**Deutsches Institut**

**für**

**Bautechnik**

DIBt

**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 Regula-

tion (EU) No **305/2011** and member **of** EOTA (European Organi- **sation** for Technical Assessment**)**

Member of

ECTA

www.eota.eu

**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:

Trade name of the construction product

Product family

to which the construction product belongs

Manufacturer

Manufacturing plant

Deutsches Institut für Bautechnik

Powder actuated fasteners: HSBR 14, HSBR 14 Tube and HSBR 14 Strip

Fastening tools: P230, P230L, P525L and P560

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.

SPIT

Route de Lyon

26500 BOURG-LÉS-VALENCE

FRANKREICH

SPIT

- ZI de Marcerolles -

Rue A. Nobel

26500 BOURG-LÉS VALENCE

FRANKREICH

This European Technical Assessment contains

This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of

This version replaces

9 pages including 4 annexes which form an integral part

of this assessment

EAD 330153-00-0602

ETA-08/0040 issued on 19 February 2013

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Z28017.18

8.06.02-157/18

European Technical Assessment

ETA**-08**/**0040**

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Page **2 of** 9 | **16 May 2018**

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8.06.02-157/18

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European Technical Assessment

ETA-**08**/**0040**

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**Specific part**

**1**

**2**

**Technical description of the product**

Page 3 of 9 | 16 May **2018**

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

**P230**

Fastener

HSBR-14

**P230L**

HSBR-14 Tube

**P525L**

HSBR-14 Tube

**P560**

HSBR-14

**P560 with**

HSBR-14 in

**magazine adapter** strip-magazine

Features

The P230 is used to drive single fasteners.

The P230L is a standup tool which is based on the P230. The fasteners are collated in tube magazines.

The P525L is a standup tool which is based on the P230. The fasteners are collated in tube magazines.

The P560 is used to drive single fasteners.

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).

**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**

Z28017.18

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

8.06.02-157/18

European Technical Assessment

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**Institut** für

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DIBt

ETA-**08/0040**

Page 4 **of** 9 | **16** May **2018**

English translation prepared by DIBt

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

See Annex 4

shear forces (interaction)

Check of deformation capacity in case of constraining

See Annex 4

forces due to temperature

Determination and check of application limits

See Annex 3

**3.2**

**Safety in case of fire** (**BWR 2)**

**Essential characteristic**

**Performance**

**3.3**

Reaction to fire

Resistance to fire

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

**Essential characteristic**

Content and/or release of dangerous substances

Class A1

See Annex 4

**Performance**

no performance determined

**3.4**

**Safety and assessibility in use** (**BWR 4)**

**3.5**

Z28017.18

**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

See Annex 4

shear forces (interaction)

Check of deformation capacity in case of constraining forces due to temperature

See Annex 4

Determination and check of application limits

See Annex 3

**Sustainable** use **of natural resources (BWR 7)**

**Essential characteristic**

Durability

**Performance**

See Annex 4, use conditions

8.06.02-157/18

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**Bautechnik**

DIBt

European Technical Assessment

ETA-08/**0040**

English translation prepared by DIBt

**4**

**5**

Page 5 of 9 | 16 **May 2018**

**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+

**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

Z28017.18

8.06.02-157/18

Page 6 of European Technical Assessment ETA-08/**0040** of 16 **May** 2018

*English translation prepared by DIBt*

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**Powder-actuated** fastener **/ Cartridge fired pin**

**Material**:

Pin Washer

04,5

Ø14

15

18

25

Steel Ck60 (1.1221) quenched and tempered, galvanised Steel Ck35 (1.1181) galvanised

Pin

Washer

I

Catridge K 6.3/16

Øn

Fasteners in a strip magazine

**Powder-actuated fastening tools**

P560

P230

P560

SPITFIRE

spit

iP230

*P560*

SPITE SER

P230L

P525L

P560 with

magazine adapter

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

Fastener and corresponding fastening tools

Z28031.18

Yellow

Medium load

Blue:

High load

Red:

Very high load

Black:

Extra high load (see above)

**spit**

**Sample for application**

5P230

Annex 1

8.06.02-157/18

Page 7 of European Technical Assessment ETA-**08**/0040 of 16 May 2018

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**Types** of **connection and corresponding loading conditions**

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Types of connection

Type a

Type b

Туре с

Type d

Type of loading

Single connection

Side lap connection

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

Types of connections

Z28035.18

Side lap + end overlap connection

Annex 2

8.06.02-157/18

Page 8 of European Technical Assessment ETA-08/0040 of 16 **May 2018**

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04,5

014

014

1,5

18-

**25**

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Powder-actuated fastener and fastening

Installation control:

tools:

69

**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**

10,5

5 mm

INS

(nail head standoff)

5mm

total sheeting thickness (1 to 4 layers)

NHS ≤ 11.5 mm - Σt,

**Design shear and tension**

**Characteristic shear and tension**

**resistance** VRK **and** N Rk

**resistance** VRd **and** NRd

sheeting

Shear Tension

thickness t

V RK

NRK

Types of connnection

VRd = VRK / YM

[mm]

[kN]

[kN]

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

YM = 1.25 in the absence of

national regulations

a cycl

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

a cycl

YM

NRd acycl N RkYM = NRK

acycl=1.0

considers the effect of repeated wind loads

=

= 1.0 for all sheeting thickness ti

= 1.25 in the absence of national regulations

2.00

10.0

10.3

a

2.50

10.0

10.4

a

3.00

10.0

10.5

a

Application limit diagram

Base material thickness (mm)

22

€ 24

UNFO ∞ & N N NN&

16

18

26

30

28

Applicable range of

base material

12

$235

10

S275

8

$355

6

350 400 450 500 550 600 650 700 750

Base material strength (Nmm2)

Cartridge selection

> 22

20

Base material thickness (mm)

₤ B

black

**16**

**Ħ**

2

**10**

**red**

8

Blue

Yellow

6

0 1 2 3 4 5

Total sheeting thickness (rm)

Base material:

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

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

Z28038.18

Annex 3

8.06.02-157/18

Page 9 of European Technical Assessment ETA-08/0040 of 16 **May 2018**

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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 t1 = 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≥ 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.

= YM

The partial safety factor of ym 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

Intended use

Specification

Z28042.18

Annex 4

8.06.02-157/18