



## European Technical Approval ETA-13/0255

English translation prepared by DIBt - Original version in German language

**Handelsbezeichnung**  
*Trade name*

GESIPA® Blindniete, PolyGrip®, BULB-TITE®, G-Bulb®

*GESIPA® Blind Rivets, PolyGrip®, BULB-TITE®, G-Bulb®*

**Zulassungsinhaber**  
*Holder of approval*

SFS intec AG  
Rosenbergsaustraße 10  
9435 HEERBRUGG  
SCHWEIZ

**Zulassungsgegenstand  
und Verwendungszweck**  
*Generic type and use  
of construction product*

Blindniete  
*Blind Rivets*

**Geltungsdauer:**  
*Validity:*

vom  
*from*  
bis  
*to*

11 June 2013

11 June 2018

**Herstellwerke**  
*Manufacturing plants*

GESIPA Blindniettechnik GmbH  
Nordendstrasse 13-39  
64546 Moerfelden-Walldorf  
DEUTSCHLAND

GESIPA Blindniettechnik GmbH  
GESIPA Werk Thal Thüringen  
Farnrodaer Strasse 7  
99843 Thal  
DEUTSCHLAND

Olympic Division of GESIPA Fasteners USA Inc.  
1830 North Pine St.  
USA-Vivian, LA 71082

**Diese Zulassung umfasst**  
*This Approval contains*

71 Seiten einschließlich 62 Anhänge  
*71 pages including 62 annexes*

## I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European technical approval is issued by Deutsches Institut für Bautechnik 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<sup>1</sup>, modified by Council Directive 93/68/EEC<sup>2</sup> and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council<sup>3</sup>;
  - *Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998<sup>4</sup>, as amended by Article 2 of the law of 8 November 2011<sup>5</sup>;*
  - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC<sup>6</sup>.
- 2 Deutsches Institut für Bautechnik 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 Deutsches Institut für Bautechnik, in particular pursuant to information by the Commission according to 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 Deutsches Institut für Bautechnik. 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 fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

<sup>1</sup> Official Journal of the European Communities L 40, 11 February 1989, p. 12  
<sup>2</sup> Official Journal of the European Communities L 220, 30 August 1993, p. 1  
<sup>3</sup> Official Journal of the European Union L 284, 31 October 2003, p. 25  
<sup>4</sup> *Bundesgesetzblatt Teil I* 1998, p. 812  
<sup>5</sup> *Bundesgesetzblatt Teil I* 2011, p. 2178  
<sup>6</sup> Official Journal of the European Communities L 17, 20 January 1994, p. 34

## II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

### 1 Definition of product/ products and intended use

#### 1.1 Definition of the construction product

The products are the blind rivets made of metal as listed in Table 1. The blind rivets are completely or partly made of carbon steel, stainless steel, aluminium and/or Monel (special alloy). Samples of blind rivets and a corresponding connection are shown in Annex 1. For details see the appropriate Annexes.

The blind rivets and the corresponding connections are subject to tension and/or shear forces. Possible failure modes of connections made with the blind rivets are described in Annex 1.

**Table 1** Different types of the blind rivets

Annex	Blind rivet	Description	Material $t_1$ / $t_2$
Annex 2	ASO-D-40 x L	Aluminium Blind rivet open	Steel / Steel
Annex 3	ATO-D11-50 x L ASO-D11-50 x L	Aluminium Blind rivet open	Steel / Steel
Annex 4	ATO-D14-50 x L ASO-D14-50 x L	Aluminium Blind rivet open	Steel / Steel
Annex 5	ATO-D-50 x L ASO-D-50 x L	Aluminium Blind rivet open	Steel / Steel
Annex 6	ASO-D-48 x L	Aluminium Blind rivet open	Steel / Steel
Annex 7	SSO-D-40 x L	Stainless Steel Blind rivet open	Steel / Steel
Annex 8 Annex 9 Annex 10 Annex 11 Annex 12	SSO-D-48 x L SSO-D15-48 x L	Stainless Steel Blind rivet open	Aluminium / Aluminium Aluminium / Steel Steel / Steel
Annex 13 Annex 14 Annex 15 Annex 16 Annex 17	PolyGrip-ASO-D-48 x L PolyGrip-ATO-D-48 x L PolyGrip-ASO-D16-48 x L PolyGrip-ATO-D16-48 x L	PolyGrip® Multi range blind rivet	Aluminium / Aluminium Aluminium / Steel Steel / Steel
Annex 18	PolyGrip-ASO-D-40 x L PolyGrip-ASO-D12-40 x L	PolyGrip® Multi range blind rivet	Steel / Steel
Annex 19	PolyGrip-SSO-D-48 x L	PolyGrip® Multi range blind rivet	Steel / Steel

Annex	Blind rivet	Description	Material $t_t$ / $t_{II}$
Annex 20 Annex 21 Annex 22 Annex 23 Annex 24 Annex 25	SOLARGRIP-ASO-D-48120-DS	PolyGrip® Multi range blind rivet	Aluminium / Aluminium Aluminium / Steel
Annex 26 Annex 27 Annex 28 Annex 29 Annex 30 Annex 31	SOLARGRIP-ASO-D-48150-DS	PolyGrip® Multi range blind rivet	Aluminium / Aluminium Aluminium / Steel
Annex 32 Annex 33 Annex 34 Annex 35 Annex 36 Annex 37	SOLARGRIP-ATO-D-64150 SOL-R-ASO-D-64150	PolyGrip® Multi range blind rivet	Aluminium / Aluminium Aluminium / Steel
Annex 38 Annex 39 Annex 40 Annex 41 Annex 42	RV6604-6 x L - W	BULB-TITE® Triple claw blind rivet	Aluminium / Aluminium Aluminium / Steel Steel / Steel
Annex 43 Annex 44 Annex 45 Annex 46 Annex 47	RV6604-8 x L - W	BULB-TITE® Triple claw blind rivet	Aluminium / Aluminium Aluminium / Steel Steel / Steel
Annex 48 Annex 49 Annex 50 Annex 51 Annex 52	RV6603-9 x L - W	BULB-TITE® Triple claw blind rivet	Aluminium / Aluminium Aluminium / Steel Steel / Steel

Annex	Blind rivet	Description	Material $t_1$ / $t_{II}$
Annex 53 Annex 54 Annex 55 Annex 56 Annex 57	RV6696-8-4	BULB-TITE® Triple claw blind rivet	Aluminium / Aluminium Aluminium / Steel Steel / Steel
Annex 58	ATC-D-48 x L ASC-D-48 x L	CAP rivet Closed end blind rivet	Steel / Steel
Annex 59	SSC-D-48 x L	CAP rivet Closed end blind rivet	Steel / Steel
Annex 60	G-BULB-SSO-D-48 x L G-BULB-TTO-D-48 x L	G-BULB® High strength blind rivet	Steel / Steel
Annex 61	G-BULB-SSO-D-64 x L G-BULB-TTO-D-64 x L	G-BULB® High strength blind rivet	Steel / Steel
Annex 62	ST/ST 6 x L K11	Steel Blind rivet	Steel / Steel

## 1.2 Intended use

The blind rivets are intended to be used for fastening metal sheeting to metal supporting structures. The sheeting can either be used as wall or roof cladding or as load bearing wall and roof element.

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

The intended use comprises blind rivets and connections for indoor and outdoor applications. Blind rivets which are intended to be used in external environments with high or very high corrosion category are usually made of stainless steel, aluminium or Monel.

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 blind rivets for the intended use of 25 years when installed in the works or of 50 years if the blind rivets are sufficiently protected against corrosion (e. g. made of stainless steel). 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.

## 2 Characteristics of product and methods of verification

### 2.1 Characteristics of product

The blind rivets shall correspond to the drawings given in the appropriate Annexes (see Table 1).

The characteristic material values, dimensions and tolerances of the blind rivets neither indicated in this section nor in the Annexes shall correspond to the respective values laid down in the technical documentation<sup>7</sup> to this European technical approval.

The characteristic values of the shear and tension resistance of the connections made with the blind rivets are given in the appropriate Annexes or in section 4.2.

The blind rivets are considered to satisfy the requirements of performance class A1 of the characteristic reaction to fire.

## 2.2 Methods of verification

The assessment of the fitness of the blind rivets 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<sup>8</sup>.

The assessment of the resistance to fire performance is only relevant to the assembled system (blind rivets, sheeting, supporting structure) which is not part of the ETA.

The blind rivets are considered to satisfy the requirements of performance class A 1 of the characteristic reaction to fire, in accordance with the provisions of the EC Decision 96/603/EC (as amended) without the need for testing on the basis of its listing in that decision.

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 the Annexes were determined by shear and tension tests.

The formulas to calculate the design resistance are given in clause 4.2.1.

## 3 Evaluation and attestation of conformity and CE marking

### 3.1 System of attestation of conformity

According to the Decision 99/92/EC of the European Commission<sup>8</sup> system 2+ of the attestation of conformity applies.

System 2+: Declaration of conformity of the product by the manufacturer on the basis of:

- (a) Tasks for the manufacturer:
  - (1) initial type-testing of the product;
  - (2) factory production control;
  - (3) testing of samples taken at the factory in accordance with a prescribed test plan.
- (b) Tasks for the approved body:
  - (4) certification of factory production control on the basis of:
    - initial inspection of factory and of factory production control;
    - continuous surveillance, assessment and approval of factory production control.

Note: Approved bodies are also referred to as "notified bodies".

<sup>7</sup> The technical documentation to this European technical approval is deposited at Deutsches Institut für Bautechnik and, as far as relevant for the tasks of the approved bodies involved in the attestation of conformity procedure is handed over to the approved bodies.

<sup>8</sup> Official Journal of the European Communities L 80 of 18.03.1998



## 3.2 Responsibilities

### 3.2.1 Tasks for the manufacturer

#### 3.2.1.1 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 insure that the product is in conformity with this European technical approval.

The factory production control shall be in accordance with the control plan which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with Deutsches Institut für Bautechnik.<sup>9</sup>

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

#### 3.2.1.2 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of fasteners in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this European technical approval.

### 3.2.2 Tasks for the approved bodies

The approved body shall perform the

- initial inspection of factory and of factory production control,
- continuous surveillance, assessment and approval of factory production control

in accordance with the provisions laid down in the control plan.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in written reports.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the factory production control stating the conformity with the provisions of this European technical approval.

In cases where the provisions of the European technical approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform Deutsches Institut für Bautechnik without delay.

## 3.3 CE marking

The CE marking shall be affixed on the accompanying commercial documents. The letters "CE" shall be followed by the identification number of the approved certification body, where relevant, and be accompanied by the following additional information:

- the name and address 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 EC certificate for the factory production control,
- the number of the European technical approval,
- the name of the product.

<sup>9</sup>

The control plan is a confidential part of the European technical approval and only handed over to the approved bodies involved in the procedure of attestation of conformity. See section 3.2.2.

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

##### 4.1 Manufacturing

The blind rivets are manufactured in accordance with the provisions of the European technical approval using the manufacturing process as laid down in the technical documentation.

The European technical approval is issued with Deutsches Institut für Bautechnik, 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 Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval shall be necessary.

##### 4.2 Design

Blind rivets completely or partly exposed to external weather or similar conditions are made of stainless steel, aluminium or Monel or are protected against corrosion. For the corrosion protection the rules given in EN 1090-2:2008 + A1:2011, EN 1993-1-3:2006 + AC:2009 and EN 1993-1-4:2006 are taken into account.

For the types of connection (a, b, c, d) listed in the Annexes it is not necessary to take into account the effect of constraints due to temperature. For other types of connection it 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. (Remark: Wind loads are regarded as predominantly static.)

Dimensions, material properties and nominal material thicknesses  $t_1$  and  $t_{II}$  as stated in the ETA or in the Annexes are observed.

The verification concept stated in EN 1990:2002 + A1:2005 + A1:2005/AC:2010 is used for the design of the connections made with the blind rivets. The characteristic values (shear and tension resistance) stated in the Annexes are used for the design of the entire connections.

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

$$N_{Rd} = \frac{N_{Rk}}{\gamma_M}$$

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

The recommended partial safety factor  $\gamma_M = 1.33$  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 blind rivets 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 + AC:2009, section 8.3 (8) is taken into account.

$$\frac{N_{Sd}}{N_{Rd}} + \frac{V_{Sd}}{V_{Rd}} \leq 1.0$$



The possibly required reduction of the tension resistance (pull-through resistance) due to the position of the blind rivet is taken into account:

- in accordance with EN 1993-1-3:2006, section 8.3 (7) and Fig. 8.2 (component I is made of steel) or EN 1999-1-4:2007 + A1:2011, section 8.1 (6) and Table 8.3 (component I is made of aluminium),
- of 0,7 if the supporting structure is an asymmetric profile (e.g. Z-profile) with  $t_{II} < 5$  mm

#### 4.3 Installation

The installation is 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.

The components I and II are directly connected to each other so that the blind rivets do not get additional bending.

The blind rivets are fixed rectangular to the surface of the components to guarantee a correct load bearing and if necessary rain-proof connection.

The manufacturer's instruction to the clamping length is taken into account.

The conformity of the installed blind rivets with the provisions of the ETA is attested by the executing company.

#### 5 Indications to the manufacturer

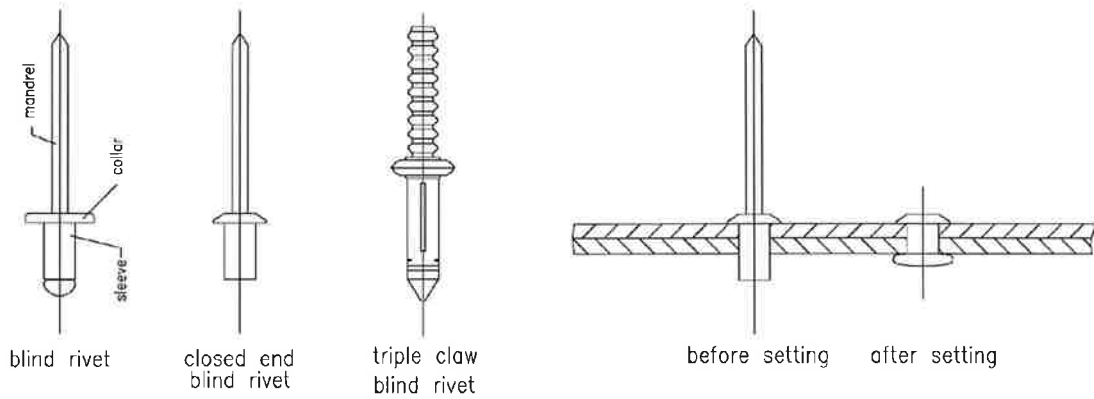
It is in the responsibility of the manufacturer to ensure that the information on the specific conditions according to 1, 2, 4.2 and 4.3 (including Annexes referred to) is given to those who are concerned. This information may be given by reproduction of the respective parts of the European technical approval.

In addition all installation data (hole diameter, application limits) shall be shown clearly on the package and/or on an enclosed instruction sheet, preferably using illustration(s).

Andreas Kummerow  
p. p. Head of Department

*beglaubigt:*  
Hahn

### Samples for blind rivets and a corresponding connection



### Types of connection

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

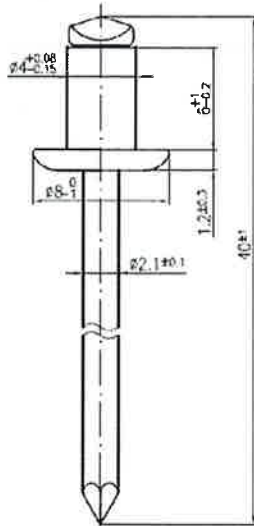
### Possible failure modes of connections

Part	Tensile load	Shear load
Blind rivet	Tensile fracture	Shear fracture
Structural part I	Pull-through of rivet	Hole elongation
Structural part II	Pull-out of rivet	Hole elongation

Blind Rivets

Samples for blind rivets and a corresponding connection  
Types of connection  
Possible failure modes of connections

Annex 1



**Material**

Sleeve: Aluminum AlMg3 – EN 573

Mandrel: Stainless steel (1.4541) – EN 10088

Component I: S280GD to S350GD – EN 10346

Component II: S280GD to S350GD – EN 10346

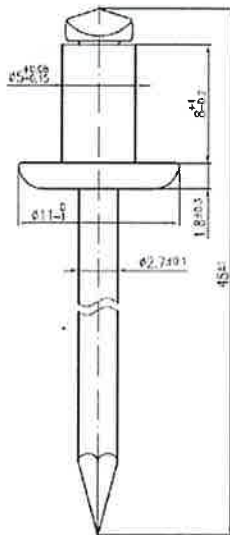
Pre-drill diameter: Ø 4,1 mm

		Thickness Component II $t_{II}$ [mm]:														
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00							
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	1,02	-	1,02	-	1,02	-	1,02	-	
		0,63	-	-	-	-	-	1,02	-	1,02	-	1,02	-	1,02	-	
		0,75	-	-	-	1,02	-	1,02	-	1,02	-	1,02	-	1,02	-	
		0,88	-	-	-	1,02	-	1,02	-	1,02	-	1,02	-	1,02	-	
		1,00	-	-	-	1,02	-	1,02	-	1,02	-	1,02	-	1,02	-	
		1,25	-	-	-	1,02	-	1,02	-	1,02	-	1,02	-	1,02	-	
		1,50	1,02	-	1,02	-	1,02	-	1,02	-	1,02	-	1,02	-	1,02	-
		≥ 2,00	1,02	-	1,02	-	1,02	-	1,02	-	1,02	-	1,02	-	1,02	-
	Tension load $N_{R,k}$ [kN]	0,50	-	-	-	-	-	0,57	-	0,57	-	0,57	-	0,57	-	
		0,63	-	-	-	-	-	0,57	-	0,57	-	0,57	-	0,57	-	
		0,75	-	-	-	0,57	-	0,57	-	0,57	-	0,57	-	0,57	-	
		0,88	-	-	-	0,57	-	0,57	-	0,57	-	0,57	-	0,57	-	
		1,00	-	-	-	0,57	-	0,57	-	0,57	-	0,57	-	0,57	-	
		1,25	-	-	-	0,57	-	0,57	-	0,57	-	0,57	-	0,57	-	
1,50	0,43	-	0,52	-	0,57	-	0,57	-	0,57	-	0,57	-	0,57	-		
≥ 2,00	0,43	-	0,52	-	0,57	-	0,57	-	0,57	-	0,57	-	0,57	-		

Blind rivet

ASO-D-40 x L

Annex 2



**Material**

Sleeve: Aluminum AlMg3 – EN 573

Mandrel: Steel galvanised – EN 10016-2

Stainless steel (1.4541) – EN 10088

Component I: S280GD to S350GD – EN 10346

Component II: S280GD to S350GD – EN 10346

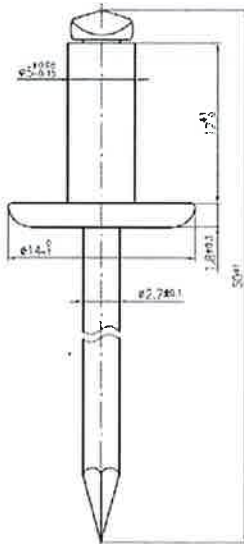
Pre-drill diameter:  $\varnothing 5,1$  mm

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{Rk}$ [kN]	0,50	-	-	-	-	-	-	-	1,59	-
		0,63	-	-	-	-	-	-	-	1,70	-
		0,75	-	-	-	-	-	-	-	1,70	-
		0,88	-	-	-	-	-	-	-	1,70	-
		1,00	-	-	-	-	-	-	1,70	1,70	-
		1,25	-	-	-	-	-	1,70	1,70	1,70	-
		1,50	-	-	-	-	1,70	1,70	1,70	1,70	-
		$\geq 2,00$	1,22	1,70	1,70	1,70	1,70	1,70	1,70	1,70	-
	Tension load $N_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	1,30	-
		0,63	-	-	-	-	-	-	-	1,60	-
		0,75	-	-	-	-	-	-	-	1,60	-
		0,88	-	-	-	-	-	-	-	1,70	-
		1,00	-	-	-	-	-	-	1,90	1,90	-
		1,25	-	-	-	-	-	2,60	2,60	2,60	-
1,50	-	-	-	-	1,90	2,60	2,60	2,60	-		
$\geq 2,00$	0,43	1,00	1,40	1,70	1,90	2,60	2,60	2,60	-		

**Blind rivet**

ATO-D11-50 x L  
ASO-D11-50 x L

**Annex 3**



**Material**

Sleeve: Aluminum AlMg3 – EN 573  
Mandrel: Steel galvanised – EN 10016-2  
stainless steel (1.4541) – EN 10088

Component I: S280GD to S350GD – EN 10346  
Component II: S280GD to S350GD – EN 10346

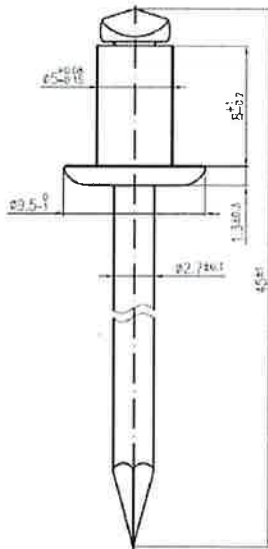
**Pre-drill diameter:** Ø 5,1 mm

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	1,59	-
		0,63	-	-	-	-	-	-	-	1,70	-
		0,75	-	-	-	-	-	-	-	1,70	-
		0,88	-	-	-	-	-	-	-	1,70	-
		1,00	-	-	-	-	-	-	1,70	1,70	-
		1,25	-	-	-	-	-	1,70	1,70	1,70	-
		1,50	-	-	-	-	1,70	1,70	1,70	1,70	-
		≥ 2,00	1,22	1,70	1,70	1,70	1,70	1,70	1,70	1,70	-
Thickness Component I $t_I$ [mm]:	Tension load $N_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	1,30	-
		0,63	-	-	-	-	-	-	-	1,60	-
		0,75	-	-	-	-	-	-	-	1,60	-
		0,88	-	-	-	-	-	-	-	1,70	-
		1,00	-	-	-	-	-	-	1,90	1,90	-
		1,25	-	-	-	-	-	2,60	2,60	2,60	-
		1,50	-	-	-	-	1,90	2,60	2,60	2,60	-
		≥ 2,00	0,43	1,00	1,40	1,70	1,90	2,60	2,60	2,60	-

**Blind rivet**

ATO-D14-50 x L  
ASO-D14-50 x L

**Annex 4**



**Material**

Sleeve: Aluminum AlMg3 – EN 573  
Mandrel: Steel galvanised – EN 10016-2  
stainless steel (1.4541) – EN 10088

Component I: S280GD to S350GD – EN 10346  
Component II: S280GD to S350GD – EN 10346

**Pre-drill diameter:**  $\varnothing 5,1$  mm

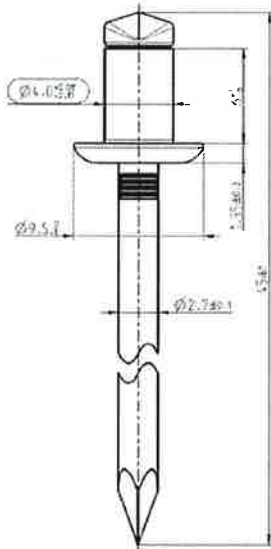
		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	1,59	-
		0,63	-	-	-	-	-	-	-	1,70	-
		0,75	-	-	-	-	-	-	-	1,70	-
		0,88	-	-	-	-	-	-	-	1,70	-
		1,00	-	-	-	-	-	-	1,70	1,70	-
		1,25	-	-	-	-	-	1,70	1,70	1,70	-
		1,50	-	-	-	-	1,70	1,70	1,70	1,70	-
		$\geq 2,00$	1,22	1,70	1,70	1,70	1,70	1,70	1,70	1,70	-
	Tension load $N_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	1,16	-
		0,63	-	-	-	-	-	-	-	1,16	-
		0,75	-	-	-	-	-	-	-	1,74	-
		0,88	-	-	-	-	-	-	-	1,74	-
		1,00	-	-	-	-	-	-	1,74	1,74	-
		1,25	-	-	-	-	-	1,74	1,74	1,74	-
1,50	-	-	-	-	1,74	1,74	1,74	1,74	-		
$\geq 2,00$	0,43	1,00	1,40	1,70	1,74	1,74	1,74	1,74	-		

**Blind rivet**

ATO-D-50 x L  
ASO-D-50 x L

**Annex 5**





**Material**

Sleeve: Aluminum AlMg3 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088

Component I: S280GD to S350GD – EN 10346

Component II: S280GD to S350GD – EN 10346

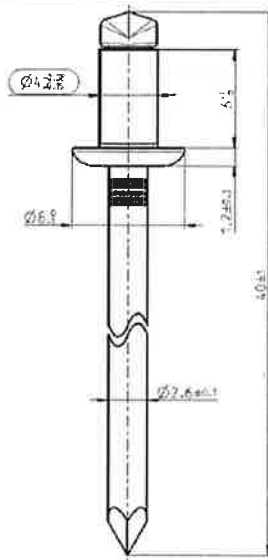
Pre-drill diameter: Ø 4,9 mm

			Thickness Component II $t_{II}$ [mm]:												
			0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00					
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	1,68	-	1,68	-		
		0,63	-	-	-	-	-	-	-	-	1,68	-	1,68	-	
		0,75	-	-	-	-	-	-	1,63	-	1,68	-	1,68	-	
		0,88	-	-	-	-	-	-	1,63	-	1,68	-	1,68	-	
		1,00	-	-	-	-	-	-	1,63	-	1,68	-	1,68	-	
		1,25	-	-	1,53	-	1,56	-	1,58	-	1,63	-	1,68	-	
		1,50	1,12	-	1,33	-	1,53	-	1,56	-	1,58	-	1,63	-	
	≥ 2,00	1,12	-	1,33	-	1,53	-	1,56	-	1,58	-	1,63	-		
	Tension load $N_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	1,16	-	1,16	-	
		0,63	-	-	-	-	-	-	-	-	1,46	-	1,46	-	
0,75		-	-	-	-	-	-	-	1,56	-	1,74	-	1,74	-	
0,88		-	-	-	-	-	-	-	1,56	-	1,74	-	1,74	-	
1,00		-	-	-	-	-	-	-	1,56	-	1,74	-	1,74	-	
1,25		-	-	0,55	-	0,80	-	1,04	-	1,56	-	1,74	-	1,74	-
1,50		0,37	-	0,46	-	0,55	-	0,80	-	1,04	-	1,56	-	1,74	-
≥ 2,00	0,37	-	0,46	-	0,55	-	0,80	-	1,04	-	1,56	-	1,74	-	

Blind rivet

ASO-D-48 x L

Annex 6



**Material**

Sleeve: Stainless steel (1.4567) – EN 10088  
Stainless steel (1.4401) – EN 10088

Mandrel: Stainless steel (1.4541) – EN 10088  
Stainless steel (1.4571) – EN 10088

Component I: S280GD to S350GD – EN 10346

Component II: S280GD to S350GD – EN 10346

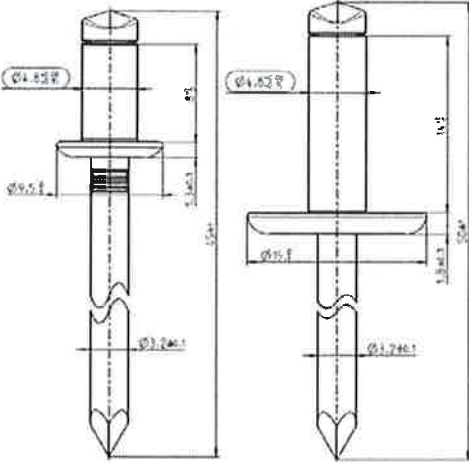
**Pre-drill diameter:** Ø 4,1 mm

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,28
		0,63	1,00	1,30	1,30	1,40	1,40	1,50	1,50	1,60
		0,75	1,00	1,30	1,50	1,50	1,60	1,80	1,80	1,90
		0,88	1,00	1,30	1,50	1,90	1,90	2,10	2,10	2,20
		1,00	1,00	1,30	1,50	1,90	2,10	2,20	2,20	2,40
		1,25	1,00	1,30	1,50	1,90	2,10	2,70	2,70	2,70
		1,50	1,00	1,30	1,50	1,90	2,10	2,70	2,70	2,70
	≥ 2,00	1,00	1,30	1,50	1,90	2,10	2,70	2,70	2,70	
	Tension load $N_{R,k}$ [kN]	0,50	0,25	0,50	0,50	0,60	0,60	0,70	0,82	0,82
		0,63	0,25	0,50	0,50	0,60	0,60	0,70	0,82	0,82
		0,75	0,25	0,50	0,70	0,80	0,82	0,90	1,00	1,00
		0,88	0,25	0,50	0,70	0,90	0,90	1,00	1,10	1,10
		1,00	0,25	0,50	0,70	1,20	1,20	1,30	1,40	1,40
		1,25	0,25	0,50	0,70	1,20	1,20	1,90	2,60	2,60
1,50		0,25	0,50	0,70	1,20	1,20	1,90	2,60	2,60	
≥ 2,00	0,25	0,50	0,70	1,20	1,20	1,90	2,60	2,60		

**Blind rivet**

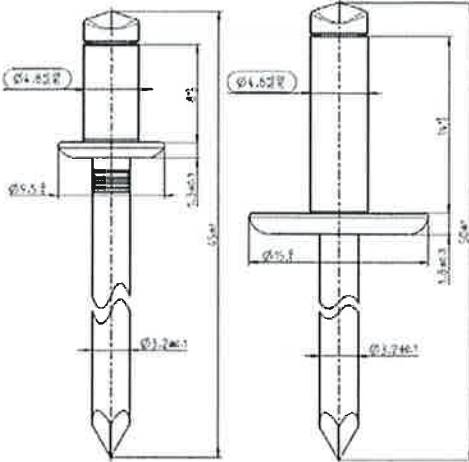
SSO-D-40 x L

**Annex 7**

	<p><b>Material</b></p> <p>Sleeve: Stainless steel (1.4567) – EN 10088 Stainless steel (1.4578) – EN 10088</p> <p>Mandrel: Stainless steel (1.4541) – EN 10088 Stainless steel (1.4571) – EN 10088</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 165 \text{ N/mm}^2</math> – EN 573</p> <p>Component II: Aluminum alloy with <math>R_{m,min} = 165 \text{ N/mm}^2</math> – EN 573</p>
	<p><b>Pre-drill diameter:</b> <math>\varnothing 4,9 \text{ mm}</math></p>

		Thickness Component II $t_{II}$ [mm]:										
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$			
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	0,62	0,62	0,62	0,62		
		0,70	-	-	-	-	0,71	0,71	0,71	0,71		
		0,80	-	-	0,76	0,76	0,76	0,76	0,76	0,76		
		0,90	-	-	0,76	0,76	0,76	0,76	0,76	0,76		
		1,00	0,36	0,63	0,76	0,76	0,76	0,76	0,76	0,76		
		1,20	0,36	0,63	0,76	0,76	0,76	0,76	0,76	0,76		
		1,50	0,36	0,63	0,76	0,76	0,76	0,76	0,76	0,76		
		$\geq 2,00$	0,36	0,63	0,76	0,76	0,76	0,76	0,76	0,76		
		Thickness Component I $t_I$ [mm]:	Tension load $N_{R,k}$ [kN]		0,15	0,27	0,33	0,41	0,49	0,66	0,91	0,91

<b>Blind rivet</b>		<b>Annex 8</b>
SSO-D-48 x L SSO-D15-48 x L		



**Material**

**Sleeve:** Stainless steel (1.4567) – EN 10088  
Stainless steel (1.4578) – EN 10088

**Mandrel:** Stainless steel (1.4541) – EN 10088  
Stainless steel (1.4571) – EN 10088

**Component I:** Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

**Component II:** Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

**Pre-drill diameter:**  $\varnothing 4,9 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:														
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$							
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	0,80	-	0,80	-	0,80	-	0,80	-	
		0,70	-	-	-	-	-	0,93	-	0,93	-	0,93	-	0,93	-	
		0,80	-	-	-	0,99	-	0,99	-	0,99	-	0,99	-	0,99	-	
		0,90	-	-	-	0,99	-	0,99	-	0,99	-	0,99	-	0,99	-	
		1,00	0,47	-	0,82	-	0,99	-	0,99	-	0,99	-	0,99	-	0,99	-
		1,20	0,47	-	0,82	-	0,99	-	0,99	-	0,99	-	0,99	-	0,99	-
		1,50	0,47	-	0,82	-	0,99	-	0,99	-	0,99	-	0,99	-	0,99	-
		$\geq 2,00$	0,47	-	0,82	-	0,99	-	0,99	-	0,99	-	0,99	-	0,99	-
	Tension load $N_{R,k}$ [kN]		0,20	0,35	0,43	0,54	0,64	0,86	1,19	1,19						

<b>Blind rivet</b>	<b>Annex 9</b>
SSO-D-48 x L SSO-D15-48 x L	

	<p><b>Material</b></p> <p>Sleeve: Stainless steel (1.4567) – EN 10088 Stainless steel (1.4578) – EN 10088</p> <p>Mandrel: Stainless steel (1.4541) – EN 10088 Stainless steel (1.4571) – EN 10088</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 165 \text{ N/mm}^2</math> – EN 573</p> <p>Component II: S280GD to S350GD – EN 10346</p>
	<p><b>Pre-drill diameter:</b> <math>\varnothing 4,9 \text{ mm}</math></p>

		Thickness Component II $t_{II}$ [mm]:														
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$							
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	0,62	-	0,62	-	0,62	-	0,62	-	
		0,70	-	-	-	-	-	0,71	-	0,71	-	0,71	-	0,71	-	
		0,80	-	-	-	-	0,76	-	0,76	-	0,76	-	0,76	-	0,76	
		0,90	-	-	-	0,62	0,76	-	0,76	-	0,76	-	0,76	-	0,76	
		1,00	0,36	-	0,50	-	0,62	-	0,76	-	0,76	-	0,76	-	0,76	
		1,20	0,36	-	0,50	-	0,62	-	0,76	-	0,76	-	0,76	-	0,76	
		1,50	0,36	-	0,50	-	0,62	-	0,76	-	0,76	-	0,76	-	0,76	
		$\geq 2,00$	0,36	-	0,50	-	0,62	-	0,76	-	0,76	-	0,76	-	0,76	
	Tension load $N_{R,k}$ [kN]															
		0,37		0,52		0,65		0,87		1,08		1,59		2,09		2,09

<b>Blind rivet</b>	<b>Annex 10</b>
SSO-D-48 x L SSO-D15-48 x L	

	<p><b>Material</b></p> <p>Sleeve: Stainless steel (1.4567) – EN 10088 Stainless steel (1.4578) – EN 10088</p> <p>Mandrel: Stainless steel (1.4541) – EN 10088 Stainless steel (1.4571) – EN 10088</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573</p> <p>Component II: S280GD to S350GD – EN 10346</p>
	<p><b>Pre-drill diameter:</b> <math>\varnothing 4,9 \text{ mm}</math></p>

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	0,80	0,80	0,80	0,80
		0,70	-	-	-	-	-	0,93	0,93	0,93	0,93
		0,80	-	-	-	0,99	0,99	0,99	0,99	0,99	0,99
		0,90	-	-	0,81	0,99	0,99	0,99	0,99	0,99	0,99
		1,00	0,47	0,65	0,81	0,99	0,99	0,99	0,99	0,99	0,99
		1,20	0,47	0,65	0,81	0,99	0,99	0,99	0,99	0,99	0,99
		1,50	0,47	0,65	0,81	0,99	0,99	0,99	0,99	0,99	0,99
		$\geq 2,00$	0,47	0,65	0,81	0,99	0,99	0,99	0,99	0,99	0,99
	Tension load $N_{R,k}$ [kN]	0,37	0,52	0,65	0,87	1,08	1,59	2,09	2,09	2,09	

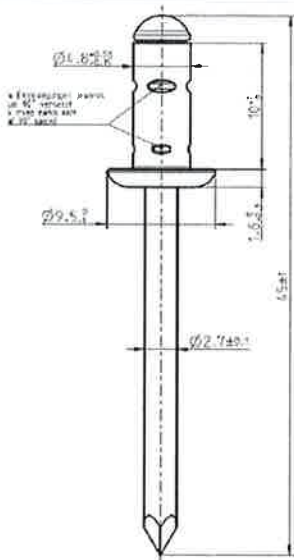
<b>Blind rivet</b>		<b>Annex 11</b>
SSO-D-48 x L SSO-D15-48 x L		



	<p><b>Material</b></p> <p><b>Sleeve:</b> Stainless steel (1.4567) – EN 10088 Stainless steel (1.4578) – EN 10088</p> <p><b>Mandrel:</b> Stainless steel (1.4541) – EN 10088 Stainless steel (1.4571) – EN 10088</p> <p><b>Component I:</b> S280GD to S350GD – EN 10346</p> <p><b>Component II:</b> S280GD to S350GD – EN 10346</p>
	<p><b>Pre-drill diameter:</b> Ø 4,9 mm</p>

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	1,53	1,53	1,53	1,53
		0,63	-	-	-	-	1,77	1,77	1,77	1,77
		0,75	-	-	1,99	1,99	1,99	1,99	1,99	1,99
		0,88	-	-	1,99	1,99	1,99	1,99	1,99	1,99
		1,00	1,08	1,54	1,99	1,99	1,99	1,99	1,99	1,99
	Tension load $N_{R,k}$ [kN]	1,25	1,08	1,54	1,99	1,99	1,99	1,99	1,99	1,99
		1,50	1,08	1,54	1,99	1,99	1,99	1,99	1,99	1,99
		≥ 2,00	1,08	1,54	1,99	1,99	1,99	1,99	1,99	1,99
		0,50	-	-	-	-	0,91	0,91	0,91	0,91
		0,63	-	-	-	0,87	1,08	1,45	1,45	1,45
0,75	-	-	0,65	0,87	1,08	1,59	1,94	1,94		
0,88	-	-	0,65	0,87	1,08	1,59	2,05	2,05		
1,00	0,37	0,52	0,65	0,87	1,08	1,59	2,09	2,09		
1,25	0,37	0,52	0,65	0,87	1,08	1,59	2,09	2,09		
1,50	0,37	0,52	0,65	0,87	1,08	1,59	2,09	2,09		
≥ 2,00	0,37	0,52	0,65	0,87	1,08	1,59	2,09	2,09		

<b>Blind rivet</b>	<b>Annex 12</b>
SSO-D-48 x L SSO-D15-48 x L	



**Material**

Sleeve: Aluminium AlMg2.5 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088  
Steel galvanised – EN 10016-2

Component I: Aluminum alloy  
with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy  
with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

**Pre-drill diameter:**  $\varnothing 4,9 \text{ mm}$

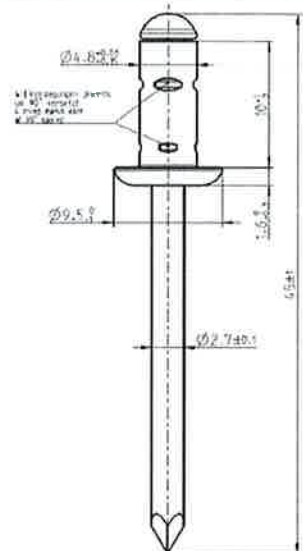
		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{Rk}$ [kN]	0,50	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57
		0,70	0,57	0,83	0,83	0,83	0,83	0,83	0,83	0,83	0,83
		0,80	0,57	0,83	0,96	0,96	0,96	0,96	0,96	0,96	0,96
		0,90	0,57	0,83	0,96	0,96	0,96	0,96	0,96	0,96	0,96
		1,00	0,57	0,83	0,96	0,96	0,96	0,96	0,96	0,96	0,96
		1,20	0,57	0,83	0,96	0,96	0,96	0,96	0,96	0,96	0,96
		1,50	0,57	0,83	0,96	0,96	0,96	0,96	0,96	0,96	0,96
		$\geq 2,00$	0,57	0,83	0,96	0,96	0,96	0,96	0,96	0,96	0,96
Tension load $N_{R,k}$ [kN]		0,18	0,27	0,31	0,35	0,38	0,38	0,38	0,38	0,38	

**Blind rivet**

PolyGrip-ASO-D-48 x L  
PolyGrip-ATO-D-48 x L

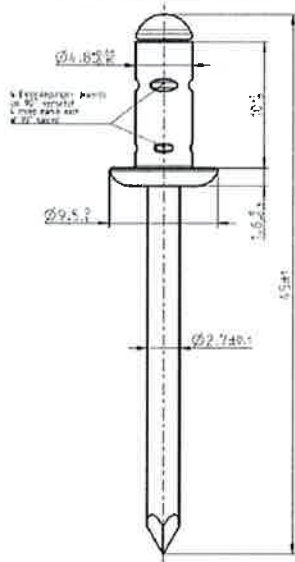
PolyGrip-ASO-D16-48 x L  
PolyGrip-ATO-D16-48 x L

**Annex 13**

	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg2.5 – EN 573 Mandrel: Stainless steel (1.4541) – EN 10088 Steel galvanised – EN 10016-2</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573 Component II: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573</p>
<p><b>Pre-drill diameter:</b> <math>\varnothing 4,9 \text{ mm}</math></p>	

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	0,75	0,75	0,75	0,75	0,75	0,75	0,75	0,75	0,75
		0,70	0,75	1,08	1,08	1,08	1,08	1,08	1,08	1,08	1,08
		0,80	0,75	1,08	1,25	1,25	1,25	1,25	1,25	1,25	1,25
		0,90	0,75	1,08	1,25	1,25	1,25	1,25	1,25	1,25	1,25
		1,00	0,75	1,08	1,25	1,25	1,25	1,25	1,25	1,25	1,25
		1,20	0,75	1,08	1,25	1,25	1,25	1,25	1,25	1,25	1,25
		1,50	0,75	1,08	1,25	1,25	1,25	1,25	1,25	1,25	1,25
		$\geq 2,00$	0,75	1,08	1,25	1,25	1,25	1,25	1,25	1,25	1,25
	Tension load $N_{R,k}$ [kN]	0,23	0,35	0,41	0,45	0,49	0,49	0,49	0,49	0,49	

<b>Blind rivet</b>		<b>Annex 14</b>
PolyGrip-ASO-D-48 x L PolyGrip-ATO-D-48 x L	PolyGrip-ASO-D16-48 x L PolyGrip-ATO-D16-48 x L	



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088  
Steel galvanised – EN 10016-2

Component I: Aluminum alloy  
with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573  
Component II: S280GD to S350GD – EN 10346

Pre-drill diameter:  $\varnothing 4,9 \text{ mm}$

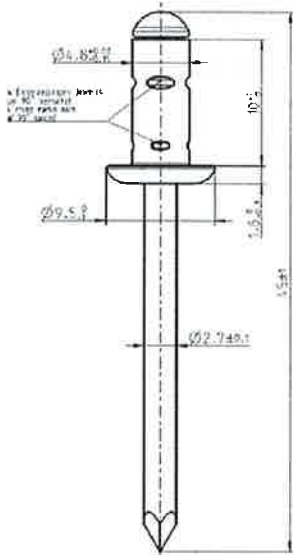
		Thickness Component II $t_{II}$ [mm]:														
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$							
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	0,57	-	0,57	-	0,57	-	0,57	-	0,57	-	0,57	-	0,57	-
		0,70	0,57	-	0,74	-	0,74	-	0,74	-	0,74	-	0,74	-	0,74	-
		0,80	0,57	-	0,74	-	0,90	-	0,96	-	0,96	-	0,96	-	0,96	-
		0,90	0,57	-	0,74	-	0,90	-	0,96	-	0,96	-	0,96	-	0,96	-
		1,00	0,57	-	0,74	-	0,90	-	0,96	-	0,96	-	0,96	-	0,96	-
		1,20	0,57	-	0,74	-	0,90	-	0,96	-	0,96	-	0,96	-	0,96	-
		1,50	0,57	-	0,74	-	0,90	-	0,96	-	0,96	-	0,96	-	0,96	-
		$\geq 2,00$	0,57	-	0,74	-	0,90	-	0,96	-	0,96	-	0,96	-	0,96	-
	Tension load $N_{R,k}$ [kN]	0,75		1,00		1,30		1,30		1,30		1,30		1,30		

**Blind rivet**

PolyGrip-ASO-D-48 x L  
PolyGrip-ATO-D-48 x L

PolyGrip-ASO-D16-48 x L  
PolyGrip-ATO-D16-48 x L

**Annex 15**



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088  
Steel galvanised – EN 10016-2

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573  
Component II: S280GD to S350GD – EN 10346

**Pre-drill diameter:**  $\varnothing 4,9 \text{ mm}$

			Thickness Component II $t_{II}$ [mm]:								
			0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$	
Thickness Component I $t_I$ [mm]:	Shear load $V_{Rk}$ [kN]	0,50	0,75	0,75	0,75	0,75	0,75	0,75	0,75	0,75	0,75
		0,70	0,75	0,97	0,97	0,97	0,97	0,97	0,97	0,97	0,97
		0,80	0,75	0,97	1,17	1,25	1,25	1,25	1,25	1,25	1,25
		0,90	0,75	0,97	1,17	1,25	1,25	1,25	1,25	1,25	1,25
		1,00	0,75	0,97	1,17	1,25	1,25	1,25	1,25	1,25	1,25
		1,20	0,75	0,97	1,17	1,25	1,25	1,25	1,25	1,25	1,25
		1,50	0,75	0,97	1,17	1,25	1,25	1,25	1,25	1,25	1,25
		$\geq 2,00$	0,75	0,97	1,17	1,25	1,25	1,25	1,25	1,25	1,25
Thickness Component I $t_I$ [mm]:	Tension load $N_{Rk}$ [kN]		0,75	1,00	1,30	1,30	1,30	1,30	1,30	1,30	

**Blind rivet**

PolyGrip-ASO-D-48 x L  
PolyGrip-ATO-D-48 x L

PolyGrip-ASO-D16-48 x L  
PolyGrip-ATO-D16-48 x L

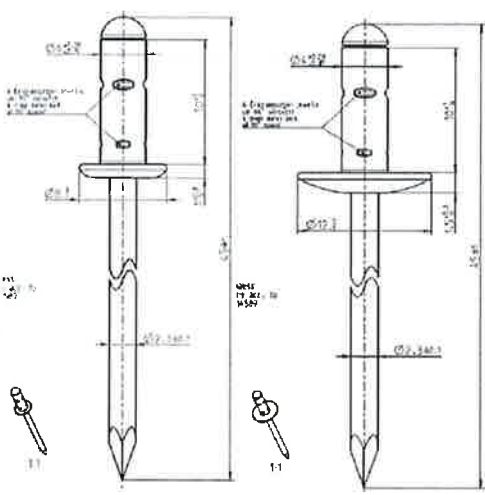
**Annex 16**

	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg2.5 – EN 573 Mandrel: Stainless steel (1.4541) – EN 10088 Steel galvanised – EN 10016-2</p> <p>Component I: S280GD to S350GD – EN 10346 Component II: S280GD to S350GD – EN 10346</p>
	<p><b>Pre-drill diameter:</b> Ø 4,9 mm</p>

		Thickness Component II $t_{II}$ [mm]:								
		0,40	0,50	0,63	0,75	0,88	1,00	1,25	≥ 1,50	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,40	0,64	0,64	0,64	0,94	0,97	1,00	1,00	1,00
		0,50	0,64	0,89	0,89	1,25	1,25	1,25	1,25	1,25
		0,63	0,64	0,89	1,50	1,50	1,50	1,50	1,50	1,50
		0,75	0,64	0,89	1,50	1,50	1,50	1,50	1,50	1,50
		0,88	0,64	0,89	1,50	1,50	1,50	1,50	1,50	1,50
		1,00	0,64	0,89	1,50	1,50	1,50	1,50	1,50	1,50
		1,25	0,64	0,89	1,50	1,50	1,50	1,50	1,50	1,50
		≥ 1,50	0,64	0,89	1,50	1,50	1,50	1,50	1,50	1,50
Thickness Component I $t_I$ [mm]:	Tension load $N_{R,k}$ [kN]	0,40	0,58	0,75	0,75	0,75	0,75	0,75	0,75	0,75
		0,50	0,58	0,75	0,90	0,90	0,90	0,90	0,90	0,90
		0,63	0,58	0,75	1,00	1,10	1,10	1,10	1,10	1,10
		0,75	0,58	0,75	1,00	1,20	1,20	1,20	1,20	1,20
		0,88	0,58	0,75	1,00	1,30	1,30	1,30	1,30	1,30
		1,00	0,58	0,75	1,00	1,30	1,30	1,30	1,30	1,30
		1,25	0,58	0,75	1,00	1,30	1,30	1,30	1,30	1,30
		≥ 1,50	0,58	0,75	1,00	1,30	1,30	1,30	1,30	1,30

<b>Blind rivet</b>		<b>Annex 17</b>
PolyGrip-ASO-D-48 x L PolyGrip-ATO-D-48 x L	PolyGrip-ASO-D16-48 x L PolyGrip-ATO-D16-48 x L	





**Material**

Sleeve: Aluminum AlMg2.5 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088

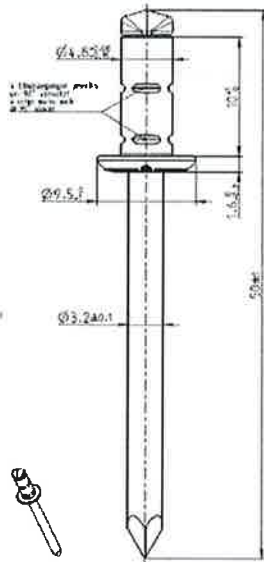
Component I: S280GD to S350GD – EN 10346  
Component II: S280GD to S350GD – EN 10346

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**Pre-drill diameter:** Ø4,1 mm

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	0,98	0,98	0,98	0,98
		0,63	-	-	-	-	0,98	0,98	0,98	0,98
		0,75	-	-	0,96	0,97	0,98	0,98	0,98	0,98
		0,88	-	-	0,96	0,97	0,98	0,98	0,98	0,98
		1,00	0,87	0,92	0,96	0,97	0,98	0,98	0,98	0,98
		1,25	0,87	0,92	0,96	0,97	0,98	0,98	0,98	0,98
		1,50	0,87	0,92	0,96	0,97	0,98	0,98	0,98	0,98
		≥ 2,00	0,87	0,92	0,96	0,97	0,98	0,98	0,98	0,98
	Tension load $N_{R,k}$ [kN]	0,50	-	-	-	-	0,78	0,78	0,78	0,78
		0,63	-	-	-	-	0,78	0,78	0,78	0,78
		0,75	-	-	0,78	0,78	0,78	0,78	0,78	0,78
		0,88	-	-	0,78	0,78	0,78	0,78	0,78	0,78
		1,00	0,52	0,77	0,78	0,78	0,78	0,78	0,78	0,78
		1,25	0,52	0,77	0,78	0,78	0,78	0,78	0,78	0,78
1,50	0,52	0,77	0,78	0,78	0,78	0,78	0,78	0,78		
≥ 2,00	0,52	0,77	0,78	0,78	0,78	0,78	0,78	0,78		

<b>Blind rivet</b>	<b>Annex 18</b>
PolyGrip-ASO-D-40 x L PolyGrip-ASO-D12-40 x L	



**Material**

Sleeve: Stainless steel (1.4567) – EN 10088

Mandrel: Stainless steel (1.4541) – EN 10088

Component I: S280GD to S350GD – EN 10346

Component II: S280GD to S350GD – EN 10346

**Pre-drill diameter:**  $\varnothing 4,9$  mm

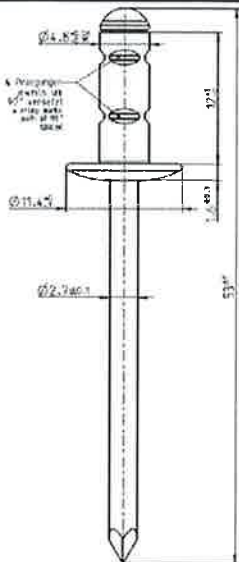
		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	1,42	1,42	1,42	1,42
		0,63	-	-	-	-	1,64	1,64	1,64	1,64
		0,75	-	-	1,85	1,85	1,85	1,85	1,85	1,85
		0,88	-	-	1,85	2,25	2,25	2,25	2,25	2,25
		1,00	1,11	1,49	1,85	2,25	2,61	2,61	2,61	2,61
		1,25	1,11	1,49	1,85	2,25	2,61	3,38	3,38	3,38
		1,50	1,11	1,49	1,85	2,25	2,61	3,38	4,14	4,14
	$\geq 2,00$	1,11	1,49	1,85	2,25	2,61	3,38	4,14	4,14	
	Tension load $N_{R,k}$ [kN]	0,50	-	-	-	-	0,81	1,03	1,24	1,24
		0,63	-	-	-	-	0,81	1,03	1,24	1,24
		0,75	-	-	0,60	0,71	0,81	1,03	1,24	1,24
		0,88	-	-	0,60	0,71	0,81	1,03	1,24	1,24
		1,00	0,31	0,46	0,60	0,71	0,81	1,03	1,24	1,24
		1,25	0,31	0,46	0,60	0,71	0,81	1,03	1,24	1,24
1,50		0,31	0,46	0,60	0,71	0,81	1,03	1,24	1,24	
$\geq 2,00$	0,31	0,46	0,60	0,71	0,81	1,03	1,24	1,24		

**Blind rivet**

PolyGrip-SSO-D-48 x L

**Annex 19**

English translation prepared by DIBt

	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg2.5 – EN 573 Mandrel: Stainless steel (1.4541) – EN 10088</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573 Component II: Aluminum alloy with <math>R_{m,min} = 165 \text{ N/mm}^2</math> – EN 573</p>
	<p><b>Pre-drill diameter:</b> <math>\varnothing 5,1 \text{ mm}</math></p>

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-	-
		$\geq 2,00$	0,33	0,54	0,64	0,85	1,06	1,06	1,06	1,06	1,06
	Tension load $N_{R,k}$ [kN]	0,14	0,29	0,37	0,43	0,49	0,70	0,70	0,70	0,70	

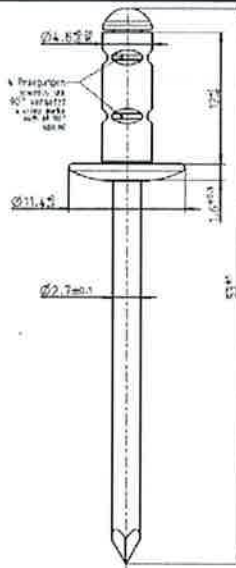
Further specifications:

- The values are valid for a clamping thickness from 3,0 mm to 5,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.
- For a clamping thickness from 4,0 mm to 4,5 mm the values from Annex 21 can be used.

**Blind rivet**

SOLARGRIP-ASO-D-48120-DS

**Annex 20**



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573

Mandrel: Stainless steel (1.4541) – EN 10088

Component I: Aluminum alloy

with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy

with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

Pre-drill diameter:  $\varnothing 5,1 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-	-
		$\geq 2,00$	0,33	0,54	0,64	0,85	1,06	1,06	1,06	1,06	1,06
	Tension load $N_{R,k}$ [kN]	0,28	0,36	0,40	0,49	0,57	0,88	0,88	0,88	0,88	

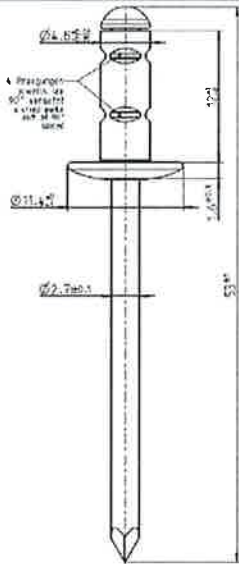
Further specifications:

- The values are valid for a clamping thickness from 4,0 mm to 4,5 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.

**Blind rivet**

SOLARGRIP-ASO-D-48120-DS

**Annex 21**

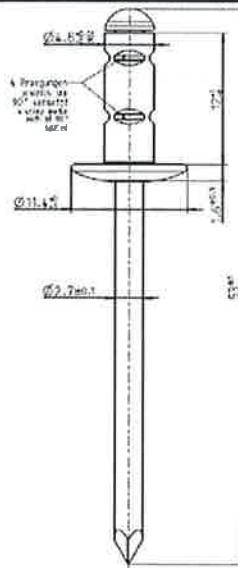
	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg2.5 – EN 573 Mandrel: Stainless steel (1.4541) – EN 10088</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573 Component II: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573</p>
	<p><b>Pre-drill diameter:</b> <math>\varnothing 5,1 \text{ mm}</math></p>

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-
	$\geq 2,00$	0,44	0,70	0,83	1,11	1,31	1,31	1,31	1,31	
	Tension load $N_{R,k}$ [kN]		0,18	0,39	0,49	0,57	0,64	0,86	0,86	0,86

Further specifications:

- The values are valid for a clamping thickness from 3,0 mm to 5,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.
- For a clamping thickness from 4,0 mm to 4,5 mm the values from Annex 23 can be used.

<b>Blind rivet</b>	<b>Annex 22</b>
SOLARGRIP-ASO-D-48120-DS	



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573

Mandrel: Stainless steel (1.4541) – EN 10088

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

**Pre-drill diameter:**  $\varnothing 5,1 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:															
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$								
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-	-					
		0,70	-	-	-	-	-	-	-	-	-	-					
		0,80	-	-	-	-	-	-	-	-	-	-					
		0,90	-	-	-	-	-	-	-	-	-	-					
		1,00	-	-	-	-	-	-	-	-	-	-					
		1,20	-	-	-	-	-	-	-	-	-	-					
		1,50	-	-	-	-	-	-	-	-	-	-					
		$\geq 2,00$	0,44	-	0,70	-	0,83	-	1,11	-	1,31	-	1,31				
	Tension load $N_{R,k}$ [kN]		0,37		0,48		0,53		0,64		0,74		1,09		1,09		1,09

Further specifications:

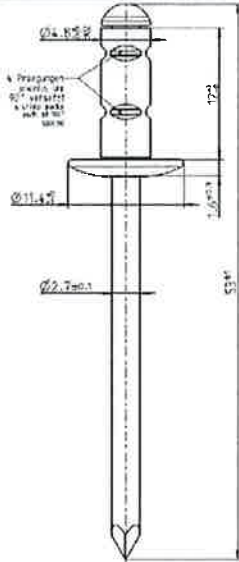
- The values are valid for a clamping thickness from 4,0 mm to 4,5 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.

**Blind rivet**

SOLARGRIP-ASO-D-48120-DS

**Annex 23**



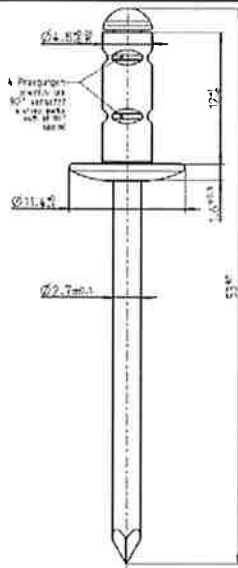
	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg2.5 – EN 573 Mandrel: Stainless steel (1.4541) – EN 10088</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573 Component II: S280GD to S350GD – EN 10346</p>
	<p><b>Pre-drill diameter:</b> <math>\varnothing 5,1 \text{ mm}</math></p>

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-	-
	$\geq 2,00$	0,92	-	1,21	-	1,31	-	1,31	-	1,31	-
Thickness Component I $t_I$ [mm]:	Tension load $N_{R,k}$ [kN]	0,45	0,62	0,96	1,30	1,61	1,61	1,61	1,61	1,61	

Further specifications:

- The values are valid for a clamping thickness from 3,0 mm to 5,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.
- For a clamping thickness from 4,0 mm to 4,5 mm the values from Annex 25 can be used.

<b>Blind rivet</b>	<b>Annex 24</b>
SOLARGRIP-ASO-D-48120-DS	



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573  
Component II: S280GD to S350GD – EN 10346

**Pre-drill diameter:**  $\varnothing 5,1 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-	-
	$\geq 2,00$	0,92	1,21	1,31	1,31	1,31	1,31	1,31	1,31	1,31	
Tension load $N_{R,k}$ [kN]		0,60	0,75	1,08	1,39	1,67	1,67	1,67	1,67		

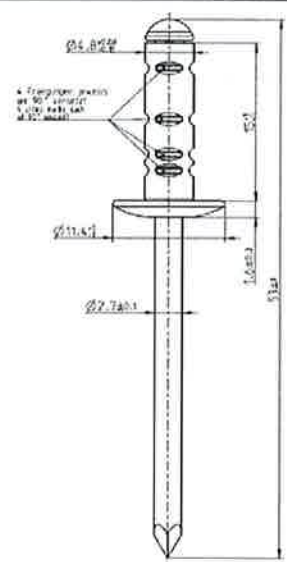
Further specifications:

- The values are valid for a clamping thickness from 4,0 mm to 4,5 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.

**Blind rivet**

SOLARGRIP-ASO-D-48120-DS

**Annex 25**

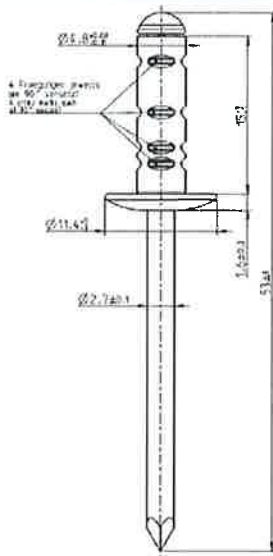
	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg2.5 – EN 573 Mandrel: Stainless steel (1.4541) – EN 10088</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573 Component II: Aluminum alloy with <math>R_{m,min} = 165 \text{ N/mm}^2</math> – EN 573</p>
	<p><b>Pre-drill diameter:</b> Ø 5,1 mm</p>

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	≥ 2,00		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-	-
		≥ 4,00	0,35	0,58	0,69	0,86	1,02	1,02	1,02	1,02	1,02
	Tension load $N_{R,k}$ [kN]	0,16	0,20	0,22	0,34	0,45	0,48	0,48	0,48	0,48	

Further specifications:

- The values are valid for a clamping thickness from 4,5 mm to 9,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 4,0 mm.
- For a clamping thickness from 5,0 mm to 7,0 mm the values from Annex 27 can be used.

<b>Blind rivet</b>	<b>Annex 26</b>
SOLARGRIP-ASO-D-48150-DS	



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088  
  
Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573  
Component II: Aluminum alloy  
with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

**Pre-drill diameter:**  $\varnothing 5,1 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-
	$\geq 4,00$	0,35	0,58	0,69	0,86	1,02	1,02	1,02	1,02	
Tension load $N_{R,k}$ [kN]		0,26	0,44	0,53	0,61	0,68	1,11	1,11	1,11	

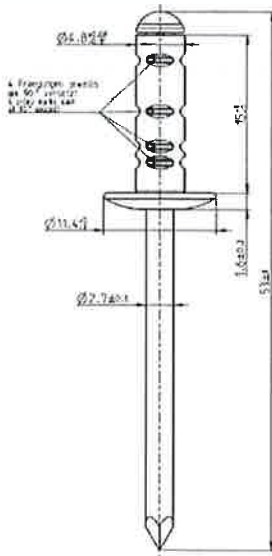
Further specifications:

- The values are valid for a clamping thickness from 5,0 mm to 7,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 4,0 mm.

**Blind rivet**

SOLARGRIP-ASO-D-48150-DS

Annex 27



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573

Mandrel: Stainless steel (1.4541) – EN 10088

Component I: Aluminum alloy

with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy

with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

**Pre-drill diameter:** Ø 5,1 mm

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	≥ 2,00	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-
	≥ 4,00	0,45	0,75	0,90	1,12	1,33	1,33	1,33	1,33	
Tension load $N_{R,k}$ [kN]		0,21	0,26	0,28	0,43	0,58	0,59	0,59	0,59	

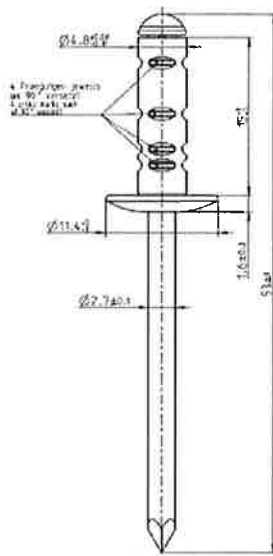
Further specifications:

- The values are valid for a clamping thickness from 4,5 mm to 9,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 4,0 mm.
- For a clamping thickness from 5,0 mm to 7,0 mm the values from Annex 29 can be used.

**Blind rivet**

SOLARGRIP-ASO-D-48150-DS

**Annex 28**



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573

Mandrel: Stainless steel (1.4541) – EN 10088

Component I: Aluminum alloy

with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy

with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Pre-drill diameter:  $\varnothing 5,1 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$	
Thickness Component I $t_I$ [mm]:	0,50	-	-	-	-	-	-	-	-	-
	0,70	-	-	-	-	-	-	-	-	-
	0,80	-	-	-	-	-	-	-	-	-
	0,90	-	-	-	-	-	-	-	-	-
	1,00	-	-	-	-	-	-	-	-	-
	1,20	-	-	-	-	-	-	-	-	-
	1,50	-	-	-	-	-	-	-	-	-
	$\geq 4,00$	0,45	0,75	0,90	1,12	1,33	1,33	1,33	1,33	
	Tension load $N_{R,k}$ [kN]	0,34	0,58	0,70	0,80	0,89	1,38	1,38	1,38	

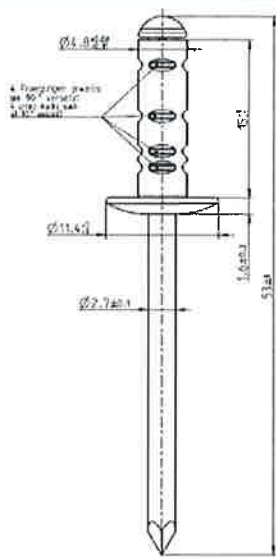
Further specifications:

- The values are valid for a clamping thickness from 5,0 mm to 7,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 4,0 mm.

**Blind rivet**

SOLARGRIP-ASO-D-48150-DS

**Annex 29**



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573  
Component II: S280GD to S350GD – EN 10346

**Pre-drill diameter:**  $\varnothing 5,1 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-	-
		$\geq 4,00$	1,07	-	1,29	-	1,38	-	1,38	-	1,38
Tension load $N_{R,k}$ [kN]		0,41	0,62	1,02	1,25	1,46	1,46	1,46	1,46	1,46	

Further specifications:

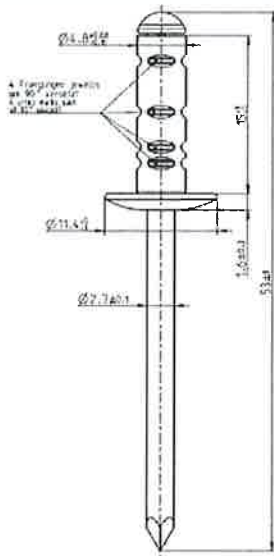
- The values are valid for a clamping thickness from 4,5 mm to 9,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 4,0 mm.
- For a clamping thickness from 5,0 mm to 7,0 mm the values from Annex 31 can be used.

**Blind rivet**

SOLARGRIP-ASO-D-48150-DS

**Annex 30**





**Material**

Sleeve: Aluminum AlMg2.5 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088

Component I: Aluminum alloy  
with  $R_{m, \min} = 215 \text{ N/mm}^2$  – EN 573  
Component II: S280GD to S350GD – EN 10346

Pre-drill diameter:  $\varnothing 5,1 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$	
Thickness Component I $t_I$ [mm]:	0,50	-	-	-	-	-	-	-	-	-
	0,70	-	-	-	-	-	-	-	-	-
	0,80	-	-	-	-	-	-	-	-	-
	0,90	-	-	-	-	-	-	-	-	-
	1,00	-	-	-	-	-	-	-	-	-
	1,20	-	-	-	-	-	-	-	-	-
	1,50	-	-	-	-	-	-	-	-	-
	$\geq 4,00$	1,07	-	1,29	-	1,38	-	1,38	-	1,38
Tension load $N_{R,k}$ [kN]		0,55	0,80	1,15	1,38	1,59	1,59	1,59	1,59	1,59
Shear load $V_{R,k}$ [kN]										

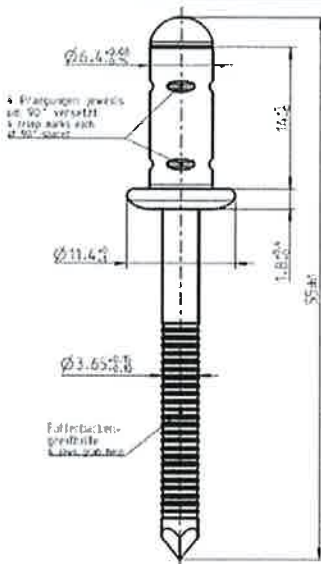
Further specifications:

- The values are valid for a clamping thickness from 5,0 mm to 7,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 4,0 mm.

**Blind rivet**

SOLARGRIP-ASO-D-48150-DS

**Annex 31**



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088  
Steel galvanised – EN 10016-2

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy  
with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

**Pre-drill diameter:**  $\varnothing 6,5 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-
	$\geq 2,00$	0,41	0,60	0,70	0,90	1,09	1,09	1,09	1,09	
Tension load $N_{R,k}$ [kN]		0,26	0,47	0,57	0,73	0,88	1,07	1,07	1,07	

**Further specifications:**

- The values are valid for a clamping thickness from 2,5 mm to 8,5 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.
- For a clamping thickness from 4,0 mm to 6,0 mm the values from Annex 33 can be used.

**Blind rivet**

SOLARGRIP-ATO-D-64150  
SOL-R-ASO-D-64150

**Annex 32**

	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg2.5 – EN 573 Mandrel: Stainless steel (1.4541) – EN 10088 Steel galvanised – EN 10016-2</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573 Component II: Aluminum alloy with <math>R_{m,min} = 165 \text{ N/mm}^2</math> – EN 573</p>
<p><b>Pre-drill diameter:</b> Ø 6,5 mm</p>	

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	≥ 2,00		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-	-
		≥ 2,00	0,41	0,60	0,70	0,90	1,09	1,09	1,09	1,09	
Tension load $N_{R,k}$ [kN]		0,36	0,56	0,66	0,76	0,86	1,13	1,13	1,13		

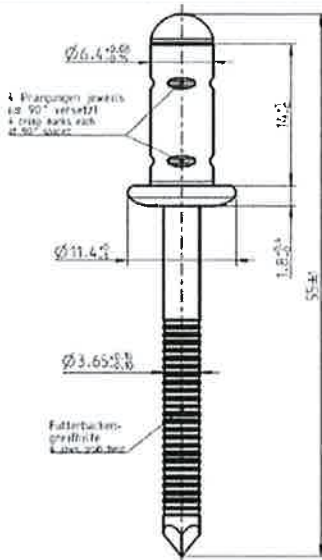
Further specifications:

- The values are valid for a clamping thickness from 4,0 mm to 6,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.

**Blind rivet**

SOLARGRIP-ATO-D-64150  
SOL-R-ASO-D-64150

**Annex 33**



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088  
Steel galvanised – EN 10016-2

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

**Pre-drill diameter:**  $\varnothing 6,5 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-	-
		$\geq 2,00$	0,53	0,78	0,91	1,17	1,42	1,42	1,42	1,42	1,42
		Tension load $N_{R,k}$ [kN]	0,34	0,61	0,75	0,95	1,13	1,33	1,33	1,33	1,33

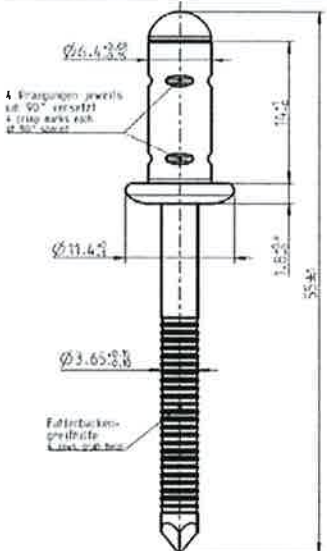
Further specifications:

- The values are valid for a clamping thickness from 2,5 mm to 8,5 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.
- For a clamping thickness from 4,0 mm to 6,0 mm the values from Annex 35 can be used.

**Blind rivet**

SOLARGRIP-ATO-D-64150  
SOL-R-ASO-D-64150

**Annex 34**

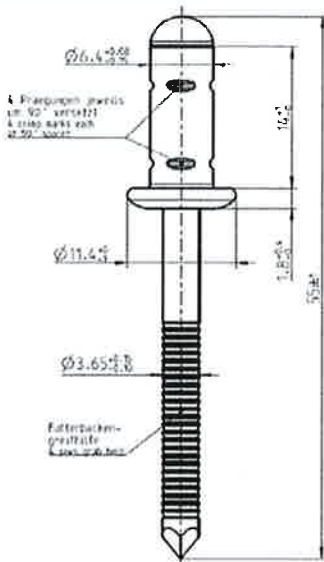
	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg2.5 – EN 573 Mandrel: Stainless steel (1.4541) – EN 10088 Steel galvanised – EN 10016-2</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573</p> <p>Component II: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573</p>
<p><b>Pre-drill diameter:</b> Ø 6,5 mm</p>	

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	≥ 2,00		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-	-
		≥ 2,00	0,53	0,78	0,91	1,17	1,42	1,42	1,42	1,42	1,42
	Tension load $N_{R,k}$ [kN]	0,47	0,73	0,86	1,00	1,13	1,41	1,41	1,41	1,41	

Further specifications:

- The values are valid for a clamping thickness from 4,0 mm to 6,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.

<b>Blind rivet</b>	<b>Annex 35</b>
SOLARGRIP-ATO-D-64150 SOL-R-ASO-D-64150	



**Material**

Sleeve: Aluminum AlMg2.5 – EN 573  
Mandrel: Stainless steel (1.4541) – EN 10088  
Steel galvanised – EN 10016-2

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573  
Component II: S280GD to S350GD – EN 10346

**Pre-drill diameter:**  $\varnothing 6,5 \text{ mm}$

			Thickness Component II $t_{II}$ [mm]:								
			0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-	-
		$\geq 2,00$	0,99	1,86	2,20	2,31	2,80	2,80	2,80	2,80	
Thickness Component I $t_I$ [mm]:	Tension load $N_{R,k}$ [kN]		0,71	0,87	1,18	1,37	1,54	1,54	1,54	1,54	

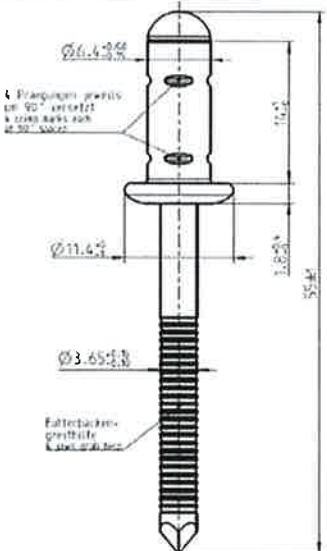
Further specifications:

- The values are valid for a clamping thickness from 2,5 mm to 8,5 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.
- For a clamping thickness from 4,0 mm to 6,0 mm the values from Annex 37 can be used.

**Blind rivet**

SOLARGRIP-ATO-D-64150  
SOL-R-ASO-D-64150

**Annex 36**

	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg2.5 – EN 573 Mandrel: Stainless steel (1.4541) – EN 10088 Steel galvanised – EN 10016-2</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573 Component II: S280GD to S350GD – EN 10346</p>
<p><b>Pre-drill diameter:</b> Ø 6,5 mm</p>	

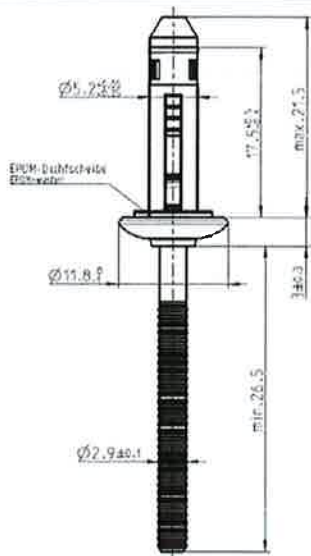
		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-
		0,70	-	-	-	-	-	-	-	-
		0,80	-	-	-	-	-	-	-	-
		0,90	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-
		1,20	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-
		≥ 2,00	0,99	1,86	2,20	2,31	2,80	2,80	2,80	2,80
Tension load $N_{R,k}$ [kN]		0,81	1,02	1,47	1,80	2,11	2,11	2,11	2,11	

Further specifications:

- The values are valid for a clamping thickness from 4,0 mm to 6,0 mm.
- Component I is made of aluminum with  $R_m \geq 215 \text{ N/mm}^2$  and has a minimum thickness of 2,0 mm.

<b>Blind rivet</b>	<b>Annex 37</b>
SOLARGRIP-ATO-D-64150 SOL-R-ASO-D-64150	





**Material**

Sleeve: Aluminum AlMg5 – EN 573  
Mandrel: Aluminum AlCuMg1 – EN 573

Component I: Aluminum alloy  
with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy  
with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

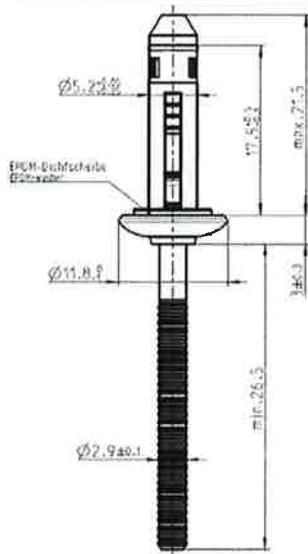
**Pre-drill diameter:**  $\varnothing 5,4 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:									
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	0,65	0,65	0,65	0,65	0,65	0,65	0,65
		0,70	-	-	0,83	0,83	0,83	0,83	0,83	0,83	0,83
		0,80	0,54	0,79	0,92	0,92	0,92	0,92	0,92	0,92	0,92
		0,90	0,54	0,79	0,92	1,04	1,04	1,04	1,04	1,04	1,04
		1,00	0,54	0,79	0,92	1,04	1,18	1,18	1,18	1,18	1,18
		1,20	0,54	0,79	0,92	1,04	1,18	1,46	1,46	1,46	1,46
		1,50	0,54	0,79	0,92	1,04	1,18	1,46	1,87	1,87	1,87
		$\geq 2,00$	0,54	0,79	0,92	1,04	1,18	1,46	1,87	1,87	1,95
	Tension load $N_{R,k}$ [kN]		0,46	0,70	0,82	0,87	0,92	0,92	0,92	0,92	

Blind rivet

RV6604-6xL-W

Annex 38



**Material**

Sleeve: Aluminum AlMg5 – EN 573  
Mandrel: Aluminum AlCuMg1 – EN 573

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

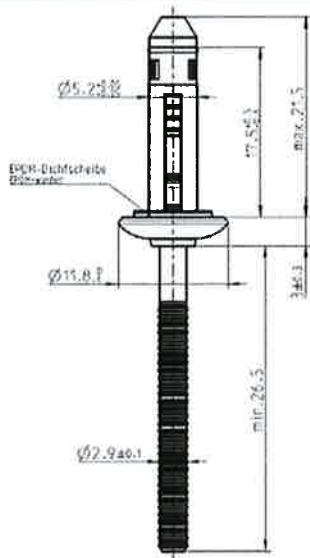
**Pre-drill diameter:** Ø 5,4 mm

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	≥ 2,00	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	0,84	0,84	0,84	0,84	0,84	0,84
		0,70	-	-	1,08	1,08	1,08	1,08	1,08	1,08
		0,80	0,70	1,03	1,20	1,20	1,20	1,20	1,20	1,20
		0,90	0,70	1,03	1,20	1,36	1,36	1,36	1,36	1,36
		1,00	0,70	1,03	1,20	1,36	1,54	1,54	1,54	1,54
		1,20	0,70	1,03	1,20	1,36	1,54	1,90	1,90	1,90
		1,50	0,70	1,03	1,20	1,36	1,54	1,90	2,44	2,44
		≥ 2,00	0,70	1,03	1,20	1,36	1,54	1,90	2,44	2,54
		Tension load $N_{R,k}$ [kN]		0,60	0,91	1,07	1,13	1,19	1,19	1,19

Blind rivet

RV6604-6xL-W

Annex 39



**Material**

Sleeve: Aluminum AlMg5 – EN 573  
Mandrel: Aluminum AlCuMg1 – EN 573

Component I: Aluminum alloy  
with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573  
Component II: S280GD to S350GD – EN 10346

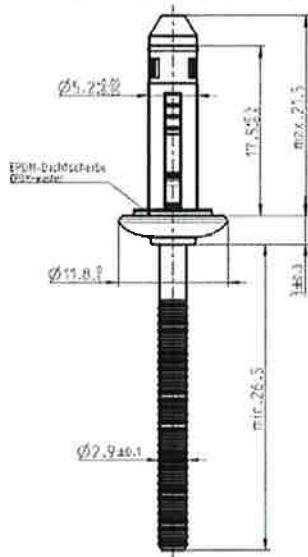
Pre-drill diameter: Ø 5,4 mm

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	0,65	0,65	0,65	0,65	0,65
		0,70	-	-	-	0,83	0,83	0,83	0,83	0,83
		0,80	0,54	0,70	0,86	0,92	0,92	0,92	0,92	0,92
		0,90	0,54	0,70	0,86	1,04	1,04	1,04	1,04	1,04
		1,00	0,54	0,70	0,86	1,04	1,18	1,18	1,18	1,18
		1,20	0,54	0,70	0,86	1,04	1,18	1,46	1,46	1,46
		1,50	0,54	0,70	0,86	1,04	1,18	1,46	1,87	1,87
		≥ 2,00	0,54	0,70	0,86	1,04	1,18	1,46	1,87	1,95
Thickness Component I $t_I$ [mm]:	Tension load $N_{R,k}$ [kN]		0,82	1,10	1,20	1,30	1,60	1,70	1,80	1,80

Blind rivet

RV6604-6xL-W

Annex 40



**Material**

Sleeve: Aluminum AlMg5 – EN 573  
Mandrel: Aluminum AlCuMg1 – EN 573

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573  
Component II: S280GD to S350GD – EN 10346

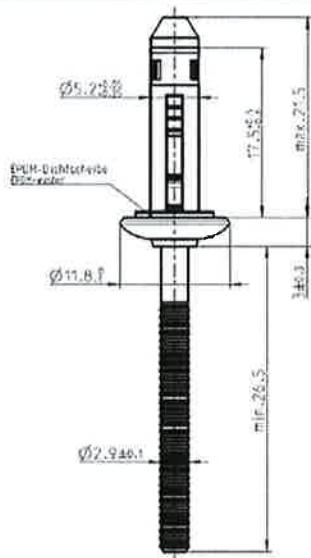
**Pre-drill diameter:** Ø 5,4 mm

		Thickness Component II $t_{II}$ [mm]:												
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00					
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	0,84	-	0,84	-	0,84	-	0,84	-
		0,70	-	-	-	-	1,08	-	1,08	-	1,08	-	1,08	-
		0,80	0,70	-	0,91	-	1,12	-	1,20	-	1,20	-	1,20	-
		0,90	0,70	-	0,91	-	1,12	-	1,36	-	1,36	-	1,36	-
		1,00	0,70	-	0,91	-	1,12	-	1,36	-	1,54	-	1,54	-
		1,20	0,70	-	0,91	-	1,12	-	1,36	-	1,54	-	1,90	-
		1,50	0,70	-	0,91	-	1,12	-	1,36	-	1,54	-	1,90	-
		≥ 2,00	0,70	-	0,91	-	1,12	-	1,36	-	1,54	-	1,90	-
Thickness Component I $t_I$ [mm]:	Tension load $N_{R,k}$ [kN]		0,82	1,10	1,20	1,30	1,60	1,70	1,80	1,80	1,80			

Blind rivet

RV6604-6xL-W

Annex 41



**Material**

Sleeve: Aluminum AlMg5 – EN 573  
Mandrel: Aluminum AlCuMg1 – EN 573

Component I: S280GD to S350GD – EN 10346  
Component II: S280GD to S350GD – EN 10346

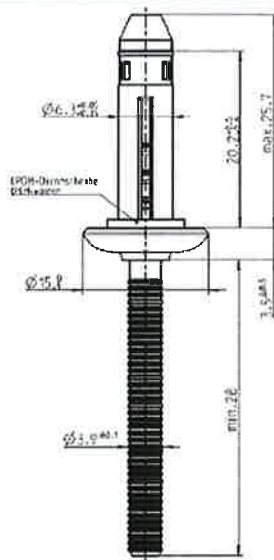
**Pre-drill diameter:** Ø 5,4 mm

		Thickness Component II $t_{II}$ [mm]:												
		0,40	0,50	0,63	0,75	0,88	1,00	1,25	≥ 1,50					
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,40	-	-	-	-	-	1,13	-	1,13	-	1,13	-	
		0,50	-	-	-	-	-	1,25	-	1,25	-	1,25	-	
		0,63	-	-	1,40	-	1,40	-	1,40	-	1,40	-	1,50	-
		0,75	-	-	1,40	-	1,40	-	1,60	-	1,60	-	1,70	-
		0,88	-	-	1,50	-	1,50	-	1,60	-	1,70	-	1,70	-
		1,00	0,91	-	1,17	-	1,50	-	1,70	-	1,70	-	1,80	-
	Tension load $N_{R,k}$ [kN]	1,25	0,91	-	1,17	-	1,60	-	1,70	-	1,70	-	1,80	-
		≥ 1,50	0,91	-	1,17	-	1,60	-	1,70	-	1,70	-	1,80	-
		0,40	-	-	-	-	-	-	1,19	-	1,19	-	1,19	-
		0,50	-	-	-	-	-	-	1,19	-	1,19	-	1,19	-
		0,63	-	-	1,10	-	1,20	-	1,30	-	1,30	-	1,40	-
		0,75	-	-	1,10	-	1,20	-	1,30	-	1,40	-	1,40	-
0,88	-	-	1,10	-	1,20	-	1,30	-	1,50	-	1,50	-		
1,00	0,82	-	0,82	-	1,10	-	1,20	-	1,30	-	1,60	-		
1,25	0,82	-	0,82	-	1,10	-	1,20	-	1,30	-	1,60	-		
≥ 1,50	0,82	-	0,82	-	1,10	-	1,20	-	1,30	-	1,60	-		

Blind rivet

RV6604-6xL-W

Annex 42



**Material**

Sleeve: Aluminum AlMg5 – EN 573  
Mandrel: Aluminum AlCuMg1 – EN 573

Component I: Aluminum alloy  
with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy  
with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

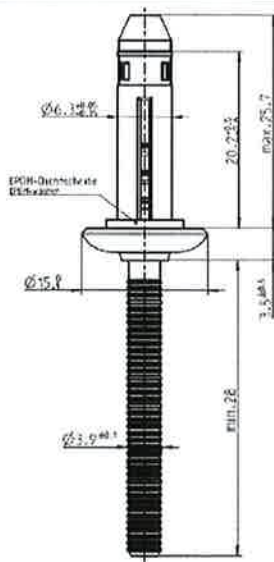
**Pre-drill diameter:**  $\varnothing 6,6 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	0,96	0,96	0,96
		0,70	-	-	-	-	-	0,96	0,96	0,96
		0,80	-	-	0,90	0,90	0,91	0,96	0,96	0,96
		0,90	-	-	0,90	0,90	0,91	0,96	0,96	0,96
		1,00	-	-	0,90	0,90	0,91	0,96	0,96	0,96
		1,20	0,86	0,89	0,90	0,90	0,91	0,96	0,96	0,96
		1,50	0,86	0,89	0,90	0,90	0,91	0,96	0,96	0,96
		$\geq 2,00$	0,86	0,89	0,90	0,90	0,91	0,96	0,96	0,96
Tension load $N_{R,k}$ [kN]		0,37	0,64	0,77	0,92	1,07	1,07	1,07	1,07	

**Blind rivet**

RV6604-8xL-W

**Annex 43**



**Material**

Sleeve: Aluminum AlMg5 – EN 573  
Mandrel: Aluminum AlCuMg1 – EN 573

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Pre-drill diameter: Ø 6,6 mm

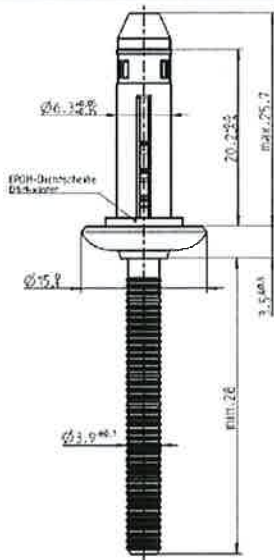
		Thickness Component II $t_{II}$ [mm]:												
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	≥ 2,00					
Thickness Component I $t_I$ [mm]:	Shear load $V_{Rk}$ [kN]	0,50	-	-	-	-	-	1,24	-	1,24	-	1,24	-	
		0,70	-	-	-	-	-	1,24	-	1,24	-	1,24	-	
		0,80	-	-	1,17	-	1,19	-	1,24	-	1,24	-	1,24	-
		0,90	-	-	1,17	-	1,19	-	1,24	-	1,24	-	1,24	-
		1,00	-	-	1,17	-	1,19	-	1,24	-	1,24	-	1,24	-
		1,20	1,11	-	1,15	-	1,17	-	1,19	-	1,21	-	1,24	-
		1,50	1,11	-	1,15	-	1,17	-	1,19	-	1,21	-	1,24	-
		≥ 2,00	1,11	-	1,15	-	1,17	-	1,19	-	1,21	-	1,24	-
Thickness Component I $t_I$ [mm]:	Tension load $N_{Rk}$ [kN]		0,48	0,83	1,01	1,20	1,40	1,40	1,40	1,40	1,40	1,40		

Blind rivet

RV6604-8xL-W

Annex 44





**Material**

Sleeve: Aluminum AlMg5 – EN 573

Mandrel: Aluminum AlCuMg1 – EN 573

Component I: Aluminum alloy

with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

Component II: S280GD to S350GD – EN 10346

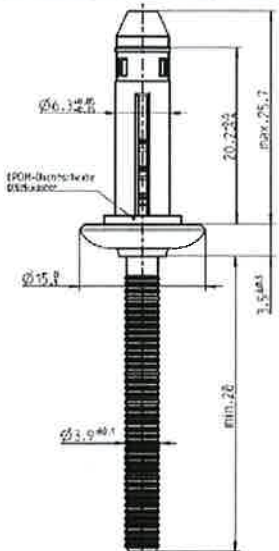
**Pre-drill diameter:**  $\varnothing 6,6 \text{ mm}$

			Thickness Component II $t_{II}$ [mm]:									
			0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	0,96	-	0,96	-
		0,70	-	-	-	-	-	-	0,96	-	0,96	-
		0,80	-	-	-	-	0,90	-	0,91	-	0,96	-
		0,90	-	-	-	-	0,90	-	0,91	-	0,96	-
		1,00	-	-	0,90	-	0,90	-	0,91	-	0,96	-
		1,20	0,86	-	0,88	-	0,90	-	0,91	-	0,96	-
		1,50	0,86	-	0,88	-	0,90	-	0,91	-	0,96	-
		$\geq 2,00$	0,86	-	0,88	-	0,90	-	0,91	-	0,96	-
Tension load $N_{R,k}$ [kN]			1,27	1,48	1,58	1,58	1,58	1,58	1,58	1,58	1,58	

**Blind rivet**

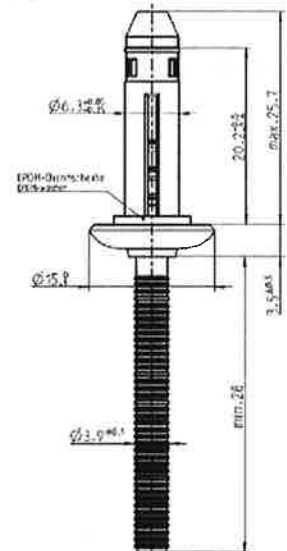
RV6604-8xL-W

**Annex 45**

	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg5 – EN 573 Mandrel: Aluminum AlCuMg1 – EN 573</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573 Component II: S280GD to S350GD – EN 10346</p>
	<p><b>Pre-drill diameter:</b> <math>\varnothing 6,6 \text{ mm}</math></p>

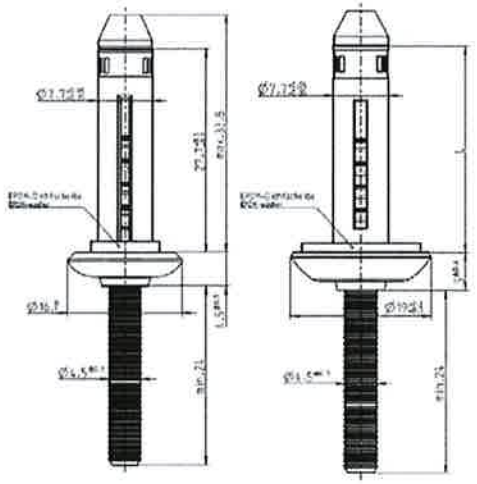
		Thickness Component II $t_{II}$ [mm]:												
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$					
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	1,24	-	1,24	-	1,24	-	
		0,70	-	-	-	-	-	1,24	-	1,24	-	1,24	-	
		0,80	-	-	-	1,19	-	1,21	-	1,24	-	1,24	-	
		0,90	-	-	-	1,19	-	1,21	-	1,24	-	1,24	-	
		1,00	-	-	1,16	-	1,19	-	1,21	-	1,24	-	1,24	-
		1,20	1,11	-	1,14	-	1,16	-	1,19	-	1,21	-	1,24	-
		1,50	1,11	-	1,14	-	1,16	-	1,19	-	1,21	-	1,24	-
		$\geq 2,00$	1,11	-	1,14	-	1,16	-	1,19	-	1,21	-	1,24	-
	Tension load $N_{R,k}$ [kN]	1,27	1,48	1,58	1,58	1,58	1,58	1,58	1,58	1,58	1,58	1,58		

<b>Blind rivet</b>	<b>Annex 46</b>
RV6604-8xL-W	

	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg5 – EN 573 Mandrel: Aluminum AlCuMg1 – EN 573</p> <p>Component I: S280GD to S350GD – EN 10346 Component II: S280GD to S350GD – EN 10346</p>
<p><b>Pre-drill diameter:</b> Ø 6,6 mm</p>	

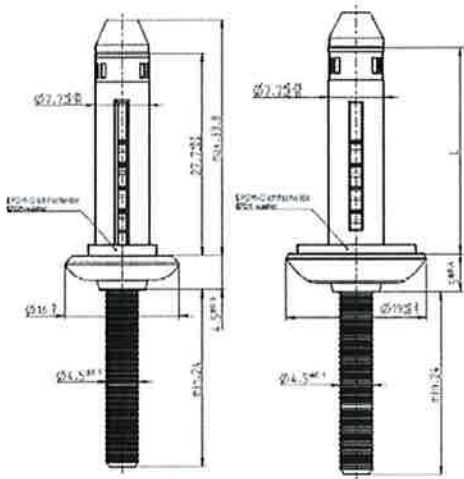
		Thickness Component II $t_{II}$ [mm]:								
		0,40	0,50	0,63	0,75	0,88	1,00	1,25	≥ 1,50	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,40	-	-	-	-	-	-	1,39	1,39
		0,50	-	-	-	-	-	-	1,66	1,66
		0,63	-	-	-	-	-	2,00	2,00	2,00
		0,75	-	-	-	-	-	2,00	2,00	2,00
		0,88	-	-	-	-	1,75	2,00	2,00	2,00
		1,00	-	-	1,78	1,78	1,78	2,00	2,00	2,00
		1,25	1,11	1,40	1,78	1,78	1,78	2,00	2,00	2,00
	≥ 1,50	1,11	1,40	1,78	1,78	1,78	2,00	2,00	2,00	
	Tension load $N_{R,k}$ [kN]	0,40	-	-	-	-	-	-	1,23	1,23
		0,50	-	-	-	-	-	-	1,58	1,58
		0,63	-	-	-	-	-	1,58	1,58	1,58
		0,75	-	-	-	-	-	1,58	1,58	1,58
		0,88	-	-	-	-	1,58	1,58	1,58	1,58
		1,00	-	-	1,48	1,58	1,58	1,58	1,58	1,58
1,25		0,99	1,27	1,48	1,58	1,58	1,58	1,58	1,58	
≥ 1,50	0,99	1,27	1,48	1,58	1,58	1,58	1,58	1,58		

<b>Blind rivet</b>	<b>Annex 47</b>
RV6604-8xL-W	

	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg5 – EN 573 Mandrel: Aluminum AlCuMg1 – EN 573</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 165 \text{ N/mm}^2</math> – EN 573 Component II: Aluminum alloy with <math>R_{m,min} = 165 \text{ N/mm}^2</math> – EN 573</p> <hr/> <p><b>Pre-drill diameter:</b> <math>\varnothing 8,2 \text{ mm}</math></p>
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		Thickness Component II $t_{II}$ [mm]:																
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$									
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	0,56	-	0,56	-	0,56	-	0,56	-	0,56	-	0,56	-				
		0,70	0,56	-	0,91	-	0,91	-	0,91	-	0,91	-	0,91	-				
		0,80	0,56	-	0,91	-	1,08	-	1,08	-	1,08	-	1,08	-				
		0,90	0,56	-	0,91	-	1,08	-	1,40	-	1,40	-	1,40	-				
		1,00	0,56	-	0,91	-	1,08	-	1,40	-	1,72	-	1,72	-				
		1,20	0,56	-	0,91	-	1,08	-	1,40	-	1,72	-	2,35	-				
		1,50	0,56	-	0,91	-	1,08	-	1,40	-	1,72	-	2,35	-				
		$\geq 2,00$	0,56	-	0,91	-	1,08	-	1,40	-	1,72	-	2,35	-				
	Tension load $N_{R,k}$ [kN]		0,44		0,75		0,91		0,98		1,05		1,05		1,05		1,05	

<b>Blind rivet</b>		<b>Annex 48</b>
RV6603-9xL-W RV6605-9xL-W		



**Material**

Sleeve: Aluminum AlMg5 – EN 573  
Mandrel: Aluminum AlCuMg1 – EN 573

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

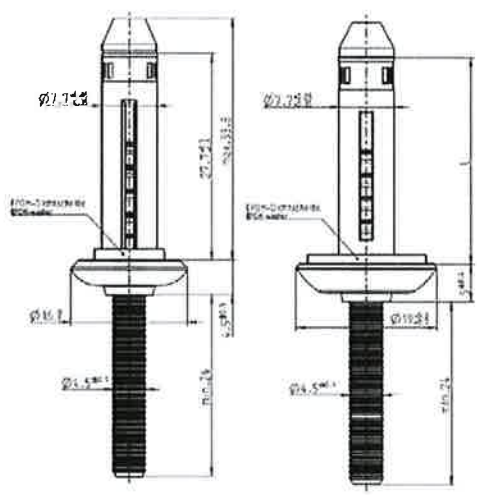
**Pre-drill diameter:**  $\varnothing 8,2 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:																	
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$										
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	0,73	-	0,73	-	0,73	-	0,73	-	0,73	-	0,73	-					
		0,70	0,73	-	1,18	-	1,18	-	1,18	-	1,18	-	1,18	-					
		0,80	0,73	-	1,18	-	1,40	-	1,40	-	1,40	-	1,40	-					
		0,90	0,73	-	1,18	-	1,40	-	1,78	-	1,78	-	1,78	-					
		1,00	0,73	-	1,18	-	1,40	-	1,78	-	2,17	-	3,17	-					
		1,20	0,73	-	1,18	-	1,40	-	1,78	-	2,17	-	2,93	-					
		1,50	0,73	-	1,18	-	1,40	-	1,78	-	2,17	-	2,93	-					
		$\geq 2,00$	0,73	-	1,18	-	1,40	-	1,78	-	2,17	-	2,93	-					
	Tension load $N_{R,k}$ [kN]		0,57		0,98		1,18		1,28		1,37		1,37		1,37		1,37		1,37

**Blind rivet**

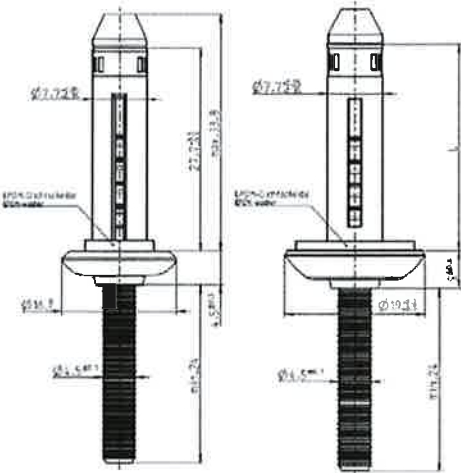
RV6603-9xL-W  
RV6605-9xL-W

**Annex 49**

	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg5 – EN 573 Mandrel: Aluminum AlCuMg1 – EN 573</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 165 \text{ N/mm}^2</math> – EN 573 Component II: S280GD to S350GD – EN 10346</p>
<p><b>Pre-drill diameter:</b> <math>\varnothing 8,2 \text{ mm}</math></p>	

		Thickness Component II $t_{II}$ [mm]:										
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$			
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	0,56	0,56	0,56	0,56	0,56	0,56	0,56	0,56	0,56	0,56
		0,70	0,56	0,79	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91
		0,80	0,56	0,79	1,00	1,08	1,08	1,08	1,08	1,08	1,08	1,08
		0,90	0,56	0,79	1,00	1,37	1,40	1,40	1,40	1,40	1,40	1,40
		1,00	0,56	0,79	1,00	1,37	1,72	1,72	1,72	1,72	1,72	1,72
		1,20	0,56	0,79	1,00	1,37	1,72	2,35	2,35	2,35	2,35	2,35
		1,50	0,56	0,79	1,00	1,37	1,72	2,35	2,35	2,35	2,35	2,35
		$\geq 2,00$	0,56	0,79	1,00	1,37	1,72	2,35	2,35	2,35	2,35	2,35
	Tension load $N_{R,k}$ [kN]	0,89	1,30	1,60	1,80	2,10	2,40	4,10	4,10	4,10	4,10	

<b>Blind rivet</b>	<b>Annex 50</b>
RV6603-9xL-W RV6605-9xL-W	

	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg5 – EN 573 Mandrel: Aluminum AlCuMg1 – EN 573</p> <p>Component I: Aluminum alloy with <math>R_{m,min} = 215 \text{ N/mm}^2</math> – EN 573 Component II: S280GD to S350GD – EN 10346</p> <hr/> <p><b>Pre-drill diameter:</b> <math>\varnothing 8,2 \text{ mm}</math></p>
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		Thickness Component II $t_{II}$ [mm]:															
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$								
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	0,73	-	0,73	-	0,73	-	0,73	-	0,73	-	0,73	-			
		0,70	0,73	-	1,02	-	1,18	-	1,18	-	1,18	-	1,18	-			
		0,80	0,73	-	1,02	-	1,29	-	1,40	-	1,40	-	1,40	-			
		0,90	0,73	-	1,02	-	1,29	-	1,70	-	1,78	-	1,78	-			
		1,00	0,73	-	1,02	-	1,29	-	1,70	-	2,17	-	2,17	-			
		1,20	0,73	-	1,02	-	1,29	-	1,70	-	2,17	-	2,93	-			
		1,50	0,73	-	1,02	-	1,29	-	1,70	-	2,17	-	2,93	-			
		$\geq 2,00$	0,73	-	1,02	-	1,29	-	1,70	-	2,17	-	2,93	-			
	Tension load $N_{R,k}$ [kN]		0,89		1,30		1,60		1,80		2,10		2,40		4,10		4,10

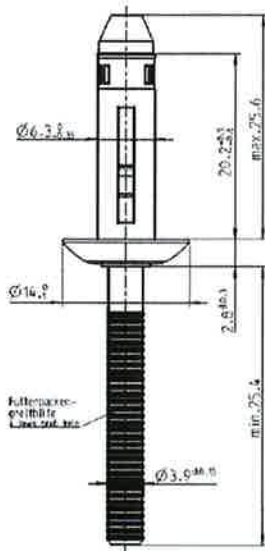
<b>Blind rivet</b>		
RV6603-9xL-W RV6605-9xL-W		<b>Annex 51</b>



	<p><b>Material</b></p> <p>Sleeve: Aluminum AlMg5 – EN 573 Mandrel: Aluminum AlCuMg1 – EN 573</p> <p>Component I: S280GD to S350GD – EN 10346 Component II: S280GD to S350GD – EN 10346</p>
	<p><b>Pre-drill diameter:</b> Ø 8,2 mm</p>

		Thickness Component II $t_{II}$ [mm]:								
		0,40	0,50	0,63	0,75	0,88	1,00	1,25	≥ 1,50	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,40	-	-	1,38	1,38	1,38	1,38	1,38	1,38
		0,50	-	1,34	1,69	1,69	1,69	1,69	1,69	1,69
		0,63	1,34	1,67	2,10	2,30	2,40	2,40	2,50	2,60
		0,75	1,34	1,67	2,10	2,70	2,80	2,80	2,90	2,90
		0,88	1,34	1,67	2,10	2,70	3,50	4,30	4,30	4,30
		1,00	1,34	1,67	2,10	2,70	3,50	4,40	4,40	4,40
		1,25	1,34	1,67	2,10	2,70	3,50	4,40	4,90	4,90
		≥ 1,50	1,34	1,67	2,10	2,70	3,50	4,40	4,90	5,30
	Tension load $N_{R,k}$ [kN]	0,40	-	-	1,30	1,36	1,36	1,36	1,36	1,36
		0,50	-	-	1,30	1,53	1,53	1,53	1,53	1,53
		0,63	0,57	0,89	1,30	1,60	1,70	1,70	1,70	1,70
		0,75	0,57	0,89	1,30	1,60	1,80	2,10	2,10	2,10
		0,88	0,57	0,89	1,30	1,60	1,80	2,10	2,40	2,60
		1,00	0,57	0,89	1,30	1,60	1,80	2,10	2,40	4,10
1,25	0,57	0,89	1,30	1,60	1,80	2,10	2,40	4,10		
≥ 1,50	0,57	0,89	1,30	1,60	1,80	2,10	2,40	4,10		

<b>Blind rivet</b>		<b>Annex 52</b>
RV6603-9xL-W RV6605-9xL-W		



**Material**

Sleeve: Monel NiCu30 – DIN 17754

Mandrel: Stainless steel (1.4567) – EN 10088

Component I: Aluminum alloy

with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy

with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573

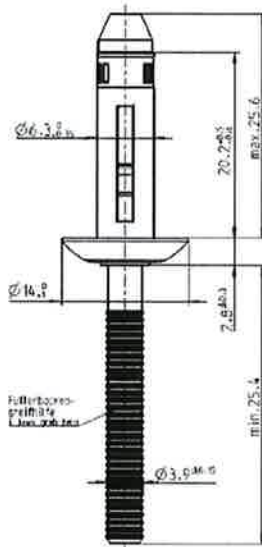
**Pre-drill diameter:**  $\varnothing 6,6 \text{ mm}$

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	$\geq 2,00$	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	1,03	1,03	1,03
		0,70	-	-	-	-	-	1,33	1,33	1,33
		0,80	-	-	1,48	1,48	1,48	1,48	1,48	1,48
		0,90	-	-	1,48	1,48	1,48	1,48	1,48	1,48
		1,00	-	-	1,48	1,48	1,48	1,48	1,48	1,48
		1,20	0,95	1,30	1,48	1,48	1,48	1,48	1,48	1,48
		1,50	0,95	1,30	1,48	1,48	1,48	1,48	1,48	1,48
	$\geq 2,00$	0,95	1,30	1,48	1,48	1,48	1,48	1,48	1,48	
	Tension load $N_{R,k}$ [kN]	0,24	0,42	0,51	0,61	0,71	0,71	0,71	0,71	

**Blind rivet**

RV6696-8-4

**Annex 53**



**Material**

Sleeve: Monel NiCu30 – DIN 17754  
Mandrel: Stainless steel (1.4567) – EN 10088

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

Component II: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573

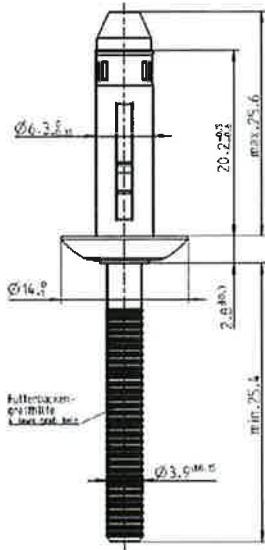
**Pre-drill diameter:** Ø 6,6 mm

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,70	0,80	0,90	1,00	1,20	1,50	≥ 2,00	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	1,34	1,34	1,34
		0,70	-	-	-	-	-	1,73	1,73	1,73
		0,80	-	-	1,92	1,92	1,92	1,92	1,92	1,92
		0,90	-	-	1,92	1,92	1,92	1,92	1,92	1,92
		1,00	-	-	1,92	1,92	1,92	1,92	1,92	1,92
		1,20	1,24	1,69	1,92	1,92	1,92	1,92	1,92	1,92
		1,50	1,24	1,69	1,92	1,92	1,92	1,92	1,92	1,92
		≥ 2,00	1,24	1,69	1,92	1,92	1,92	1,92	1,92	1,92
	Tension load $N_{R,k}$ [kN]		0,31	0,54	0,66	0,79	0,92	0,92	0,92	0,92

Blind rivet

RV6696-8-4

Annex 54



**Material**

Sleeve: Monel NiCu30 – DIN 17754  
Mandrel: Stainless steel (1.4567) – EN 10088

Component I: Aluminum alloy  
with  $R_{m,min} = 165 \text{ N/mm}^2$  – EN 573  
Component II: S280GD to S350GD – EN 10346

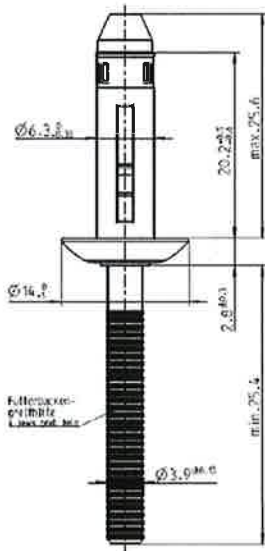
**Pre-drill diameter:** Ø 6,6 mm

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	1,03	1,03	1,03
		0,70	-	-	-	-	-	1,33	1,33	1,33
		0,80	-	-	-	1,48	1,48	1,48	1,48	1,48
		0,90	-	-	-	1,48	1,48	1,48	1,48	1,48
		1,00	-	-	-	1,48	1,48	1,48	1,48	1,48
		1,20	0,95	1,18	1,39	1,48	1,48	1,48	1,48	1,48
		1,50	0,95	1,18	1,39	1,48	1,48	1,48	1,48	1,48
		≥ 2,00	0,95	1,18	1,39	1,48	1,48	1,48	1,48	1,48
Tension load $N_{R,k}$ [kN]		0,78	1,33	1,84	1,84	1,84	1,84	1,84	1,84	

Blind rivet

RV6696-8-4

Annex 55



**Material**

Sleeve: Monel NiCu30 – DIN 17754  
Mandrel: Stainless steel (1.4567) – EN 10088

Component I: Aluminum alloy  
with  $R_{m,min} = 215 \text{ N/mm}^2$  – EN 573  
Component II: S280GD to S350GD – EN 10346

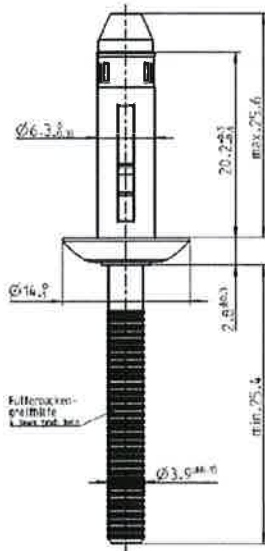
Pre-drill diameter: Ø 6,6 mm

			Thickness Component II $t_{II}$ [mm]:											
			0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00				
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	1,34	-	1,34	-	1,34	-	
		0,70	-	-	-	-	-	1,73	-	1,73	-	1,73	-	
		0,80	-	-	-	-	1,92	-	1,92	-	1,92	-	1,92	-
		0,90	-	-	-	-	1,92	-	1,92	-	1,92	-	1,92	-
		1,00	-	-	-	-	1,92	-	1,92	-	1,92	-	1,92	-
		1,20	1,24	-	1,53	-	1,81	-	1,92	-	1,92	-	1,92	-
		1,50	1,24	-	1,53	-	1,81	-	1,92	-	1,92	-	1,92	-
		≥ 2,00	1,24	-	1,53	-	1,81	-	1,92	-	1,92	-	1,92	-
	Tension load $N_{R,k}$ [kN]		0,78		1,33		1,84		1,84		1,84		1,84	

Blind rivet

RV6696-8-4

Annex 56



**Material**

Sleeve: Monel NiCu30 – DIN 17754

Mandrel: Stainless steel (1.4567) – EN 10088

Component I: S280GD to S350GD – EN 10346

Component II: S280GD to S350GD – EN 10346

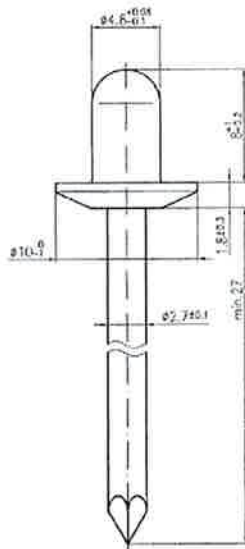
**Pre-drill diameter:** Ø 6,6 mm

		Thickness Component II $t_{II}$ [mm]:										
		0,40	0,50	0,63	0,75	0,88	1,00	1,25	≥ 1,50			
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,40	-	-	-	-	-	-	1,50	-	1,50	-
		0,50	-	-	-	-	-	-	2,15	-	2,15	-
		0,63	-	-	-	-	-	2,99	2,99	-	2,99	-
		0,75	-	-	-	-	-	3,09	3,09	-	3,09	-
		0,88	-	-	-	-	3,19	3,19	3,19	-	3,19	-
	Tension load $N_{R,k}$ [kN]	1,00	-	-	2,56	2,86	3,19	3,19	3,19	-	3,19	-
		1,25	1,34	1,87	2,56	2,86	3,19	3,19	3,19	-	3,19	-
		≥ 1,50	1,34	1,87	2,56	2,86	3,19	3,19	3,19	-	3,19	-
		0,40	-	-	-	-	-	-	1,42	-	1,42	-
		0,50	-	-	-	-	-	-	1,84	-	1,84	-
	0,63	-	-	-	-	-	1,84	-	1,84	-		
	0,75	-	-	-	-	-	1,84	-	1,84	-		
	0,88	-	-	-	-	1,84	1,84	-	1,84	-		
	1,00	-	-	1,33	1,84	1,84	1,84	-	1,84	-		
	1,25	0,54	0,78	1,33	1,84	1,84	1,84	-	1,84	-		
	≥ 1,50	0,54	0,78	1,33	1,84	1,84	1,84	-	1,84	-		

Blind rivet

RV6696-8-4

Annex 57



**Material**

Sleeve: Aluminum AlMg5 – EN 573  
Mandrel: Steel galvanised – EN 10016-2  
Stainless steel (1.4541) – EN 10088

Component I: S280GD to S350GD – EN 10346  
Component II: S280GD to S350GD – EN 10346

**Pre-drill diameter:**  $\varnothing 4,9$  mm

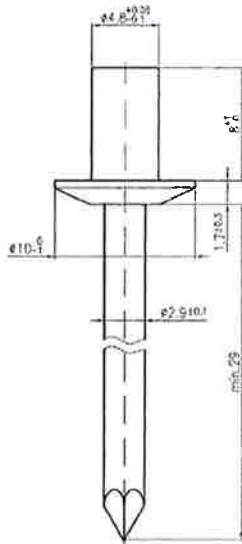
			Thickness Component II $t_{II}$ [mm]:												
			0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$					
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-	-			
		0,63	-	1,70	-	1,90	-	2,10	-	2,20	-	2,30	-	2,30	-
		0,75	-	1,80	-	1,90	-	2,10	-	2,20	-	2,40	-	2,40	-
		0,88	-	1,80	-	1,90	-	2,10	-	2,20	-	2,40	-	2,40	-
		1,00	-	1,80	-	1,90	-	2,10	-	2,20	-	2,40	-	2,40	-
		1,25	-	1,80	-	1,90	-	2,10	-	2,20	-	2,40	-	2,40	-
		1,50	-	1,80	-	1,90	-	2,10	-	2,20	-	2,40	-	2,40	-
		$\geq 2,00$	-	1,80	-	1,90	-	2,10	-	2,20	-	2,40	-	2,40	-
	Tension load $N_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-	-	-	-	-	
		0,63	-	0,80	-	1,00	-	1,30	-	1,40	-	1,40	-	1,40	-
0,75		-	0,80	-	1,00	-	1,30	-	1,50	-	1,50	-	1,50	-	
0,88		-	0,80	-	1,00	-	1,30	-	1,50	-	1,50	-	1,50	-	
1,00		-	0,80	-	1,00	-	1,30	-	1,50	-	1,50	-	1,50	-	
1,25		-	0,80	-	1,00	-	1,30	-	1,50	-	1,60	-	1,60	-	
1,50		-	0,80	-	1,00	-	1,30	-	1,50	-	1,60	-	1,60	-	
$\geq 2,00$	-	0,80	-	1,00	-	1,30	-	1,50	-	1,60	-	1,60	-		

**Blind rivet**

ATC-D-48xL  
ASC-D-48xL

**Annex 58**





**Material**

Sleeve: Stainless steel (1.4301) – EN 10088

Mandrel: Stainless steel (1.4021) – EN 10088

Component I: S280GD to S350GD – EN 10346

Component II: S280GD to S350GD – EN 10346

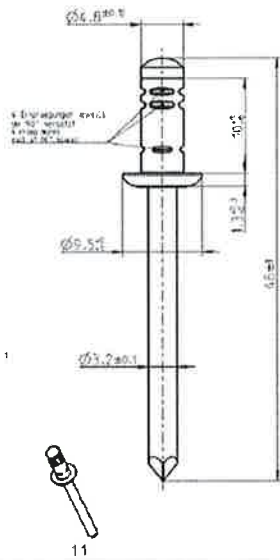
**Pre-drill diameter:**  $\varnothing 4,9$  mm

			Thickness Component II $t_{II}$ [mm]:									
			0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$		
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	0,69	0,69	0,69	0,69	0,69	0,69	-	-	-	-
		0,63	0,69	0,88	0,88	0,88	0,88	0,88	-	-	-	-
		0,75	0,69	0,88	1,06	1,06	1,06	1,06	-	-	-	-
		0,88	0,69	0,88	1,06	1,66	1,66	1,66	-	-	-	-
		1,00	0,69	0,88	1,06	1,66	2,21	2,21	-	-	-	-
		1,25	-	-	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	-	-	-	-	-
		$\geq 2,00$	-	-	-	-	-	-	-	-	-	-
	Tension load $N_{R,k}$ [kN]	0,50	0,05	0,10	0,14	0,17	0,19	0,19	-	-	-	-
		0,63	0,05	0,10	0,14	0,17	0,19	0,19	-	-	-	-
0,75		0,05	0,10	0,14	0,17	0,19	0,19	-	-	-	-	
0,88		0,05	0,10	0,14	0,17	0,19	0,19	-	-	-	-	
1,00		0,05	0,10	0,14	0,17	0,19	0,19	-	-	-	-	
1,25		-	-	-	-	-	-	-	-	-	-	
1,50		-	-	-	-	-	-	-	-	-	-	
$\geq 2,00$		-	-	-	-	-	-	-	-	-	-	

Blind rivet

SSC-D-48 x L

Annex 59



**Material**

Sleeve: Steel galvanised – EN 10016-2  
Stainless steel (1.4567) – EN 10088  
Mandrel: Steel galvanised – EN 10016-2  
Stainless steel (1.4541) – EN 10088

Component I: S280GD to S350GD – EN 10346  
Component II: S280GD to S350GD – EN 10346

Pre-drill diameter: Ø 5,2 mm

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00	
Thickness Component I $t_I$ [mm]:	Shear load $V_{Rk}$ [kN]	0,50	-	-	-	-	1,47	1,47	1,47	1,47
		0,63	-	-	-	-	1,66	1,66	1,66	1,66
		0,75	-	-	1,84	1,84	1,84	1,84	1,84	1,84
		0,88	-	-	1,84	2,32	2,32	2,32	2,32	2,32
		1,00	0,97	1,42	1,84	2,32	2,77	2,77	2,77	2,77
		1,25	0,97	1,42	1,84	2,32	2,77	2,77	2,77	2,77
		1,50	0,97	1,42	1,84	2,32	2,77	2,77	2,77	2,77
		≥ 2,00	0,97	1,42	1,84	2,32	2,77	2,77	2,77	2,77
	Tension load $N_{Rk}$ [kN]	0,50	-	-	-	-	1,17	1,17	1,17	1,17
		0,63	-	-	-	-	1,35	1,35	1,35	1,35
0,75		-	-	0,94	1,15	1,35	1,35	1,35	1,35	
0,88		-	-	0,94	1,15	1,35	1,35	1,35	1,35	
1,00		0,41	0,69	0,94	1,15	1,35	1,35	1,35	1,35	
1,25		0,41	0,69	0,94	1,15	1,35	1,35	1,35	1,35	
1,50		0,41	0,69	0,94	1,15	1,35	1,35	1,35	1,35	
≥ 2,00		0,41	0,69	0,94	1,15	1,35	1,35	1,35	1,35	

**Blind rivet**

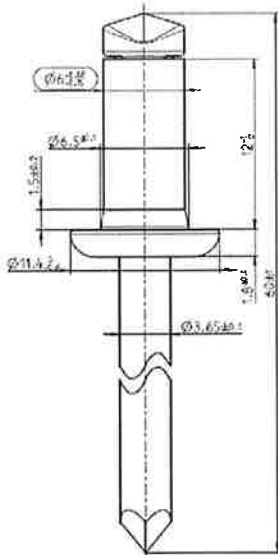
G-BULB-SSO-D-48xL  
G-BULB-TTO-D-48xL

**Annex 60**

	<p><b>Material</b></p> <p>Sleeve: Steel galvanised – EN 10016-2 Stainless steel (1.4567) – EN 10088</p> <p>Mandrel: Steel galvanised – EN 10016-2 Stainless steel (1.4541) – EN 10088</p> <p>Component I: S280GD to S350GD – EN 10346 Component II: S280GD to S350GD – EN 10346</p>
	<p><b>Pre-drill diameter:</b> Ø 6,8 mm</p>

		Thickness Component II $t_{II}$ [mm]:														
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	≥ 2,00							
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	1,86	-	1,86	-				
		0,63	-	-	-	-	-	-	2,82	-	2,82	-				
		0,75	-	-	-	-	-	3,70	-	3,70	-	3,70	-			
		0,88	-	-	-	-	-	3,98	-	3,98	-	3,98	-			
		1,00	-	-	-	-	4,24	-	4,24	-	4,24	-	4,24	-		
		1,25	-	-	2,20	-	3,26	-	4,24	-	4,24	-	4,24	-		
		1,50	1,37	-	1,80	-	2,20	-	3,26	-	4,24	-	4,24	-		
		≥ 2,00	1,37	-	1,80	-	2,20	-	3,26	-	4,24	-	4,24	-		
	Tension load $N_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	1,23	-	1,23	-			
		0,63	-	-	-	-	-	-	-	1,23	-	1,23	-			
		0,75	-	-	-	-	-	-	1,23	-	1,23	-	1,23	-		
		0,88	-	-	-	-	-	-	1,23	-	1,23	-	1,23	-		
		1,00	-	-	-	-	-	1,23	-	1,23	-	1,23	-	1,23	-	
		1,25	-	-	0,81	-	1,03	-	1,23	-	1,23	-	1,23	-	1,23	-
		1,50	0,45	-	0,69	-	0,81	-	1,03	-	1,23	-	1,23	-	1,23	-
		≥ 2,00	0,45	-	0,69	-	0,81	-	1,03	-	1,23	-	1,23	-	1,23	-

<b>Blind rivet</b>		<b>Annex 61</b>
<p>G-BULB-SSO-D-64xL G-BULB-TTO-D-64xL</p>		



**Material**

Sleeve: Steel galvanised – EN 10016-2

Mandrel: Steel galvanised – EN 10016-2

Component I: S280GD to S350GD – EN 10346

Component II: S280GD to S350GD – EN 10346

**Pre-drill diameter:**  $\phi 6,2$  mm

		Thickness Component II $t_{II}$ [mm]:								
		0,50	0,63	0,75	0,88	1,00	1,25	1,50	$\geq 2,00$	
Thickness Component I $t_I$ [mm]:	Shear load $V_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-	-
		0,63	-	-	-	-	-	-	-	-
		0,75	-	-	-	-	-	-	-	-
		0,88	-	-	-	-	-	-	-	-
		1,00	-	-	-	-	-	-	-	-
		1,25	-	-	-	-	-	-	-	-
		1,50	-	-	-	-	-	4,30	4,30	-
		$\geq 2,00$	-	-	-	-	-	4,30	4,30	-
		Tension load $N_{R,k}$ [kN]	0,50	-	-	-	-	-	-	-
			0,63	-	-	-	-	-	-	-
		0,75	-	-	-	-	-	-	-	
		0,88	-	-	-	-	-	-	-	
		1,00	-	-	-	-	-	-	-	
		1,25	-	-	-	-	-	-	-	
		1,50	-	-	-	-	-	2,45	2,45	
		$\geq 2,00$	-	-	-	-	-	2,45	2,45	

Blind rivet

ST/ST 6xL K11

Annex 62