods					IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure[1]										
Characteristic tension resistance, Steel, strength class	5.8		$N_{Rk,s}$	[kN]	10	17	29	42	76	123
	8.8		$N_{Rk,s}$	[kN]	16	27	46	67	121	196
Partial factor, strength class 5.8 and 8.8			$\gamma_{Ms,N}$	[-]	1,5					
Characteristic tension resistance, Stainless Steel A4 and HCR, Strength class 70[2]			$N_{Rk,s}$	[kN]	14	26	41	59	110	124
Partial factor			$\gamma_{Ms,N}$	[-]	1,87					2,86
Combined pull-out and concrete cone failure										
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	14	14	13	12	12	11
	II: 50°C/72°C				11	10	10	9,5	9,0	8,5
	III:60°C/80°C				5,5	5,0	4,5	4,5	4,5	4,0
Reduction factor $\psi^0_{sus,100}$ in uncracked concrete C20/25 in diamond drilled holes (DD)										
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\psi^0_{sus,100}$	[-]	0,73					
	II: 50°C/72°C				0,70					
	III:60°C/80°C				0,72					
Increasing factors for concrete			ψ_c	[-]	$(f_{ck} / 20)^{0,2}$					
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,ucr,100}$ =		$\psi_c * \tau_{Rk,ucr,100,(C20/25)}$					
Concrete cone failure										
Relevant parameter					see Table C2					
Splitting failure										
Relevant parameter					see Table C2					
Installation factor										
for dry and wet concrete (DD)			γ_{inst}	[-]	1,0					
for flooded bore hole (DD)					1,2		1,4			

1) Fastenings (incl. nut and washer) must comply with the appropriate material and property class of the internal threaded rod. The characteristic tension resistance for steel failure is valid for the internal threaded rod and the fastening element.

2) For IG-M20 strength class 50 is valid

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 11**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (Internal threaded anchor rod)	

Table C12: Characteristic values of shear loads under static and quasi-static action for a working life of 50 and 100 years

Internal threaded anchor rods				IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure without lever arm[1]									
Characteristic shear resistance, Steel, strength class	5.8	$V^0_{Rk,s}$	[kN]	5	9	15	21	38	61
	8.8	$V^0_{Rk,s}$	[kN]	8	14	23	34	60	98
Partial factor, strength class 5.8 and 8.8		$\gamma_{Ms,V}$	[-]	1,25					
Characteristic shear resistance, Stainless Steel A4 and HCR, Strength class 70[2]		$V^0_{Rk,s}$	[kN]	7	13	20	30	55	40
Partial factor		$\gamma_{Ms,V}$	[-]	1,56					2,38
Ductility factor		k_7	[-]	1,0					
Steel failure with lever arm[1]									
Characteristic bending moment, Steel, strength class	5.8	$M^0_{Rk,s}$	[Nm]	8	19	37	66	167	325
	8.8	$M^0_{Rk,s}$	[Nm]	12	30	60	105	267	519
Partial factor, strength class 5.8 and 8.8		$\gamma_{Ms,V}$	[-]	1,25					
Characteristic bending moment, Stainless Steel A4 and HCR, Strength class 70[2]		$M^0_{Rk,s}$	[Nm]	11	26	52	92	233	456
Partial factor		$\gamma_{Ms,V}$	[-]	1,56					2,38
Concrete pry-out failure									
Factor		k_8	[-]	2,0					
Installation factor		γ_{inst}	[-]	1,0					
Concrete edge failure									
Effective length of fastener		l_f	[mm]	$\min(h_{ef}; 12 \cdot d_{nom})$					$\min(h_{ef}; 300mm)$
Outside diameter of fastener		d_{nom}	[mm]	10	12	16	20	24	30
Installation factor		γ_{inst}	[-]	1,0					

1) Fastenings (incl. nut and washer) must comply with the appropriate material and property class of the internal threaded rod. The characteristic tension resistance for steel failure is valid for the internal threaded rod and the fastening element.

2) For IG-M20 strength class 50 is valid

Table C13: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Reinforcing bar				Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Steel failure															
Characteristic tension resistance		$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ [1]											
Cross section area		A_s	[mm²]	50	79	113	154	201	314	452	491	616	804	1018	1256
Partial factor		$\gamma_{Ms,N}$	[-]	1,4 [2]											
Combined pull-out and concrete failure															
Characteristic bond resistance in uncracked concrete C20/25 in hammer (HD) and compressed air drilled holes (CD)															
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	16	16	16	16	16	16	15	15	15	15	15	15
Temperature range II: 50°C/72°C				12	12	12	12	12	12	12	12	11	11	11	11
Temperature range III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0	4,5	4,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)															
Temperature range I: 24°C/40°C	Dry, wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	14	14	13	13	13	13	13	13	13	13	3)	
Temperature range II: 50°C/72°C				12	12	12	11	11	11	11	11	11	11		
Temperature range III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0		
Temperature range I: 24°C/40°C	flooded bore hole			13	13	13	13	13	13	13	13	13	13		
Temperature range II: 50°C/72°C				11	11	11	11	11	11	11	11	11	11		
Temperature range III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0		
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)															
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,cr}$	[N/mm²]	7,0	7,0	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5	3)	
Temperature range II: 50°C/72°C				6,0	6,0	7,0	7,0	7,0	7,0	7,0	7,0	7,0	7,0		
Temperature range III: 60°C/80°C				4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5		
Reduction factor ψ^0_{sus} in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)															
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	ψ^0_{sus}	[-]	0,80											
Temperature range II: 50°C/72°C				0,68											
Temperature range III: 60°C/80°C				0,70											
Increasing factors for concrete		ψ_c	[-]	$(f_{ck} / 20)^{0,1}$											
Characteristic bond resistance depending on the concrete strength class		$\tau_{Rk,ucr}$ =		$\psi_c \cdot \tau_{Rk,ucr,(C20/25)}$											
		$\tau_{Rk,cr}$ =		$\psi_c \cdot \tau_{Rk,cr,(C20/25)}$											
Concrete cone failure															
Relevant parameter				see Table C2											
Splitting															
Relevant parameter				see Table C2											
Installation factor (HD; HDB, CD)															
for dry and wet concrete		γ_{inst}	[-]	1,0										1,2	
for flooded bore hole				1,2										3)	

1) f_{uk} shall be taken from the specifications of reinforcing bars

2) in absence of national regulation

3) no performance assessed

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete

Performances
Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (reinforcing bar)

Annex C 13

Table C14: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Reinforcing bar				**Ø 8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 24**	**Ø 25**	**Ø 28**	**Ø 32**	**Ø 36**	**Ø 40**
Steel failure															
Characteristic tension resistance		$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ [1)]											
Cross section area		A_s	[mm²]	50	79	113	154	201	314	452	491	616	804	1018	1256
Partial factor		$\gamma_{Ms,N}$	[-]	1,4 [2)]											
Combined pull-out and concrete failure															
Characteristic bond resistance in uncracked concrete C20/25 in hammer (HD) and compressed air drilled holes (CD)															
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	16	16	16	16	16	16	15	15	15	15	15	15
Temperature range II: 50°C/72°C				12	12	12	12	12	12	12	12	11	11	11	11
Temperature range III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0	4,5	4,5
Characteristic bond resistance in uncracked concrete C20/25 in hammer drilled holes with hollow drill bit (HDB)															
Temperature range I: 24°C/40°C	Dry, wet concrete	$\tau_{Rk,ucr,100}$	[N/mm²]	14	14	13	13	13	13	13	13	13	13	3)	
Temperature range II: 50°C/72°C				12	12	12	11	11	11	11	11	11	11		
Temperature range III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0		
Temperature range I: 24°C/40°C	flooded bore hole			13	13	13	13	13	13	13	13	13	13		
Temperature range II: 50°C/72°C				11	11	11	11	11	11	11	11	11	11		
Temperature range III: 60°C/80°C				5,5	5,5	5,5	5,5	5,5	5,5	5,0	5,0	5,0	5,0		
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)															
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,cr,100}$	[N/mm²]	6,5	6,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	3)	
Temperature range II: 50°C/72°C				5,5	5,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5		
Temperature range III: 60°C/80°C				4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5		
Reduction factor $\psi^0_{sus,100}$ in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)															
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\psi^0_{sus,100}$	[-]	0,80											
Temperature range II: 50°C/72°C				0,68											
Temperature range III: 60°C/80°C				0,70											
Increasing factors for concrete		ψ_c	[-]	$(f_{ck} / 20)^{0,1}$											
Characteristic bond resistance depending on the concrete strength class		$\tau_{Rk,ucr,100}$ =		$\psi_c \cdot \tau_{Rk,ucr,100,(C20/25)}$											
		$\tau_{Rk,cr,100}$ =		$\psi_c \cdot \tau_{Rk,cr,100,(C20/25)}$											
Concrete cone failure															
Relevant parameter				see Table C2											
Splitting															
Relevant parameter				see Table C2											
Installation factor (HD; HDB, CD)															
for dry and wet concrete		γ_{inst}	[-]	1,0										1,2	
for flooded bore hole				1,2										3)	

1) f_{uk} shall be taken from the specifications of reinforcing bars

2) in absence of national regulation

3) no performance assessed

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete

Performances
Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (reinforcing bar)

Annex C 14

Table C15: Characteristic values of tension loads under static and quasi-static action for a working life of 50 years

Reinforcing bar				**Ø 8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 24**	**Ø 25**	**Ø 28**	**Ø 32**	**Ø 36**	**Ø 40**
Steel failure															
Characteristic tension resistance		$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ [1)]											
Cross section area		A_s	[mm²]	50	79	113	154	201	314	452	491	616	804	1018	1256
Partial factor		$\gamma_{Ms,N}$	[-]	1,4 [2)]											
Combined pull-out and concrete failure															
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)															
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr}$	[N/mm²]	14	13	13	13	12	12	11	11	11	11	11	10
Temperature range II: 50°C/72°C				11	11	10	10	10	9,5	9,5	9,5	9,0	9,0	8,5	8,5
Temperature range III: 60°C/80°C				5,0	5,0	5,0	4,5	4,5	4,5	4,0	4,0	4,0	4,0	4,0	4,0
Reduction factor ψ^0_{sus} in uncracked concrete C20/25 in diamond drilled holes (DD)															
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	ψ^0_{sus}	[-]	0,77											
Temperature range II: 50°C/72°C				0,72											
Temperature range III: 60°C/80°C				0,72											
Increasing factors for concrete		ψ_c	[-]	$(f_{ck} / 20)^{0,2}$											
Characteristic bond resistance depending on the concrete strength class		$\tau_{Rk,ucr} =$		$\psi_c \cdot \tau_{Rk,ucr,(C20/25)}$											
Concrete cone failure															
Relevant parameter				see Table C2											
Splitting															
Relevant parameter				see Table C2											
Installation factor (DD)															
for dry and wet concrete		γ_{inst}	[-]	1,0											1,2
for flooded bore hole				1,2					1,4						3)

1) f_{uk} shall be taken from the specifications of reinforcing bars

2) in absence of national regulation

3) no performance assessed

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 15**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 50 years (reinforcing bar)	

Table C16: Characteristic values of tension loads under static and quasi-static action for a working life of 100 years

Reinforcing bar				Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Steel failure															
Characteristic tension resistance		$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$ [1]											
Cross section area		A_s	[mm²]	50	79	113	154	201	314	452	491	616	804	1018	1256
Partial factor		$\gamma_{Ms,N}$	[-]	1,4 [2]											
Combined pull-out and concrete failure															
Characteristic bond resistance in uncracked concrete C20/25 in diamond drilled holes (DD)															
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,ucr,100}$	[N/mm²]	14	13	13	13	12	12	11	11	11	11	11	10
Temperature range II: 50°C/72°C				11	10	10	10	9,5	9,0	9,0	9,0	8,5	8,5	8,0	8,0
Temperature range III: 60°C/80°C				5,0	5,0	5,0	4,5	4,5	4,5	4,0	4,0	4,0	4,0	4,0	4,0
Reduction factor $\psi^0_{sus,100}$ in uncracked concrete C20/25 in diamond drilled holes (DD)															
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\psi^0_{sus,100}$	[-]	0,73											
Temperature range II: 50°C/72°C				0,70											
Temperature range III: 60°C/80°C				0,72											
Increasing factors for concrete		ψ_c	[-]	$(f_{ck} / 20)^{0,2}$											
Characteristic bond resistance depending on the concrete strength class		$\tau_{Rk,ucr,100}$ =		$\psi_c \cdot \tau_{Rk,ucr,100,(C20/25)}$											
Concrete cone failure															
Relevant parameter				see Table C2											
Splitting															
Relevant parameter				see Table C2											
Installation factor (DD)															
for dry and wet concrete		γ_{inst}	[-]	1,0										1,2	
for flooded bore hole				1,2				1,4						3)	

1) f_{uk} shall be taken from the specifications of reinforcing bars

2) in absence of national regulation

3) no performance assessed

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 16**
Performances Characteristic values of tension loads under static and quasi-static action for a working life of 100 years (reinforcing bar)	

Table C17: Characteristic values of shear loads under static and quasi-static action for a working life of 50 and 100 years

Reinforcing bar			**Ø 8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 24**	**Ø 25**	**Ø 28**	**Ø 32**	**Ø 36**	**Ø 40**
Steel failure without lever arm														
Characteristic shear resistance	$V^0_{Rk,s}$	[kN]	$0,5 \cdot A_s \cdot f_{uk}$ [1)]											
Cross section area	A_s	[mm²]	50	79	113	154	201	314	452	491	616	804	1018	1256
Partial factor	$\gamma_{Ms,V}$	[-]	1,5 [2)]											
Ductility factor	k_7	[-]	1,0											
Steel failure with lever arm														
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	$1,2 \cdot W_{el} \cdot f_{uk}$ [1)]											
Elastic section modulus	W_{el}	[mm³]	50	98	170	269	402	785	1357	1534	2155	3217	4580	6283
Partial factor	$\gamma_{Ms,V}$	[-]	1,5 [2)]											
Concrete pry-out failure														
Factor	k_8	[-]	2,0											
Installation factor	γ_{inst}	[-]	1,0											
Concrete edge failure														
Effective length of fastener	l_f	[mm]	$\min(h_{ef}; 12 \cdot d_{nom})$							$\min(h_{ef}; 300mm)$				
Outside diameter of fastener	d_{nom}	[mm]	8	10	12	14	16	20	24	25	28	32	36	40
Installation factor	γ_{inst}	[-]	1,0											

1) f_{uk} shall be taken from the specifications of reinforcing bars

2) in absence of national regulation

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 17**
Performances Characteristic values of shear loads under static and quasi-static action for a working life of 50 and 100 years (reinforcing bar)	

Table C20: Displacements under tension load[1] in hammer drilled holes (HD), comp. air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Uncracked concrete under static and quasi-static action for a working life of 50 and 100 years										
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,028	0,029	0,030	0,033	0,035	0,038	0,039	0,041
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,028	0,029	0,030	0,033	0,035	0,038	0,039	0,041
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,044	0,047	0,051	0,052	0,055
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,047	0,049	0,051	0,055	0,059	0,064	0,067	0,070
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,044	0,047	0,051	0,052	0,055
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,047	0,049	0,051	0,055	0,059	0,064	0,067	0,070
Cracked concrete under static and quasi-static action for a working life of 50 and 100 years										
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,069	0,071	0,072	0,074	0,076	0,079	0,081	0,082
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,100	0,115	0,122	0,128	0,135	0,142	0,155	0,171
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,092	0,095	0,096	0,099	0,102	0,106	0,109	0,110
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,134	0,154	0,163	0,172	0,181	0,189	0,207	0,229
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,092	0,095	0,096	0,099	0,102	0,106	0,109	0,110
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,134	0,154	0,163	0,172	0,181	0,189	0,207	0,229

[1] Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension

Table C18: Displacements under tension load[1] in diamond drilled holes (DD)

Threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Uncracked concrete under static and quasi-static action for a working life of 50 years										
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,011	0,012	0,012	0,013	0,014	0,014	0,015	0,015
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,018	0,019	0,019	0,020	0,022	0,023	0,024	0,025
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,013	0,014	0,014	0,015	0,016	0,016	0,018	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,052	0,053	0,055	0,058	0,062	0,065	0,068	0,070
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,013	0,014	0,014	0,015	0,016	0,016	0,018	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,052	0,053	0,055	0,058	0,062	0,065	0,068	0,070
Uncracked concrete under static and quasi-static action for a working life of 100 years										
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,011	0,012	0,012	0,013	0,014	0,014	0,015	0,015
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,020	0,021	0,021	0,023	0,024	0,025	0,026	0,027
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,013	0,014	0,014	0,015	0,016	0,016	0,018	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,043	0,045	0,047	0,049	0,051
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,013	0,014	0,014	0,015	0,016	0,016	0,018	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,043	0,045	0,047	0,049	0,051

[1] Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension

Table C19: Displacements under shear load[1] for all drilling methods

Threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Uncracked and cracked concrete under static and quasi-static action for a working life of 50 and 100 years										
All temperature ranges	δ_{V0}-factor	[mm/kN]	0,06	0,06	0,05	0,04	0,04	0,03	0,03	0,03
	$\delta_{V\infty}$-factor	[mm/kN]	0,09	0,08	0,08	0,06	0,06	0,05	0,05	0,05

[1] Calculation of the displacement $\delta_{V0} = \delta_{V0}\text{-factor} \cdot V$; $\delta_{V\infty} = \delta_{V\infty}\text{-factor} \cdot V$; V: action shear load

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete

Performances
Displacements under static and quasi-static action
for a working life of 50 and 100 years (threaded rod)

Annex C 18

Table C21: Displacements under tension load[1] in hammer drilled holes (HD), comp. air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Internal threaded anchor rods			IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Uncracked concrete under static and quasi-static action for a working life of 50 and 100 years								
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,029	0,030	0,033	0,035	0,038	0,041
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,029	0,030	0,033	0,035	0,038	0,041
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,039	0,040	0,044	0,047	0,051	0,055
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,049	0,051	0,055	0,059	0,064	0,070
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,039	0,040	0,044	0,047	0,051	0,055
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,049	0,051	0,055	0,059	0,064	0,070
Cracked concrete under static and quasi-static action for a working life of 50 and 100 years								
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,071	0,072	0,074	0,076	0,079	0,082
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,115	0,122	0,128	0,135	0,142	0,171
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,095	0,096	0,099	0,102	0,106	0,110
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,154	0,163	0,172	0,181	0,189	0,229
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,095	0,096	0,099	0,102	0,106	0,110
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,154	0,163	0,172	0,181	0,189	0,229

[1] Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension

Table C22: Displacements under tension load[1] in diamond drilled holes (DD)

Internal threaded anchor rods			IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Uncracked concrete under static and quasi-static action for a working life of 50 years								
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,012	0,012	0,013	0,014	0,014	0,015
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,019	0,019	0,020	0,022	0,023	0,025
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,014	0,014	0,015	0,016	0,016	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,053	0,055	0,058	0,062	0,065	0,070
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,014	0,014	0,015	0,016	0,016	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,053	0,055	0,058	0,062	0,065	0,070
Uncracked concrete under static and quasi-static action for a working life of 100 years								
Temperature range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,012	0,012	0,013	0,014	0,014	0,015
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,021	0,021	0,023	0,024	0,025	0,027
Temperature range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,014	0,014	0,015	0,016	0,016	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,039	0,040	0,043	0,045	0,047	0,051
Temperature range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,014	0,014	0,015	0,016	0,016	0,018
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,039	0,040	0,043	0,045	0,047	0,051

[1] Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension

Table C23: Displacements under shear load[1] for all drilling methods

Internal threaded anchor rods			IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Uncracked and cracked concrete under static and quasi-static action for a working life of 50 and 100 years								
All temperature ranges	δ_{V0}-factor	[mm/kN]	0,07	0,06	0,06	0,05	0,04	0,04
	$\delta_{V\infty}$-factor	[mm/kN]	0,10	0,09	0,08	0,08	0,06	0,06

[1] Calculation of the displacement $\delta_{V0} = \delta_{V0}\text{-factor} \cdot V$; $\delta_{V\infty} = \delta_{V\infty}\text{-factor} \cdot V$; V: action shear load

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 19**
Performances Displacements under static and quasi-static action for a working life of 50 and 100 years (Internal threaded anchor rod)	

Table C24: Displacements under tension load[1] in hammer drilled holes (HD), comp. air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Reinforcing bar			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Uncracked concrete under static and quasi-static action for a working life of 50 and 100 years														
Temp.- range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,028	0,029	0,030	0,031	0,033	0,035	0,038	0,038	0,040	0,043	0,045	0,047
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,028	0,029	0,030	0,031	0,033	0,035	0,038	0,038	0,040	0,043	0,045	0,047
Temp.- range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,042	0,044	0,047	0,051	0,051	0,054	0,058	0,060	0,063
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,047	0,049	0,051	0,053	0,055	0,059	0,065	0,065	0,068	0,072	0,074	0,079
Temp.- range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,038	0,039	0,040	0,042	0,044	0,047	0,051	0,051	0,054	0,058	0,060	0,063
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,047	0,049	0,051	0,053	0,055	0,059	0,065	0,065	0,068	0,072	0,074	0,079
Cracked concrete under static and quasi-static action for a working life of 50 and 100 years														
Temp.- range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,069	0,071	0,072	0,073	0,074	0,076	0,079	0,079	0,081	0,084	2)	
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,115	0,122	0,128	0,135	0,142	0,155	0,171	0,171	0,181	0,194		
Temp.- range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,092	0,095	0,096	0,098	0,099	0,102	0,106	0,106	0,109	0,113		
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,154	0,163	0,172	0,181	0,189	0,207	0,229	0,229	0,242	0,260		
Temp.- range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,092	0,095	0,096	0,098	0,099	0,102	0,106	0,106	0,109	0,113		
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,154	0,163	0,172	0,181	0,189	0,207	0,229	0,229	0,242	0,260		

1) Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension
2) No performance assessed

Table C25: Displacements under tension load[1] in diamond drilled holes (DD)

Reinforcing bar			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Uncracked concrete under static and quasi-static action for a working life of 50 years														
Temp.- range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,008	0,009	0,009	0,01	0,011	0,012	0,013	0,013	0,014	0,015	0,016	0,017
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,018	0,018	0,019	0,020	0,021	0,024	0,027	0,027	0,028	0,031	0,032	0,034
Temp.- range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,009	0,011	0,011	0,012	0,013	0,014	0,015	0,015	0,016	0,018	0,019	0,020
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,048	0,051	0,054	0,058	0,061	0,068	0,076	0,076	0,081	0,088	0,090	0,097
Temp.- range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,009	0,011	0,011	0,012	0,013	0,014	0,015	0,015	0,016	0,018	0,019	0,020
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,048	0,051	0,054	0,058	0,061	0,068	0,076	0,076	0,081	0,088	0,090	0,097
Uncracked concrete under static and quasi-static action for a working life of 100 years														
Temp.- range I: 24°C/40°C	δ_{N0}-factor	[mm/(N/mm²)]	0,008	0,009	0,009	0,010	0,011	0,012	0,013	0,013	0,014	0,015	0,016	0,017
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,018	0,020	0,021	0,022	0,024	0,026	0,029	0,029	0,031	0,034	0,035	0,037
Temp.- range II: 50°C/72°C	δ_{N0}-factor	[mm/(N/mm²)]	0,009	0,011	0,011	0,012	0,013	0,014	0,015	0,015	0,016	0,018	0,019	0,020
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,035	0,037	0,040	0,042	0,045	0,049	0,055	0,055	0,059	0,064	0,066	0,070
Temp.- range III: 60°C/80°C	δ_{N0}-factor	[mm/(N/mm²)]	0,009	0,011	0,011	0,012	0,013	0,014	0,015	0,015	0,016	0,018	0,019	0,020
	$\delta_{N\infty}$-factor	[mm/(N/mm²)]	0,035	0,037	0,040	0,042	0,045	0,049	0,055	0,055	0,059	0,064	0,090	0,097

1) Calculation of the displacement: $\delta_{N0} = \delta_{N0}\text{-factor} \cdot \tau$; $\delta_{N\infty} = \delta_{N\infty}\text{-factor} \cdot \tau$; τ: action bond stress for tension

Table C26: Displacements under shear load[1] for all drilling methods

Reinforcing bar			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32	Ø 36	Ø 40
Uncracked and cracked concrete under static and quasi-static action for a working life of 50 and 100 years														
All temperature ranges	δ_{V0}-factor	[mm/kN]	0,06	0,05	0,05	0,04	0,04	0,04	0,03	0,03	0,03	0,03	0,03	0,03
	$\delta_{V\infty}$-factor	[mm/kN]	0,09	0,08	0,08	0,06	0,06	0,05	0,05	0,05	0,04	0,04	0,04	0,04

1) Calculation of the displacement $\delta_{V0} = \delta_{V0}\text{-factor} \cdot V$; $\delta_{V\infty} = \delta_{V\infty}\text{-factor} \cdot V$; V: action shear load

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete

Performances
Displacements under static and quasi-static action
for a working life of 50 and 100 years (reinforcing bar)

Annex C 20

Table C27: Characteristic values of tension loads under seismic action (performance category C1) for a working life of 50 years

Threaded rod					M8	M10	M12	M16	M20	M24	M27	M30
Steel failure												
Characteristic tension resistance			$N_{Rk,s,eq,C1}$	[kN]	$1{,}0 \cdot N_{Rk,s}$							
Partial factor			$\gamma_{Ms,N}$	[-]	see Table C1							
Combined pull-out and concrete failure												
Characteristic bond resistance in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	7,0	7,0	8,5	8,5	8,5	8,5	8,5	8,5
	II: 50°C/72°C		$\tau_{Rk,eq,C1}$	[N/mm²]	6,0	6,0	7,0	7,0	7,0	7,0	7,0	7,0
	III:60°C/80°C		$\tau_{Rk,eq,C1}$	[N/mm²]	5,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5
Increasing factors for concrete			ψ_C	[-]	1,0							
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,eq,C1} =$		$\psi_C \cdot \tau_{Rk,eq,C1,(C20/25)}$							
Installation factor												
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0							
for flooded bore hole (HD; HDB, CD)					1,2							

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 21**
Performances Characteristic values of tension loads under seismic action (performance category C1) for a working life of 50 years (threaded rod)	

Table C28: Characteristic values of tension loads under seismic action (performance category C1) for a working life of 100 years

Threaded rod					**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel failure												
Characteristic tension resistance			$N_{Rk,s,eq,C1}$	[kN]	$1{,}0 \cdot N_{Rk,s}$							
Partial factor			$\gamma_{Ms,N}$	[-]	see Table C1							
Combined pull-out and concrete failure												
Characteristic bond resistance in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)												
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	6,5	6,5	7,5	7,5	7,5	7,5	7,5	7,5
	II: 50°C/72°C		$\tau_{Rk,eq,C1}$	[N/mm²]	5,5	5,5	6,5	6,5	6,5	6,5	6,5	6,5
	III:60°C/80°C		$\tau_{Rk,eq,C1}$	[N/mm²]	5,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5
Increasing factors for concrete			ψ_c	[-]	1,0							
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,eq,C1} =$		$\psi_c \cdot \tau_{Rk,eq,C1,(C20/25)}$							
Installation factor												
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0							
for flooded bore hole (HD; HDB, CD)					1,2							

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 22**
Performances Characteristic values of tension loads under seismic action (performance category C1) for a working life of 100 years (threaded rod)	

Table C29: Characteristic values of shear loads under seismic action (performance category C1) for a working life of 50 and 100 years

Threaded rod			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel failure										
Characteristic shear resistance (Seismic C1)	$V_{Rk,s,eq,C1}$	[kN]	$0{,}70 \cdot V^0_{Rk,s}$							
Partial factor	$\gamma_{Ms,V}$	[-]	see Table C1							
Factor for annular gap	α_{gap}	[-]	0,5 (1,0) [1)]							

1) Value in brackets valid for filled annular gab between fastener and clearance hole in the fixture. Use of special filling washer Annex A 3 is recommended.

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 23**
Performances Characteristic values of shear loads under seismic action (performance category C1) for a working life of 50 and 100 years (threaded rod)	

Table C30: Characteristic values of tension loads under seismic action (performance category C1) for a working life of 50 years

Reinforcing bar				**Ø 8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 24**	**Ø 25**	**Ø 28**	**Ø 32**
Steel failure													
Characteristic tension resistance		$N_{Rk,s,eq,C1}$	[kN]	$1,0 \cdot A_s \cdot f_{uk}$ [1)]									
Cross section area		A_s	[mm²]	50	79	113	154	201	314	452	491	616	804
Partial factor		$\gamma_{Ms,N}$	[-]	1,4[2)]									
Combined pull-out and concrete failure													
Characteristic bond resistance in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)													
Temperature range I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	7,0	7,0	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5
Temperature range II: 50°C/72°C		$\tau_{Rk,eq,C1}$	[N/mm²]	6,0	6,0	7,0	7,0	7,0	7,0	7,0	7,0	7,0	7,0
Temperature range III:60°C/80°C		$\tau_{Rk,eq,C1}$	[N/mm²]	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5
Increasing factors for concrete		ψ_c	[-]	1,0									
Characteristic bond resistance depending on the concrete strength class		$\tau_{Rk,eq,C1} =$		$\psi_c \cdot \tau_{Rk,eq,C1,(C20/25)}$									
Installation factor													
for dry and wet concrete (HD; HDB, CD)		γ_{inst}	[-]	1,0									
for flooded bore hole (HD; HDB, CD)				1,2									

1) f_{uk} shall be taken from the specifications of reinforcing bars

2) in absence of national regulation

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 24**
Performances Characteristic values of tension loads under seismic action (performance category C1) for a working life of 50 years (reinforcing bar)	

Table C31: Characteristic values of tension loads under seismic action (performance category C1) for a working life of 100 years

Reinforcing bar					Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 24	Ø 25	Ø 28	Ø 32
Steel failure														
Characteristic tension resistance			$N_{Rk,s,eq,C1}$	[kN]	$1,0 \cdot A_s \cdot f_{uk}$ [1]									
Cross section area			A_s	[mm²]	50	79	113	154	201	314	452	491	616	804
Partial factor			$\gamma_{Ms,N}$	[-]	1,4 [2]									
Combined pull-out and concrete failure														
Characteristic bond resistance in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)														
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C1}$	[N/mm²]	6,5	6,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5
	II: 50°C/72°C		$\tau_{Rk,eq,C1}$	[N/mm²]	5,5	5,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5
	III:60°C/80°C		$\tau_{Rk,eq,C1}$	[N/mm²]	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5
Increasing factors for concrete			Ψ_c	[-]	1,0									
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,eq,C1} =$		$\Psi_c \cdot \tau_{Rk,eq,C1,(C20/25)}$									
Installation factor														
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0									
for flooded bore hole (HD; HDB, CD)					1,2									

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

[2] in absence of national regulation

Injection System EJOT MULTIFIX Epoxy / Sormat ITH Epoxy for concrete	**Annex C 25**
Performances Characteristic values of tension loads under seismic action (performance category C1) for a working life of 100 years (reinforcing bar)	

Table C32: Characteristic values of shear loads under seismic action (performance category C1) for a working life of 50 and 100 years

Reinforcing bar			**Ø 8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 24**	**Ø 25**	**Ø 28**	**Ø 32**
Steel failure												
Characteristic shear resistance	$V_{Rk,s,eq,C1}$	[kN]	$0{,}35 \cdot A_s \cdot f_{uk}$ [1]									
Cross section area	A_s	[mm²]	50	79	113	154	201	314	452	491	616	804
Partial factor	$\gamma_{Ms,V}$	[-]	1,5 [2]									
Factor for annular gap	α_{gap}	[-]	0,5 (1,0) [3]									

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

[2] in absence of national regulation

[3] Value in brackets valid for filled annular gab between fastener and clearance hole in the fixture. Use of special filling washer Annex A 3 is recommended.

Table C33: Characteristic values of tension loads under seismic action (performance category C2) for a working life of 50 and 100 years

Threaded rod					**M12**	**M16**	**M20**	**M24**
Steel failure								
Characteristic tension resistance, Steel, strength class 8.8 Stainless Steel A4 and HCR, Strength class ≥70			$N_{Rk,s,eq,C2}$	[kN]	$1,0 \cdot N_{Rk,s}$			
Partial factor			$\gamma_{Ms,N}$	[-]	see Table C1			
Combined pull-out and concrete failure								
Characteristic bond resistance in cracked and uncracked concrete C20/25 in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)								
Temperature range	I: 24°C/40°C	Dry, wet concrete and flooded bore hole	$\tau_{Rk,eq,C2}$	[N/mm²]	5,8	4,8	5,0	5,1
	II: 50°C/72°C		$\tau_{Rk,eq,C2}$	[N/mm²]	5,0	4,1	4,3	4,4
	III:60°C/80°C		$\tau_{Rk,eq,C2}$	[N/mm²]	1,9	1,6	1,6	1,7
Increasing factors for concrete			ψ_c	[-]	1,0			
Characteristic bond resistance depending on the concrete strength class			$\tau_{Rk,eq,C2} =$		$\psi_c \cdot \tau_{Rk,eq,C2,(C20/25)}$			
Installation factor								
for dry and wet concrete (HD; HDB, CD)			γ_{inst}	[-]	1,0			
for flooded bore hole (HD; HDB, CD)					1,2			

Table C34: Characteristic values of shear loads under seismic action (performance category C2) for a working life of 50 and 100 years

Threaded rod		**M12**	**M16**	**M20**	**M24**
Steel failure					
Characteristic shear resistance Steel, strength class 8.8 Stainless Steel A4 and HCR, Strength class ≥70	$V_{Rk,s,eq,C2}$ [kN]	$0,70 \cdot V^0_{Rk,s}$			
Partial factor	$\gamma_{Ms,V}$ [-]	see Table C1			
Factor for annular gap	α_{gap} [-]	0,5 (1,0)[1)]			

1) Value in brackets valid for filled annular gab between fastener and clearance hole in the fixture. Use of special filling washer Annex A 3 is recommended.

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Characteristic values of tension and shear loads under seismic action (performance category C2) for a working life of 50 and 100 years (threaded rod)

Annex C 27

Table C35: Displacements under tension load (threaded rod)

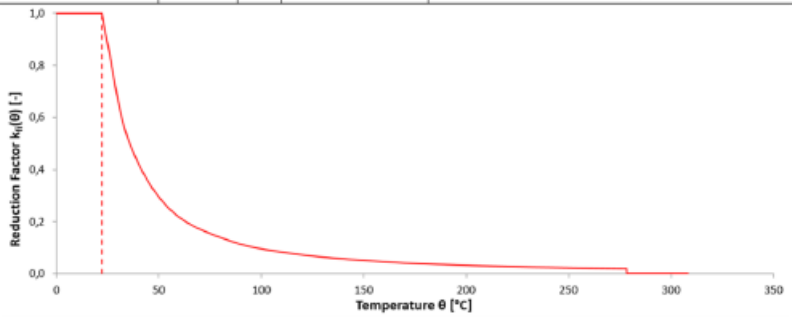
Threaded rod			M12	M16	M20	M24
Uncracked and cracked concrete under seismic action (performance category C2) for a working life of 50 and 100 years						
All temperature ranges	$\delta_{N,eq,C2(50\%)} = \delta_{N,eq,C2(DLS)}$	[mm]	0,21	0,24	0,27	0,36
	$\delta_{N,eq,C2(100\%)} = \delta_{N,eq,C2(ULS)}$	[mm]	0,54	0,51	0,54	0,63

Table C36: Displacements under shear load (threaded rod)

Threaded rod			M12	M16	M20	M24
Uncracked and cracked concrete under seismic action (performance category C2) for a working life of 50 and 100 years						
All temperature ranges	$\delta_{V,eq,C2(50\%)} = \delta_{V,eq,C2(DLS)}$	[mm]	3,1	3,4	3,5	4,2
	$\delta_{V,eq,C2(100\%)} = \delta_{V,eq,C2(ULS)}$	[mm]	6,0	7,6	7,3	10,9

Table C37: Characteristic values of tension and shear loads under fire exposure in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Threaded rod					**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel failure												
Characteristic tension resistance; Steel, Stainless Steel A2, A4 and HCR, strength class 5.8 resp. 50 and higher	$N_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	1,1	1,7	3,0	5,7	8,8	12,7	16,5	20,2
				60	0,9	1,4	2,3	4,2	6,6	9,5	12,4	15,1
				90	0,7	1,0	1,6	3,0	4,7	6,7	8,7	10,7
				120	0,5	0,8	1,2	2,2	3,4	4,9	6,4	7,9
Characteristic bond resistance in cracked and uncracked concrete C20/25 up to C50/60 under fire conditions for a given temperature θ												
Temperature reduction factor	$k_{fi,p}(\theta)$	[-]	$\theta < 23°C$		$1,0$							
			$23°C \leq \theta \leq 278°C$		$150{,}28 \cdot \theta^{-1{,}598} \leq 1{,}0$							
			$\theta > 278°C$		$0{,}0$							



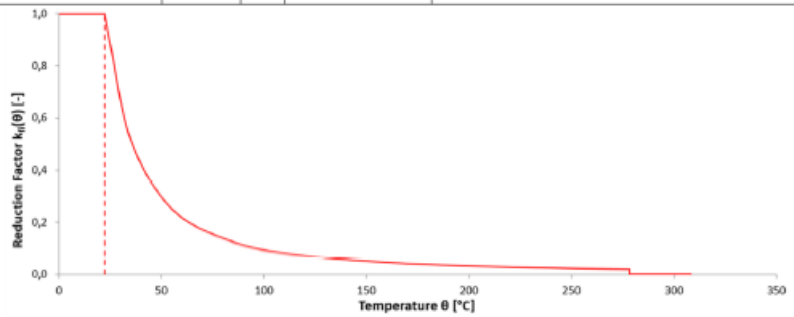
Characteristic bond resistance for a given temperature (θ)	$\tau_{Rk,fi}(\theta)$	[N/mm²]	$k_{fi,p}(\theta) \cdot \tau_{Rk,cr,(C20/25)}$ [1)]

Steel failure without lever arm												
Characteristic shear resistance; Steel, Stainless Steel A2, A4 and HCR, strength class 5.8 resp. 50 and higher	$V_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	1,1	1,7	3,0	5,7	8,8	12,7	16,5	20,2
				60	0,9	1,4	2,3	4,2	6,6	9,5	12,4	15,1
				90	0,7	1,0	1,6	3,0	4,7	6,7	8,7	10,7
				120	0,5	0,8	1,2	2,2	3,4	4,9	6,4	7,9
Steel failure with lever arm												
Characteristic bending moment; Steel, Stainless Steel A2, A4 and HCR, strength class 5.8 resp. 50 and higher	$M^0_{Rk,s,fi}$	[Nm]	Fire exposure time [min]	30	1,1	2,2	4,7	12,0	23,4	40,4	59,9	81,0
				60	0,9	1,8	3,5	9,0	17,5	30,3	44,9	60,7
				90	0,7	1,3	2,5	6,3	12,3	21,3	31,6	42,7
				120	0,5	1,0	1,8	4,7	9,1	15,7	23,3	31,5

[1)] $\tau_{Rk,cr,(C20/25)}$ characteristic bond resistance for cracked concrete for concrete strength class C20/25 for the relevant temperature range

Table C38: Characteristic values of tension and shear loads under fire exposure in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Internal threaded anchor rods					IG-M6	IG-M8	IG-M10	IG-M12	IG-M16	IG-M20
Steel failure										
Characteristic tension resistance; Steel, Stainless Steel A4 and HCR, strength class 5.8 and 8.8 resp. 70	$N_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	0,3	1,1	1,7	3,0	5,7	8,8
				60	0,2	0,9	1,4	2,3	4,2	6,6
				90	0,2	0,7	1,0	1,6	3,0	4,7
				120	0,1	0,5	0,8	1,2	2,2	3,4
Characteristic bond resistance in cracked and uncracked concrete C20/25 up to C50/60 under fire conditions for a given temperature θ										
Temperature reduction factor	$k_{fi,p}(\theta)$	[-]	$\theta < 23°C$		1,0					
			$23°C \leq \theta \leq 278°C$		$150{,}28 \cdot \theta^{-1{,}598} \leq 1{,}0$					
			$\theta > 278°C$		0,0					

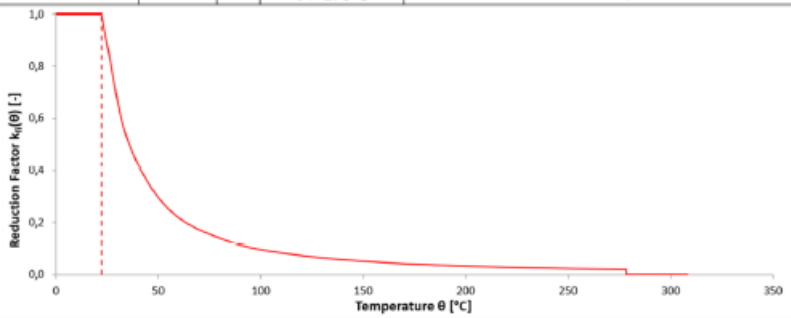


Characteristic bond resistance for a given temperature (θ)	$\tau_{Rk,fi}(\theta)$	[N/mm²]	$k_{fi,p}(\theta) \cdot \tau_{Rk,cr,(C20/25)}$ [1)]

Steel failure without lever arm										
Characteristic shear resistance; Steel, Stainless Steel A4 and HCR, strength class 5.8 and 8.8 resp. 70	$V_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	0,3	1,1	1,7	3,0	5,7	8,8
				60	0,2	0,9	1,4	2,3	4,2	6,6
				90	0,2	0,7	1,0	1,6	3,0	4,7
				120	0,1	0,5	0,8	1,2	2,2	3,4
Steel failure with lever arm										
Characteristic bending moment; Steel, Stainless Steel A4 and HCR, strength class 5.8 and 8.8 resp. 70	$M^0_{Rk,s,fi}$	[Nm]	Fire exposure time [min]	30	0,2	1,1	2,2	4,7	12,0	23,4
				60	0,2	0,9	1,8	3,5	9,0	17,5
				90	0,1	0,7	1,3	2,5	6,3	12,3
				120	0,1	0,5	1,0	1,8	4,7	9,1

[1)] $\tau_{Rk,cr,(C20/25)}$ characteristic bond resistance for cracked concrete for concrete strength class C20/25 for the relevant temperature range

Table C39: Characteristic values of tension and shear loads under fire exposure in hammer drilled holes (HD), compressed air drilled holes (CD) and in hammer drilled holes with hollow drill bit (HDB)

Reinforcing bar					**Ø 8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 24**	**Ø 25**	**Ø 28**	**Ø 32**
Steel failure														
Characteristic tension resistance; BSt 500	$N_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	0,5	1,2	2,3	3,1	4,0	6,3	9,0	9,8	12,3	16,1
				60	0,5	1,0	1,7	2,3	3,0	4,7	6,8	7,4	9,2	12,1
				90	0,4	0,8	1,5	2,0	2,6	4,1	5,9	6,4	8,0	10,5
				120	0,3	0,6	1,1	1,5	2,0	3,1	4,5	4,9	6,2	8,0
Characteristic bond resistance in cracked and uncracked concrete C20/25 up to C50/60 under fire conditions for a given temperature θ														
Temperature reduction factor	$k_{fi,p}(\theta)$	[-]	$\theta < 25°C$		$1,0$									
			$25°C \leq \theta \leq 278°C$		$176,37 \cdot \theta^{-1,598} \leq 1,0$									
			$\theta > 278°C$		$0,0$									
														
Characteristic bond resistance for a given temperature (θ)	$\tau_{Rk,fi}(\theta)$	[N/mm²]			$k_{fi,p}(\theta) \cdot \tau_{Rk,cr,(C20/25)}$ [1)]									
Steel failure without lever arm														
Characteristic shear resistance; BSt 500	$V_{Rk,s,fi}$	[kN]	Fire exposure time [min]	30	0,5	1,2	2,3	3,1	4,0	6,3	9,0	9,8	12,3	16,1
				60	0,5	1,0	1,7	2,3	3,0	4,7	6,8	7,4	9,2	12,1
				90	0,4	0,8	1,5	2,0	2,6	4,1	5,9	6,4	8,0	10,5
				120	0,3	0,6	1,1	1,5	2,0	3,1	4,5	4,9	6,2	8,0
Steel failure with lever arm														
Characteristic bending moment; BSt 500	$M^0_{Rk,s,fi}$	[Nm]	Fire exposure time [min]	30	0,6	1,8	4,1	6,5	9,7	18,8	32,6	36,8	51,7	77,2
				60	0,5	1,5	3,1	4,8	7,2	14,1	24,4	27,6	38,8	57,9
				90	0,4	1,2	2,6	4,2	6,3	12,3	21,2	23,9	33,6	50,2
				120	0,3	0,9	2,0	3,2	4,8	9,4	16,3	18,4	25,9	38,6

1) $\tau_{Rk,cr,(C20/25)}$ characteristic bond resistance for cracked concrete for concrete strength class C20/25 for the relevant temperature range

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