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Członek EOTA

European Technical Approval ETA-13/0087

English language translation - the original version is in Polish language

Nazwa handlowa *Trade name*	**WKF** *WKF*
Właściciel aprobaty *Holder of approval*	**P.H. HAMAR Sp. J. B. i H. Grzesiak** **ul. Hutnicza 7** **81-061 Gdynia** **Poland**
Rodzaj i przeznaczenie wyrobu *Generic type and use of construction products*	**Wkręty do mocowania elementów metalowych i blach** *Fastening screws for metal members and sheeting*
Termin ważności **od** *Valid from*	**13. 03. 2013**
do *to*	**13. 03. 2018**
Zakład produkcyjny *Manufacturing plant*	**P.H. HAMAR Sp. J. B. i H. Grzesiak** **ul. Hutnicza 7** **81-061 Gdynia** **Poland**
Niniejsza Europejska Aprobata Techniczna zawiera *This European Technical Approval contains*	**20 stron, w tym 12 Załączników** *20 pages including 12 Annexes*

I LEGAL BASES AND GENERAL CONDITIONS

1. This European Technical Approval is issued by Instytut Techniki Budowlanej in accordance with:

   - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[1], modified by Council Directive 93/68/EEC of July 1993[2] and Regulation (EC) № 1882/2003 of the European Parliament and of the Council[3];
   - ustawa z dnia 16 kwietnia 2004 r. o wyrobach budowlanych (law on construction products from 16th April 2004)[4];
   - rozporządzenie Ministra Infrastruktury z dnia 14 października 2004 r. w sprawie europejskich aprobat technicznych oraz polskich jednostek organizacyjnych upoważnionych do ich wydawania (regulation of Ministry of Infrastructure of 14th October 2004 on the European Technical Approvals and Polish bodies entitled to issue them)[5];
   - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex of Commission Decision 94/23/EC[6].

2. Instytut Techniki Budowlanej is authorized to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.

3. This European Technical Approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European Technical Approval.

4. This European Technical Approval may be withdrawn by Instytut Techniki Budowlanej, in particular after information by the Commission on the basis of Article 5 (1) of Council Directive 89/106/EEC.

5. Reproduction of this European Technical Approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Instytut Techniki Budowlanej. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Approval.

6. The European Technical Approval is issued by the approval body in its official language. This version corresponds to the version circulated within EOTA. Translations into other languages have to be designated as such.

[1] Official Journal of the European Communities № L 40, 11.02.1989, p. 12
[2] Official Journal of the European Communities № L 220, 30.08.1993, p. 1
[3] Official Journal of the European Union L 284, 31 October 2003, p. 25
[4] Official Journal of Polish Republic № 92/2004, pos. 881
[5] Official Journal of Polish Republic № 237/2004, pos. 2375
[6] Official Journal of the European Communities № L 17, 20.01.1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1 Definition of product

The fastening screws WKF are self-drilling screws listed in Table 1. The fastening screws WKF (H) and WKF (H-GW) are made of galvanized carbon steel. The fastening screws WKF (HS3H), WKF (HS3H-GW), WKF (HS4) and WKF (HS4-GW) are made of stainless steel. They are partly completed with metallic washers and EPDM sealing rings. For details see the appropriate Annexes.

The fastening screws and the corresponding connections are subject to tension and shear forces.

Table 1 Different types of self drilling screws

No.	Self drilling screw	Description	Annex
1[1)]	WKF (H) 4,8 × L	with hexagon head and sealing washer ≥ Ø14 mm	1, 2
2[1)]	WKF (H-GW) 4,8 × L	with hexagon head	3
3[2)]	WKF (H) 6,3 × L	with hexagon head and sealing washer ≥ Ø16 mm	4
4[2)]	WKF (H-GW) 6,3 × L	with hexagon head	5
5[1)]	WKF (H) 6,5 × L	with hexagon head and sealing washer ≥ Ø16 mm	6, 7
6[1)]	WKF (H-GW) 6,5 × L	with hexagon head	8
7[1)]	WKF (HS3H) 4,8 × L	with hexagon head and sealing washer ≥ Ø14 mm	9
8[1)]	WKF (HS3H-GW) 4,8 × L	with hexagon head	10
9[3)]	WKF (HS4) 4,8 × L	with hexagon head and sealing washer ≥ Ø14 mm	11
10[3)]	WKF (HS4-GW) 4,8 × L	with hexagon head	12

[1)] These self-drilling screws are applicable for fastening to metal or timber substructures
[2)] These self-drilling screw is applicable for fastening to metal substructures
[3)] These self-drilling screw is applicable for fastening to timber substructures

1.2 Intended use

The fastening screw is intended to be used for fastening steel sheet to steel sheet and for fastening steel sheeting to timber structures. The sheeting can either be used as wall or roof cladding or as load bearing wall and roof element.

The fastening screws can also be used for the fastening of other thin gauge metal members.

The component to be fastened is component I and the substructure is component II. The intended use comprises fastening screws and connections for indoor and outdoor applications. The fastening screws made of stainless steel are intended to be used in environments with high corrosion category.

Furthermore the intended use comprises connections with predominantly static loads (e.g. wind loads, dead loads).

The provisions made in this European Technical Approval are based on an assumed working life of the self drilling screws of 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or Approval Body, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

2 Characteristics of product and methods of verification

2.1 Characteristics of product

The fastening screw shall correspond to the drawings given in the Annexes 1 to 12.

The characteristic material values, dimensions and tolerances of the fastening screw not indicated in these Annexes shall correspond to the respective values laid down in the technical documentation[7] of this European Technical Approval.

The fastening screws are considered to satisfy the requirements of performance class A1 of reaction to fire, in accordance with the provisions of the EC Decision 96/603/EC[8] (as amended) without the need for testing on the basis of its listing in that decision.

2.2 Methods of verification

The assessment of the fitness of the fastening screw for the intended use in relation to the Essential Requirements ER 1 (Mechanical resistance and stability), ER 2 (Safety in case of fire), ER 4 (Safety in use) and additional aspects of durability has been made in accordance with section 3.2 of the Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC[6].

The assessment of the resistance to fire performance is only relevant to the assembled system (fastening screws, sheeting, substructure) which is not part of the ETA.

Concerning Essential Requirements No. 1 (Mechanical resistance and stability) and No. 4 (Safety in use) the following applies:

- the characteristic values of resistance given in Annexes were determined by shear and tension tests,
- the formulas to calculate the design resistance are given in clause 4.2.1.

3 Evaluation of conformity of the product and CE-marking

3.1 Attestation of conformity system

According to the Decision 99/92 of the European Commission[9] system 3 of the attestation of conformity applies.

This system of attestation of conformity provides declaration of conformity of the

[7] The technical documentation to this European technical approval is deposited at Instytut Techniki Budowlanej and, as far as relevant fort the tasks of the approved bodies involved in the attestation of conformity procedure is handed over to the approved bodies.
[8] Official Journal of the European Communities № L 267 of 04.10.1996.
[9] Official Journal of the European Communities № L 80 of 18.03.1998.

product by the manufacturer on the basis of:

(a) Tasks for the manufacturer:

(1) factory production control;

(b) Tasks for the approved body:

(2) initial type-testing of the product.

3.2 Responsibilities

3.2.1 Tasks of the manufacturer; factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the products are in conformity with this European Technical Approval.

The manufacturer shall only use raw materials stated in the technical documentation of this ETA.

The factory production control shall be in accordance with the control plan[10] which is a part of the technical documentation of this ETA. The control plan has been agreed between the manufacturer and Instytut Techniki Budowlanej and is laid down in the context of the factory production control system operated by the manufacturer and deposited with Instytut Techniki Budowlanej.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

The manufacturer shall make a declaration of conformity, stating that the fastening screws WKF for metal members and sheeting are in conformity with the provisions of the ETA.

3.2.2 Tasks of the approved body

The notified body shall perform the initial type-testing of the product.

The notified body shall retain the essential points of its actions referred to above and state the results obtained and conclusion drawn in written report.

3.3 CE-marking

The CE marking shall be affixed on the product itself, the attached label, or the accompanying commercial documents. The letters „CE” shall be followed by the following additional information:

- the name or identification mark of the producer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE-marking was affixed,
- the number of the European Technical Approval,
- the name of the product.

[10] The control plan has been deposited with Instytut Techniki Budowlanej and may be handed over only to the notified body involved in the procedure of attestation of conformity.

4 Assumptions under which the fitness of the product for the intended use was favorably assessed

4.1 Manufacturing

The ETA is issued on the basis of agreed data/information, deposited with Instytut Techniki Budowlanej, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Instytut Techniki Budowlanej before the changes are introduced. Instytut Techniki Budowlanej will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

4.2 Design

4.2.1 General

Fastening screws completely or partly exposed to external weather are made of stainless steel or are protected against corrosion. For the corrosion protection the rules given in EN 1090-2:2008, EN 1993-1-3:2006 and EN 1995-1-1:2004 + A1:2008 are to be taken into account. For connections the effect of constraints due to temperature shall be considered for design unless constraining forces due to temperature do not occur or are not significant (e.g. sufficient flexibility of the structure). The loading is predominantly static (for instance wind loads are regarded as predominantly static).

Dimensions, material properties, torque moments $M_{t,norm}$, minimum effective screw-in length l_{ef} and nominal fastened material thicknesses t_N as stated in the ETA are observed. The verification concept stated in EN 1990:2002 is used for the design of the connections made with the fastening screw. The characteristic values of shear and tension resistance, stated in Annexes are to be used for the design of the entire connections.

The following formulas are to be used to calculate the values of design resistance:

$$N_{R,d} = \frac{N_{R,k}}{\gamma_M}$$

$$V_{R,d} = \frac{V_{R,k}}{\gamma_M}$$

The recommended partial safety factor γ_M = 1,33 is used in order to determine the corresponding design resistances, provided no values are given in national regulations of the member state in which the fastening screws are used or in the respective National Annex to Eurocode 3.

In case of combined tension and shear forces the linear interaction formula according to EN 1993-1-3:2006, section 8.3 (8) is taken into account.

$$\frac{N_{S,d}}{N_{R,d}} + \frac{V_{S,d}}{V_{R,d}} \leq 1{,}0$$

The possibly required reduction of the tension resistance due to the position of the fastening screw is to be taken into account in accordance with EN 1993-1-3:2006, section 8.3 (7) and Fig. 8.2.

4.2.2 Additional rules for connections with timber substructures

As far as no other provisions are made the following EN 1995-1-1:2004 + A1:2008 applies.

The following terms are used:

l_g – screw-in length – part of thread screwed in to component II including drill point

l_b – length of the drill-point

l_{ef} – effective screw-in length $l_{ef} = l_g - l_b$

$N_{R,k} = F_{ax,Rk} \bullet k_{mod}$

$V_{R,k} = F_{v,Rk} \bullet k_{mod}$

$F_{ax,Rk}$ according to EN 1995-1-1:2004 + A1:2008, equation (8.40a)

Remark: $F_{ax,Rk} = F_{ax,\alpha,Rk}$ with $\alpha = 90°$

$F_{v,Rk}$ according to EN 1995-1-1:2004 + A1:2008, clause 8.2.3

k_{mod} according to EN 1995-1-1:2004 + A1:2008, Table 3.1

$M_{y,Rk}$ moment in equation (8.9) of EN 1995-1-1:2004 + A1:2008 is given in Annexes of this ETA

$f_{ax,k}$ steel stress in equation (8.40a) of EN 1995-1-1:2004 + A1:2008 is given in Annexes of this ETA.

The characteristic values for fastening screw (pull out and bearing resistance, timber structure) calculated according to EN 1995-1-1:2004 + A1:2008 are compared with the characteristic values for component I (pull over and bearing resistance) stated in the last column of the tables in the appropriate Annexes. The lower value is used for further calculations.

4.3 Installation

The fitness for use of the fastening screw can only be assumed if the following conditions of installation are met:

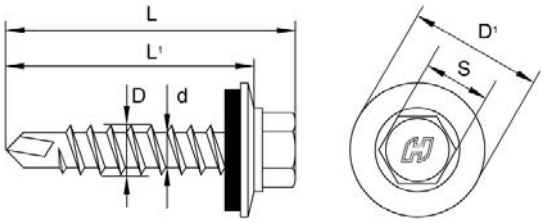
- the installation is to be only carried out according to the manufacturer's instructions; the manufacturer hands over the assembly instructions to the assembler,
- it is guaranteed by the execution that no bimetallic corrosion will occur,
- for regular shear forces (without lever arm) the components I and II are directly connected to each other so that the fastening screws do not get additional bending; the use of compression resistant thermal insulation strips up to a thickness of 3 mm is allowed,
- the fastening screws are fixed rectangular to the surface of the components to guarantee a correct load bearing and if necessary rain-proof connection,
- fastening screws for steel substructures are screwed-in to the substructure with the cylindrical part of the thread,
- the conformity of the installed fastening screws with the provisions of the ETA is confirmed by the executing company.

5 Recommendations for the manufacturer

It is in the responsibility of the manufacturer to ensure that the information on the specific conditions according to 1, 2, 4.2 and 4.3 (and in Annexes) is given to those who are concerned. This information may be given by reproduction of the respective parts of the European Technical Approval. In addition all installation data (torque moment, application limits) shall be shown clearly on the package and/or on an enclosed instruction sheet, preferably using illustration(s).

On behalf of Instytut Techniki Budowlanej

Marek Kaproń
Deputy Director of ITB



Materials
Fastener: carbon steel – SAE1022
quenched, tempered and galvanized (≥ 12 µm)
Washer: EPDM sealing ring with metal top
made of aluminum
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: S280GD, S320GD or S350GD – EN 10346
or structural timber – EN 14081

Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}25$ mm

Timber substructures
For timber substructures performance determined with

$M_{y,Rk}$ = 4,390 Nm
$f_{ax,k}$ = 12,321 N/mm² for $l_{ef} \geq 20$ mm
$f_{ax,k}$ = 15,523 N/mm² for $l_{ef} \geq 27$ mm

$t_{N,II}$ [mm]		0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	Wood class ≥ C24		
$M_{t,nom}$		3 Nm								20 mm	27 mm	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88*	—	*bearing resistance of component I **bearing resistance of component II
	0,55	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88*	—	
	0,63	0,88	0,88	1,27	1,27	1,27	1,27	1,27	1,27	0,91**	—	
	0,75	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	0,88	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,00	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,13	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,25	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,54	0,54	0,54	0,54	0,54	0,54	0,54	0,54	1,29*	2,13**	*bearing resistance of component II **bearing resistance of component I
	0,55	0,54	0,54	0,54	0,54	0,54	0,54	0,54	0,54	1,29*	2,13**	
	0,63	0,54	0,54	0,69	0,69	0,69	0,69	0,69	0,69	1,29*	2,13**	
	0,75	0,54	0,54	0,69	0,77	0,77	0,77	0,77	0,77	1,29*	2,13**	
	0,88	0,54	0,54	0,69	0,77	0,97	0,97	0,97	0,97	1,29*	2,13**	
	1,00	0,54	0,54	0,69	0,77	0,97	1,46	1,46	1,46	1,29*	2,13**	
	1,13	0,54	0,54	0,69	0,77	0,97	1,46	1,46	1,46	1,29*	2,13**	
	1,25	0,54	0,54	0,69	0,77	0,97	1,46	1,46	1,82	1,29*	2,13**	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	

If both components I and II are made of S320GD the values $V_{R,k}$ may be increased by 8,3%
If both components I and II are made of S350GD the values $V_{R,k}$ may be increased by 16,6%

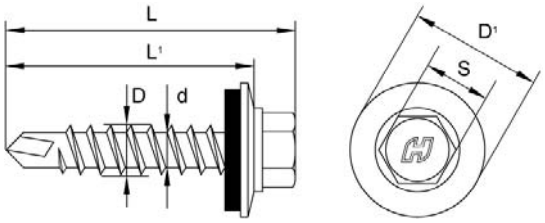
WKF fastening screws for metal members and sheeting

WKF (H) 4,8 × L

with hexagon head and sealing washer ≥ Ø14 mm
with metal top made of aluminum

Annex 1

of European Technical Approval ETA-13/0087



Materials
Fastener: carbon steel – SAE1022
quenched, tempered and galvanized (≥ 12 µm)
Washer: EPDM sealing ring with metal top
made of coated carbon steel
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: S280GD, S320GD or S350GD – EN 10346
or structural timber – EN 14081

Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}25$ mm

Timber substructures
For timber substructures performance determined with

$M_{y,Rk}$ = 4,390 Nm
$f_{ax,k}$ = 12,321 N/mm² for $l_{ef} \geq 20$ mm
$f_{ax,k}$ = 15,523 N/mm² for $l_{ef} \geq 27$ mm

$t_{N,II}$ [mm]		0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	Wood class ≥ C24		
$M_{t,nom}$		3 Nm								20 mm	27 mm	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88*	—	*bearing resistance of component I **bearing resistance of component II
	0,55	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88*	—	
	0,63	0,88	0,88	1,27	1,27	1,27	1,27	1,27	1,27	0,91**	—	
	0,75	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	0,88	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,00	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,13	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,25	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,54	0,54	0,54	0,54	0,54	0,54	0,54	0,54	1,29*	2,19*	*bearing resistance of component II
	0,55	0,54	0,54	0,54	0,54	0,54	0,54	0,54	0,54	1,29*	2,19*	
	0,63	0,54	0,54	0,69	0,69	0,69	0,69	0,69	0,69	1,29*	2,19*	
	0,75	0,54	0,54	0,69	0,77	0,77	0,77	0,77	0,77	1,29*	2,19*	
	0,88	0,54	0,54	0,69	0,77	0,97	0,97	0,97	0,97	1,29*	2,19*	
	1,00	0,54	0,54	0,69	0,77	0,97	1,46	1,46	1,46	1,29*	2,19*	
	1,13	0,54	0,54	0,69	0,77	0,97	1,46	1,46	1,46	1,29*	2,19*	
	1,25	0,54	0,54	0,69	0,77	0,97	1,46	1,46	1,82	1,29*	2,19*	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	

If both components I and II are made of S320GD the values $V_{R,k}$ may be increased by 8,3%
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WKF fastening screws for metal members and sheeting

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with hexagon head and sealing washer ≥ Ø14 mm
with metal top made of coated carbon steel

Annex 2

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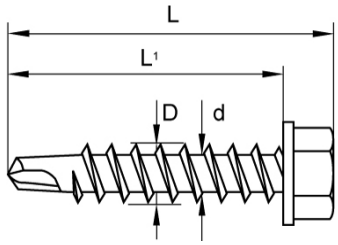

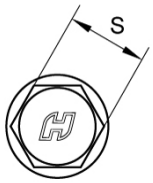

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Component II: S280GD, S320GD or S350GD – EN 10346
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Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}25$ mm

Timber substructures
For timber substructures performance determined with

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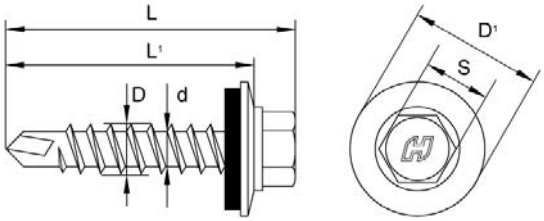
$t_{N,II}$ [mm]		0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	Wood class ≥ C24		
$M_{t,nom}$		3 Nm								20 mm	27 mm	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88*	—	*bearing resistance of component I **bearing resistance of component II
	0,55	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88*	—	
	0,63	0,88	0,88	1,27	1,27	1,27	1,27	1,27	1,27	0,91**	—	
	0,75	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	0,88	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,00	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,13	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,25	0,88	0,88	1,27	1,40	1,40	1,40	1,40	1,40	0,91**	—	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	bearing resistance of component I
	0,55	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	
	0,63	0,45	0,45	0,69	0,69	0,69	0,69	0,69	0,69	0,84	0,84	
	0,75	0,45	0,45	0,69	0,77	0,77	0,77	0,77	0,77	0,84	0,84	
	0,88	0,45	0,45	0,69	0,77	0,84	0,84	0,84	0,84	0,84	0,84	
	1,00	0,45	0,45	0,69	0,77	0,84	0,84	0,84	0,84	0,84	0,84	
	1,13	0,45	0,45	0,69	0,77	0,84	0,84	0,84	0,84	0,84	0,84	
	1,25	0,45	0,45	0,69	0,77	0,84	0,84	0,84	0,84	0,84	0,84	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	

If both components I and II are made of S320GD the values $V_{R,k}$ may be increased by 8,3%
If both components I and II are made of S350GD the values $V_{R,k}$ may be increased by 16,6%

WKF fastening screws for metal members and sheeting

WKF (H-GW) 4,8 × L
with hexagon head

Annex 3
of European Technical Approval ETA-13/0087



Materials
Fastener: carbon steel – SAE1022
quenched, tempered and galvanized (≥ 12 µm)
Washer: EPDM sealing ring with metal top
made of aluminum or coated carbon steel
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}50$ mm

Timber substructures
no performance determined

$t_{N,II}$ [mm]		0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	Wood class ≥ C24
$M_{t,nom}$		4 Nm									
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	1,24	1,24	1,24	1,24	1,24	1,24	1,24	1,24	1,24	
	0,55	1,24	1,24	1,24	1,24	1,24	1,24	1,24	1,24	1,24	
	0,63	1,24	1,24	2,16	2,16	2,16	2,16	2,16	2,16	2,16	
	0,75	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	0,88	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	1,00	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	1,13	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	1,25	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	1,50	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	1,75	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	
	0,55	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	
	0,63	0,45	0,45	0,73	0,73	0,73	0,73	0,73	0,73	0,73	
	0,75	0,45	0,45	0,73	0,83	0,83	0,83	0,83	0,83	0,83	
	0,88	0,45	0,45	0,73	0,83	1,16	1,16	1,16	1,16	1,16	
	1,00	0,45	0,45	0,73	0,83	1,16	1,81	1,81	1,81	1,81	
	1,13	0,45	0,45	0,73	0,83	1,16	1,81	1,81	1,81	1,81	
	1,25	0,45	0,45	0,73	0,83	1,16	1,81	1,81	2,25	2,25	
	1,50	0,45	0,45	0,73	0,83	1,16	1,81	1,81	2,25	2,90	
	1,75	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	

If both components I and II are made of S320GD the values $V_{R,k}$ may be increased by 8,3%
If both components I and II are made of S350GD the values $V_{R,k}$ may be increased by 16,6%

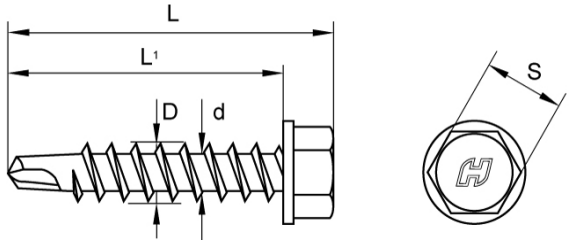
WKF fastening screws for metal members and sheeting

WKF (H) 6,3 × L

with hexagon head and sealing washer ≥ Ø16 mm
with metal top made of aluminum or coated carbon steel

Annex 4

of European Technical Approval ETA-13/0087



Materials
Fastener: carbon steel – SAE1022
quenched, tempered and galvanized (≥ 12 µm)
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}50$ mm

Timber substructures
no performance determined

$t_{N,II}$ [mm]		0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	Wood class ≥ C24
$M_{t,nom}$		4 Nm									
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	1,24	1,24	1,24	1,24	1,24	1,24	1,24	1,24	1,24	
	0,55	1,24	1,24	1,24	1,24	1,24	1,24	1,24	1,24	1,24	
	0,63	1,24	1,24	2,16	2,16	2,16	2,16	2,16	2,16	2,16	
	0,75	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	0,88	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	1,00	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	1,13	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	1,25	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	1,50	1,24	1,24	2,16	2,52	2,52	2,52	2,52	2,52	2,52	
	1,75	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	
	0,55	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	
	0,63	0,45	0,45	0,73	0,73	0,73	0,73	0,73	0,73	0,73	
	0,75	0,45	0,45	0,73	0,83	0,83	0,83	0,83	0,83	0,83	
	0,88	0,45	0,45	0,73	0,83	0,94	0,94	0,94	0,94	0,94	
	1,00	0,45	0,45	0,73	0,83	0,94	0,94	0,94	0,94	0,94	
	1,13	0,45	0,45	0,73	0,83	0,94	0,94	0,94	0,94	0,94	
	1,25	0,45	0,45	0,73	0,83	0,94	0,94	0,94	0,94	0,94	
	1,50	0,45	0,45	0,73	0,83	0,94	0,94	0,94	0,94	0,94	
	1,75	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	

If both components I and II are made of S320GD the values $V_{R,k}$ may be increased by 8,3%
If both components I and II are made of S350GD the values $V_{R,k}$ may be increased by 16,6%

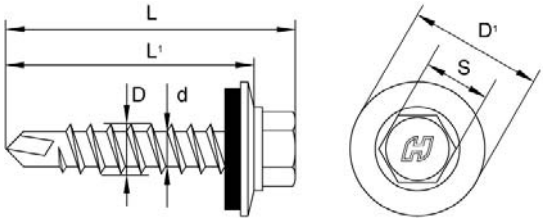
WKF fastening screws for metal members and sheeting

WKF (H-GW) 6,3 × L

with hexagon head

Annex 5

of European Technical Approval ETA-13/0087



Materials

Fastener:	carbon steel – SAE1022 quenched, tempered and galvanized (≥ 12 µm)
Washer:	EPDM sealing ring with metal top made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S280GD, S320GD or S350GD – EN 10346 or structural timber – EN 14081

Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}25$ mm

Timber substructures

For timber substructures performance determined with

$M_{y,Rk}$ = 9,660 Nm
$f_{ax,k}$ = 7,362 N/mm^2 for $l_{ef} \geq 20$ mm
$f_{ax,k}$ = 17,289 N/mm^2 for $l_{ef} \geq 27$ mm

$t_{N,II}$ [mm]		0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	Wood class ≥ C24		
$M_{t,nom}$		4 Nm								20 mm	27 mm	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49*	—	*bearing resistance of component I **bearing resistance of component II
	0,55	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49*	—	
	0,63	1,49	1,49	2,37	2,37	2,37	2,37	2,37	2,37	1,61**	—	
	0,75	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	0,88	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,00	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,13	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,25	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,62	0,62	0,62	0,62	0,62	0,62	0,62	0,62	0,77*	2,22**	*bearing resistance of component II **bearing resistance of component I
	0,55	0,62	0,62	0,62	0,62	0,62	0,62	0,62	0,62	0,77*	2,22**	
	0,63	0,62	0,62	0,79	0,79	0,79	0,79	0,79	0,79	0,77*	2,44*	
	0,75	0,62	0,62	0,79	0,86	0,86	0,86	0,86	0,86	0,77*	2,44*	
	0,88	0,62	0,62	0,79	0,86	1,09	1,09	1,09	1,09	0,77*	2,44*	
	1,00	0,62	0,62	0,79	0,86	1,09	1,77	1,77	1,77	0,77*	2,44*	
	1,13	0,62	0,62	0,79	0,86	1,09	1,77	1,77	1,77	0,77*	2,44*	
	1,25	0,62	0,62	0,79	0,86	1,09	1,77	1,77	2,17	0,77*	2,44*	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	

If both components I and II are made of S320GD the values $V_{R,k}$ may be increased by 8,3%
If both components I and II are made of S350GD the values $V_{R,k}$ may be increased by 16,6%

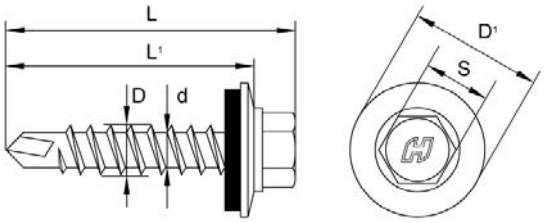
WKF fastening screws for metal members and sheeting

WKF (H) 6,5 × L

with hexagon head and sealing washer ≥ Ø16 mm
with metal top made of aluminum

Annex 6

of European Technical Approval ETA-13/0087



Materials
Fastener: carbon steel – SAE1022
quenched, tempered and galvanized (≥ 12 µm)
Washer: EPDM sealing ring with metal top
made of coated carbon steel
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: S280GD, S320GD or S350GD – EN 10346
or structural timber – EN 14081

Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}25$ mm

Timber substructures
For timber substructures performance determined with

$M_{y,Rk}$ = 9,660 Nm
$f_{ax,k}$ = 7,362 N/mm² for $l_{ef} \geq 20$ mm
$f_{ax,k}$ = 17,289 N/mm² for $l_{ef} \geq 27$ mm

$t_{N,II}$ [mm]		0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	Wood class ≥ C24		
$M_{t,nom}$		4 Nm								20 mm	27 mm	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49*	—	*bearing resistance of component I **bearing resistance of component II
	0,55	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49*	—	
	0,63	1,49	1,49	2,37	2,37	2,37	2,37	2,37	2,37	1,61**	—	
	0,75	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	0,88	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,00	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,13	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,25	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,62	0,62	0,62	0,62	0,62	0,62	0,62	0,62	0,77*	2,44*	*bearing resistance of component II
	0,55	0,62	0,62	0,62	0,62	0,62	0,62	0,62	0,62	0,77*	2,44*	
	0,63	0,62	0,62	0,79	0,79	0,79	0,79	0,79	0,79	0,77*	2,44*	
	0,75	0,62	0,62	0,79	0,86	0,86	0,86	0,86	0,86	0,77*	2,44*	
	0,88	0,62	0,62	0,79	0,86	1,09	1,09	1,09	1,09	0,77*	2,44*	
	1,00	0,62	0,62	0,79	0,86	1,09	1,77	1,77	1,77	0,77*	2,44*	
	1,13	0,62	0,62	0,79	0,86	1,09	1,77	1,77	1,77	0,77*	2,44*	
	1,25	0,62	0,62	0,79	0,86	1,09	1,77	1,77	2,17	0,77*	2,44*	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	

If both components I and II are made of S320GD the values $V_{R,k}$ may be increased by 8,3%
If both components I and II are made of S350GD the values $V_{R,k}$ may be increased by 16,6%

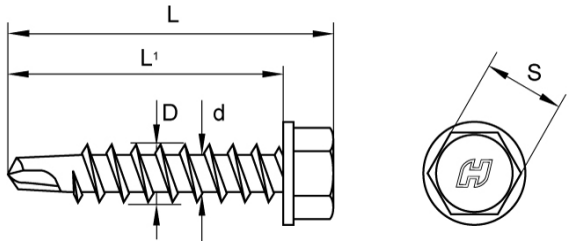
WKF fastening screws for metal members and sheeting

WKF (H) 6,5 × L

with hexagon head and sealing washer ≥ Ø16 mm
with metal top made of coated carbon steel

Annex 7

of European Technical Approval ETA-13/0087



Materials
Fastener: carbon steel – SAE1022
quenched, tempered and galvanized (≥ 12 µm)
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: S280GD, S320GD or S350GD – EN 10346
or structural timber – EN 14081

Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}25$ mm

Timber substructures
For timber substructures performance determined with

$M_{y,Rk}$ = 9,660 Nm
$f_{ax,k}$ = 7,362 N/mm² for $l_{ef} \geq 20$ mm
$f_{ax,k}$ = 17,289 N/mm² for $l_{ef} \geq 27$ mm

$t_{N,II}$ [mm]		0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	Wood class ≥ C24		
$M_{t,nom}$		4 Nm								20 mm	27 mm	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49*	—	*bearing resistance of component I **bearing resistance of component II
	0,55	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49	1,49*	—	
	0,63	1,49	1,49	2,37	2,37	2,37	2,37	2,37	2,37	1,61**	—	
	0,75	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	0,88	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,00	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,13	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,25	1,49	1,49	2,37	2,78	2,78	2,78	2,78	2,78	1,61**	—	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,52	0,52	0,52	0,62	0,62	0,62	0,62	0,62	0,52*	0,52*	*bearing resistance of component I **bearing resistance of component II
	0,55	0,52	0,52	0,52	0,62	0,62	0,62	0,62	0,62	0,52*	0,52*	
	0,63	0,52	0,52	0,79	0,79	0,79	0,79	0,79	0,79	0,77**	0,94*	
	0,75	0,52	0,52	0,79	0,86	0,86	0,86	0,86	0,86	0,77**	0,94*	
	0,88	0,52	0,52	0,79	0,86	0,94	0,94	0,94	0,94	0,77**	0,94*	
	1,00	0,52	0,52	0,79	0,86	0,94	0,94	0,94	0,94	0,77**	0,94*	
	1,13	0,52	0,52	0,79	0,86	0,94	0,94	0,94	0,94	0,77**	0,94*	
	1,25	0,52	0,52	0,79	0,86	0,94	0,94	0,94	0,94	0,77**	0,94*	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	

If both components I and II are made of S320GD the values $V_{R,k}$ may be increased by 8,3%
If both components I and II are made of S350GD the values $V_{R,k}$ may be increased by 16,6%

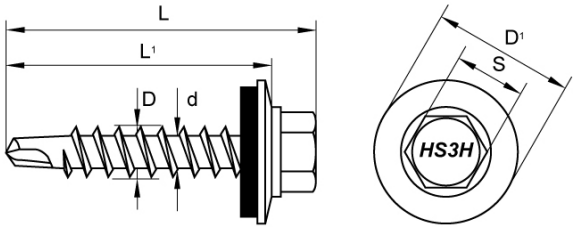
WKF fastening screws for metal members and sheeting

WKF (H-GW) 6,5 × L

with hexagon head

Annex 8

of European Technical Approval ETA-13/0087



Materials
Fastener: stainless steel – 1.4301 – EN 10088-1
Washer: EPDM sealing ring with metal top made of stainless steel
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: S280GD, S320GD or S350GD – EN 10346 or structural timber – EN 14081

Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}25$ mm

Timber substructures
For timber substructures performance determined with

$M_{y,Rk}$ = 3,370 Nm
$f_{ax,k}$ = 10,976 N/mm² for $l_{ef} \geq 20$ mm
$f_{ax,k}$ = 14,312 N/mm² for $l_{ef} \geq 27$ mm

$t_{N,II}$ [mm]		0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	Wood class ≥ C24		
$M_{t,nom}$		3 Nm								20 mm	27 mm	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57*	—	*bearing resistance of component I **bearing resistance of component II
	0,55	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57*	—	
	0,63	0,57	0,57	1,12	1,12	1,12	1,12	1,12	1,12	0,91**	—	
	0,75	0,57	0,57	1,12	1,15	1,15	1,15	1,15	1,15	0,91**	—	
	0,88	0,57	0,57	1,12	1,15	1,15	1,15	1,15	1,15	0,91**	—	
	1,00	0,57	0,57	1,12	1,15	1,15	1,15	1,15	1,15	0,91**	—	
	1,13	0,57	0,57	1,12	1,15	1,15	1,15	1,15	1,15	0,91**	—	
	1,25	0,57	0,57	1,12	1,15	1,15	1,15	1,15	1,15	0,91**	—	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,41	0,41	0,41	0,41	0,41	0,41	0,41	0,41	1,15	2,00	bearing resistance of component II
	0,55	0,41	0,41	0,41	0,41	0,41	0,41	0,41	0,41	1,15	2,00	
	0,63	0,41	0,41	0,53	0,53	0,53	0,53	0,53	0,53	1,15	2,00	
	0,75	0,41	0,41	0,53	0,68	0,68	0,68	0,68	0,68	1,15	2,00	
	0,88	0,41	0,41	0,53	0,68	0,88	0,88	0,88	0,88	1,15	2,00	
	1,00	0,41	0,41	0,53	0,68	0,88	1,41	1,41	1,41	1,15	2,00	
	1,13	0,41	0,41	0,53	0,68	0,88	1,41	1,41	1,41	1,15	2,00	
	1,25	0,41	0,41	0,53	0,68	0,88	1,41	1,41	1,76	1,15	2,00	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	

If both components I and II are made of S320GD the values $V_{R,k}$ may be increased by 8,3%
If both components I and II are made of S350GD the values $V_{R,k}$ may be increased by 16,6%

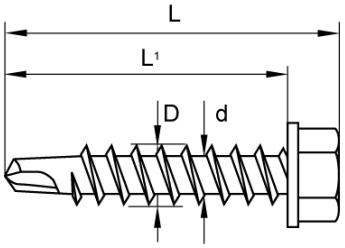
WKF fastening screws for metal members and sheeting

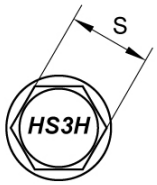
WKF (HS3H) 4,8 × L

with hexagon head and sealing washer ≥ Ø14 mm
with metal top made of stainless steel

Annex 9

of European Technical Approval ETA-13/0087





Materials
Fastener: stainless steel – 1.4301 – EN 10088-1
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: S280GD, S320GD or S350GD – EN 10346 or structural timber – EN 14081

Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}25$ mm

Timber substructures
For timber substructures performance determined with

$M_{y,Rk}$ = 3,370 Nm
$f_{ax,k}$ = 10,976 N/mm^2 for $l_{ef} \geq 20$ mm
$f_{ax,k}$ = 14,312 N/mm^2 for $l_{ef} \geq 27$ mm

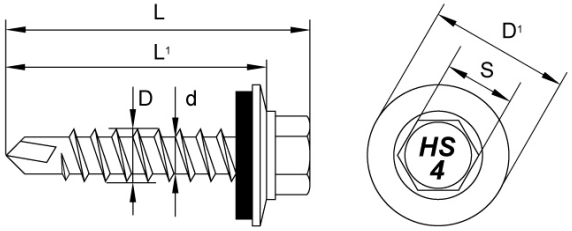
$t_{N,II}$ [mm]		0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	Wood class ≥ C24		
$M_{t,nom}$		3 Nm								20 mm	27 mm	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57*	—	*bearing resistance of component I **bearing resistance of component II
	0,55	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57*	—	
	0,63	0,57	0,57	1,12	1,12	1,12	1,12	1,12	1,12	0,91**	—	
	0,75	0,57	0,57	1,12	1,15	1,15	1,15	1,15	1,15	0,91**	—	
	0,88	0,57	0,57	1,12	1,15	1,15	1,15	1,15	1,15	0,91**	—	
	1,00	0,57	0,57	1,12	1,15	1,15	1,15	1,15	1,15	0,91**	—	
	1,13	0,57	0,57	1,12	1,15	1,15	1,15	1,15	1,15	0,91**	—	
	1,25	0,57	0,57	1,12	1,15	1,15	1,15	1,15	1,15	0,91**	—	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50	0,41	0,41	0,41	0,41	0,41	0,41	0,41	0,41	0,45	0,45	bearing resistance of component I
	0,55	0,41	0,41	0,41	0,41	0,41	0,41	0,41	0,41	0,45	0,45	
	0,63	0,41	0,41	0,53	0,53	0,53	0,53	0,53	0,53	0,84	0,84	
	0,75	0,41	0,41	0,53	0,68	0,68	0,68	0,68	0,68	0,84	0,84	
	0,88	0,41	0,41	0,53	0,68	0,84	0,84	0,84	0,84	0,84	0,84	
	1,00	0,41	0,41	0,53	0,68	0,84	0,84	0,84	0,84	0,84	0,84	
	1,13	0,41	0,41	0,53	0,68	0,84	0,84	0,84	0,84	0,84	0,84	
	1,25	0,41	0,41	0,53	0,68	0,84	0,84	0,84	0,84	0,84	0,84	
	1,50	—	—	—	—	—	—	—	—	—	—	
	1,75	—	—	—	—	—	—	—	—	—	—	
	2,00	—	—	—	—	—	—	—	—	—	—	

If both components I and II are made of S320GD the values $V_{R,k}$ may be increased by 8,3%
If both components I and II are made of S350GD the values $V_{R,k}$ may be increased by 16,6%

WKF fastening screws for metal members and sheeting

WKF (HS3H-GW) 4,8 × L
with hexagon head

Annex 10
of European Technical Approval ETA-13/0087



Materials
Fastener: stainless steel – 1.4006 – EN 10088-1
Washer: EPDM sealing ring with metal top made of stainless steel
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: structural timber – EN 14081

Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}25$ mm

Timber substructures
For timber substructures performance determined with

$M_{y,Rk}$ = 3,370 Nm
$f_{ax,k}$ = 9,554 N/mm² for $l_{ef} \geq 20$ mm
$f_{ax,k}$ = 10,244 N/mm² for $l_{ef} \geq 27$ mm

$t_{N,II}$ [mm]		0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	Wood class ≥ C24		
$M_{t,nom}$		3 Nm								20 mm	27 mm	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50									0,57*	—	*bearing resistance of component I **bearing resistance of component II
	0,55									0,57*	—	
	0,63									0,91**	—	
	0,75									0,91**	—	
	0,88									0,91**	—	
	1,00									0,91**	—	
	1,13									0,91**	—	
	1,25									0,91**	—	
	1,50									—	—	
	1,75									—	—	
	2,00									—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0,50									1,00	1,44	bearing resistance of component II
	0,55									1,00	1,44	
	0,63									1,00	1,44	
	0,75									1,00	1,44	
	0,88									1,00	1,44	
	1,00									1,00	1,44	
	1,13									1,00	1,44	
	1,25									1,00	1,44	
	1,50									—	—	
	1,75									—	—	
	2,00									—	—	

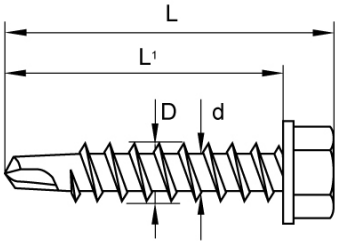
WKF fastening screws for metal members and sheeting

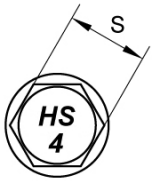
WKF (HS4) 4,8 × L

with hexagon head and sealing washer ≥ Ø14 mm
with metal top made of stainless steel

Annex 11

of European Technical Approval ETA-13/0087





Materials
Fastener: stainless steel – 1.4006 – EN 10088-1
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: structural timber – EN 14081

Drilling capacity: $\Sigma t_i \leq 2 \times 1{,}25$ mm

Timber substructures
For timber substructures performance determined with

$M_{y,Rk}$ = 3,370 Nm
$f_{ax,k}$ = 9,554 N/mm^2 for $l_{ef} \geq 20$ mm
$f_{ax,k}$ = 10,244 N/mm^2 for $l_{ef} \geq 27$ mm

$t_{N,II}$ [mm]	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	Wood class ≥ C24		
$M_{t,nom}$	3 Nm								20 mm	27 mm	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm] 0,50									0,57*	—	*bearing resistance of component I **bearing resistance of component II
0,55									0,57*	—	
0,63									0,91**	—	
0,75									0,91**	—	
0,88									0,91**	—	
1,00									0,91**	—	
1,13									0,91**	—	
1,25									0,91**	—	
1,50									—	—	
1,75									—	—	
2,00									—	—	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm] 0,50									0,45	0,45	bearing resistance of component I
0,55									0,45	0,45	
0,63									0,84	0,84	
0,75									0,84	0,84	
0,88									0,84	0,84	
1,00									0,84	0,84	
1,13									0,84	0,84	
1,25									0,84	0,84	
1,50									—	—	
1,75									—	—	
2,00									—	—	

WKF fastening screws for metal members and sheeting

WKF (HS4-GW) 4,8 × L
with hexagon head

Annex 12
of European Technical Approval ETA-13/0087

Instytut Techniki Budowlanej

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