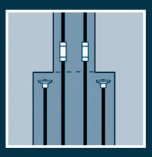

DYWIDAG

GEOTECHNICAL SYSTEMS

Coupler and anchorages of reinforcing bars with thread ribs B500B-*GEWI*®
nominal diameter: 40.0 to 50.0mm

Approval Number Z-1.5-149
Validity 1st October 2015 - 30th September 2020

Deutsches Institut für Bautechnik DIBt
(German Institute for Building Technology)

Approval Body for Building Products and Building Methods
Constructional Testing Authority
A statutory body jointly sponsored by the German national government and the German Länder
Member of EOTA, UEAtc and WFTAO

General Construction Supervisory Authority Approval

Date: 16/10/2015

Reference No.: I 24-1.1.5-9/15

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Period of validity:
from: **October 01, 2015**
to: **September 30, 2020**

Applicant:
DYWIDAG-Systems International GmbH
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Subject of approval:
Coupler and anchorages of reinforcing bars with thread ribs B500B-GEWI nominal diameter: 40.0 to 50.0 mm

The above-mentioned subject matter is hereby granted general construction supervisory authority accreditation/approval.
This notice comprises 9 pages and 16 annexes.
The subject matter was granted a general construction supervisory authority approval on Dezember 1, 1976 for the first time.

I. GENERAL REGULATIONS

1 This general construction supervisory authority approval verifies the suitability (fitness for the intended purpose) of the subject of the approval in keeping with the state construction ordinances.

2 If this general construction supervisory authority approval requires special knowledge and experience in assembly and usage of construction products and application acc. to §17 Abs. 5 Model Building Regulation, this verification can be confirmed with similar certificates in other member states of the European Union. This is eventually also valid for certificates approved for the European Economic Area (EWR) or othe bilateral contracts.

3 The general construction supervisory authority approval does not replace the permissions, agreements and certifications required by law for a construction project to be carried out.

4 The general construction supervisory authority approval is granted without prejudicing the rights of third parties, especially private protection rights.

5 Notwithstanding any further regulations in the "Special Provisions" section, the manufacturer and distributor of the subject of approval shall provide the user with copies of the certificate of approval; furthermore, they shall inform the user that the certificate of approval must be available at the place of use. Copies of the general construction supervisory authority approval must be made available to involved authorities on request.

6 The general construction supervisory authority approval may only be copied completely. The publication of extracts is subject to approval by the DIBt. Texts and drawings of advertising material may not contradict the general construction supervisory authority approval. Translations of the general construction supervisory authority approval must contain the note 'Translation of the German original which has not been checked by the DIBt".

7 The general construction supervisory authority approval is granted, but is revocable. The provisions in the general construction supervisory authority approval can be subsequently supplemented or changed, especially if the latest technical findings give reason for this.

II. SPECIAL PROVISIONS

1 Subject of approval, and applications

1.1 Subject of approval

Object of this approval are mechanical couplers and anchorages of reinforcing steel with thread ribs by means of screwed couplers or screwed-on anchoring components (see Annex 1).

The diameters of the reinforcing steel with thread ribs BSt 500 S-GEWI (GEWI Threadbar) are 40 and 50 mm. A general construction supervisory authority approval is required for the reinforcing steel.

The coupling and anchoring components have an internal thread into which the threadbars are screwed in. Slip-reducing fastening of threads is achieved by a torque either applied to the lock nuts (T 2040, T 2003) or directly to the threadbars.

Couplers (T 3003) and long couplers (T 3010) are used to form tension and compression splices of threadbars having identical diameters.

Reducing couplers (T 3102) serve for coupling bars with diameters 32/40, 40/50 and 50/63.5 mm.

Turnbuckles (T 3105 / T 3014 / T 3013) are used when the GEWI Threadbars to be connected are immovable and non rotatable. Free movement of the bar threads is synchronised by means of a change-over coupler (T 3013) that has a metric thread outside and a GEWI thread inside to receive the connecting bar.

Contact couplers (T 3006) are used to form sheer compression splices. The coupler secures the centrical position of the bars whose end faces are pressed onto each other by a defined torque.

GEWI Threadbars are anchored by means of anchor pieces (T 2073G) or anchor plates (T 2008) that are fastened with the thread of the bar via anchor nuts (T 2163G or T 2002) or with anchor plates with cone (T 2239), fastened with domed nuts (T 2044). The anchoring components are fastened with lock nuts (T 2003 and T 2040) with the thread bar.

Weld-on pieces (T 3022 or T 3026) suited for welding that are welded on with a fillet weld placed along the periphery serve to transfer axial tensile and compressive loads from the GEWI Threadbar to a steel component.

1.2 Applications

The object of the approval serves for anchoring and splicing threadbars B500B-GEWI in accordance with DIN EN 1992-1-1 and DIN EN 1992-1-1/NA, section 4.4.1 and 8.2.

2 Regulations covering the construction product

2.1 Properties and composition

2.1.1 Material properties

The raw material for the coupling and anchoring components is specified in Annex 2. The requirements for the material properties specified in the standards indicated therein shall be met.

2.1.2 Geometry

The specifications provided in Annexes 3 to 11 shall apply to the outer dimensions of the coupling and anchoring components as well as to the geometry of the threads to be observed. The shop drawings including the indicated tolerances are deposited at DIBt and the external surveillance authority.

2.2 Manufacture, packaging, transport, storage and marking

2.2.1 Manufacture

Depending on the material used (see Annex 2), the coupling and anchoring components are either cast into their final form or cut as blanks from the bar stock into sections, drilled and provided with a cut interior thread analogous to the GEWI Threadbar at the plant.

2.2.2 Packaging, transport and storage

The coupling and anchoring components shall be packed, transported and stored so that they are protected from corrosion, mechanical damage and dirt accumulation prior to their use on the construction site.

2.2.3 Marking

The couplers, anchoring components and lock nuts shall be provided with the manufacturer's mark at the positions specified in the relevant annexes.

The manufacturer shall mark the delivery note for coupling and anchoring components with the compliance mark (Ü- Zeichen) pursuant to the compliance mark regulations issued by the German Länder. This mark may only be affixed if all requirements of the compliance certificate pursuant to Section 2.3 have fully been met.

2.3 Compliance certificate

2.3.1 General

Every plant must comply with the following provisions to confirm compliance of the coupling and anchoring components on the basis of a factory production control and regular external surveillance including initial inspection with the provisions of this general construction supervisory authority approval.

The manufacturer of the coupling and anchoring components shall commission a notified product certification body and a recognised external surveillance agency to issue the certificate of compliance and conduct external surveillance including the inspection of products.

The manufacturer shall provide the statement, that a certificate of conformity is granted, using the conformity sign (Ü-Zeichen) including the indication for application.

The certification authority shall submit a copy of the certificate of compliance issued to DIBt and inform DIBt about the results of the initial inspection.

2.3.2 Factory production control

Each plant must set up and also carry out its own factory production control. Factory production control is understood to be the continual monitoring of production by the manufacturer who thus ensures that the construction products manufactured by him meet the requirements of this general construction supervisory authority approval.

The factory production control must include at least the measures specified in the "Approval principles for mechanical connections and anchorages of reinforcing steel" in the edition of may 2007.

The thread geometry shall be checked by means of a yes/no check (statistical evaluation not required). Samples of the finished screwed couplers shall be taken under statistical aspects and their outer dimensions checked.

One sample that must represent the coupling and anchoring components fabricated shall be taken for each 1000 couplers and anchor pieces manufactured. The sample shall be tested with regard to its load capacity in a tensile test. Special attention must be paid that the couplers and anchorages are inspected in line with the materials used and the quantity manufactured. The test has been passed, if the requirements of "Approval principles for mechanical connections and anchorages of reinforcing steel" in the edition of may 2007, section 2.7.2 are fulfilled:
The results of factory production control shall be recorded and evaluated. The records must at least contain the following information:

- The description of the construction product or of the basic material and of its components,
- the type of the control or inspection,
- the date of manufacture and the date of inspection of the construction product or of the basic material or of its components,
- the results of the controls and inspections and, if applicable, a comparison with the relevant requirements,
- the signature of the person in charge of the internal production control system.

The records must be kept for a minimum of five years and submitted to the notified product certification body involved in continuous surveillance. They must be submitted to DIBt and to the competent highest construction supervisory authority on request.
If the test results are unsatisfactory, the manufacturer must immediately take the measures necessary to eliminate the identified deficiency. Construction products which do not meet the requirements must be handled in such a manner that they cannot be mistaken for conforming products. Once the deficiency has been eliminated, the test in question must be immediately repeated, provided that this is technically feasible and also required to verify the elimination of the deficiency.

2.3.3 External surveillance

The facilities and the internal factory production control system in all manufacturing plants must be reviewed by a notified product certification body on a regular basis, but at least twice a year in accordance with the principles specified in Section 2.3.2.
As part of the external surveillance, samples shall be taken.
The evaluations of tensile tests to be carried out within the scope of the factory production control shall be checked as per Section 2.3.2.
The results of the certification and of the external surveillance must be kept for a minimum of five years. They must be presented to DIBt and to the competent highest construction supervisory authority by the notified product certification body on request.

3 Regulations covering design and dimensions

3.1 General

Unless stated otherwise hereinafter DIN EN 1992-1-1 and DIN EN 1992-1-1/NA shall apply to design and dimensions.

All bars in one section may be spliced (full splice).

The position and dimension of the coupler splices and anchorages must be plotted in the reinforcement drawings, and the prerequisites specified in the installation regulations must be fulfilled.

3.2 Proof of ultimate limit state

3.2.1 Predominantly dead load

Splices and anchorages as per this approval may be loaded 100% like an unspliced bar in case of predominantly dead tensile and compressive loads.

3.2.2 Fatigue load

If designed as per DIN EN 1992-1-1 and DIN EN 1992-1-1/NA evidence of the fatigue behaviour must be produced as stipulated in Section 6.8. The characteristic value of the fatigue strength $\Delta_{\sigma RSk}$ = 60N/mm² assuming N = 2 * 10^6 load cycles.

The stress exponents of the stress-number curve shall be put up with k_1 = 4 and k_2 = 5 for N = 10^7. (DIN EN 1992-1-1, picture 6.30).

For weld-on pieces the load capacity of the weld seam must additionally be observed.

3.2.3 Extraordinary load

The screwed coupler splices and anchorages can be handled like usually reinforcement steel for impact loads according to DIN EN 1991-1-7.

3.3 Concrete cover, bar spacing

As regards the concrete cover over the outer edge of a coupler, of an anchoring component or a nut, and the clearances in between, the same values as for unspliced bars shall apply in line with DIN EN 1992-1-1 and DIN EN 1992-1-1/NA, section 4.4.1 and 8.2.

The distances and, if applicable, larger spaces required for installation remain unaffected thereby.

3.4 Centre and edge distances of anchorages

The centre and edge distances apply as stated in Annex 15. In deviation therefrom, the centre distances of the anchorages among each other may be decreased by up to 15% in one direction, if the required minimum spacing of the additional reinforcement is observed, and the centre distances in the other direction (vertical thereto) may be increased by the same relative value.

If the anchorages cannot be installed in one cross-sectional level they shall be shifted by at least twice the centre distance in the direction of the bar.

The aforementioned provisions apply to temporary and permanent anchorages.

3.5 Connecting reinforced concrete and steel components

The reinforcing bar of a reinforced concrete component is connected to a steel component by means of weld-on pieces T 3022 and T 3026 according to Annex 7. This connection has to be made so that the steel bar transfers constant normal stresses via the cross- section only.

Steel component, weld-on piece and lock nut shall be protected against corrosion in line with the provisions applicable to the specific use case - DIN EN ISO 12944-5

Coating by hot-dip galvanizing is not allowed.

For welding on corrosion protection coatings the rules acc. to DASt-guideline have to be regarded.

3.6 Bending

The regular bending of a bar may only start in a distance of at least 5 * d_s from the end of the coupler (d_s = nominal diameter of the bent bar).

If coupler bars are bent with special equipment at the plant, the distance to the coupler end may be decreased up to 2 * d_s.

4. Regulations for work execution

4.1 General

Only components marked as per Section 2.2.3 may be used. Usage and installation is only possible under technical steering of the applicant.

To torque the screwed coupler connections and anchorages only torque equipment may be used that has been checked acc. to DIN EN ISO 6789. The force of the torque to be applied is specified by Annex 16.

The coupler connections and anchorages may only be made by trained personnel. Therefore the manufacturer shall provide written work instructions.

The dimensions of the coupling and anchoring components, especially the length of nuts and their arrangement, must comply with the engineering drawings (reinforcement drawings).

The threads of bars, coupling and anchoring components must be free of rust and dirt accumulations.

4.2 Coupler splices

The design of coupler splices is shown in Annexes 12 and 13.

A suited permanent marking shall be affixed in a distance of 20 cm from the end of the bar to the spliced by which the central seat of the couplers can be verified.

If standard couplers (T 3003) according to Annex 3 are used, the connecting bar must always be longitudinally movable and freely rotatable. If it is longitudinally movable, but not freely rotatable, long couplers (T 3010) shall be used.

As regards turnbuckle splices, the bars to be connected may be immovable and non- rotatable.

For tension splices shorter lock nuts (T 2040) in accordance with Annex 11 may be used; however, for compression splices, except for contact splices that may be used without lock nuts, always longer lock nuts (T 2003) in line with Annex 11 may be used.

Reducing couplers (T 3102 and T 3012) as per Annex 4 shall be used for tension and compression splices of bars with different nominal diameters. The length of the lock nuts follows the loading conditions (see previous section).

4.3 Anchorages

The design of anchorages is shown in Annexes 14 and 15.
The strength class of the concrete for the anchorage must be at least C 20/25.

4.4 Weld-on pieces

To connect weld-on pieces T 3022 and T 3026 as per Annex 7 to a steel component, recognised WPS welding instructions in accordance with DIN EN ISO 15609-1 must be available that must be observed by the welding personnel. Welding personnel has to have a valid welding certification acc. to DIN EN 287-1.

Weld-on pieces may be torqued with short nuts (T 2040) in case of tensile load, and must be secured with long nuts (T 2003), see Annex 11, in case of compressive load.

4.5 Monitoring the manufacturing of coupler connections and anchorages on construction site

The screw-in length is to be verified by means of markings in distance of 20 cm to the respective end of the bar.
The installation of the prescribed, depending on the load case lock nut (short or long) shall be checked.
Compliance with the provisions set out in Sections 4.1 to 4.4, in particular the central seat of the couplers, and compliance with the specified torque moments shall be observed.
Torque equipment shall be checked prior to use and during use acc. to Section 4.1.

4.6 Notification to the construction supervision authority

The construction supervision authority or the person charged with the construction supervision must be notified about the assembly of screwed coupler connections and/or end anchorages beforehand.

Following standards and documents are referred by this general construction supervisory authority approval:

- DIN EN 287-1:2011-11	Certification of welders – melt-welding – part 1: steels; german version EN 287-1:2011
- DIN EN 1090-1:2012-02	Execution of steel structures and aluminium structures – Part 1: Requirements for conformity assessment of structural components; German version EN 1090-1:2009+A1:2011
- DIN EN 1090-2:2011-10	Execution of steel structures and aluminium structures – Part 2: Technical requirements for steel structures; German version EN 1090- 2:2008+A1:2011
- DIN EN 1562:2006-08	Castings – malleable iron; German version EN 1562:1997 + A1:2006
- DIN EN 1563:2003-02 version	Castings – spheroidal cast iron (incl. changes A1:2002); German EN 1563:1997 + A1:2002
- DIN EN 1991-1-7:2010-12	Eurocode 1: Actions on structures – Part 1-7: General actions – Accidental actions; German version EN 1991-1-7:2006 + AC:2010
- DIN EN 1991-1-7/NA:2010-12	National Annex – Nationally determined parameters – Eurocode 1: Actions on structures – Part 1-7: General actions – Accidental actions
- DIN EN 1992-1-1:2011-01	Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings; German version EN 1992-1-1:2004+AC:2010
- DIN EN 1992-1-1/NA:2013-04	National Annex – Nationally determined parameters – Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings

- DIN EN 10025-2:2005-04	Hot rolled steels – part 2: technical delivery specifications for non-alloyed steel; German version EN 10025-2:2004
- DIN EN 10083-2:2006-10	Tempering steels – part 2: technical delivery specifications for non-alloyed steel; German version EN 10083-2:2006
- DIN EN ISO 6789:2003-10	Screwing tools – hand-used torque tools – requirements and testing methods for type testing and re-calibration (ISO6789:2003)
- DIN EN ISO 9692-1:2013-12	Welding and similar processes – recommendations for preparation of the welding seam – part 1: arc welding, gas-shielded welding, gas welding, TIG welding and beam welding of steel (ISO9638-1:2013); German version EN ISO 9692-1:2013
- DIN EN ISO 12944-5:2008-01	Coating – corrosion protection of steel structures – part 5: coating systems (ISO 12944-5:2007); German version EN ISO 12944-5:2007
- DIN EN ISO 15609-1:2005-01	Requirements and certification of welding procedures for metallic materials – welding procedures – part 1: arc welding (ISO 15609-1:2004); German version EN ISO 15609-1:2004
- DASt-recomendation 006:2008	Overwelding of instant-coatings in steel structures

Andreas Kummerow
Section Head

Certified

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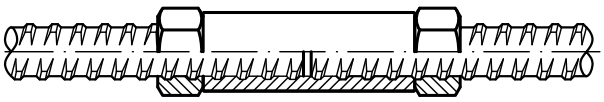
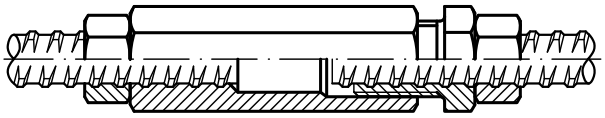
Deutsches Institut
für Bautechnik
5

GEWI®-Coupler splices

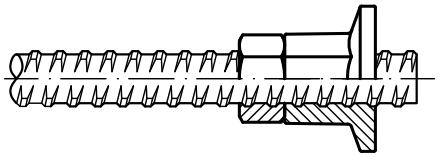


Coupler, e.g., for tension loads

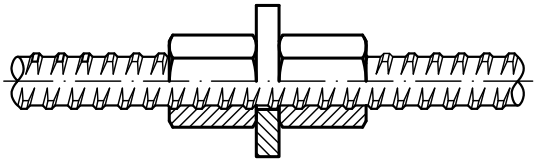


Turnbuckle, e.g., for connection of two bars with gap

GEWI®-Anchorages



Anchor piece, e.g., for tension loads



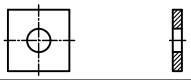
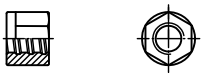
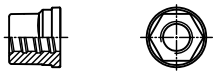
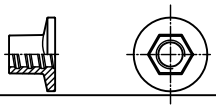
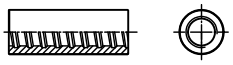
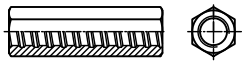
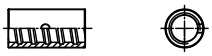
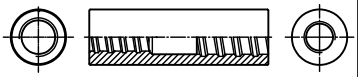
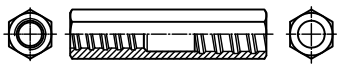
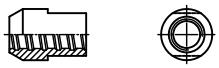
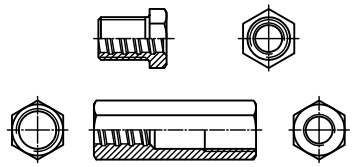
Anchor plate, e.g., for alternating loads

	GEWI®-Accessories	Appendix	for GEWI - Steel d_s [mm] 40	50
Coupler splices	Coupler	3	o	o
	Coupler - long (A/F)	3	o	o
	Turnbuckle	5	o	o
	Reduction coupler	4	o	o
	Reduction coupler - long (A/F)	4	o	o
	Contact coupler	6	o	o
Anchorages	Weld-on piece	7	o	o
	Weld-on piece - long (A/F)	7	o	o
	Anchor piece	8	o	o
	Flanged anchor nut	8	o	o
	Anchor nut	9	o	o
	Anchor nut - long	9	o	o
	Anchor plate	9	o	o
	Anchor nut - long	10	o	o
	Anchor plate	10	o	o

Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

System Overview

Annex 1

GEWI® -Article	Type	Illustration	Material
Anchor nut (s. appendix 9)	T 2002		DIN EN 10025-2 S355J0+N (1.0553+N) DIN EN 10083-2 C45+N (1.0503)
Anchor nut - long (s. appendix 9)	T 2024		DIN EN 10025-2 S355J0+N (1.0553+N) DIN EN 10083-2 C45+N (1.0503)
Anchor plate (s. appendix 9)	T 2008		DIN EN 10025-2 S235JR (1.0038)
Lock nut - short (s. appendix 10)	T 2040		DIN EN 10025-2 S355J0+N (1.0553+N) DIN EN 10083-2 C45+N (1.0503)
Lock nut - short - cast (s. appendix 10)	T 2040G		EN 1563 EN-GJS-500-7 (EN-JS 1050) EN 1562 EN-GJMB-550-4 (EN-JM 1160)
Lock nut - long (s. appendix 10)	T 2003		DIN EN 10025-2 S355J0+N (1.0553+N) DIN EN 10083-2 C45+N (1.0503)
Lock nut - long - cast (s. appendix 10)	T 2003G		EN 1563 EN-GJS-500-7 (EN-JS 1050) EN 1562 EN-GJMB-550-4 (EN-JM 1160)
Flanged anchor nut (s. appendix 8)	T 2163G		EN 1563 EN-GJS-500-7 (EN-JS 1050) EN 1562 EN-GJMB-550-4 (EN-JM 1160)
Anchor piece (s. appendix 8)	T 2073G		EN 1563 EN-GJS-500-7 (EN-JS 1050) EN 1562 EN-GJMB-550-4 (EN-JM 1160)
Coupler (s. appendix 3)	T 3003		DIN EN 10025-2 S355J0+N (1.0553+N) DIN EN 10293 G42CrMo4 (1.7231)
Coupler - long (A/F) (s. appendix 3)	T 3010		DIN EN 10025-2 S355J0+N (1.0553+N) DIN EN 10083-2 C45+N (1.0503)
Contact coupler (s. appendix 6)	T 3006		DIN EN 10025-2 S355J0+N (1.0553+N) DIN EN 10083-2 C45+N (1.0503)
Reduction coupler (s. appendix 4)	T 3102		DIN EN 10025-2 S355J0+N (1.0553+N) DIN EN 10083-2 C45+N (1.0503)
Reduction coupler - long (A/F) (s. appendix 4)	T 3012		DIN EN 10025-2 S355J0+N (1.0553+N) DIN EN 10083-2 C45+N (1.0503)
Weld-on piece (s. appendix 7)	T 3022		DIN EN 10025-2 S355J0+N (1.0553+N)
Weld-on piece-long (A/F) (s. appendix 7)	T 3026		DIN EN 10025-2 S355J0+N (1.0553+N)
Turnbuckle -change over coupler -Tensioning coupler (s. appendix 5)	T 3105 -T 3013 -T 3014		DIN EN 10025-2 S355J0+N (1.0553+N) DIN EN 10083-2 C45+N (1.0503)

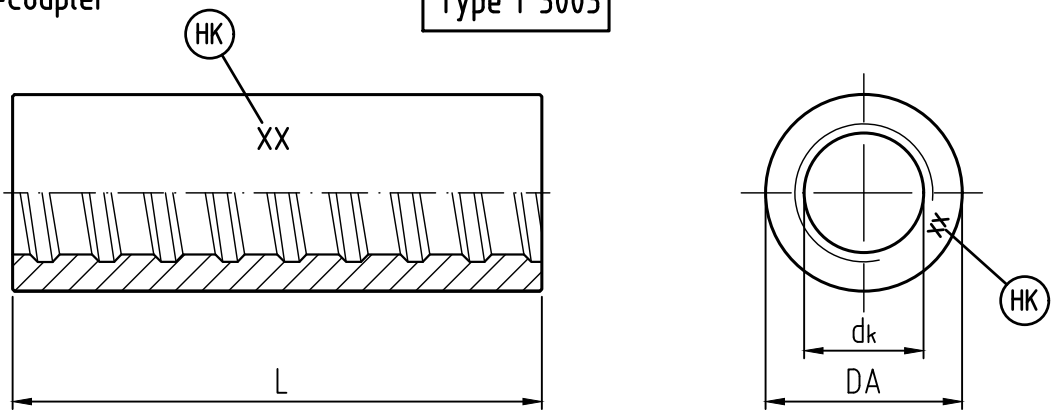
Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Annex 2

Article Overview

GEWI®-Coupler

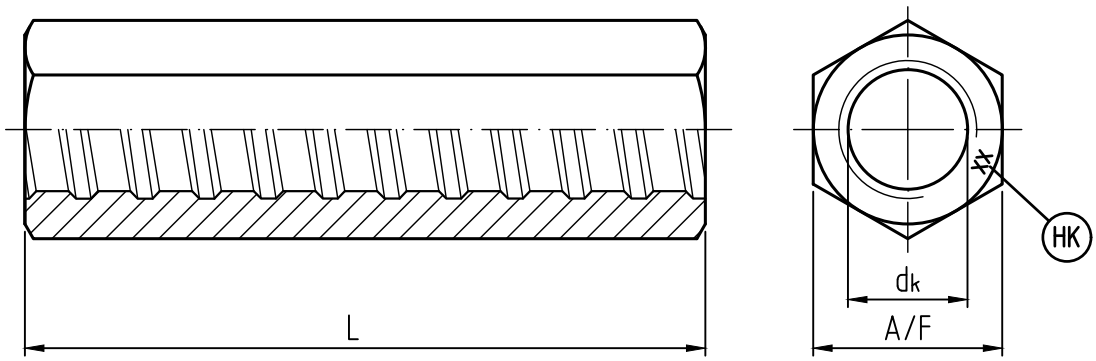
Type T 3003



GEWI-Steel	d_s [mm]	40	50
Dimensions	L [mm]	160	200
	DA [mm]	65	80
	max. d_k [mm]	39,9	50,0

GEWI® -Coupler-long (A/F)

Type T 3010



GEWI-Steel	d_s [mm]	40	50
Dimensions	L [mm]	210	240
	A/F [mm]	60	80
	max. d_k [mm]	39,9	50,0

Remarks: for material see appendix 2

(HK) = Supplier's marking: DYWIDAG or DW

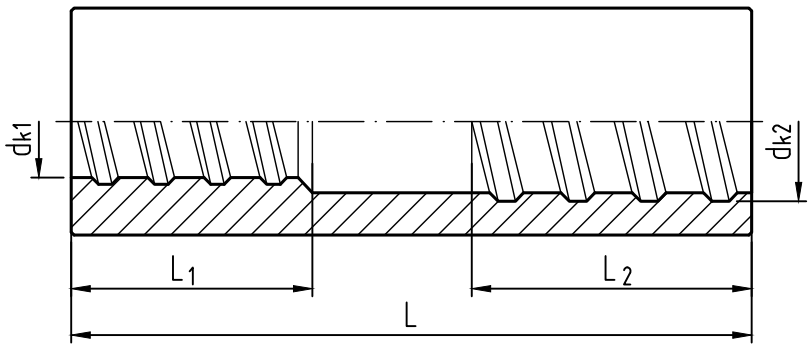
Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

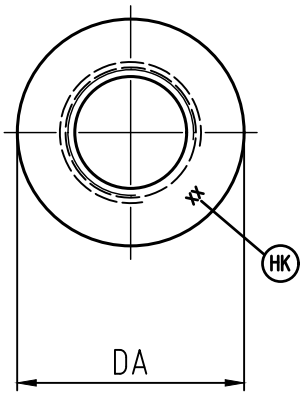
Annex 3

Coupler

Coupler - long (A/F)

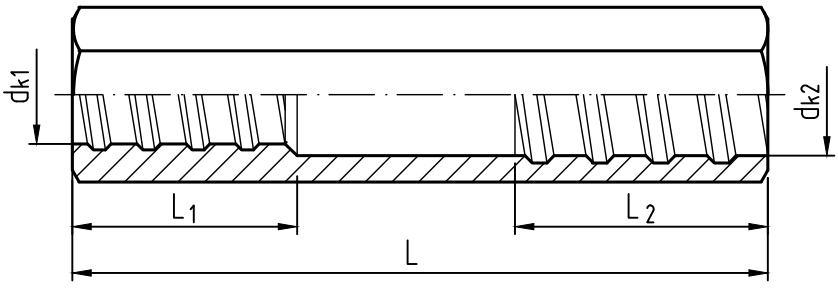
GEWI® - Reduction coupler — Type T 3102

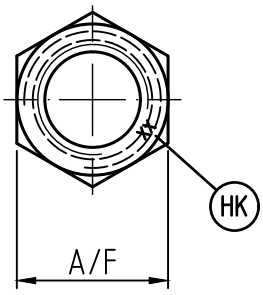




GEWI-Steel	d_s [mm]	32/40	40/50	50/63,5
Dimensions	L [mm]	150	190	240
	L_1 [mm]	70	80	100
	L_2 [mm]	70	80	100
	DA [mm]	60	75	93
max.	d_{k1} [mm]	32,0	39,9	50,0
max.	d_{k2} [mm]	39,9	50,0	63,5

GEWI® - Reduction coupler - long (A/F) — Type T 3012





GEWI-Steel	d_s [mm]	32/40	40/50	50/63,5
Dimensions	L [mm]	170	215	260
	L_1 [mm]	90	105	120
	L_2 [mm]	70	80	100
	A/F [mm]	60	80	90
max.	d_{k1} [mm]	32,0	39,9	50,0
max.	d_{k2} [mm]	39,9	50,0	63,5

Remarks: for material see appendix 2

(HK) = Supplier's marking: DYWIDAG or DW

Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

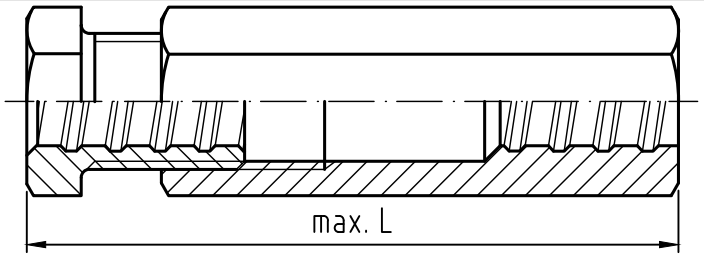
Annex 4

Reduction coupler

Reduction coupler - long (A/F)

Type T 3105

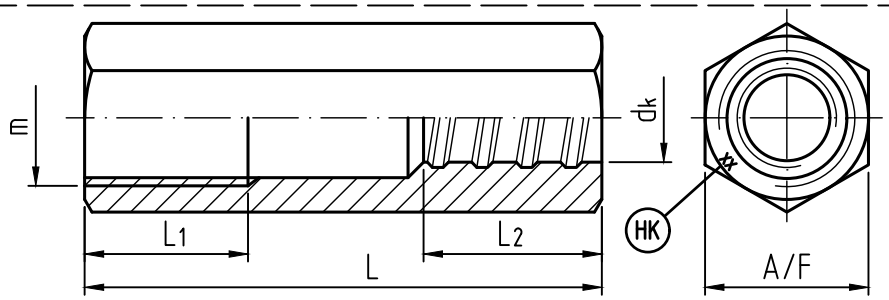
***GEWI®*-Turnbuckle**



GEWI-Steel	d_s	40	50
Installation	max. L [mm]	270	305

Type T 3014

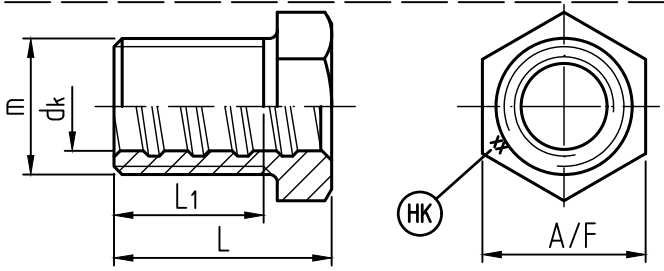
***GEWI®*-Tensioning Coupler**



GEWI-Steel	d_s	40	50
Dimensions	L [mm]	225	270
	L_1 [mm]	70	90
	L_2 [mm]	75	90
	A/F [mm]	80	100
max.	d_k [mm]	39,9	50,0
M ø metric system DIN 13		M 60x3 - right hand thread	M 80x3 - right hand thread

Type T 3013

***GEWI®* Change over Coupler**



GEWI-Steel	d_s [mm]	40	50
Dimensions	L [mm]	95	105
	L_1 [mm]	65	75
	A/F [mm]	80	100
max.	d_k [mm]	39,9	50,0
M ø metric system DIN 13		M 60x3 - right hand thread	M 80x3 - right hand thread

Remarks: for material see appendix 2

(HK) = supplier's marking: DYWIDAG or DW

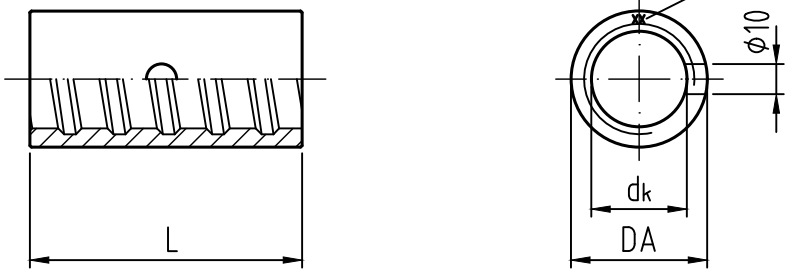
Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Annex 5

Turnbuckle consisting of tensioning coupler and change over coupler

GEWI®-Contact coupler

Type T 3006



GEWI-Steel	d_s [mm]	40	50
Dimensions	L [mm]	120	160
	DA [mm]	52	65
	max d_k [mm]	39,9	50,0

Remarks: for material see appendix 2

(HK) = supplier's marking: DYWIDAG or DW

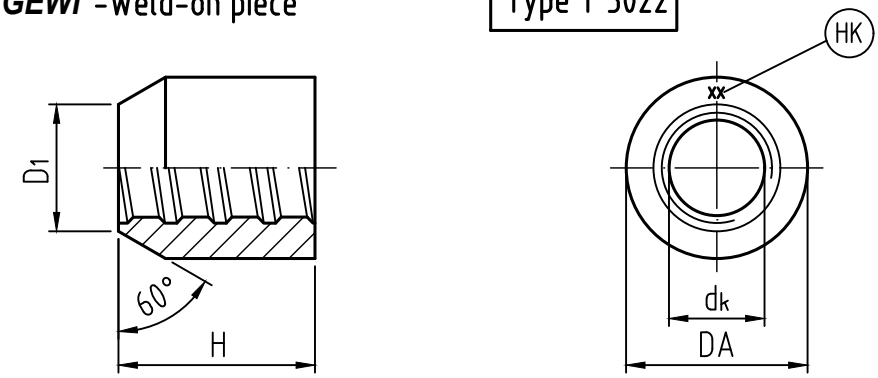
Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Annex 6

Contact coupler

GEWI®-Weld-on piece

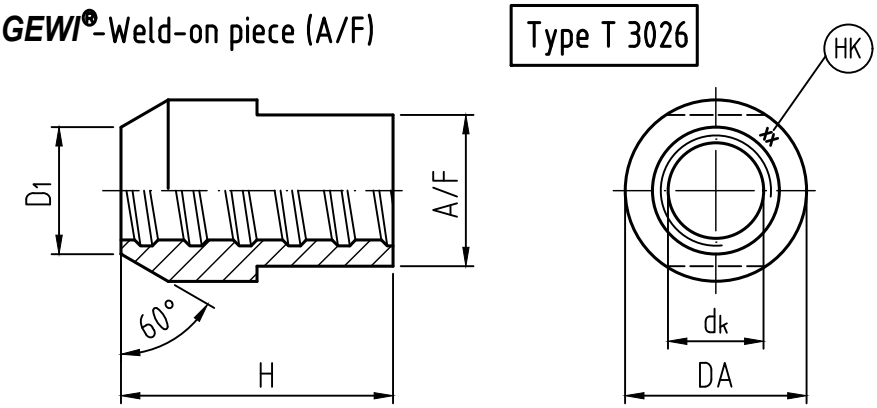
Type T 3022



GEWI-Steel	d_s [mm]	40	50
Dimensions	H [mm]	80	90
	D_A [mm]	80	90
	D1 [mm]	54	64
	max. d_k [mm]	39,9	50,0

GEWI®-Weld-on piece (A/F)

Type T 3026



GEWI-Steel	d_s [mm]	40	50
Dimensions	H [mm]	100	120
	D_A [mm]	80	90
	D_1 [mm]	54	64
	A/F [mm]	60	80
	max. d_k [mm]	39,9	50,0

Remarks: for material see appendix 2

(HK) = supplier's marking: DYWIDAG or DW

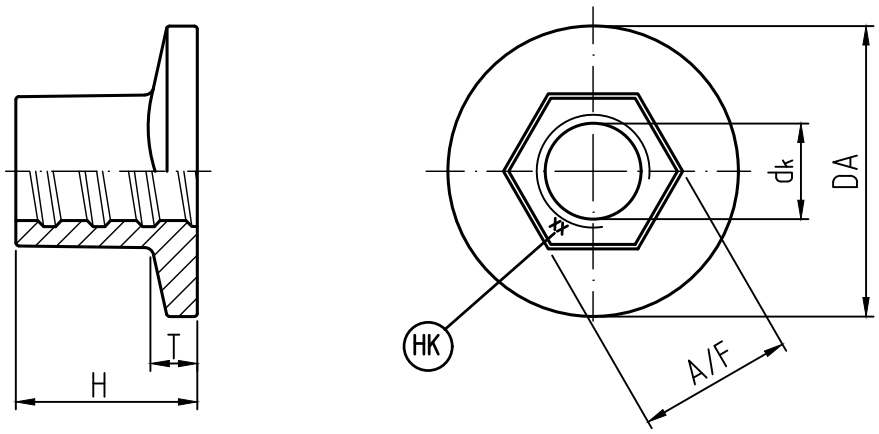
Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Annex 7

Weld-on piece
Weld-on piece - long (A/F)

GEWI®-Anchor piece

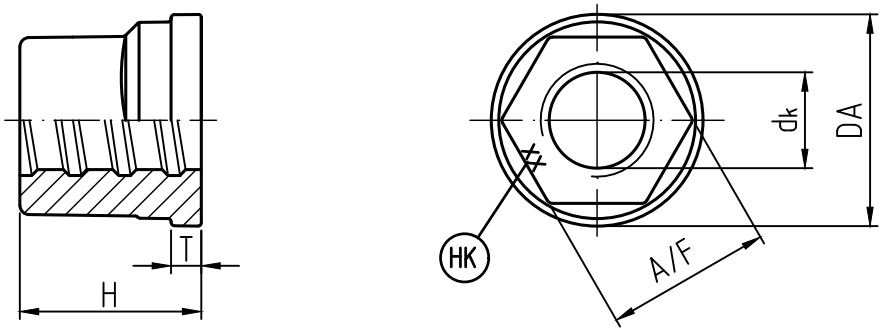
Type T 2073



GEWI-Steel	d_s [mm]	40	50
Dimensions	H [mm]	70	85
	T [mm]	20	25
	D_A [mm]	120	150
	A/F [mm]	60	80
max. d_k [mm]		39,9	50,0

GEWI®-Flanged anchor nut

Type T 2163



GEWI-Steel	d_s [mm]	40	50
Dimensions	H [mm]	70	85
	T [mm]	12	15
	D_A [mm]	85	100
	A/F [mm]	60	80
max. d_k [mm]		39,9	50,0

Remarks: for material see appendix 2

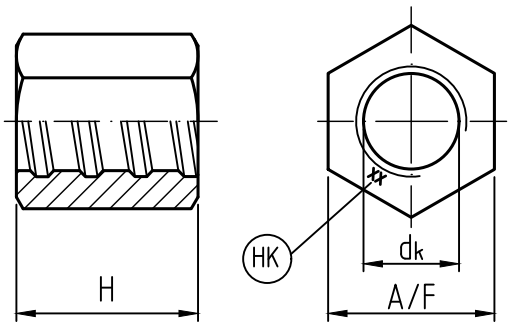
(HK) = supplier's marking: DYWIDAG or DW

Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Annex 8

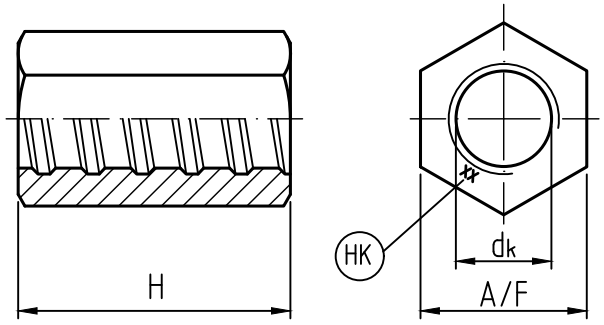
Anchor piece
Flanged anchor nut

GEWI®-Anchor nut — Type T 2002



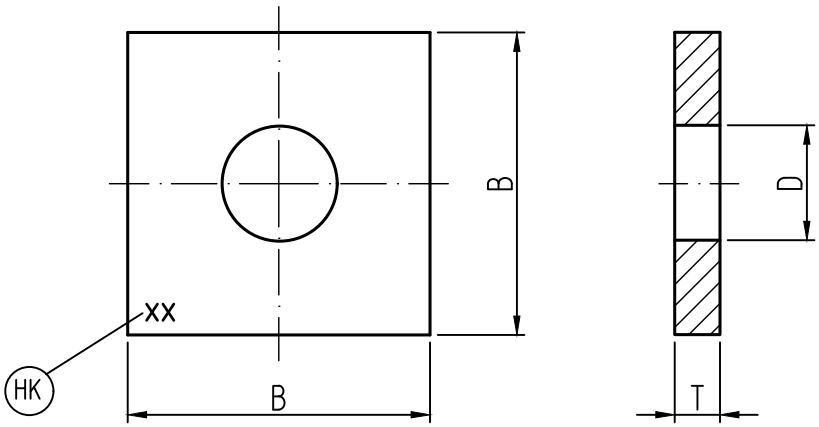
GEWI-Steel	d_s [mm]	40	50
Dimensions	H [mm]	70	85
	A/F [mm]	65	80
	max. d_k [mm]	39,9	50,0

GEWI®-Anchor nut - long — Type T 2024



GEWI-Steel	d_s [mm]	40	50
Dimensions	H [mm]	100	120
	A/F [mm]	60	80
	max. d_k [mm]	39,9	50,0

GEWI®-anchor plate — Type T 2008



GEWI-Steel	d_s [mm]	40	50
Dimensions	B/B [mm]	120	150
	D [mm]	47	58
	T [mm]	17	20

Remarks: for material see appendix 2

(HK) = supplier's marking: DYWIDAG or DW

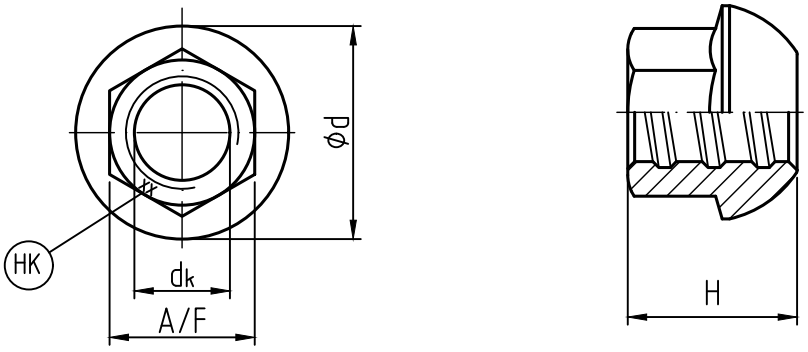
Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Annex 9

Anchor nut, anchor nut- long
anchor plate

GEWI domed nut

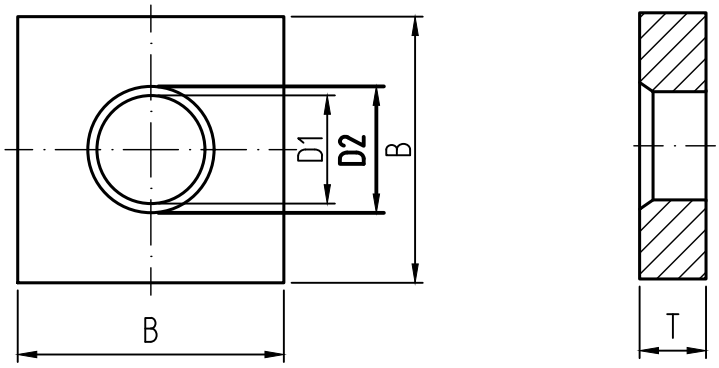
Typ T 2044



GEWI-Steel	d_s [mm]	40	50
Dimensions	H [mm]	70	50
	A/F[mm]	60	80
	ød [mm]	88	107
	max. d_k [mm]	39,9	50,0

Anchor plate with cone

Typ T 2011



GEWI-Stahl	d_s [mm]	40	50
Dimensions	B/B[mm]	150	190
	D1 [mm]	65	83
	D2 [mm]	76	96
	T [mm]	40	45

Remarks: for material see Annex 2

(HK) = supplier's marking: DSI, DYWIDAG or DW

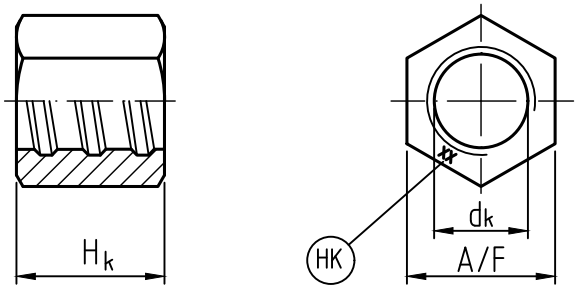
Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Domed nut

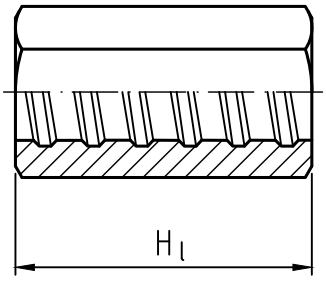
Anchor plate with cone

Annex 10

***GEWI®*-lock nut - short** Type T 2040



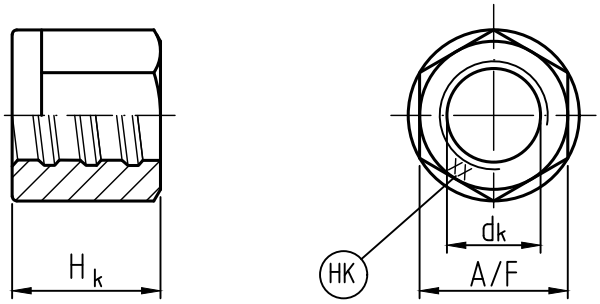
***GEWI®*-lock nut - long** Type T 2003



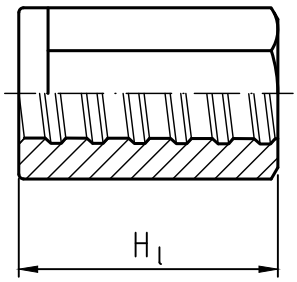
GEWI-Steel	d_s [mm]	40	50
Dimensions	H_k [mm]	35	50
	H_l [mm]	65	80
	A/F [mm]	60	80
	max. d_k [mm]	39,9	50,0

HK = supplier's marking: DYWIDAG or DW

***GEWI®*-lock nut cast - short** Type T 2040G



***GEWI®*-lock nut cast - long** Type T 2003G



GEWI-Steel	d_s [mm]	40	50
Dimensions	H_k [mm]	35	50
	H_l [mm]	65	80
	A/F [mm]	60	80
	max. d_k [mm]	39,9	50,0

Remarks: for material see appendix 2

HK = supplier's marking: DSI or GEWI

Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Annex 11

lock nut-short, lock nut - long
lock nut cast - short, lock nut cast - long

For tension loads	for compression loads

Fig. 1: ***GEWI®***-Coupler splice

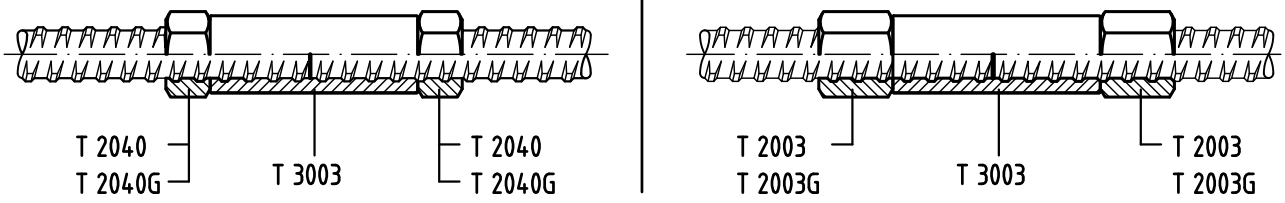


Fig. 2: ***GEWI®***-Coupler splice-long (A/F)

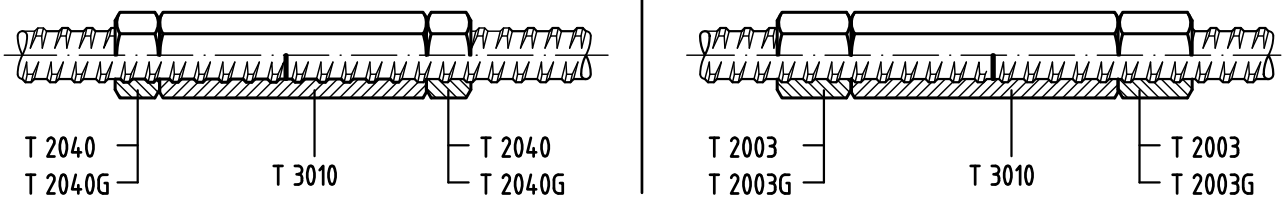


Fig. 3: ***GEWI®***-Coupler splice with reduction coupler

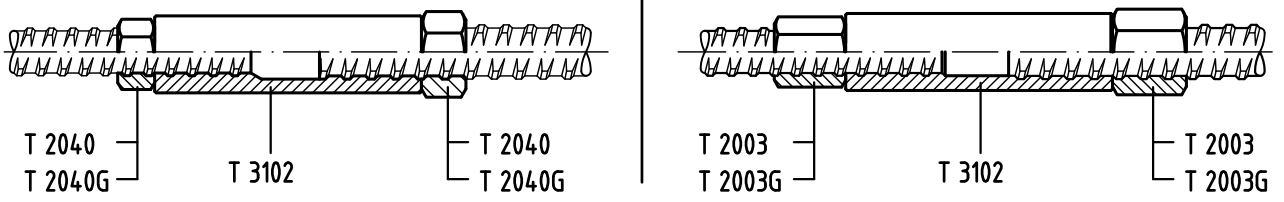


Fig 4: ***GEWI®***-Coupler splice with reduction coupler - long (A/F)

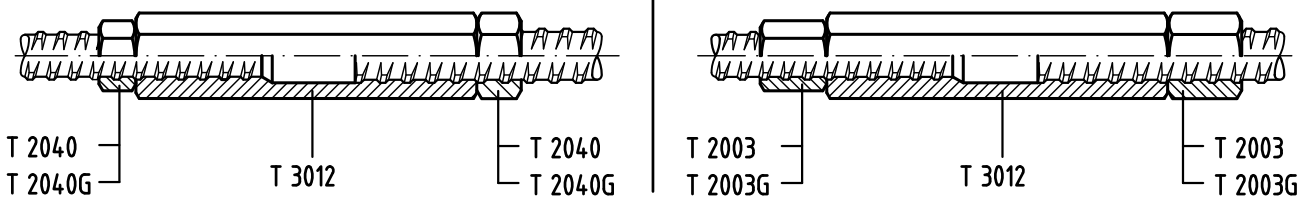
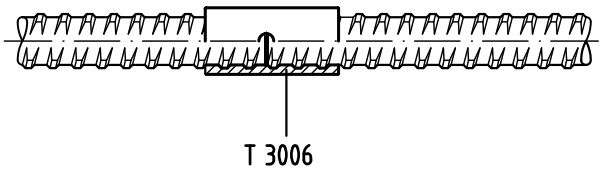


Fig. 5: ***GEWI®***- Coupler splice with contact coupler



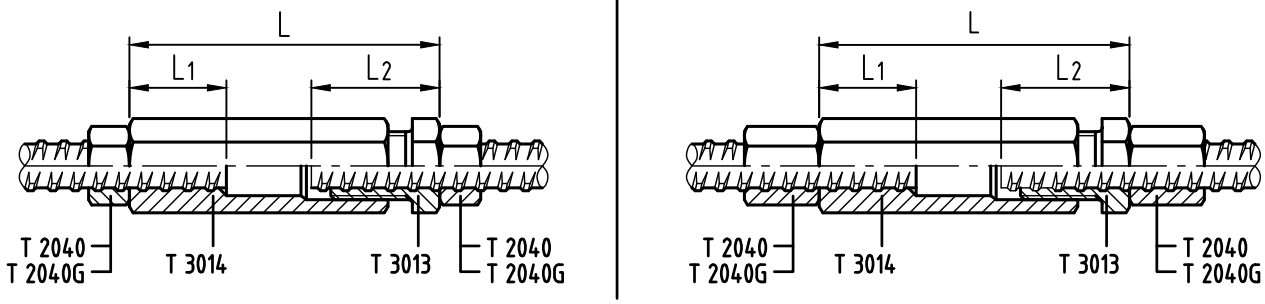
Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Annex 12

Assembly of coupler splices

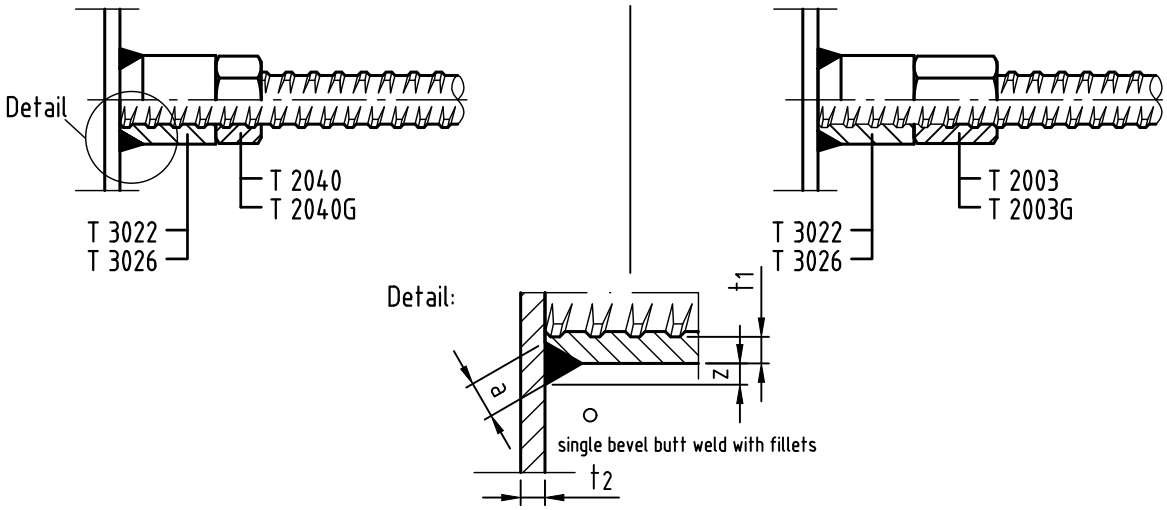
For tension loads	For compression loads

Fig. 6 : ***GEWI®***-Splice with turbuckle



GEWI-Steel	d_s	40	50
thread length	L_1	70	90
	L_2	95	105
Installation max. L [mm]		270	305

Fig. 7: ***GEWI®***-Welding connection



GEWI-Steel	d_s [mm]	40	50
steel thickness	t_1 [mm]	17	17
weld seam	a [mm]	12	14
	z [mm]	4	4
Preparation of welding work in accordance with DIN EN ISO 9692-1			
Excution of welding work in accordance with DIN 18800-7			

Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Annex 13

Assembly of coupler splices

Fig 8: ***GEWI®***-Anchorage for tension loads

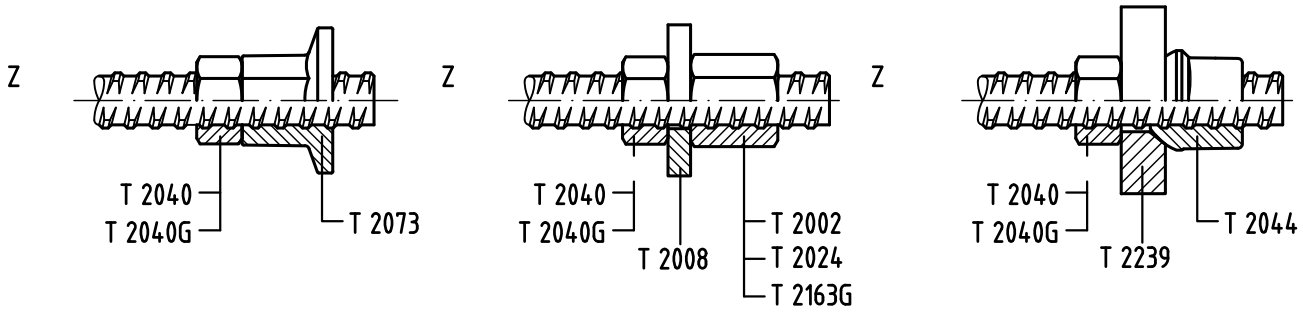


Fig 9: ***GEWI®*** -Anchorage for compression loads

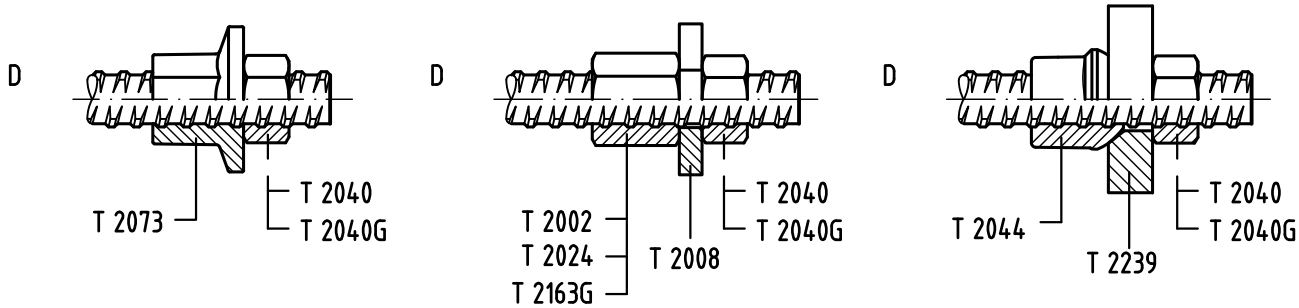
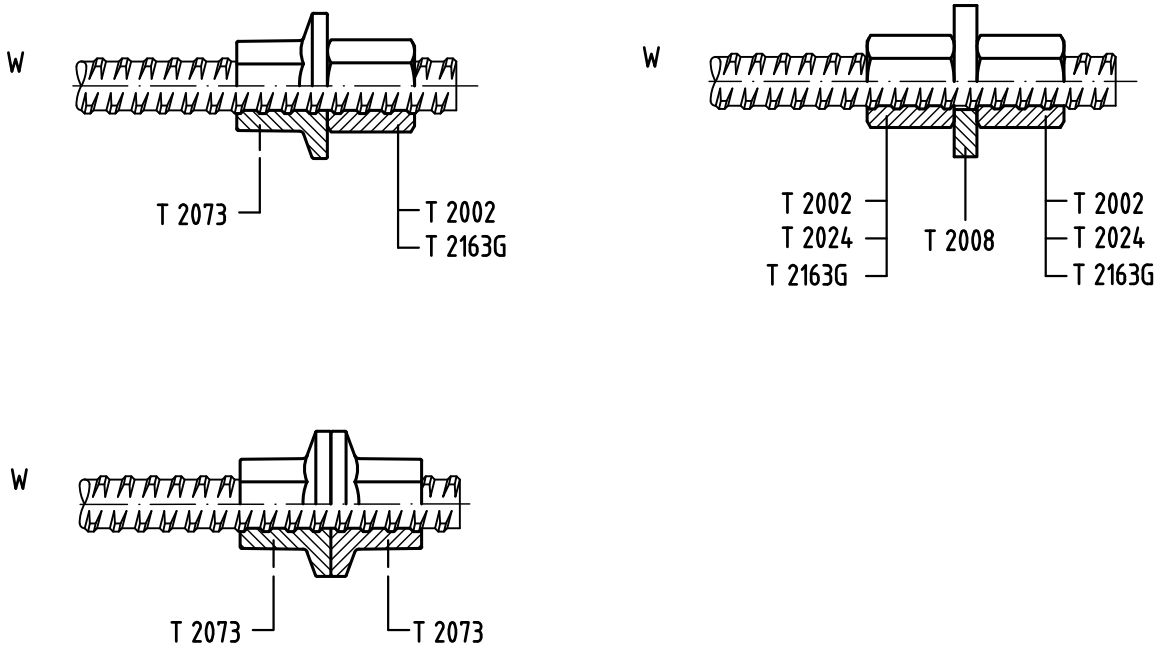


Fig 10: ***GEWI®***-Anchorage for alternating loads



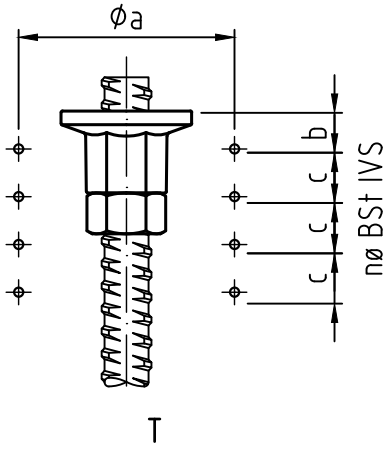
Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Assembly of anchorages

Annex 14

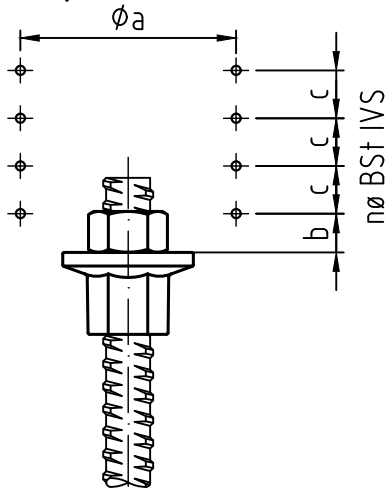
GEWI®-Anchorage

Tension loads



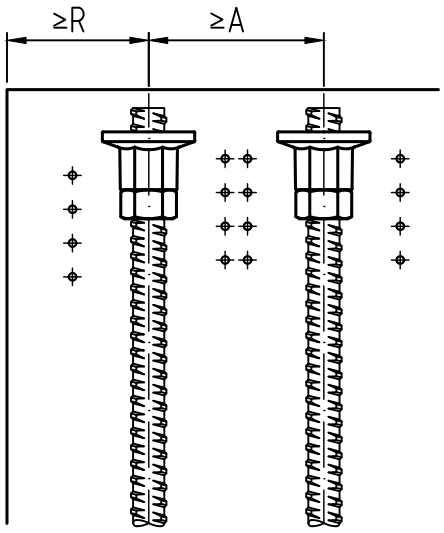
T

Compression loads

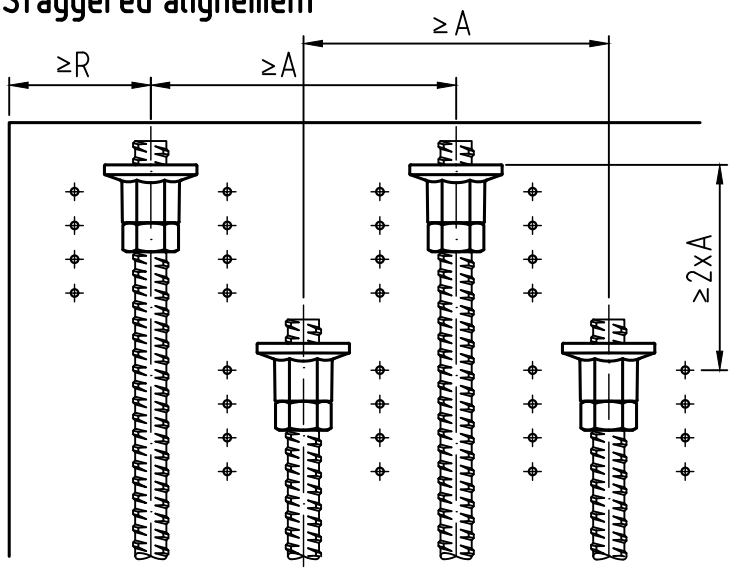


C

Unstaggered alignement



Staggered alignement



Nominal Diameter GEWI BSt 500 S d_s [mm]	Center distance A [2)] [mm]	Edge distance R [mm]	Additional reinforcement [1)] n	d_s [mm]	a [mm]	b [mm]	c [mm]	α_a [3)] [mm]
40	250	$0,5 \times A + c_{nom}$	3	10	220	25	45	0,4
50	270		5	10	250	25	45	0,4

1) Additional reinforcement can be neglected if min. edge and center distances are dounled

2) Minimum axis distance of anchorages may be reduced by up to 15% in one direction, if the axis distances in the other direction are increased by the same percentage

3) α_a – coefficient for consideration of anchorages type in accordance with DIN 1045-1

Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Annex 15

Center and edge distances of the anchorages

	GEWI Accessories	App. No.	Locking torques M_{kont} [kNm] for GEWI coupler splices and anchorages for bar diameters d_s [mm] (Values in brackets for reduction coupler)		
			40 (32/40)	50 (40/50)	- (50/63,5)
Coupler splices	Thread coupler - standard	3	2,90	8,00	-
	Thread coupler - long (A/F)	3			
	Turnbuckle	5			
	Reduction coupler	4	1,60	2,90	8,00
	Reduction coupler - long (A/F)	4			
	Contact coupler (round or A/F)	6	0,20	0,20	-
Anchorages	Weld-on piece - short (round)	7	2,90	8,00	-
	Weld-on piece - long (A/F)	7			
	Anchor piece	8			
	Flanged anchor nut	8			
	Anchor nut - short	9			
	Anchor nut - long	9			
	[1] Values decisive for GEWI ø40 [2] Values decisive for GEWI ø40				

Dywidag-Systems coupler connections and anchoring of reinforcing bars with thread ribs BSt 500 S-GEWI Ø40 and 50mm

Annex 16

Locking torques

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