



## GEOTECHNICAL SYSTEMS

**Coupler splices and anchorages of  
reinforcing bars with thread ribs  
B500B-GEWI®  
nominal diameter: 12.0 to 32.0mm**

Approval Number Z-1.5-76  
Validity 30<sup>th</sup> April 2017 - 30<sup>th</sup> April 2022

**DYWIDAG** 

**General Construction Supervisory Authority Approval  
No. Z-1.5-76 from May 11, 2017**

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

## **General Construction Supervisory Authority Approval**

**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

**Date:** [Reference No.:](#)  
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**Approval No.:**

**Z-1.5-76**

**Period of validity:**

from: **April 30, 2017**  
to: **April 30, 2022**

**Applicant:**

**DYWIDAG-Systems  
International GmbH**  
Destouchesstrasse 68  
80796 München

**Subject of approval:**

**Coupler and anchorages of reinforcing bars with  
thread ribs B500B-GEWI  
nominal diameter: 12.0 to 32.0 mm**

The above-mentioned subject matter is hereby granted general construction supervisory authority accreditation/approval.  
This notice comprises 9 pages and 15 annexes.

The subject matter was granted a general construction supervisory authority approval on März 2, 1987 for the first time.

**Important note**

This general construction supervisory authority approval/general design-type approval is the translation of a document originally prepared in the German language which has not been verified and officially authorized by "Deutsches Institut für Bautechnik" (DIBt; German Institute for Civil Engineering). In case of doubt in respect to the wording and interpretation of this notice, the original German version hereof shall prevail exclusively. Therefore, no liability is assumed for translation errors or inaccuracies.

**I. GENERAL REGULATIONS**

- 1 This notice verifies usability and applicability of the object of approval as stipulated by the state building regulations.
- 2 This approval document does not replace any permits, licences and certificates required for the execution of construction projects by law.
- 3 This approval is granted without prejudice to third party rights, in particular private property rights.
- 4 Notwithstanding any further regulations in the "Special Regulations" section, the manufacturer and distributor of the object of approval shall provide the user with copies of the approval; furthermore, they shall inform the user that the approval must be available at the place of use. Copies of this approval must be submitted to all authorities involved on request.
- 5 This approval may only be copied in its entirety. The publication of excerpts requires the consent of the German Institute for Building Technology. Texts and drawings in advertising material must not contradict the approval. Translations of the approval must contain the following notice: "Translation of the German original which has not been certified by the German Institute for Building Technology".
- 6 This approval is not granted irrevocably. The provisions of this approval may be amended or modified later, in particular, if new technical findings should require so.

**II. SPECIAL REGULATIONS****1 Subject of approval and applications**

The subject of the approval are threaded couplers and anchoring elements for mechanical connections and anchorages according to DIN EN 1992-1-1: 2011-01, Sections 8.4 and 8.7 (see Annex 1).

The coupling and anchoring elements may be used for reinforcing steel with threaded ribs B500B-GEWI (GEWI steel) with nominal diameters 10 to 32 mm in accordance with general construction supervisory approval.

The coupling and anchoring components have an internal thread into which the threadbars are screwed. 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.

The following bar connections / bar anchoring are possible:

- Couplers (T 3003 and T 3010) are used to form tension and compression splices of threadbars with identical diameters.
- Bars with varying diameters that are adjacent in the regulated diameter series are connected by means of reducing couplers (T 3102 and T 3012).
- Turnbuckle splices (T 3015) 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 and T 3106) are used to form sheer compression splices. The coupler secures the centric position of the bars whose end faces are pressed onto each other by a defined torque.
- Weldable welded pieces (T 3022 and T 3026) that are welded on with a fillet weld serve to transfer axial tensile and compressive loads from the GEWI Threadbar to a steel component.
- GEWI Threadbars are anchored by means of anchor pieces (T 2073G) or anchor plates (T 2008) that are fastened to the thread of the bar using anchor nuts (T 2163G and T 2002).

**2 Regulations covering the construction product****2.1 Properties and composition**

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. The specifications provided in Annexes 3 to 10 shall apply to the outer dimensions of the coupling and anchoring components as well as to the geometry of the threads to be observed.

**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 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 installation on the construction site.

**2.2.3 Marking and delivery note**

The coupling and anchoring components shall be marked at the positions indicated in Annexes 3 to 10 so that the manufacturer can be derived therefrom. If the manufacturer is indicated encrypted,

a list including the complete data and the encryptions assigned shall be deposited with DIBt and the notified product certification body.

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 States. If the coupling and anchoring components are manufactured by a supplier, the surveillance report for those products shall be submitted to the manufacturer for marking. Marking may only be carried out if all requirements of the certificate of compliance pursuant to Section 2.3 have been fully met.

## **2.3 Compliance certificate**

### **2.3.1 General**

Every manufacturer and supplier 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 shall commission notified product certification body and a recognised external surveillance authority to issue the certificate of conformity and perform the external surveillance, including the inspection of products, of both the manufacturer and its suppliers.

The manufacturer shall show that a certificate of compliance has been issued by marking the construction products with the compliance mark (Ü- Zeichen) including a reference to the designated use. The notified product certification body must send a copy of the certificate of conformity issued to the DIBt.

### **2.3.2 Factory production control**

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

If a manufacturer uses semi-finished products not manufactured at his plant, but by suppliers, those products shall be subjected to an appropriate reception inspection.

The factory production control must at least include the measures specified in the "Principles for approval and monitoring examinations of mechanical reinforcing steel connections", May 2007 edition.

The geometry of coupler and bar threads shall be checked by means of a yes/no check (statistical evaluation not required). Samples of the finished coupling and anchoring components shall be taken under statistical aspects and their outer dimensions shall be checked.

One sample in form of an individual coupling component or assembled connection or anchorage respectively shall be taken for each 1000 coupling components of each coupling type or anchoring components manufactured.

This coupling or anchoring component or this connection respectively shall be tested with regard to its load capacity in a tensile test. The test has been passed if the assessment criteria detailed in the "Principles for approval and monitoring examinations of mechanical reinforcing steel connections", May 2007 edition, Section 2.7.2 have been met.

The results of the factory production control shall be recorded and evaluated by each manufacturer and each supplier. 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 for planing and design**

### **3.1 General**

Planing and design are subject to the regulations of DIN EN 1992-1-1, in conjunction with DIN EN 1992-1-1 / NA.

All bars in one cross-sectional plane may be spliced (full splice).

The position and dimension of coupler splices and anchorages must be plotted in the reinforcement drawings, and the requirements 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 general construction supervisory authority approval may be loaded 100% like an unspliced bar in case of predominantly dead tensile and compressive loads.

#### **3.2.2 Fatigue load**

The provisions hereinafter for not predominantly dead loads shall apply to the coupler types and anchorages mentioned in Section 1, but not to connections by means of contact couplers.

Evidence of the fatigue behaviour shall be provided as stipulated in DIN EN 1992-1-1 and DIN EN 1992-1-1/NA Section 6.8. To determine the characteristic value of the fatigue strength, a stress variation range of  $\Delta\sigma_{RSK} = 80 \text{ N/mm}^2$  for  $N = 2 \cdot 10^6$  load cycles shall be assumed (see DIN EN 1992-1-1, Fig. 6.30). The stress exponents of the stress-number curve shall be arranged with  $k_1 = 3$  and  $k_2 = 5$  for  $N^* = 10^7$ .

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

### **3.3 Concrete cover, bar spacing**

For the concrete cover beyond the outer edge of a coupler, of an anchoring component or of a nut, and for the clearance between the outer edges of adjacent couplers, the same values as for unspliced bars shall apply in line with DIN EN 1992-1-1 und DIN EN 1992-1-1/NA, section 4.4.1 and 8.2.

The distances required for installation remain unaffected.

### 3.4 Centre and edge distances of anchorages

The centre and edge distances as stated in Annex 14 apply. In deviation therefrom, the centre distances of the anchorages from each other may be decreased by up to 15% in one direction if the required minimum spacing of the additional reinforcement is observed and if the centre distances into the vertical direction are increased by the same relative value.

If the anchorages cannot be installed in one cross-sectional plane, they shall be shifted by at least 1.5 times the centre distance in the direction of the bar.

In case of deviations from the previously specified dimensions, the resistance to the transverse tensile stresses by transverse reinforcement or by transverse pressure must be proofed by design calculation.

The aforementioned provisions apply to intermediate and end 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 in keeping with Annex 7. Only normal forces may be transmitted. The proof of the load transfer of the bar force via the weld to the steel component is to be provided in detail. Steel component, weld-on pieces and lock nut shall be protected against corrosion in line with the provisions applicable to the specific use case – cf. DIN EN ISO 12944-05. The requirements of the DASg guideline 006 must be observed when welding on corrosion protection coatings.

### 3.6 Bending

For bent (pre-bent) bars, regular bending may only commence in an interval of  $5 \cdot d_s$  from the end of the coupler ( $d_s$  = nominal diameter of the bent bar).

If prefabricated coupler and connecting bars are bent with special equipment at the manufacturer's plant, the distance to the coupler end may be decreased up to  $2 \cdot d_s$ .

## 4. Regulations for work execution

### 4.1 General

Only instructed personnel may assemble coupling or anchoring components in accordance with the manufacturers written work instructions. These assembly instructions are part of the shipping documents.

Only such coupling and anchoring components marked as per Section 2.2.3 shall be used.

The required movability and rotability of the bars must be ensured.

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

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

To torque screwed coupler connections and anchorages, only torque equipment may be used that has been checked with regard to operability and accuracy in keeping with DIN EN ISO 6789. The force of the torque to be applied is specified by Annex 15.

### 4.2 Coupler splices

The design of coupler splices is shown in Annexes 11 and 12, Figures 1 to 6.

A suitable permanent marking by which the central seat of the couplers can be verified shall be applied 20 cm from the end of the bar to be spliced.

If couplers (T 3003) in line with 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.

With respect to the turnbuckle splice (T 3015), the bars to be connected may be immovable and non-rotatable.

Shorter lock nuts (T 2040) in accordance with Annex 10 may be used for tension splices; however, longer lock nuts (T 2003) in line with Annex 10 must be used for compression splices at all times - except for contact splices, which may be used without lock nuts.

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 is specified in Section 4.2.

#### **4.3 Anchorages**

For exclusively tensile or compressive loads, the anchorages either consists of an anchor nut and a lock nut with an interposed anchor plate or of an anchor piece with lock nut (cf. Annex 13).

For alternating loads (tensile and compressive loads), the anchorage either consists of two anchor nuts with an interposed anchor plate or of an anchor piece with lock nut (see Annex 13).

The strength class of the concrete to receive the anchorage must at least be C 20/25.

#### **4.4 Weld-on pieces**

To connect weld-on pieces T 3022 or T 3026 to a steel component as per Annex 7, recognised WPS welding instructions in accordance with DIN EN ISO 15609-1 shall be available at the jobsite and must be observed by the welding personnel. The welding manufacturer must submit a welding certificate in accordance with DIN EN 1090-1, Table B.1. Welders must have valid welder examination certificates in accordance with DIN EN ISO 9606-1.

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 10, in case of compressive load.

#### **4.5 Monitoring the manufacturing of coupler connections and anchorages on the 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 lock nut that is stipulated depending on the type of loading (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 and during use - at least every half year with regard to the setting accuracy.

#### **4.6 Notification to the construction supervision authority**

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

This general approval refers to the following norms and standards:

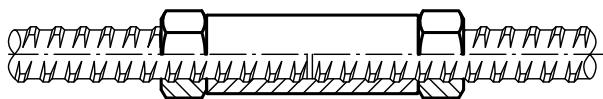
- DIN EN 1090-1:2012-02 Design of steel structures and aluminum structures - Part 1: Verification of compliance of structural components; German version EN 1090-1: 2009 + A1: 2011
- DIN EN 1992-1-1:2011-01 Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings; German version EN 1992-1-1:2004 + AC:2010
- DIN EN 1992-1-1/NA:2011-01 National Annex - Nationally determined parameters - Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings
- DIN EN ISO 9606-1:2013-12 Testing welders - Fusion welding - Part 1: Steels; German version EN ISO 9606-1: 2013
- DIN EN ISO 6789:2003-10 Assembly tools for screws and nuts - Hand torque tools - Requirements and test methods for design conformance testing, quality conformance testing and recalibration procedure (ISO 6789:2003)
- DIN EN ISO 15609-1:2005-01 Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 1: Arc welding (ISO 15609-1:2004); German version EN ISO 15609-1:2004
- DIN EN ISO 12944-05:2008-01 Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 5: Protective paint systems (ISO 12944-5:2007); German version EN ISO 12944-5:2007
- DASt guidelines 006:1980-01 Over-welding of production coatings (FB) in steel construction

Andreas Kummerow  
Section Head

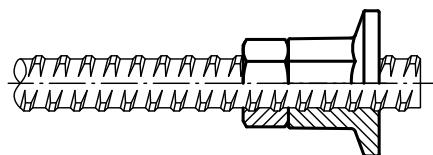
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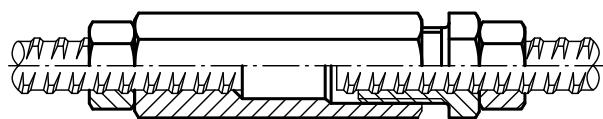
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Deutsches Institut  
für Bautechnik  
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**GEWI® Coupler splices**

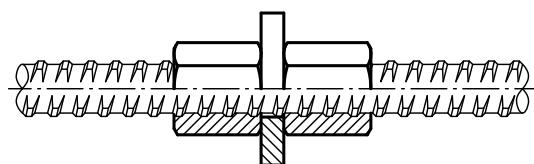
e.g. Coupler (tension)

**GEWI® Anchorages**

e.g. Anchor piece (tension)



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



e.g. Anchor plate (alternating loads)

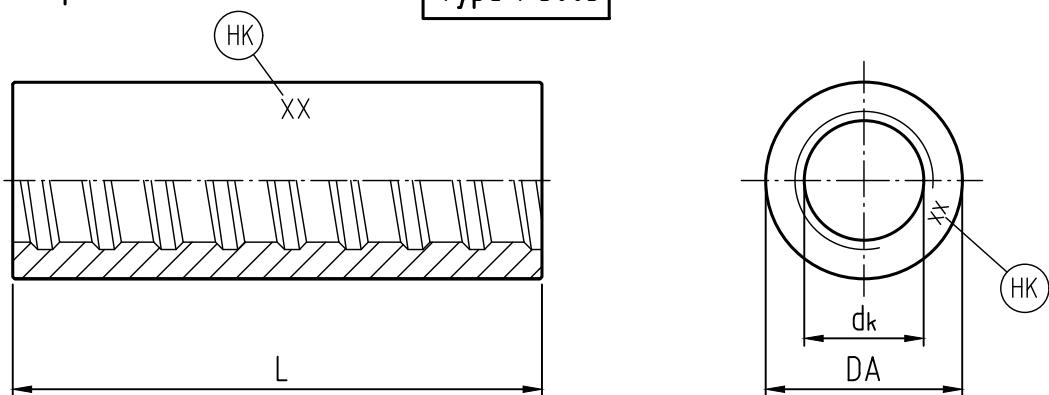
<b>GEWI® Accessories</b>		ann. No.	for <b>GEWI® Steel d<sub>s</sub></b> [mm]					
			12	16	20	25	28	32
Coupler splices	Coupler	3	○	○	○	○	○	○
	Coupler-long (A/F)	3	○	○	○	○	○	○
	Turnbuckle	5	○	○	○	○	○	○
	Reduction coupler	4	○	○	○	○	○	○
	Reduction coupler-long (A/F)	4	○	○	○	○	○	○
	Contact coupler	6	—	—	—	—	—	○
Anchorages	Weld-on piece	7	○	○	○	○	○	○
	Weld-on piece-long (A/F)	7	○	○	○	○	○	○
	Anchor piece	8	—	○	○	○	○	○
	Flanged anchor nut	8	—	○	○	○	○	○
	Anchor nut	9	○	○	○	○	○	○
	Anchor nut-long	9	○	○	○	○	○	○
	Anchor plate	9	○	○	○	○	○	○

DYWIDAG-System coupler splices and anchorages of  
bar steel with threaded ribs B500B- GEWI

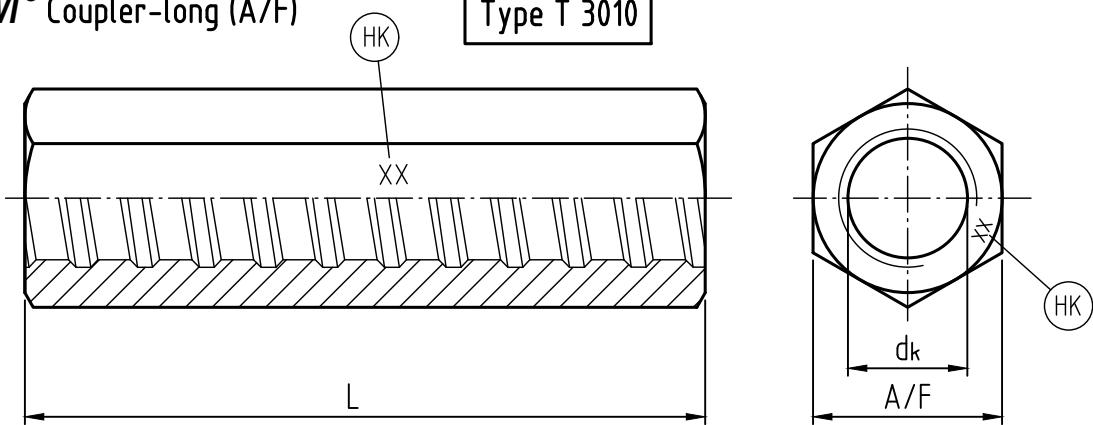
Annex 1

System Overview

<b>GEWI® Accessories</b>	Type	Illustration	Material
Anchor nut (Appendix 9)	T 2002		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N) DIN EN 10083:2006-10 C45+N (1.0503)
Anchor nut-long (Appendix 9)	T 2024		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N) DIN EN 10083:2006-10 C45+N (1.0503)
Anchor plate (Appendix 9)	T 2008		DIN EN 10025-2:2005-04 S235JR (1.0038)
Lock nut-short (Appendix 10)	T 2040		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N) DIN EN 10083:2006-10 C45+N (1.0503)
Lock nut-short cast (Appendix 10)	T 2040G		EN 1563:2003-02 EN-GJS-500-7 (EN-JS 1050) EN 1562:1997-08 EN-GJMB-550-4 (EN-JM 1160)
Lock nut-long (Appendix 10)	T 2003		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N) DIN EN 10083:2006-10 C45+N (1.0503)
Lock nut-short cast (Appendix 10)	T 2003G		EN 1563:2003-02 EN-GJS-500-7 (EN-JS 1050) EN 1562:1997-08 EN-GJMB-550-4 (EN-JM 1160)
Flanged anchor nut (Appendix 8)	T 2163G		EN 1563:2003-02 EN-GJS-500-7 (EN-JS 1050) EN 1562:1997-08 EN-GJMB-550-4 (EN-JM 1160)
Anchor piece (Appendix 8)	T 2073G		EN 1563:2003-02 EN-GJS-500-7 (EN-JS 1050) EN 1562:1997-08 EN-GJMB-550-4 (EN-JM 1160)
Coupler (Appendix 3)	T 3003		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N) DIN EN 10293:2005-06 G42CrMo4 (1.7231)
Coupler-long (A/F) (Appendix 3)	T 3010		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N) DIN EN 10083:2006-10 C45+N (1.0503)
Contact coupler (Appendix 6)	T 3006		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N) DIN EN 10083:2006-10 C45+N (1.0503)
Contact coupler (A/F) (Appendix 6)	T 3106		EN 1563:2003-02 EN-GJS-500-7 (EN-JS 1050) EN 1562:1997-08 EN-GJMB-550-4 (EN-JM 1160)
Reduction coupler (Appendix 4)	T 3102		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N) DIN EN 10083:2006-10 C45+N (1.0503)
Reduction coupler-long (A/F) (Appendix 4)	T 3012		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N) DIN EN 10083:2006-10 C45+N (1.0503)
Weld-on piece (Appendix 7)	T 3022		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N)
Weld-on piece-long (A/F) (Appendix 7)	T 3026		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N)
Turnbuckle -Change over coupler -Tensioning coupler (Appendix 5)	T 3105 -T 3013 -T 3014		DIN EN 10025-2:2005-04 S355J0+N (1.0553+N) DIN EN 10083:2006-10 C45+N (1.0503)
<b>DYWIDAG-System coupler splices and anchorages of bar steel with threaded ribs B500B- GEWI</b>			Annex 2
Article Overview			

**GEWI® Coupler****Type T 3003**

<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32
Dimensions	L [mm]	60	90	105	115	125	140
	DA [mm]	22	32	36	40	45	52
	max. $d_k$ [mm]	12.1	16.3	20.25	25.15	28.1	32.0

**GEWI® Coupler-long (A/F)****Type T 3010**

<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32
Dimensions	L [mm]	80	120	140	160	180	180
	A/F [mm]	22	32	32	41	41	50
	max. $d_k$ [mm]	12.1	16.3	20.25	25.15	28.1	32.0

Remarks: Material see appendix 2

(HK)= DSI/DYwidag/DW

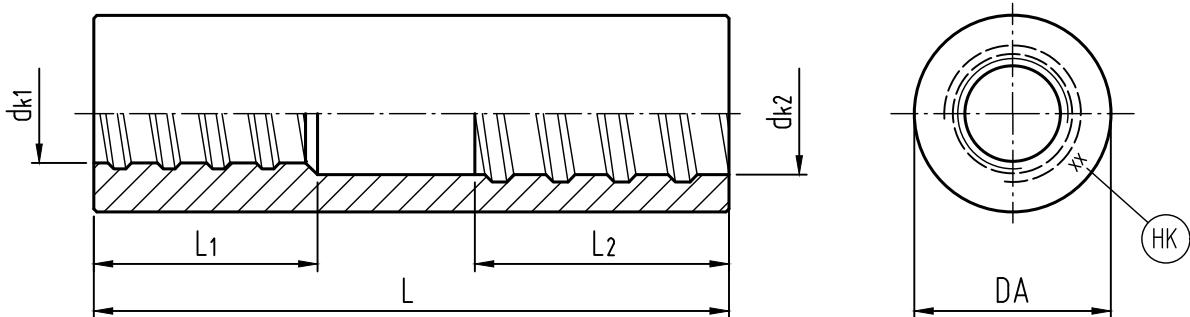
DYwidag-System coupler splices and anchorages of  
bar steel with threaded ribs B500B- GEWI

Coupler  
Coupler-long (A/F)

Annex 3

**GEWI® Reduction coupler**

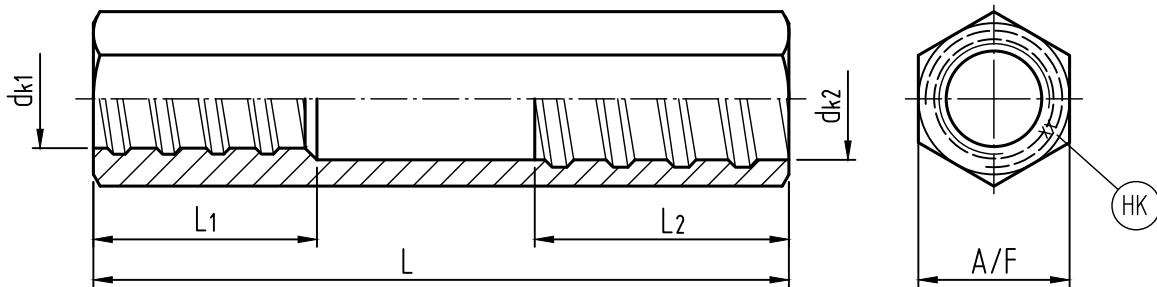
Type T 3102



<b>GEWI® Steel</b>	d <sub>s</sub> [mm]	12/16	16/20	20/25	25/28	28/32
Dimensions	L [mm]	100	130	150	170	180
	L <sub>1</sub> [mm]	30	45	50	55	65
	L <sub>2</sub> [mm]	45	50	55	65	70
	DA [mm]	32	36	40	45	52
	max. d <sub>k1</sub> [mm]	12.1	16.3	20.25	25.15	28.1
	max. d <sub>k2</sub> [mm]	16.3	20.25	25.15	28.1	32.0

**GEWI® Reduction coupler-long (A/F)**

Type T 3012



<b>GEWI® Steel</b>	d <sub>s</sub> [mm]	12/16	16/20	20/25	25/28	28/32
Dimensions	L [mm]	110	140	175	220	230
	L <sub>1</sub> [mm]	35	55	65	75	85
	L <sub>2</sub> [mm]	55	65	75	85	90
	A/F [mm]	32	32	41	41	50
	max. d <sub>k1</sub> [mm]	12.1	16.3	20.25	25.15	28.1
	max. d <sub>k2</sub> [mm]	16.3	20.25	25.15	28.1	32.0

Remarks: Material see appendix 2

(HK) = DSI/DYwidag/DW

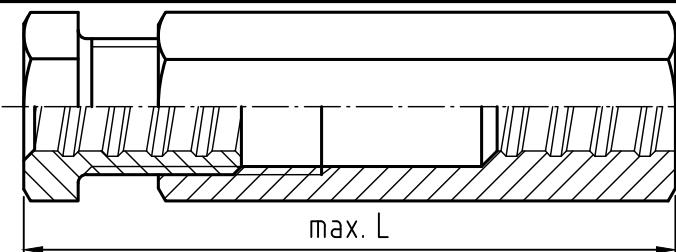
DYwidag-System coupler splices and anchorages of  
bar steel with threaded ribs B500B- GEWIReduction coupler  
Reduction coupler-long (A/F)

Annex 4

General Construction Supervisory Authority Approval/  
No. Z-1.5-76 from May 11, 2017

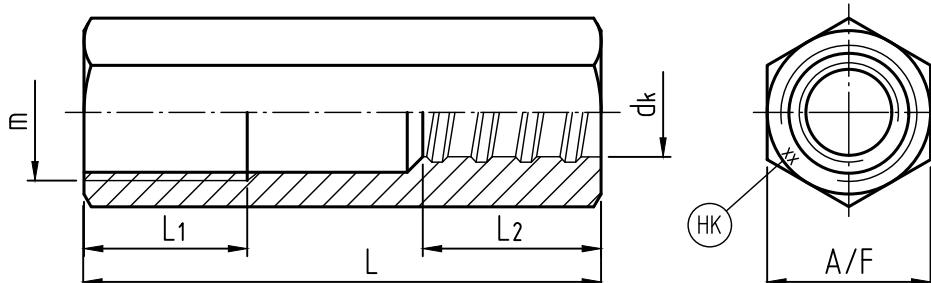
Type T 3105

GEWI® Turnbuckle



GEWI® Steel	$d_s$	12	16	20	25	28	32
assembled	max. L [mm]	115	150	175	190	205	225

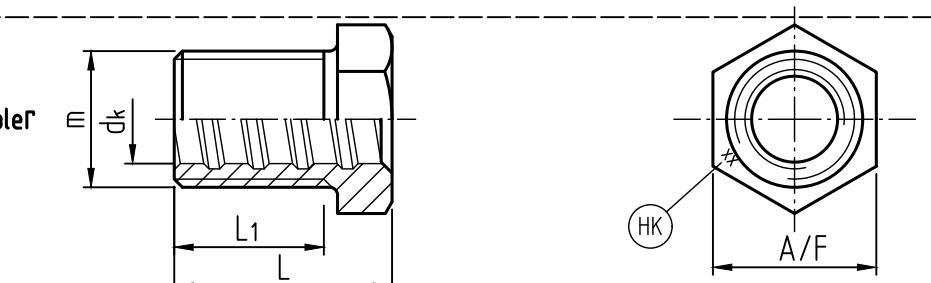
Type T 3014

GEWI®  
Tensioning coupler

GEWI® Steel	$d_s$	12	16	20	25	28	32
dimensions	L [mm]	100	125	145	160	175	190
	L <sub>1</sub> [mm]	30	40	45	50	55	60
	L <sub>2</sub> [mm]	30	45	50	55	60	65
	A/F [mm]	32	36	41	46	50	60
	max. d <sub>k</sub> [mm]	12.1	16.3	20.25	25.15	28.1	32.0
m ø metric DIN 13		M 20x2	M 27x2	M 33x2	M 36x2	M 42x2	M 50x3

Type T 3013

GEWI® Change over coupler



GEWI® Steel	$d_s$ [mm]	12	16	20	25	28	32
dimensions	L [mm]	40	50	60	65	70	80
	L <sub>1</sub> [mm]	22	30	40	45	50	55
	A/F [mm]	32	36	41	46	50	60
	max. d <sub>k</sub> [mm]	12.1	16.3	20.25	25.15	28.1	32.0
m ø metric DIN 13		M 20x2	M 27x2	M 33x2	M 36x2	M 42x2	M 50x3

Remarks: Material see appendix 2

(HK) = DSI/DYwidag/DW

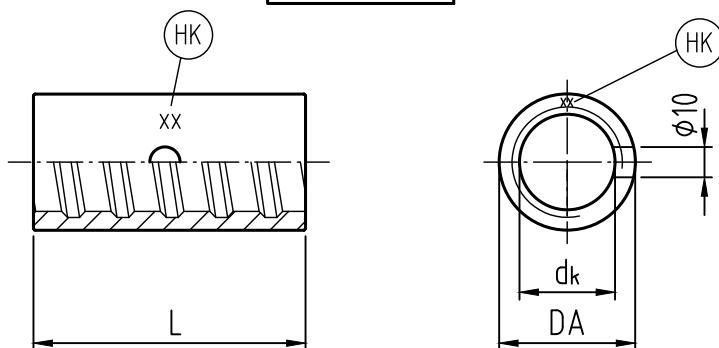
DYwidag-System coupler splices and anchorages of  
bar steel with threaded ribs B500B- GEWI

Turnbuckle consisting of  
Tensioning and Change over coupler

Annex 5

**GEWI® Contact coupler**

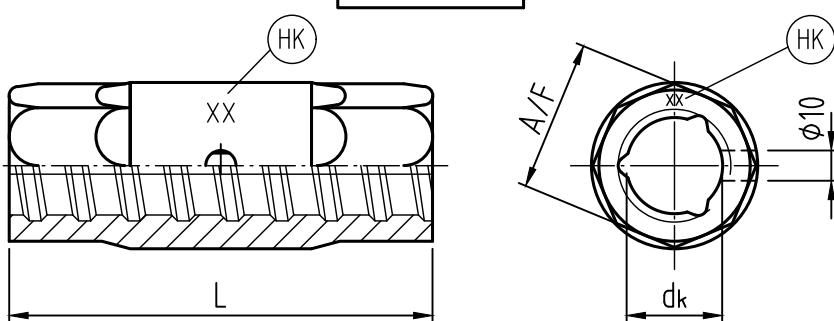
Type T 3006



<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32
Dimensions	$L$ [mm]	-	-	-	-	-	90
	$DA$ [mm]	-	-	-	-	-	45
	max. $d_k$ [mm]	-	-	-	-	-	32.0

**GEWI® Contact coupler (A/F)**

Type T 3106



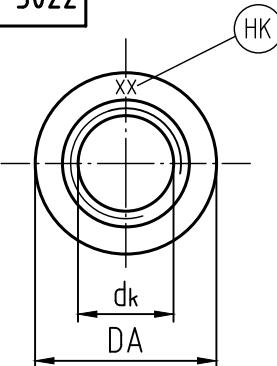
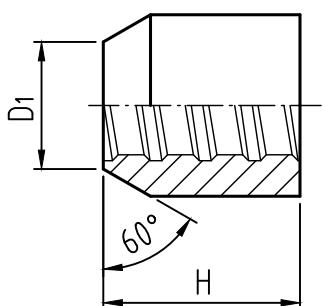
<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32
Dimensions	$L$ [mm]	-	-	-	-	-	140
	$A/F$ [mm]	-	-	-	-	-	50
	max. $d_k$ [mm]	-	-	-	-	-	32.0

Remarks: Material see appendix 2

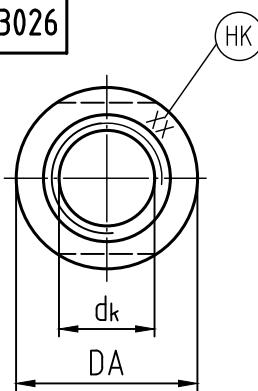
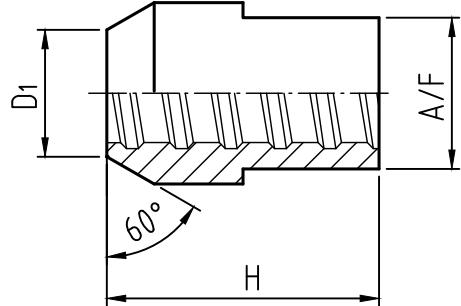
(HK) = DSI/DYWIDAG/DW

DYWIDAG-System coupler splices and anchorages of  
bar steel with threaded ribs B500B- GEWIContact coupler  
Contact coupler (A/F)

Annex 6

**GEWI® Weld-on piece****Type T 3022**

<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32
Dimensions	H [mm]	40	45	50	55	60	65
	$D_A$ [mm]	30	40	45	50	55	60
	$D_1$ [mm]	20	30	31	38	38	42
	max. $d_k$ [mm]	12.1	16.3	20.25	25.15	28.1	32.0

**GEWI® Weld-on piece-long (A/F)****Type T 3026**

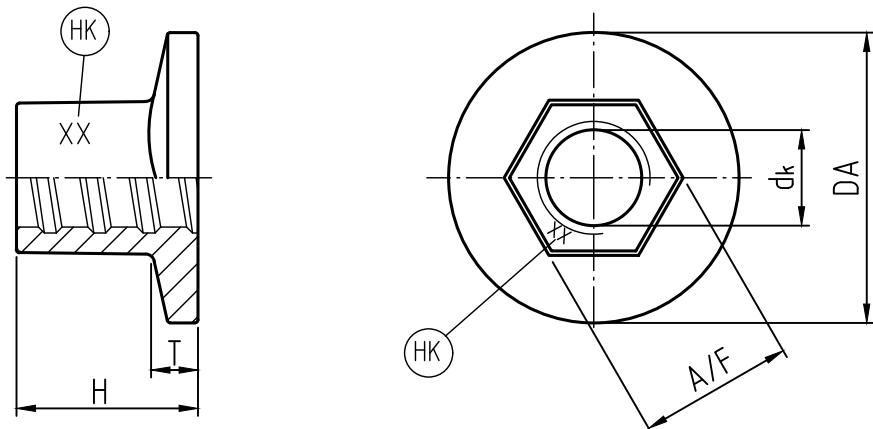
<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32
Dimensions	H [mm]	40	55	65	75	85	90
	$D_A$ [mm]	30	40	45	50	55	60
	$D_1$ [mm]	20	30	31	38	38	42
	A/F [mm]	22	32	32	41	41	50
	max. $d_k$ [mm]	12.1	16.3	20.25	25.15	28.1	32.0

Remarks: Material see appendix 2

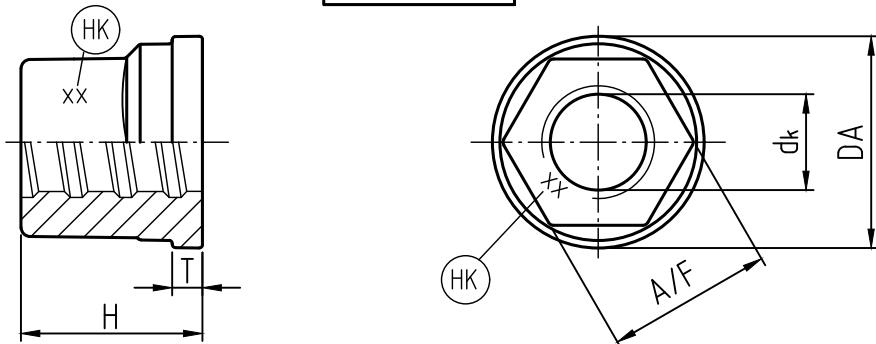
(HK) = DSI/DYWIDAG/DW

**DYWIDAG-System coupler splices and anchorages of  
bar steel with threaded ribs B500B- GEWI**Weld-on piece  
Weld-on piece-long (A/F)**Annex 7**

General Construction Supervisory Authority Approval/  
No. Z-1.5-76 from May 11, 2017

**GEWI® Anchor piece****Type T 2073**

<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32
Dimensions	H [mm]	-	35	40	45	50	60
	T [mm]	-	8	10	12	14	15
	$D_A$ [mm]	-	50	60	70	85	100
	A/F [mm]	-	30	36	41	46	50
	max. $d_k$ [mm]	-	16.3	20.25	25.15	28.1	32.0

**GEWI® Flanged anchor nut****Type T 2163**

<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32
Dimensions	H [mm]	-	35	40	45	50	60
	T [mm]	-	8	10	12	14	15
	$D_A$ [mm]	-	42	47	52	58	70
	A/F [mm]	-	30	36	41	46	55
	max. $d_k$ [mm]	-	16.3	20.25	25.15	28.1	32.0

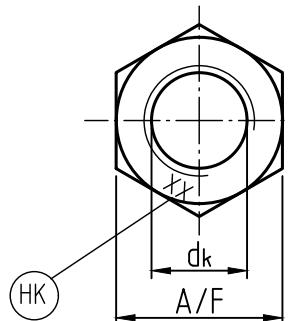
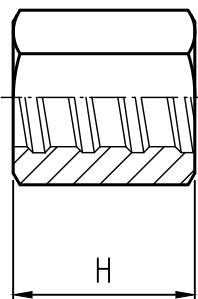
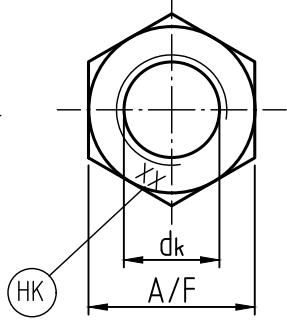
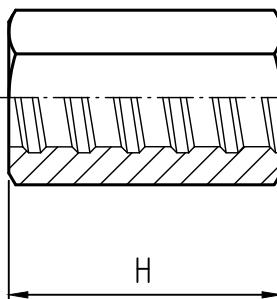
Remarks: Material see appendix 2

(HK) = DSI/DYwidag/DW

**DYwidag-System coupler splices and anchorages of  
bar steel with threaded ribs B500B- GEWI**

Anchor piece  
Flanged anchor nut

Annex 8

**GEWI® Anchor nut****Type T 2002****GEWI® Anchor nut-long****Type T 2024****GEWI® Steel****T 2002****A/F [mm]**

12

16

20

25

28

32

**H [mm]**

22

32

36

41

46

55

**T 2024****A/F [mm]**

22

32

32

41

41

50

**H [mm]**

25

40

45

50

55

60

**max. dk [mm]**

12.1

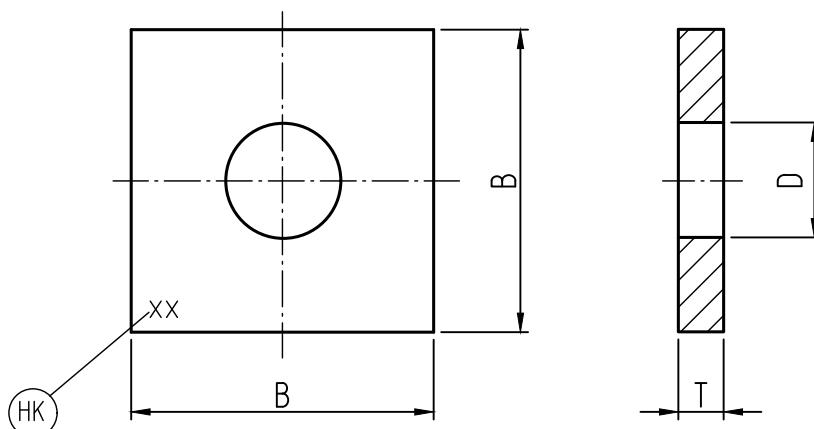
16.3

20.25

25.15

28.1

32.0

**GEWI® Anchor plate****Type T 2008****GEWI® Steel****d<sub>s</sub> [mm]**

12

16

20

25

28

32

**B/B [mm]**

40

50

60

70

85

100

**T [mm]**

6

8

10

12

14

15

**D [mm]**

16

20

25

30

33

38

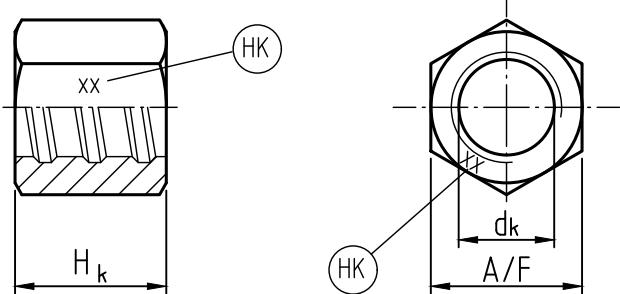
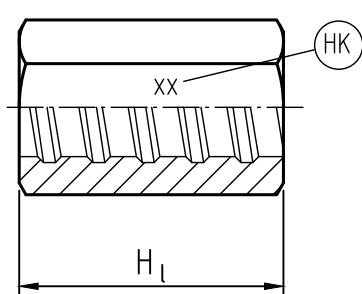
Remarks:

Material see appendix 2

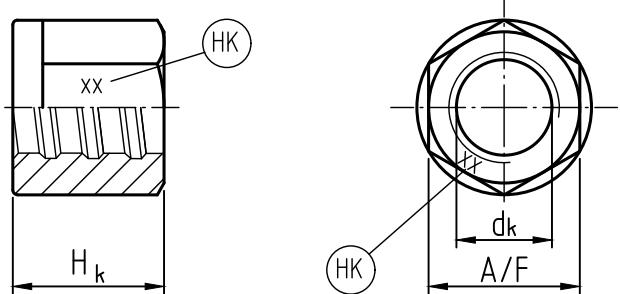
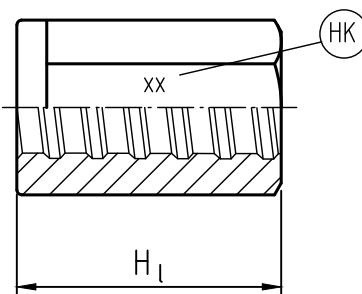
(HK) = DSI/DYWIDAG/DW

DYWIDAG-System coupler splices and anchorages of  
bar steel with threaded ribs B500B- GEWIAnchor nut, Anchor nut-long  
Anchor plate

Annex 9

**GEWI® Lock nut-short****Type T 2040****GEWI® Lock nut-long****Type T 2003**

<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32
Dimensions	$H_k$ [mm]	13	15	20	20	25	30
	$H_l$ [mm]	20	30	40	40	45	50
	A/F [mm]	19	32	32	41	41	50
	max. $d_k$ [mm]	12.1	16.3	20.25	25.15	28.1	32.0

**GEWI® Lock nut-short cast****Type T 2040G****GEWI® Lock nut-long cast****Type T 2003G**

<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32
Dimensions	$H_k$ [mm]	-	15	20	20	25	30
	$H_l$ [mm]	-	30	40	40	45	50
	A/F [mm]	-	32	32	41	41	50
	max. $d_k$ [mm]	-	16.3	20.25	25.15	28.1	32.0

Remarks: Material see appendix 2

(HK) = DSI/DYwidag/DW

DYwidag-System coupler splices and anchorages of  
bar steel with threaded ribs B500B- GEWILock nut-short, -long  
Lock nut-short cast, -long cast

Annex 10

For tension loads	For compression loads
<p>Fig. 1: <b>GEWI® Coupler splice</b></p>	
<p>Fig. 2: <b>GEWI® Coupler-long (A/F) splice</b></p>	
<p>Fig. 3: <b>GEWI® Reduction coupler splice</b></p>	
<p>Fig. 4: <b>GEWI® Reduction coupler-long (A/F) splice</b></p>	
<p>Fig. 5: <b>GEWI® Contact coupler splice</b></p>	
<b>DYWIDAG-System coupler splices and anchorages of bar steel with threaded ribs B500B- GEWI</b> <b>Assembly of coupler splices</b>	<b>Annex 11</b>

For tension loads	For compression loads																																
<b>Fig. 6 : GEWI® Turnbuckle splice</b>																																	
<table border="1"> <thead> <tr> <th><b>GEWI® Steel</b></th><th><math>d_s</math></th><th>12</th><th>16</th><th>20</th><th>25</th><th>28</th><th>32</th></tr> </thead> <tbody> <tr> <td>thread length</td><td><math>L_1</math></td><td>45</td><td>45</td><td>50</td><td>55</td><td>60</td><td>65</td></tr> <tr> <td></td><td><math>L_2</math></td><td>50</td><td>50</td><td>60</td><td>65</td><td>70</td><td>80</td></tr> <tr> <td>assembled</td><td>max. L [mm]</td><td>115</td><td>150</td><td>175</td><td>190</td><td>205</td><td>225</td></tr> </tbody> </table>		<b>GEWI® Steel</b>	$d_s$	12	16	20	25	28	32	thread length	$L_1$	45	45	50	55	60	65		$L_2$	50	50	60	65	70	80	assembled	max. L [mm]	115	150	175	190	205	225
<b>GEWI® Steel</b>	$d_s$	12	16	20	25	28	32																										
thread length	$L_1$	45	45	50	55	60	65																										
	$L_2$	50	50	60	65	70	80																										
assembled	max. L [mm]	115	150	175	190	205	225																										
<b>Fig. 7: GEWI® Weld-on piece connection</b>																																	
<p>single bevel butt weld with fillets</p> <p><math>t_1</math></p> <p><math>t_2</math></p> <p><math>z</math></p>																																	
<table border="1"> <thead> <tr> <th><b>GEWI® Steel</b></th><th><math>d_s</math> [mm]</th><th>12</th><th>16</th><th>20</th><th>25</th><th>28</th><th>32</th></tr> </thead> <tbody> <tr> <td>steel thickness</td><td><math>t_1</math> [mm]</td><td>8</td><td>11</td><td>11</td><td>12</td><td>12</td><td>12</td></tr> <tr> <td>weld seam</td><td><math>a</math> [mm]</td><td>6</td><td>6</td><td>8</td><td>8</td><td>10</td><td>10</td></tr> <tr> <td></td><td><math>z</math> [mm]</td><td>3</td><td>3</td><td>3</td><td>4</td><td>4</td><td>4</td></tr> </tbody> </table>		<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32	steel thickness	$t_1$ [mm]	8	11	11	12	12	12	weld seam	$a$ [mm]	6	6	8	8	10	10		$z$ [mm]	3	3	3	4	4	4
<b>GEWI® Steel</b>	$d_s$ [mm]	12	16	20	25	28	32																										
steel thickness	$t_1$ [mm]	8	11	11	12	12	12																										
weld seam	$a$ [mm]	6	6	8	8	10	10																										
	$z$ [mm]	3	3	3	4	4	4																										
<b>DYWIDAG-System coupler splices and anchorages of bar steel with threaded ribs B500B- GEWI</b> <b>Assembly of splices</b>																																	
<b>Annex 12</b>																																	

Fig. 8: GEWI® Tension loads

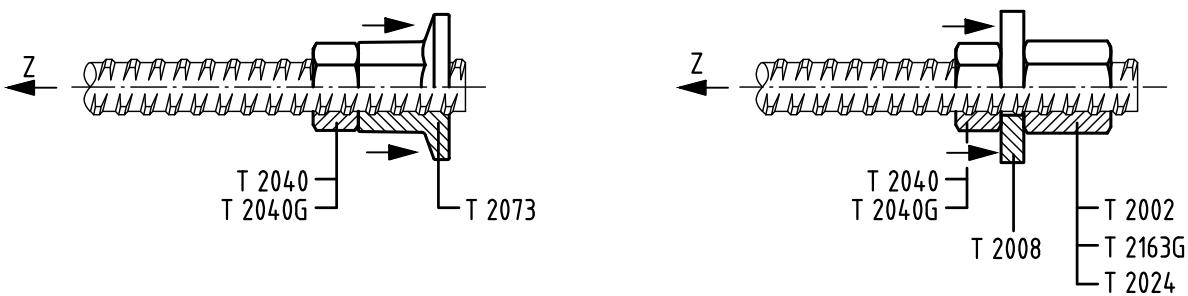


Fig. 9: GEWI® Compression loads

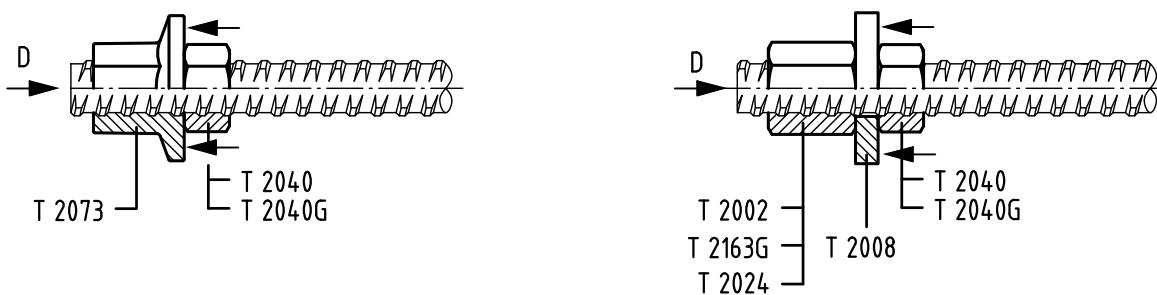
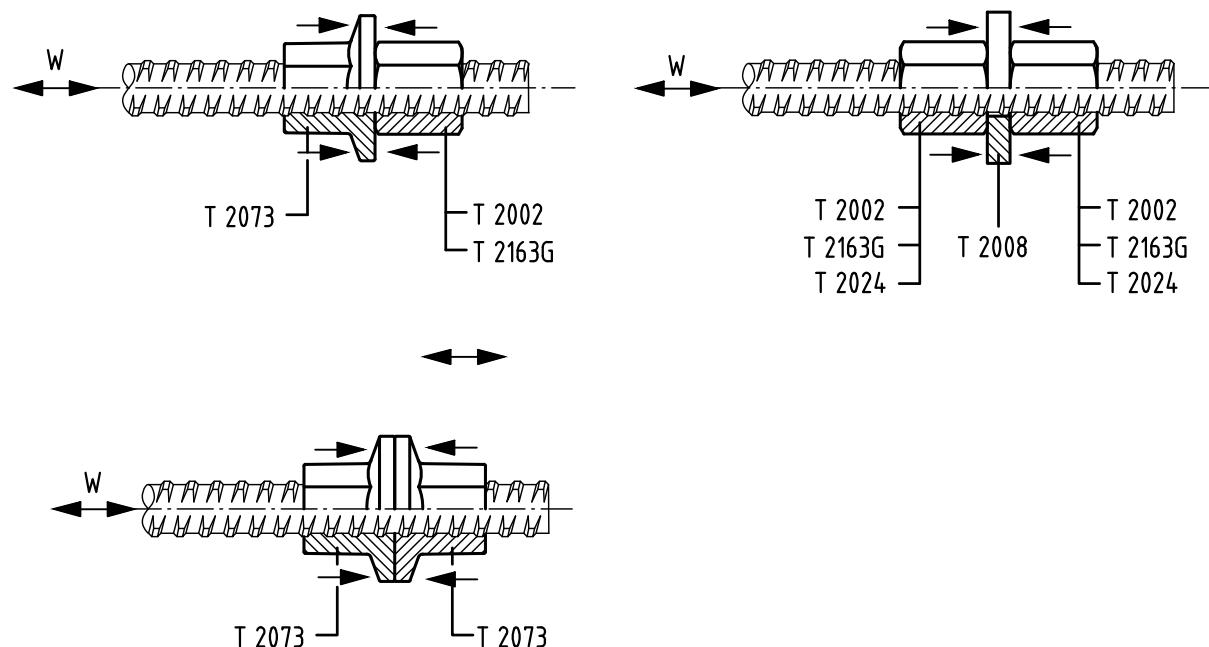
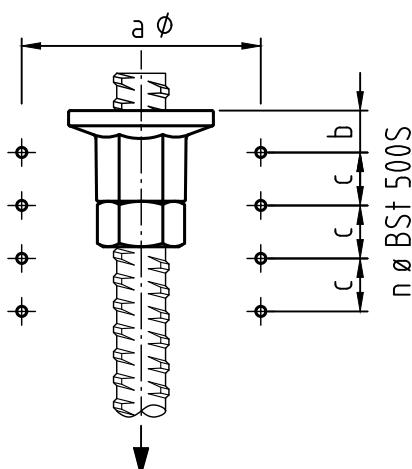


Fig. 10: GEWI® Alteranting loads

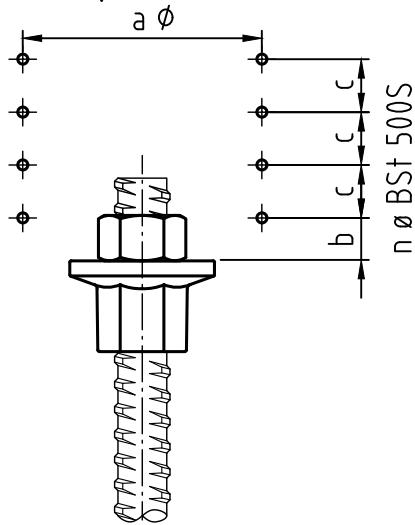


## Tension loads

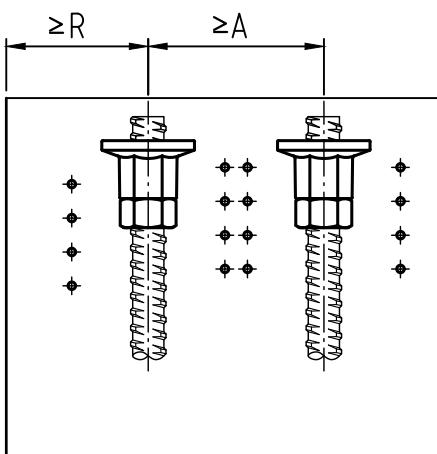


## GEWI® Anchorage

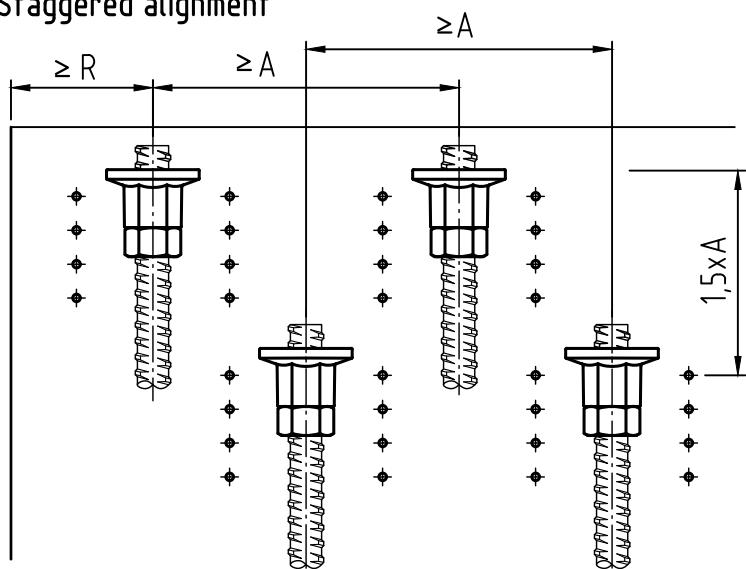
## Compression loads



## Unstaggered alignment



## Staggered alignment



nominal $\phi$ <b>GEWI®</b> BST 500 S	centre 2) distance		edge distance R [mm]	Additional reinforcement 1)					
	$d_s$ [mm]	A [mm]	$A_v$ [mm]	n	$d_s$ [mm]	a [mm]	b [mm]	c [mm]	
12	80	90	60	2	6	60	20	25	
16	100	105	70	3	6	70	20	30	
20	130	140	85	3	6	100	20	30	
25	145	165	90	4	6	120	15	40	
28	165	190	100	4	6	140	10	40	
32	180	200	110	3	8	155	20	50	

1) Additional reinforcement can be neglected if the minimum centre and edge distances are doubled.

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

DYWIDAG-System coupler splices and anchorages of  
bar steel with threaded ribs B500B- GEWI

Centre and edge distances for concrete  
C 20/25 acc. to DIN 1045-1 ( $f_{ck} \geq 20 \text{ N/mm}^2$ )

Annex 14

<b>GEWI® accessories</b>		Ann. No.	Locking torques $M_{kont}$ [kNm] for <b>GEWI®</b> coupler splices und anchorages for bar diameters $d_s$ [mm] (values in brackets are for reduction coupler)					
			12	16 (12/16)	20 (16/20)	25 (20/25)	28 (25/28)	32 (28/32)
Coupler splices	Coupler	3	0.08	0.20	0.35	0.70	0.95	1.60
	Coupler-long (A/F)	3		-	0.08	0.20	0.35	0.70
	Turnbuckle	5		-	-	-	-	0,20
	Reduction coupler	4		-	0.08	0.20	0.35	0.70
	Reduction coupler-long (A/F)	4		-	-	-	-	0.95
	Contact coupler	6		-	-	-	-	-
Anchorages	Weld-on piece	7	0.08	0.20	0.35	0.70	0.95	1.60
	Weld-on piece-long (A/F)	7		-	-	-	-	-
	Anchor piece	8		-	-	-	-	-
	Flanged anchor nut	8		-	-	-	-	-
	Anchor nut	9		-	-	-	-	-
	Anchor nut-long	9		-	-	-	-	-

DYwidag-System coupler splices and anchorages of  
bar steel with threaded ribs B500B- GEWI

Locking torques

Annex 15



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