Deutsches Institut für Bautechnik

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-08/0040 of 16 May 2018

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Powder actuated fasteners: HSBR 14, HSBR 14 Tube and HSBR 14 Strip Fastening tools: P230, P230L , P525L and P560
Product family to which the construction product belongs	SPIT powder actuated fasteners HSBR 14, HSBR 14 Tube and HSBR 14 Strip in combination with SPIT fastening tools P230, P230L, P525L and P560 for fastening of steel sheeting to steel members.
Manufacturer	SPIT Route de Lyon 26500 BOURG-LÉS-VALENCE FRANKREICH
Manufacturing plant	SPIT - ZI de Marcerolles - Rue A. Nobel 26500 BOURG-LÉS VALENCE FRANKREICH
This European Technical Assessment contains	9 pages including 4 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 330153-00-0602
This version replaces	ETA-08/0040 issued on 19 February 2013

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Specific part

1 Technical description of the product

The products are mechanical fasteners (powder actuated fasteners / cartridge fired pins)[1] made of steel. The fasteners comprise a pin (nominal diameter: 4.5 mm) which is assembled with one washer. The washer in connection with the same diameter pin-head serves to guide the fasteners while they are being driven into the base material. The washer also serves to improve the bearing area. Special fastening tools are used in order to install the fasteners. The driving force of the fastening tools is provided by the power load of the used cartridge (several cartridge strengths available). The application limit depends on the strength and thickness of the base material.

The dimensions and materials of the fastener are given in Annex 3. The difference of the fastening tools is the kind of feeding: single fasteners or collated in tube magazines or strip-magazines. Table 1 provides an overview of the 5 powder actuated fastening systems approved.

Table 1 Overview of the fastening systems

Fastening Tool	Fastener	Features
P230	HSBR-14	The P230 is used to drive single fasteners.
P230L	HSBR-14 Tube	The P230L is a standup tool which is based on the P230. The fasteners are collated in tube magazines.
P525L	HSBR-14 Tube	The P525L is a standup tool which is based on the P230. The fasteners are collated in tube magazines.
P560	HSBR-14	The P560 is used to drive single fasteners.
P560 with magazine adapter	HSBR-14 in strip-magazine	The P560 in combination with the magazine adapter is used to drive fasteners in strip-magazines.

Fasteners, fastening tools and cartridges are shown in Annex 1.

The fastener and the corresponding connections are subject to tension and/or shear forces (see Annex 2).

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

The intended use is specified in Annex 4.

The performances given in Section 3 are only valid if the fastener is used in compliance with the specifications and conditions given in Annex 4.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the fastener of at least 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

[1] Both terms (powder actuated fastener and cartridge fired pin) are commonly used.

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

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Tension resistance of connection	See Annex 3
Shear resistance of connection	See Annex 3
Design resistance in case of combined tension and shear forces (interaction)	See Annex 4
Check of deformation capacity in case of constraining forces due to temperature	See Annex 4
Determination and check of application limits	See Annex 3

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex 4

3.3 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Content and/or release of dangerous substances	no performance determined

3.4 Safety and assessibility in use (BWR 4)

Essential characteristic	Performance
Tension resistance of connection	See Annex 3
Shear resistance of connection	See Annex 3
Design resistance in case of combined tension and shear forces (interaction)	See Annex 4
Check of deformation capacity in case of constraining forces due to temperature	See Annex 4
Determination and check of application limits	See Annex 3

3.5 Sustainable use of natural resources (BWR 7)

Essential characteristic	Performance
Durability	See Annex 4, use conditions

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

In accordance with EAD No. 330153-00-0602, the applicable European legal act is: Decision 1998/214/EC, amended by 2001/596/EC.

The system to be applied is: 2+

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 16 May 2018 by Deutsches Institut für Bautechnik

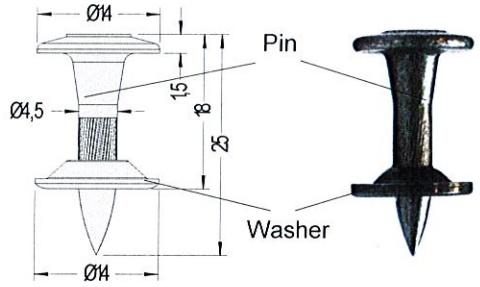
BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Schult

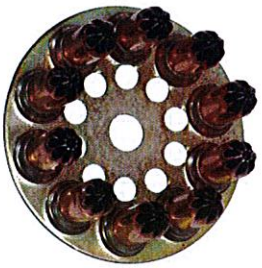
Deutsches Institut für Bautechnik DIBt

Powder-actuated fastener / Cartridge fired pin

Material: Pin — Steel Ck60 (1.1221) quenched and tempered, galvanised
Washer — Steel Ck35 (1.1181) galvanised



Catridge K 6.3 / 16

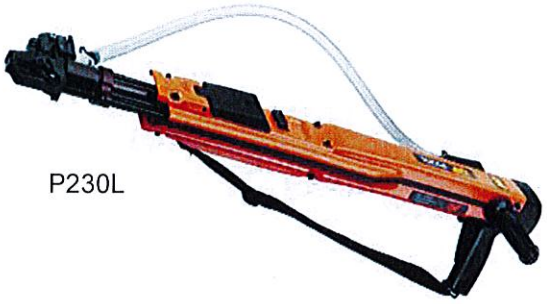


Fasteners in a strip magazine

Yellow	Medium load
Blue:	High load
Red:	Very high load
Black:	Extra high load (see above)

Powder-actuated fastening tools

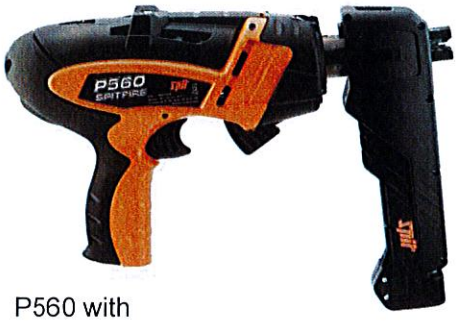
P230



P230L

P560

P525L



P560 with
magazine adapter

Sample for application

Powder actuated fasteners: HSBR 14, HSBR 14 Tube and HSBR 14 Strip Fastening tools: P230, P230L , P525L and P560	Annex 1
Fastener and corresponding fastening tools	

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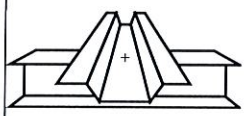
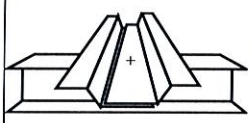
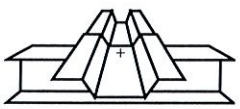
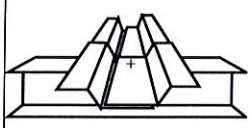
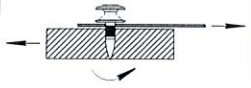
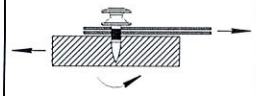
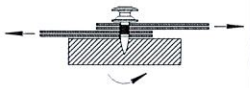
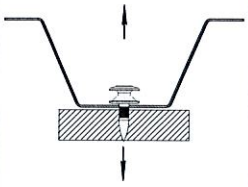
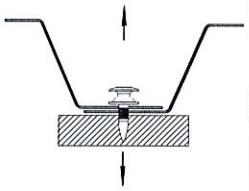
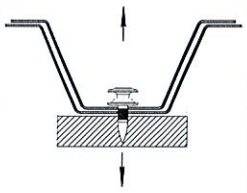
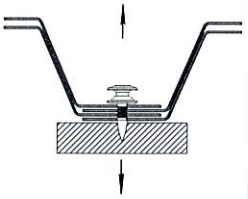
Types of connection and corresponding loading conditions

	Types of connection			
	Type a	Type b	Type c	Type d
				
Type of loading	Single connection	Side lap connection	End overlap connection	Side lap + end overlap connection
Shear loading				
Tension loading				

Powder actuated fasteners: HSBR 14, HSBR 14 Tube and HSBR 14 Strip Fastening tools: P230, P230L , P525L and P560	Annex 2
Types of connections	

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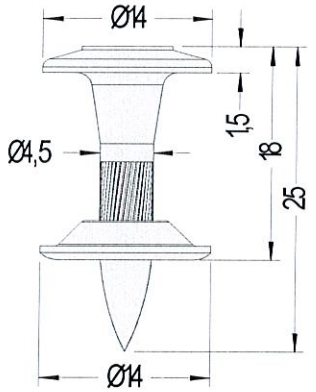
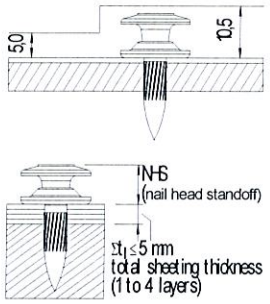


Powder-actuated fastener and fastening tools:

HSBR-14 with: **P230, P230L or P525L or P560**

Cartridges: **K 6.3 / 16 - Yellow**
K 6.3 / 16 - Blue
K 6.3 / 16 - Red
K 6.3 / 16 - Black

Installation control:



5 mm ≤ NHS ≤ 11.5 mm - Σt_I

Characteristic shear and tension resistance V_{Rk} and N_{Rk}

sheeting thickness t_I [mm]	Shear V_{Rk} [kN]	Tension N_{Rk} [kN]	Types of connnection
0.63	4.2	5.3	a,b,c,d
0.75	5.8	6.6	a,b,c,d
0.88	7.5	7.7	a,b,c,d
1.00	8.6	8.2	a,b,c,d
1.13	9.1	9.1	a,c
1.25	9.5	9.5	a,c
1.50	10.0	10.0	a
1.75	10.0	10.1	a
2.00	10.0	10.3	a
2.50	10.0	10.4	a
3.00	10.0	10.5	a

Design shear and tension resistance V_{Rd} and N_{Rd}

$V_{Rd} = V_{Rk} / \gamma_M$

γ_M = 1.25 in the absence of national regulations

$N_{Rd} = \alpha_{cycl} N_{Rk} / \gamma_M$

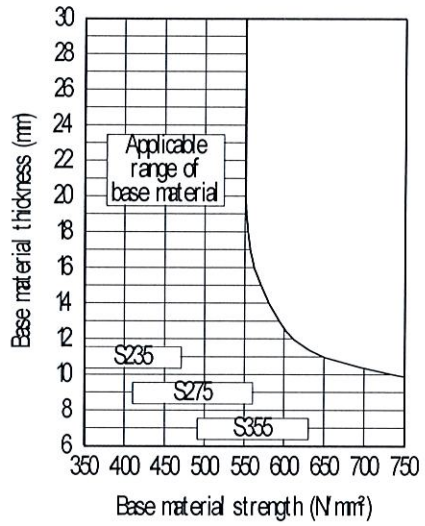
$\alpha_{cycl} = 1.0$

α_{cycl} considers the effect of repeated wind loads

α_{cycl} = 1.0 for all sheeting thickness t_I

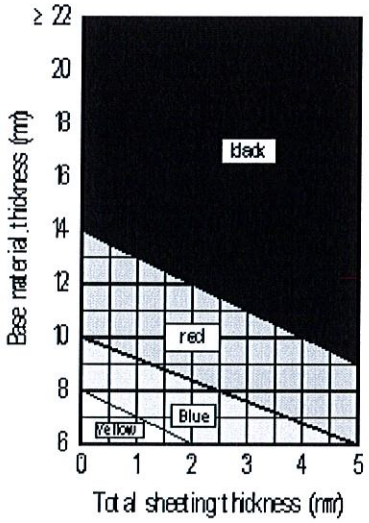
γ_M = 1.25 in the absence of national regulations

Application limit diagram



Base material:
Structural steel S235, S275 and S355 according to EN 10025-1:2004; minimum thickness = 6 mm

Cartridge selection



Note:
In case of too much energy, change of cartridge colour till correct stand-offs NHS are achieved.

Powder actuated fasteners: HSBR 14, HSBR 14 Tube and HSBR 14 Strip
Fastening tools: P230, P230L , P525L and P560

Characteristic and design resistance,
application limit,
cartridge selection and nail head standoff

Annex 3

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Specification of intended use

The fasteners are intended to be used for fastening of steel sheeting to steel members. The sheeting can either be used as cladding or as load bearing wall and roof element.

Anchorages subject to:

- Predominantly static and quasi-static loads.

Fixed material sheeting (flat products and therewith produced profiled products):

- Steel sheeting of steel grades ≥ S280 according to EN 10346:2015 and a thickness t_I = 0.63 mm to 3.0 mm (with max 5 mm for 2 to 4 layers).
- Other thin gauge steel members.

Base materials:

- Structural steel ≥ S235 with a nominal thickness t_{II} ≥ 6 mm provided the relevant application limits (Annex 3) are taken into account.

Use conditions (Environmental conditions):

- The intended use only comprises fasteners and connections which are not directly exposed to external weather conditions or moist atmospheres.

Design:

- The verification concept stated in EN 1990:2002 + A1:2005 + A1:2005/AC:2010 is used for the design of the connection made with the fasteners. The characteristic values (shear and tension resistance) according to Annex 3 are used for the design of the entire connection.
- The partial safety factor of γ_M = 1.25 is used in order to determine the corresponding design resistance, provided no values are given in national regulations of the member state in which the fastener is 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 + AC:2009, section 8.3 (8) is taken into account.
- The possibly required reduction of the tension resistance due to the position of the fastener is taken into account in accordance with EN 1993-1-3:2006 + AC:2009, section 8.3 (7) and Fig. 8.2.
- For the type of connection (a, b, c, d) listed in Annex 3 it is not necessary to take into account the effect of constraints due to temperature for the steel grades S280 to S350 in accordance with EN 10346:2015.
- Dimensions, material properties, application limits and nail head standoffs as stated in the ETA are observed.
- Resistance to fire: The part of the structure in which the powder-actuated fasteners HSBR 14, HSBR 14 Tube and HSBR 14 Strip are intended to be installed shall be tested, using the test method relevant for the corresponding fire resistance class, in order to be classified according to the appropriate part of EN 13501.

Installation:

- The installation is only carried out according to the manufacturer's instructions. The manufacturer hands over the assembly instructions to the assembler.
- The installation is carried out such that the fasteners are replaceable if necessary.
- The steel sheeting is in direct contact with the steel base material in the area of the connection.
- The conformity of the installed fastener with the provisions of the ETA is attested by the executing company.

Powder actuated fasteners: HSBR 14, HSBR 14 Tube and HSBR 14 Strip Fastening tools: P230, P230L , P525L and P560	Annex 4
Intended use Specification	