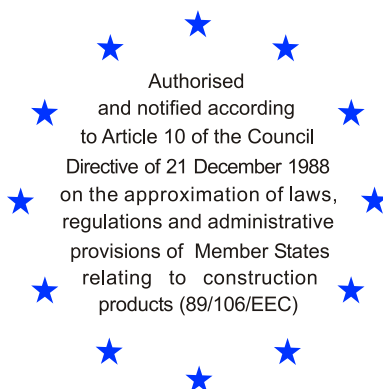


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Europeiskt Tekniskt Godkännande European Technical Approval

ETA-11/0380

Handelsnamn

Trade name

Glasräcke med Pauli + Sohn klämfästen

Glazed railing kit with Pauli + Sohn clamps

Innehavare

Holder of approval

Pauli + Sohn GmbH

Industristraße 20

51597 Morsbach-Lichtenberg

Produktbeskrivning och avsedd användning

Generic type and use
of construction product

Skyddsräcken av glas

Glazing guardrail kit

Giltighetstid

Validity:

från
from
t o m
to

2012-06-27

27.06.2012

2016-10-31

31.10.2016

Detta ETA ersätter:

This ETA replaces:

ETA-11/0380, giltigt från 2011-10-31 till 2016-10-31

ETA-11/0380, validity from 31.10.2011 till 31.10.2016

Tillverkningsställe

Manufacturing plant

Pauli + Sohn GmbH

Industristraße 20, 51597 Morsbach-Lichtenberg

Godkännandet innehåller

This Approval contains

47 Sidor inklusive bilagor

47 Pages including annexes



European Organisation for Technical Approvals

I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European Technical Approval is issued by SITAC 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 products¹, modified by Council Directive 93/68/EEC² and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council³;
 - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex to Commission Decision 94/23/EC⁴;
- 2 SITAC 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/ laid down in the context/ of this European Technical Approval
- 4 This European Technical Approval may be withdrawn by SITAC, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.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 SITAC. 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 English. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

1 Official Journal of the European Communities N° L 40, 11.2.1989, p. 12

2 Official Journal of the European Communities N° L 220, 30.8.1993, p. 1

3 Official Journal of the European Union N° L 284, 31.10.2003, p. 25

4 Official Journal of the European Communities N° L 17, 20.1.1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of products and intended use

1.1 Definition of the construction product (kit)

The Glazing Guardrail Kit is composed of a glass pane, which is linked to metallic members of a guardrail by glass clamps. The definition of the kit includes a guardrail with handrail, glass pane with or without holes and glass clamps.

Relevant to ETA: glass clamps and glazing.

NOT relevant to ETA: Handrail, posts and all metallic members of the guardrail except the glass clamps.

The anchorage of the guardrail to the structure of the building is not part of the kit.

1.2 Intended use

This ETA covers a Glazing guardrail kit for use as a protective barrier for internal or external application.

The provisions made in this European Technical Approval are based on an assumed working life of the Glazing guardrail kit of 25 years, provided that the conditions laid down in sections 4.2 / 5.1 / 5.2 for the packaging / transport / storage / installation / use / maintenance / repair are met. 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 products and methods of verification

2.1 Characteristics of the product

2.1.1 Glazing guardrail kit

The glass pane is fastened with glass clamps which are screwed into the metallic member of the guardrail. Elastic spacers of EPDM are used between the glass and the glass clamps. Locking pins or locking plates can be used as mechanical protection to ensure that the glass pane doesn't slip.

There are three kinds of installation

- Installation type 1: Installation without locking against sliding of the glass panes.
- Installation type 2: Installation with the possibility of using locking pins at the upper and lower glass clamps.
- Installation type 3: Installation with the possibility of using locking plates at the lower glass clamps.

Annex 1 shows the different installation types together with possible glass clamps. Glazing with locking against sliding can be mounted over and in front of the floor panel. Glazing without locking against sliding must be assembled over the floor panel.

2.1.2 Glass

General requirements:

- The glass type has to be chosen following the respective national provisions for the intended use (Annex 2).
- Glass panes have to be plane; all edges have to be polished.
- The basic glass to be used for the manufacture of the glass products is float glass of soda lime silicate glass according to EN 572-2.

Possible glass types for the intended application are:

- 1) Float glass (SPG) according to EN 572-2 and national provisions.
- 2) Thermally toughened safety glass (ESG) according to EN 12150-1 and national provisions.
- 3) Heat strengthened glass (TVG) according to EN 1863-1 and national provisions.
- 4) Heat soaked thermally toughened safety glass (ESG-H) according to EN 14179-1 and according to additional national provisions.
- 5) Laminated glass (VSG) according to EN 14449 and respective national provisions. The glass pane is made up of single glass referred to in paragraph 1)-3) above which are laminated together with an interlayer film of at least 0,76 mm thick Polyvinyl-Butyral (PVB).

National provisions for Germany regarding glass types are presented in Annex 2.

2.1.3 Glass clamps

The glass clamps consists of two parts screwed together by clamping screws. Elastic spacers of EPDM are used between the glass and the glass clamps. The glass clamps are mounted in the metallic guardrail member with mounting screws.

- The metal parts of the clamps are made of zinc alloy ZP0410 according to EN 12844 or stainless steel with material No 1.4401 according to EN 10088-1.
- Clamping screws M6x16 according to EN ISO 10642 are made of stainless steel with material No 1.4301 according to EN 10088-1 for the glass clamps of zinc alloy and stainless steel with material number 1.4401 according to EN 10088-1 for the glass clamps of stainless steel.
- Locking pins and locking plates are made of stainless steel with material No 1.4301 according to EN 10088-1.
- Mounting screws M8x20 according to EN ISO 4762 are made of stainless steel with material No 1.4301 according to EN 10088-1 for the glass clamps of zinc alloy and stainless steel with material number 1.4401 according to EN 10088-1 for the glass clamps of stainless steel.
- Spacers are made from EPDM. Detailed material specification is deposited at SITAC.

Detailed description of the glass clamps are presented in Annex 3.

2.2 Methods of verification

The product characteristics methods of verification and assessment criteria which are relevant for the fitness of the glazing guardrail kit for the intended use referred to in 1.2 are given in Table 2.1.

Table 2.1 Product characteristics and methods of verification and assessment

Nb	Product characteristic	Performance
Essential Requirement (ER 1): Mechanical resistance and stability		
		Not relevant
Essential Requirement (ER 2): Safety in case of fire		
		Not applicable on the kit
Essential Requirement (ER 3): Hygiene, health and environment		
	Content and/or release of dangerous substances	No dangerous substances. Note: In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.
Essential Requirement (ER 4): Safety in use		
	Design height	Dimensions for installation depending on installation type, glass and glass clamps are presented in Annex 4. Additional or deviant national provisions must be respected.
	Imposed load resistance of the handrail	The handrail of the Glazing Guardrail Kit has to be verified according to national provisions for each application on site.
	Impact resistance	The impact resistance shall be determined taking into account national regulations. Germany: Passed (the installations according to Annex 1, 3, 4 are classified as Category C according to “Technische Regeln für die Verwendung von absturzsichernden Verglasungen (TRAV) – Schlussfassung Januar 2003”).
	Wind resistance	For external application, the wind resistance of the guardrail shall be calculated case by case, using a structural analysis. The regulations of the respective Member State in which the glazing guardrail kit will be used shall be observed. Germany: Verified glass thickness for external use depending on wind load and the width of glass panes are shown in Annex 5.
	Safety against personal injuries by contact	Passed (all edges polished)

Essential Requirement (ER 5): Protection against noise		
		Not relevant
Essential Requirement (ER 6): Energy economy and heat retention		
		Not relevant
General aspects relating to fitness for use		
	Serviceability	/

The characteristics of the components of the assembled system, methods of verification and assessment criteria which are relevant for the fitness of glazing guardrail kit for the intended use are given in Table 2.2 and Table 2.3.

Table 2.2 Characteristics of glass and methods of verification and assessment

Nb	Product characteristic	Performance
Essential Requirement (ER 2): Safety in case of fire		
	Reaction to fire	NPD
Essential Requirement (ER 4): Safety in use		
	Glass classification	See section 2.1.2.
	Strength resistance	The glass resistance shall be determined taking into account prEN 13474 and/or national regulations. In Annex 5 design values according to German requirements are given.
General aspects relating to fitness for use		
	Durability	Conformity to EN 1863, EN 14179 and EN 14449.

Table 2.3 Characteristics of glass clamps and methods of verification and assessment

Nb	Product characteristic	Performance
Essential Requirement (ER 2): Safety in case of fire		
	Reaction to fire	According to Commission Decision 96/603/EC (as amended) the glass clamps will be classified in category A1.
Essential Requirement (ER 4): Safety in use		
	Load capacity	Characteristic values of load capacity for the glass clamps are given in Annex 6.
General aspects relating to fitness for use		
	Durability	Atmosphere must be chosen according to the restrictions given for the materials in section 2.1.3.

3 Evaluation and attestation of conformity and CE marking

3.1 System of attestation of conformity

The system of attestation of conformity laid down in the decision 96/579/CE of the European Commission shall apply to the Glazing guardrail kit.

The system of attestation of conformity is defined as follows:

System 1: Certification of the conformity of the product by an approved certification body on the basis of:

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

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

3.2 Responsibilities

3.2.1 Tasks of 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 manufacturer may only use constituent materials stated in the technical documentation of 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 within SITAC.⁵

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

⁵ The "control plan" is a confidential part of the European Technical Approval and only handed over to the approved body or bodies involved in the procedure of attestation of conformity. See section 3.2.2.

3.2.1.2 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body (bodies) which is (are) approved for the tasks referred to in section 3.1 in the field of Glazing guardrail kit 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 or bodies involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of the European Technical Approval ETA-11/0380 issued on 31.10.2016.

3.2.2 Tasks for the approved bodies

The approved bodies shall perform the

- initial type-testing of the product,
- 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 (bodies) shall retain the essential points of its (their) actions referred to above and state the results obtained and conclusions drawn in (a) written report (reports).

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the product 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 SITAC without delay.

3.3 CE marking

The CE marking shall be affixed on packaging and accompanying commercial document. 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 of conformity for the product,
- the number of the European Technical Approval,

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

4.1 Manufacturing

The glass panes and the glass clamps are to be manufactured in accordance with the definitions given in section 2.1.

The European Technical Approval is issued for the product on the basis of agreed data/information, deposited with SITAC, 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 SITAC before the changes are introduced. SITAC will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

4.2 Installation

Prior to the installation all components must be checked for defects. Damaged components should be exchanged without delay.

The application has to be carried out according to the manufacturer's instructions. The installation should only be carried out by professionals who have been instructed for this kind of work by the manufacturer. Contact between glass and metal must be avoided permanently. The conformity of the installed Glazing Guardrail Kit with the provisions of the ETA is attested by the executing assembler.

5 Indications to the manufacturer

5.1 Packaging, transport and storage

The manufacturer shall take suitable precautions during packing, transport and storage to ensure that the elements are protected against damage by, e.g. breakage, scratching, splitting or contamination.

Transportation of the glass elements is only to be carried out using suitable methods and equipment so as to exclude any damage to the glass edges. Storage on construction sites must ensure protection to edges of the glass panes.

5.2 Use, maintenance, repair

Cleaning of the components shall be carried out according to the manufacturer's recommendations.

Damaged glass panes or damaged clamps have to be replaced immediately. In the case of replacing a damaged or destroyed glass pane only components in accordance with the provisions of this ETA shall be used. The installation shall be in compliance with this ETA.

5.3 Design

The design of the Glazing guardrail kit has to follow all national provisions for the intended field of application concerning e.g. glass type, end use conditions and type of breakage.

All members not included in this ETA, as specified in chapter 1, have to be verified separately according to European and national standards.

The design of the substructure as well as the handrail has to secure a restraint-free support of the glass pane. No additional loads are to be applied on the glazing pane due to e.g. deformations of the substructure.

On behalf of SITAC

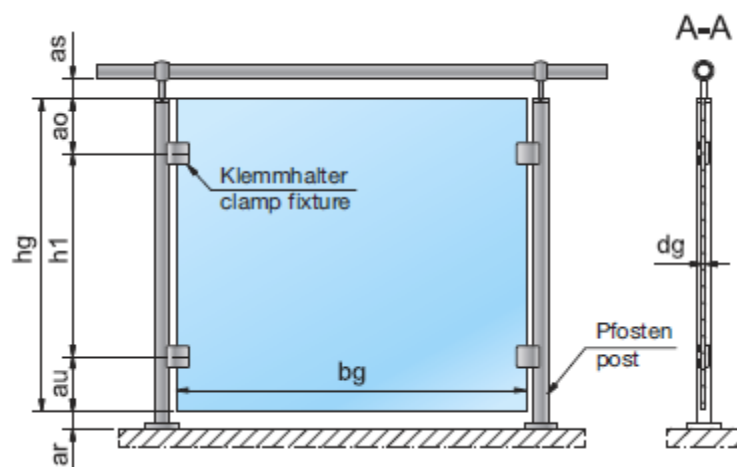
Borås, 27 June 2012




Lennart Månsson

ANNEX 1 – Installation types

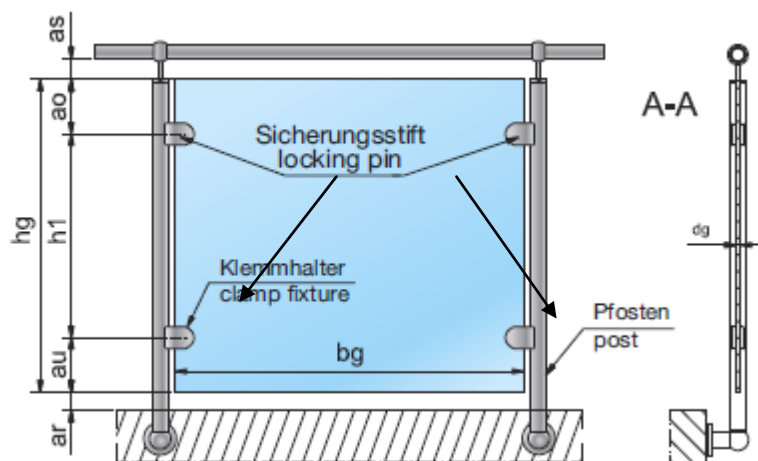
Installation type 1:



All clamps without locking pins or locking plates:

Art. Nr. item no.	Art. Nr. item no.
 4800 4801 4802	 4808 4809 4810 4811 4812 4842 4843 4852 4853 4854 9300 9301 9302 9303 9304 9305 9306 9307 9308 9309
 4804 4805 4806 4807 9002 9006	 4813 4814 4816 4817 4821 4827 9013 9014 9016 9017 9320 9321 9322 9323 9324 9325 9326 9327 9328 9329
 4841 4845 4846 4847 4848 4859 9044 9045 9047 9048 9341 9343 9344 9347 9348 9349	 11110 11112 11113 11117 11118 11119
 4890 4891 4893 4894 4896 4897 9082 9086	 9511 9512 9513 9521 9522 9523 9711 9712 9713 9721 9722 9723
 9330 9331 9332 9333 9334 9335 9336 9337 9338 9339	 4831 4832 4836 4837

Installation type 2:



All clamps with locking pins:

Sicherungsstift bei oberen und unteren Klemmbefestigungen erforderlich | locking pin is required with upper and lower clamp fixtures



Art. Nr. | item no.

4821 4827 9013 9014 9016 9017



9320 9321 9324 9325 9328 9329

Sicherungsstift nur bei oberen Klemmbefestigungen erforderlich | locking pin is required in the case of upper clamp fixtures only

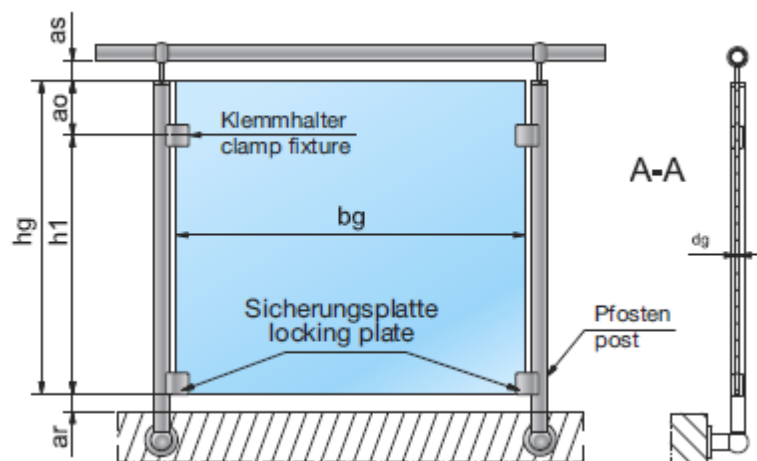


Art. Nr. | item no.

9511 9512 9513 9711 9712 9713



9521 9522 9523 9721 9722 9723

Installation type 3:**All clamps with locking plates:**

<u>Art. Nr. item no.</u>	<u>Art. Nr. item no.</u>
 4800 4801 4802	 4890 4891 4893 4894 4896 4897 9082 9086
 4804 4805 4806 4807 9002 9006	 9330 9331 9332 9333 9334 9335 9336 9337 9338 9339
 4841 4845 4846 4847 4848 4859 9044 9045 9047 9048 9341 9343 9344 9347 9348 9349	

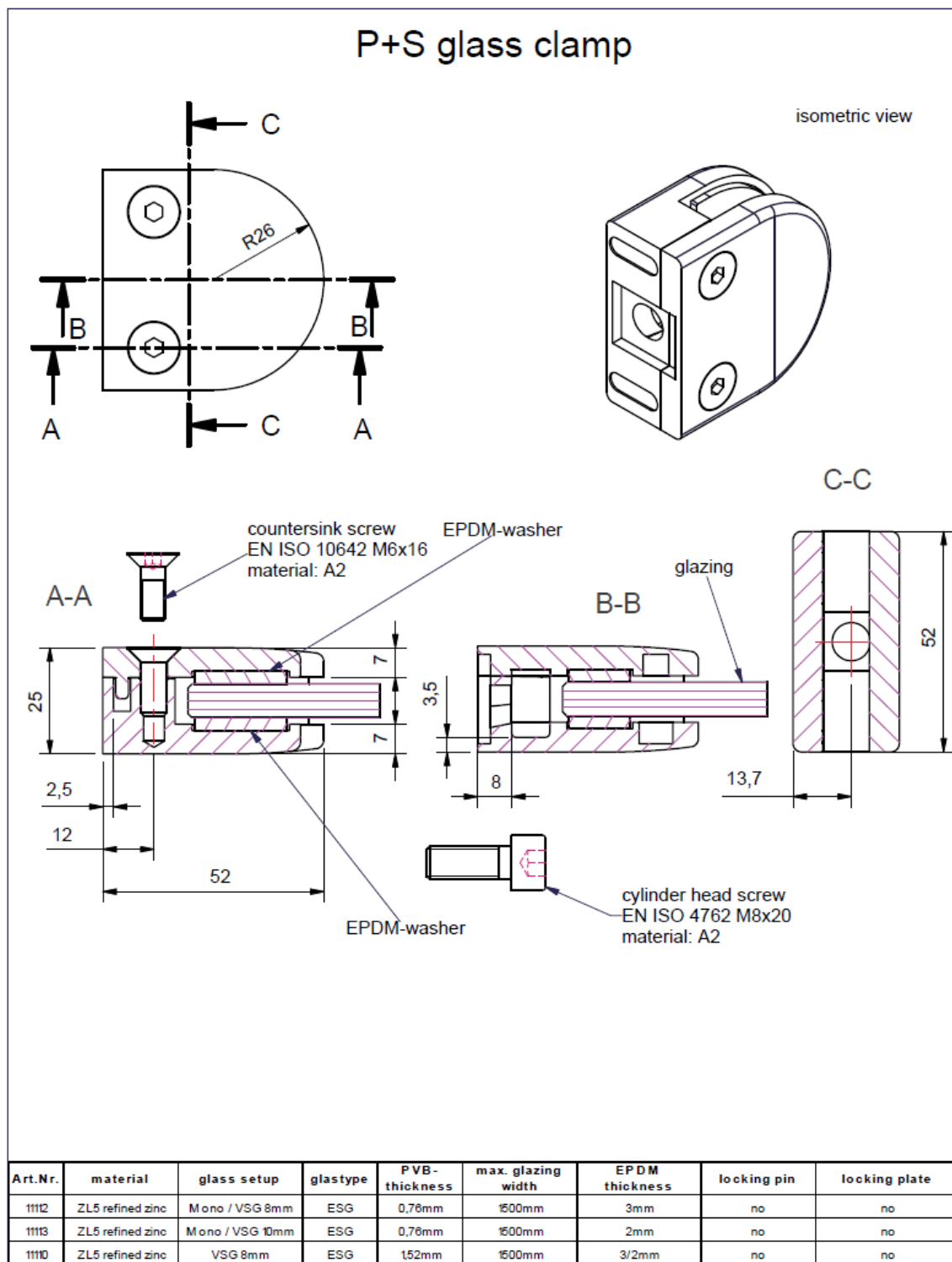
ANNEX 2 – National provisions for glass

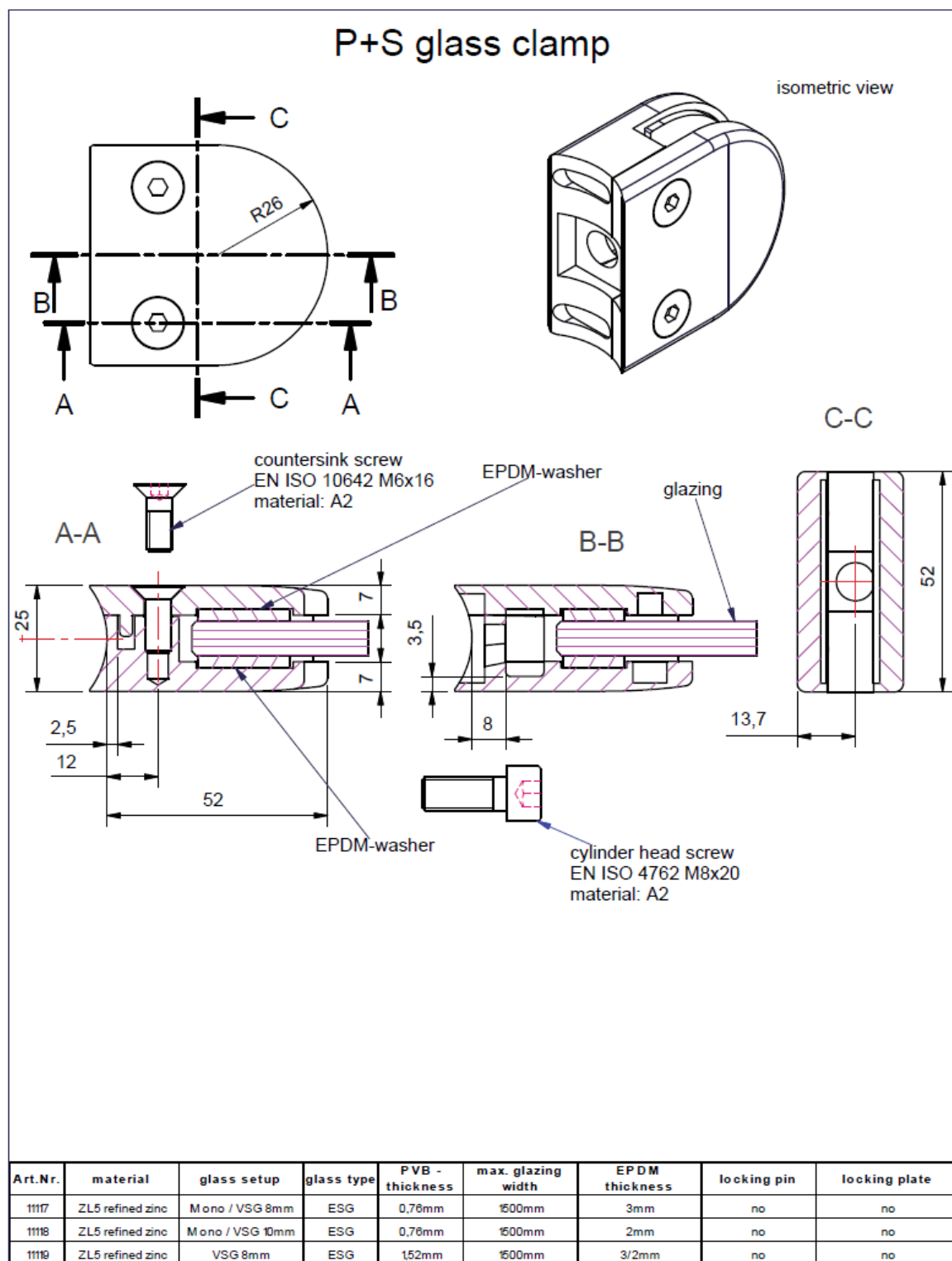
Germany:

The Glass type is to be chosen depending on the intended application according to the German regulations “Technische Regeln für die Verwendung von absturzsichernden Verglasungen (TRAV) – Schlussfassung Januar 2003” and “Technische Regeln für die Bemessung und die Ausführung punktförmig gelagerter Verglasungen (TRPV) – Schlussfassung August 2006“.

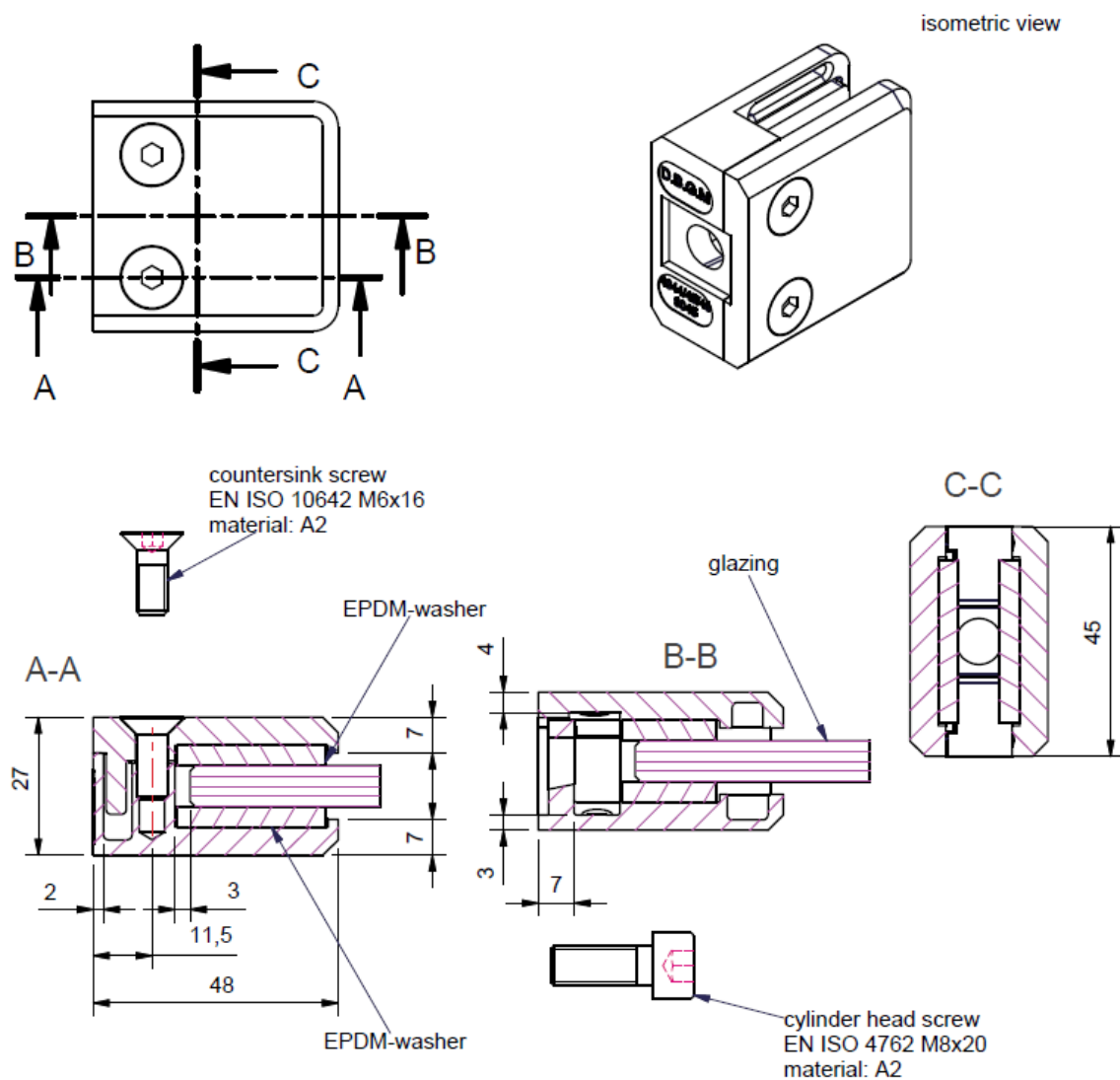
- Basic soda lime silicate glass (Float glass): e.g. SPG according to ”Bauregelliste A Teil 1 No. 11.10”.
- Thermally toughened soda lime silicate safety glass : e.g. ESG according to ”Bauregelliste A Teil 1 No. 11.12”.
- Heat soaked thermally toughened soda lime silicate safety glass : e.g. ESG-H according to ”Bauregelliste A Teil 1 No. 11.13”.
- Heat strengthened soda lime silicate glass: e.g. TVG according to technical approval.
- Laminated safety glass : e.g. VSG according to ”Bauregelliste A Teil 1 No. 11.14”.

ANNEX 3 – Glass clamps





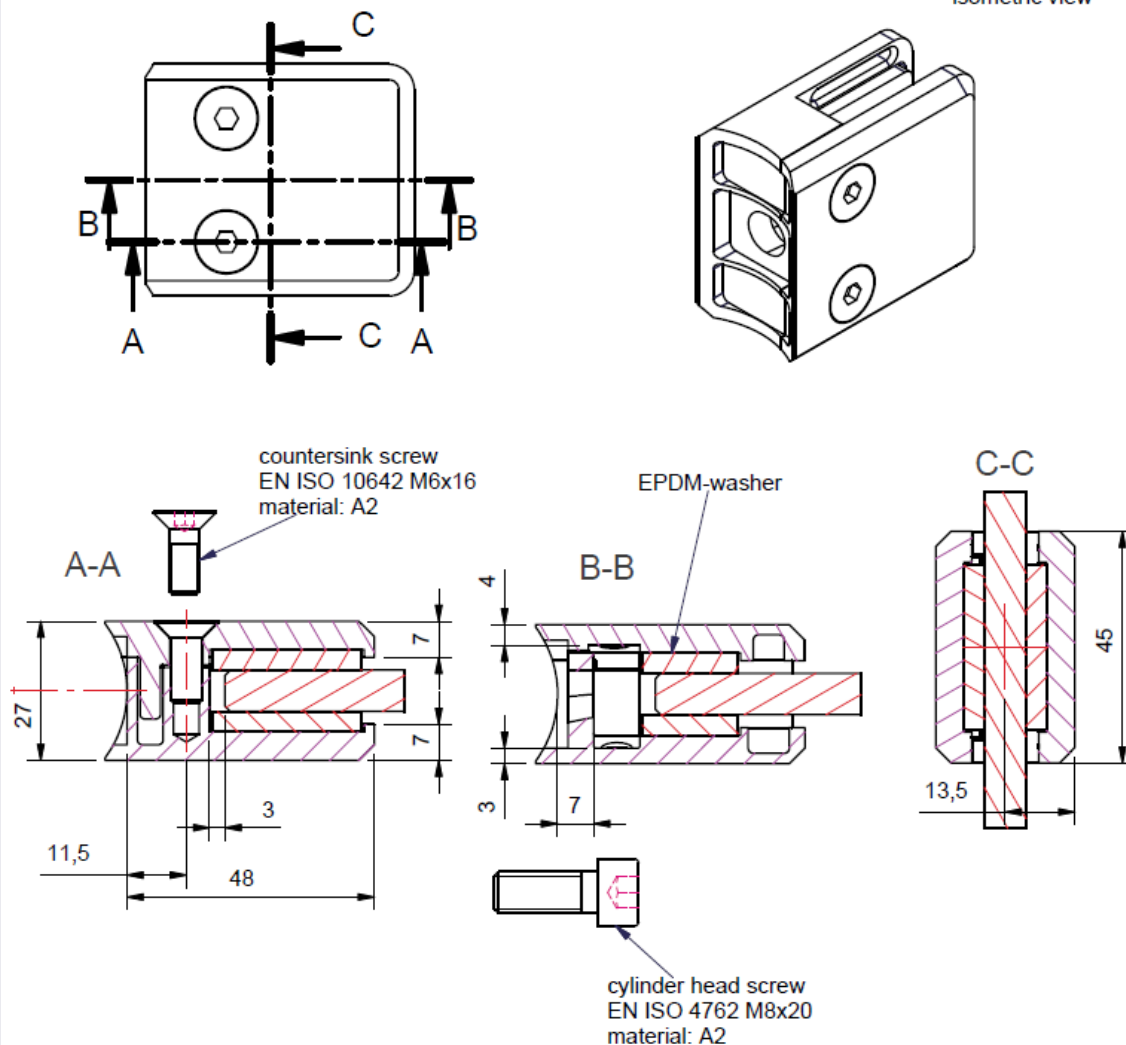
P+S glass clamp



Art.Nr.	material	glass setup	glass type	PVB - thickness	max. glazing width	EPDM thickness	locking pin	locking plate
4845	ZL5 refined zinc	Mono / VSG 8mm	ESG	0,76mm	1600mm	4mm	no	yes or no
4841	ZL5 refined zinc	VSG 8mm	ESG	1,52mm	1600mm	4/3mm	no	yes or no
4848	ZL5 refined zinc	Mono / VSG 10mm	ESG	0,76mm	1600mm	3mm	no	yes or no
9044	ZL5 refined zinc	VSG 10mm	ESG	1,52mm	1600mm	3/2mm	no	yes or no
9044	ZL5 refined zinc	VSG 10mm	SPG/TVG	1,52mm	1600mm	3/2mm	no	no
9045	ZL5 refined zinc	Mono / VSG 12mm	ESG	0,76mm	1600mm	2mm	no	yes or no

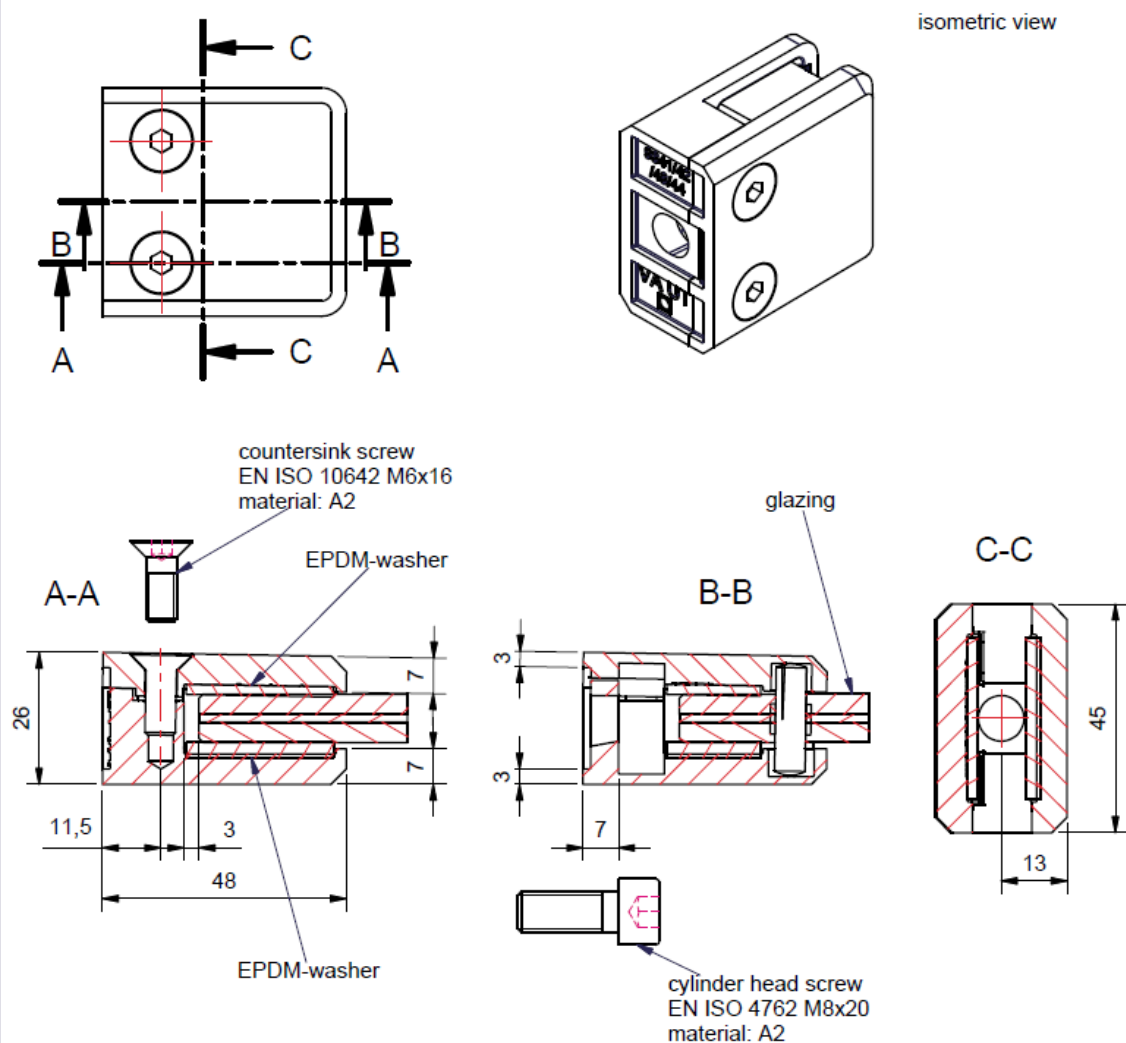
P+S glass clamp

isometric view



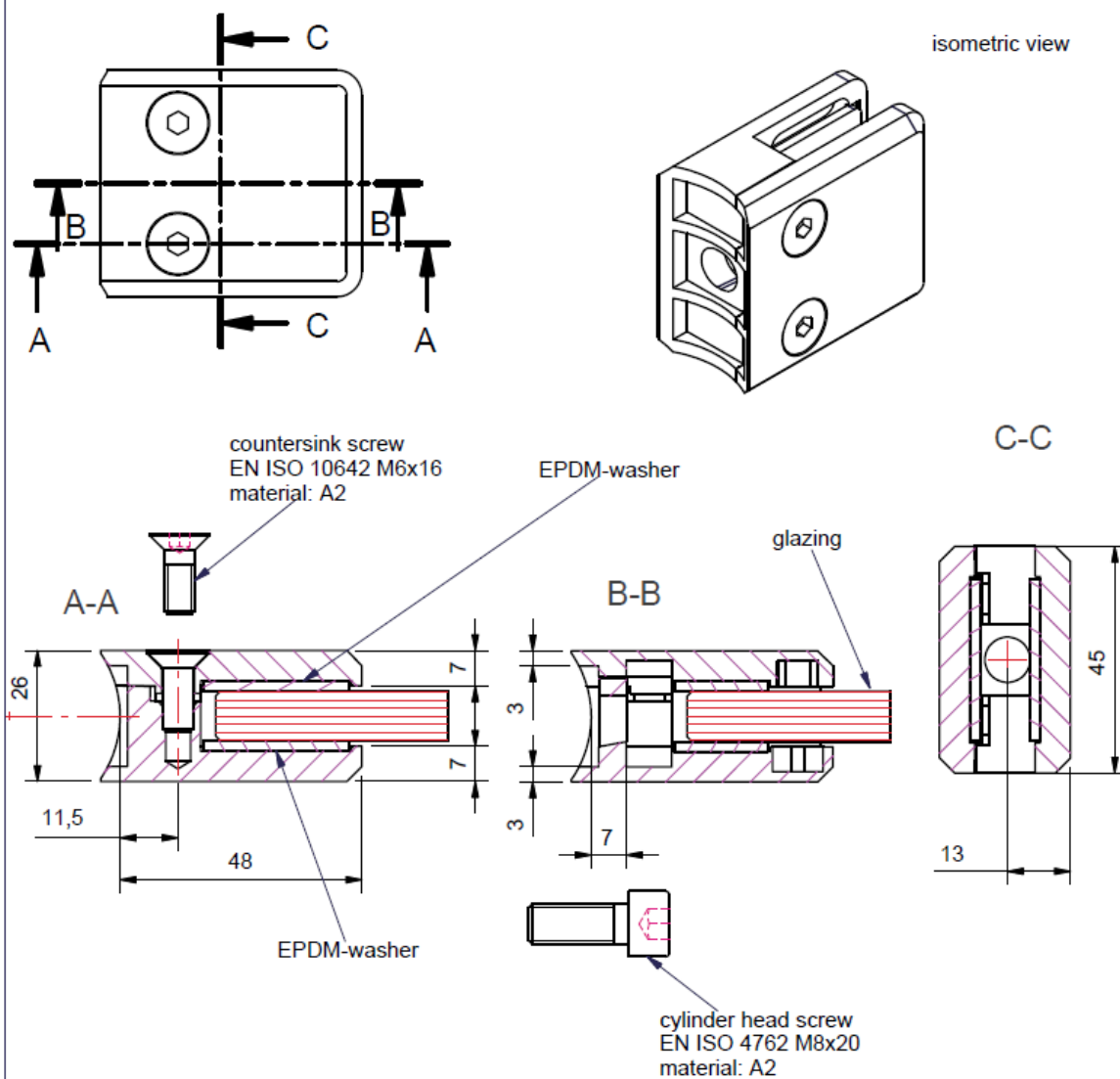
Art.Nr.	material	glass setup	glass type	PVB - thickness	max. galzing width	EPDM thickness	locking pin	locking plate
4847	ZL5 refined zinc	Mono / VSG 8mm	ESG	0,76mm	1500mm	4mm	no	yes or no
4859	ZL5 refined zinc	VSG 8mm	ESG	1,52mm	1500mm	4/3mm	no	yes or no
4848	ZL5 refined zinc	Mono / VSG 10mm	ESG	0,76mm	1500mm	3mm	no	yes or no
9047	ZL5 refined zinc	VSG 10mm	ESG	1,52mm	1500mm	3/2mm	no	yes or no
9047	ZL5 refined zinc	VSG 10mm	SPG/TVG	1,52mm	1500mm	3/2mm	no	no
9048	ZL5 refined zinc	Mono / VSG 12mm	ESG	0,76mm	1500mm	2mm	no	yes or no

P+S glass clamp

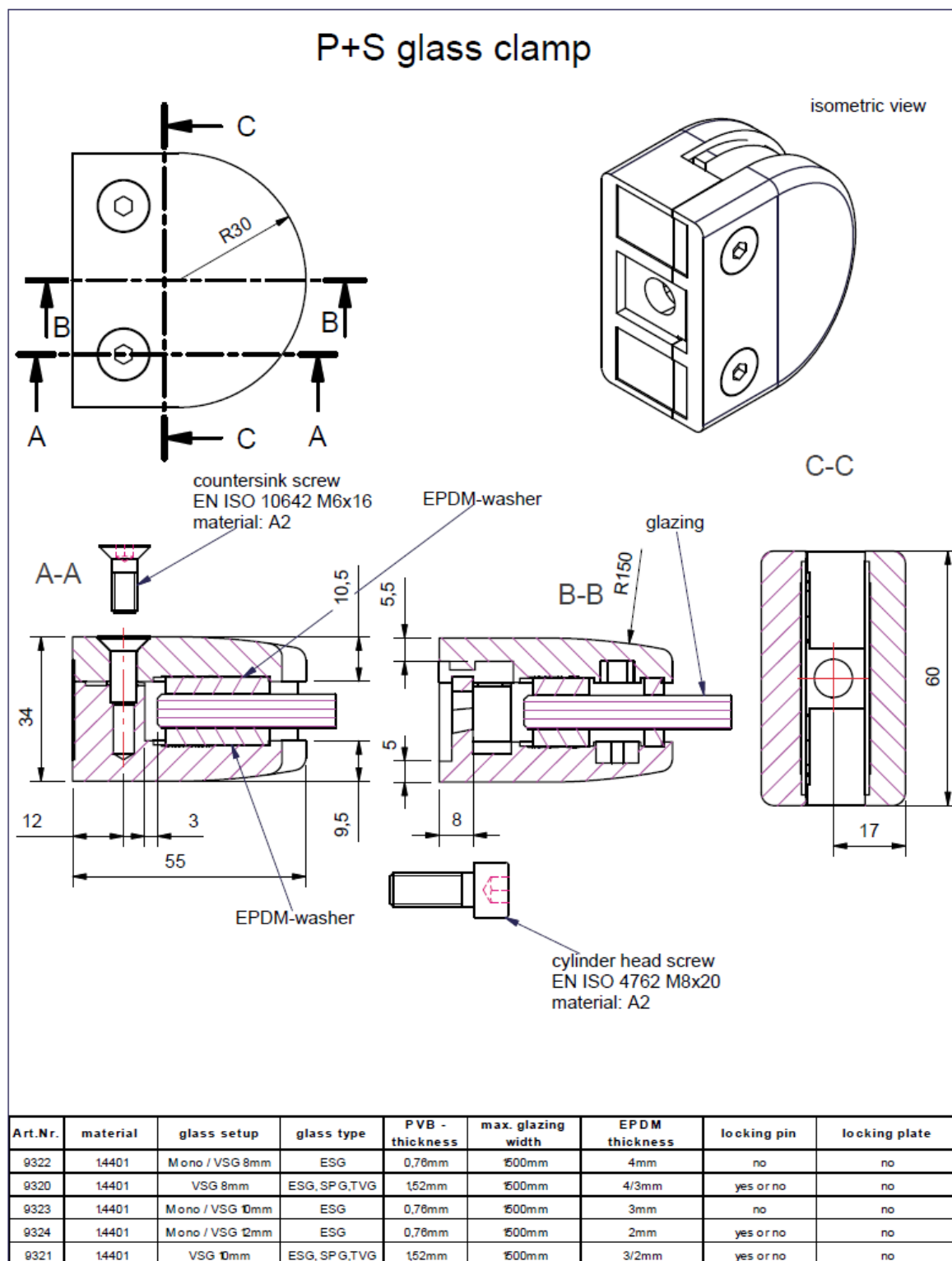


Art.Nr.	material	glass setup	glass type	PVB - thickness	max. glazing width	EPDM thickness	locking pin	locking plate
9343	14401	Mono / VSG 8mm	ESG	0,76mm	≤600mm	3mm	no	yes or no
9344	14401	Mono / VSG 10mm	ESG	0,76mm	≤600mm	2mm	no	yes or no
9341	14401	VSG 8mm	ESG	1,52mm	≤600mm	3/2mm	no	yes or no

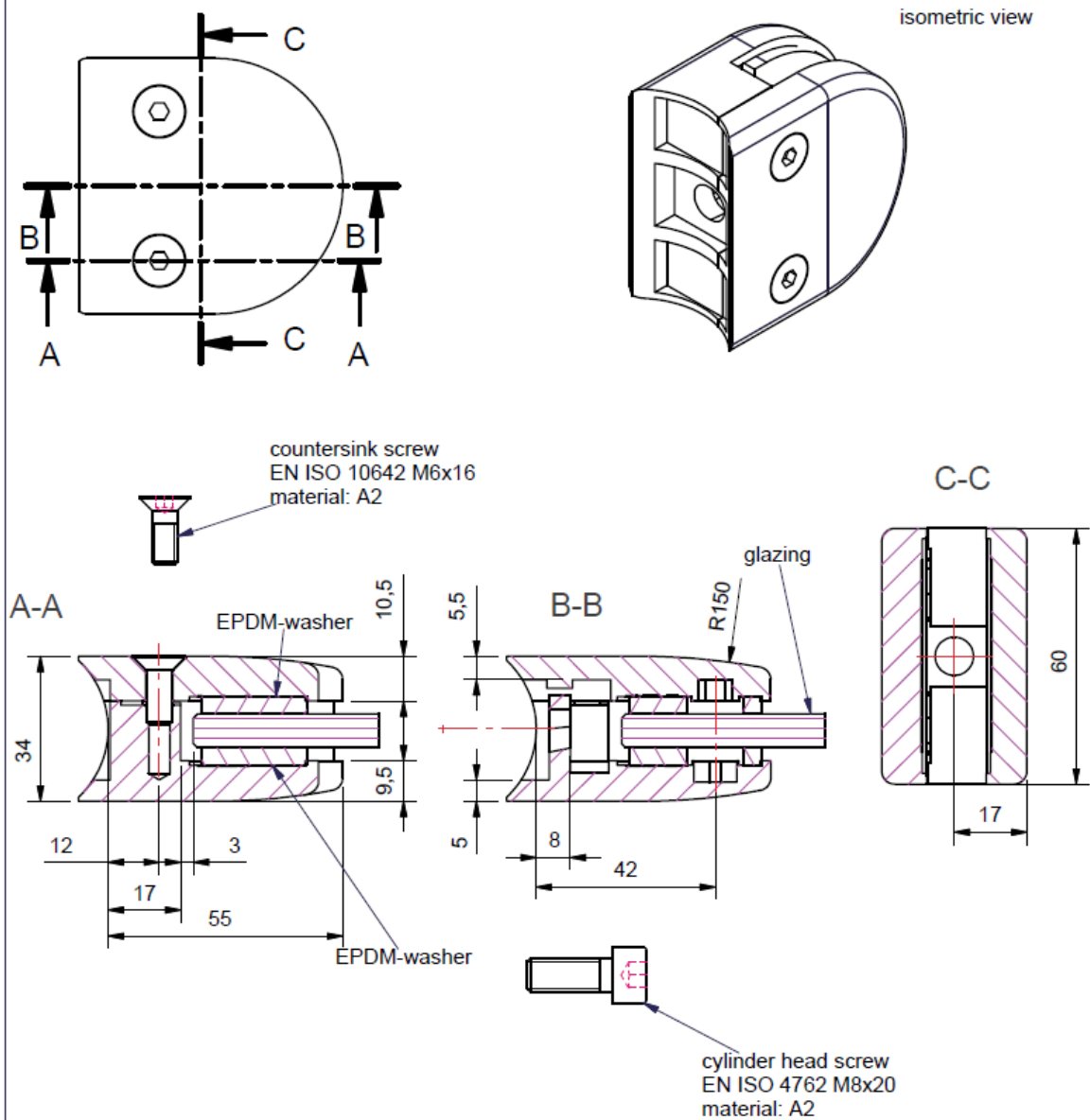
P+S glass clamp



Art.Nr.	material	glass setup	glass type	PVB - thickness	max. glazing width	EPDM thickness	locking pin	locking plate
9347	14401	Mono / VSG 8mm	ESG	0,76mm	≤600mm	3mm	no	yes or no
9348	14401	Mono / VSG 10mm	ESG	0,76mm	≤600mm	2mm	no	yes or no
9349	14401	VSG 8mm	ESG	1,52mm	≤600mm	3/2mm	no	yes or no

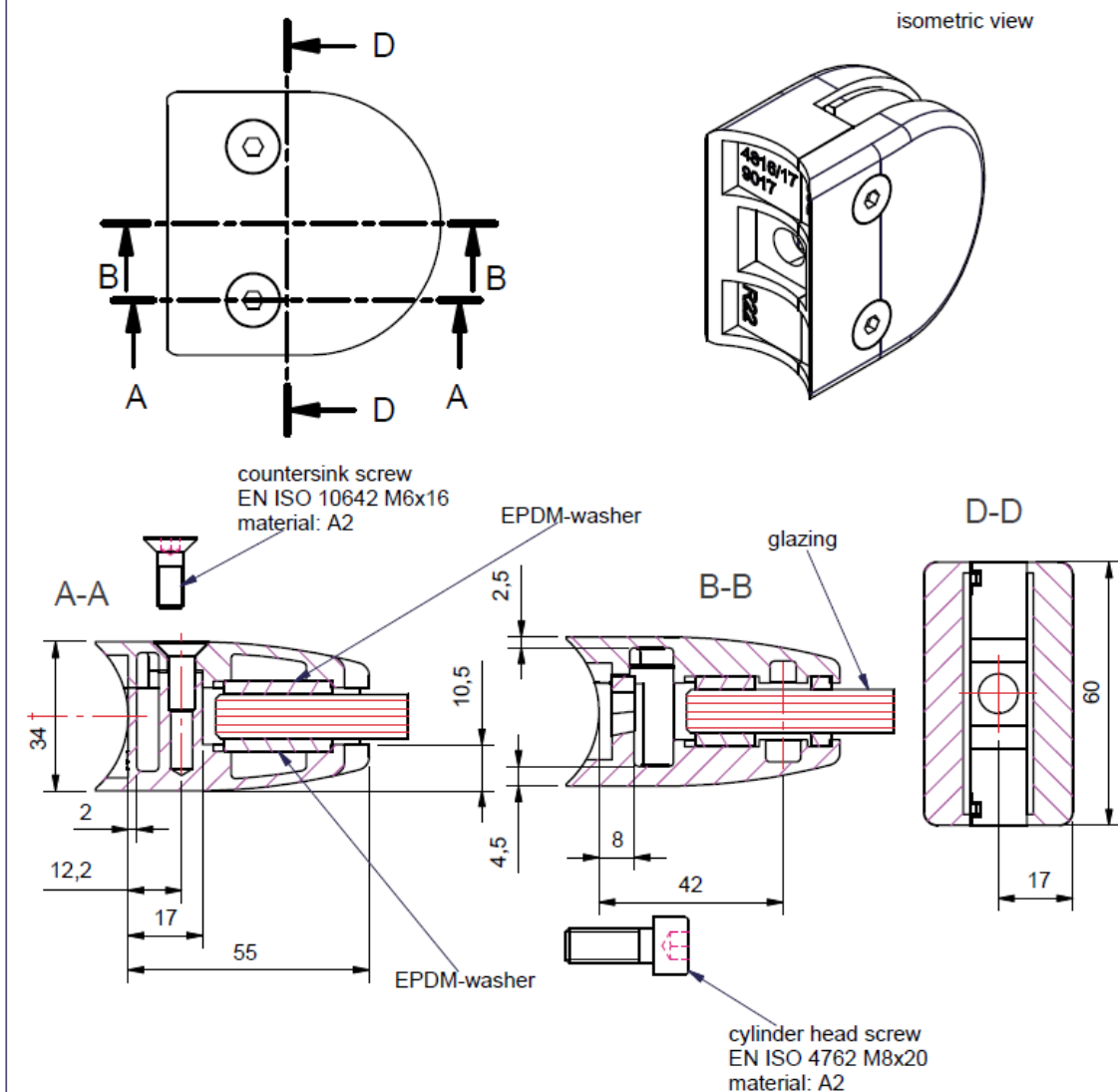


P+S glass clamp



Art.Nr.	material	glass setup	glass setup	PVB - thickness	max. glazing width	EPDM thickness	locking pin	locking plate
9326	14401	Mono / VSG 8mm	ESG	0,76mm	1500mm	4mm	no	no
9325	14401	VSG 8mm	ESG, SPG,TVG	1,52mm	1500mm	4/3mm	yes or no	no
9327	14401	Mono / VSG 10mm	ESG	0,76mm	1500mm	3mm	no	no
9328	14401	Mono / VSG 12mm	ESG	0,76mm	1500mm	2mm	yes or no	no
9329	14401	VSG 10mm	ESG, SPG,TVG	1,52mm	1500mm	3/2mm	yes or no	no

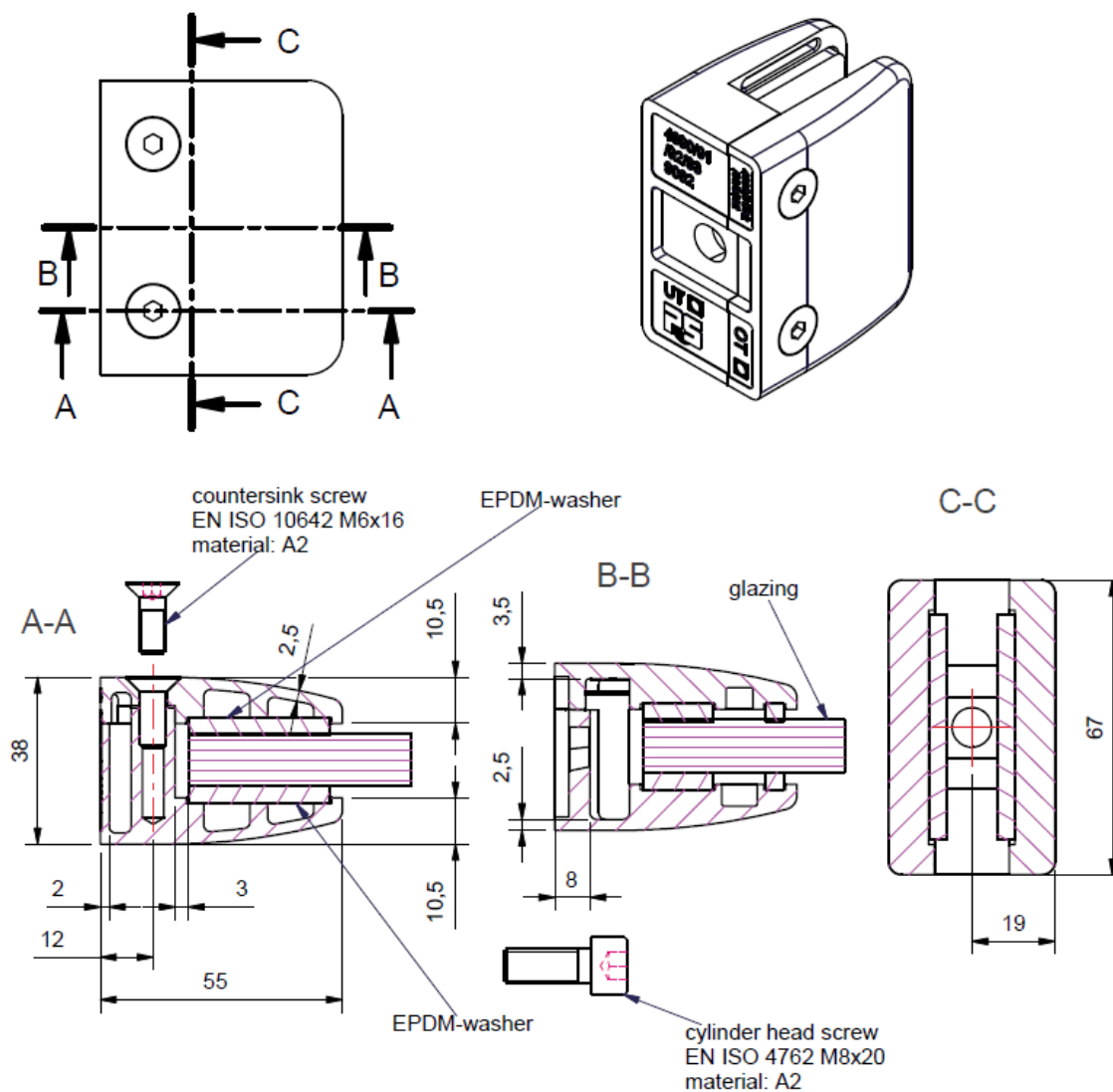
P+S glass clamp



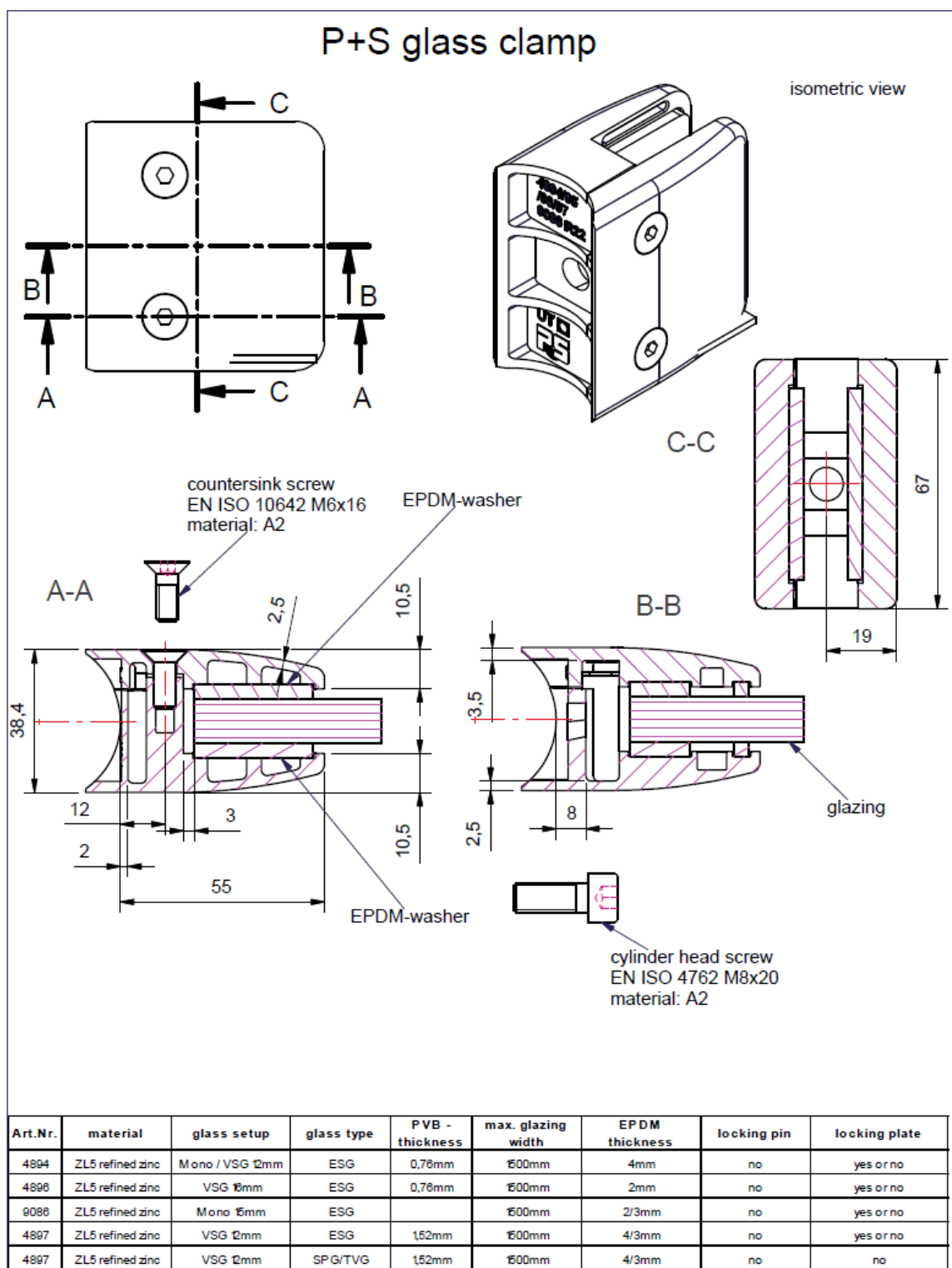
Art.Nr.	material	glass setup	glass type	PVB - thickness	max. glazing width	EPDM thickness	locking pin	locking plate
4816	ZL5 refined zinc	Mono / VSG 8mm	ESG	0,76mm	1600mm	4mm	no	no
4827	ZL5 refined zinc	VSG 8mm	ESG,SPG,TVG	1,52mm	1600mm	3/4mm	yes or no	no
4817	ZL5 refined zinc	Mono / VSG 10mm	ESG	0,76mm	1600mm	3mm	no	no
9016	ZL5 refined zinc	VSG 10mm	ESG,SPG,TVG	1,52mm	1600mm	3/2mm	yes or no	no
9017	ZL5 refined zinc	Mono / VSG 12mm	ESG	0,76mm	1600mm	2mm	yes or no	no

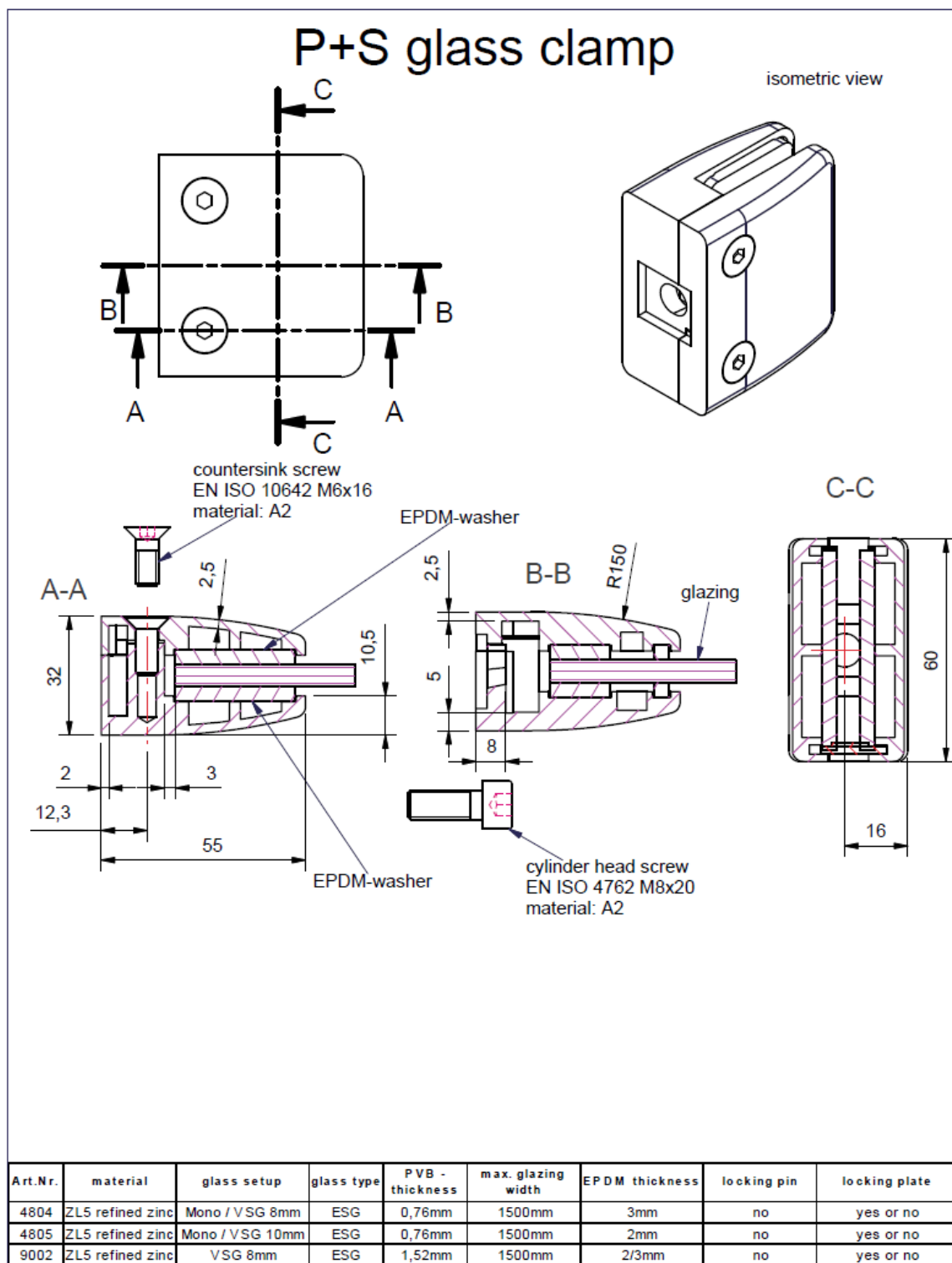
P+S glass clamp

isometric view

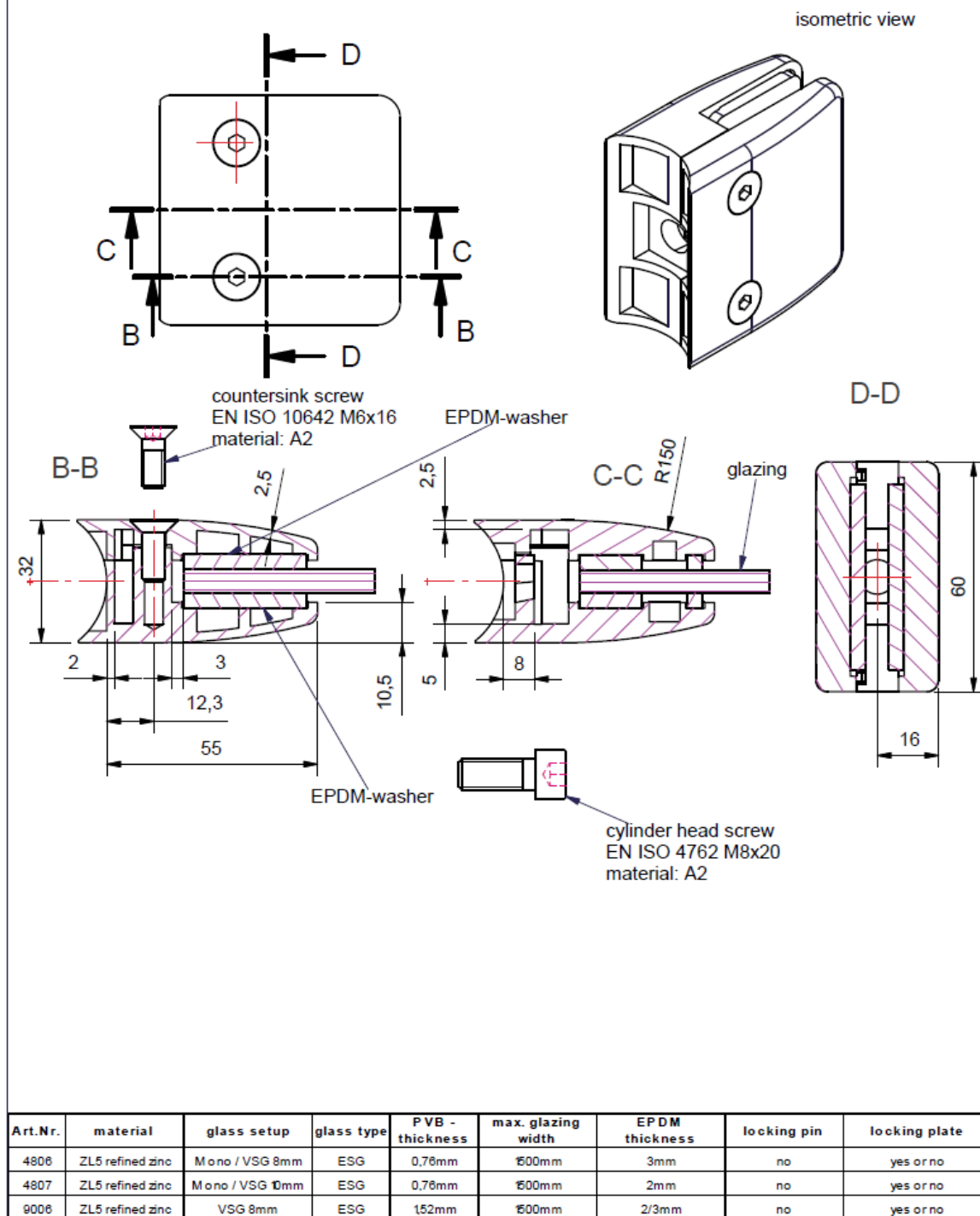


Art.Nr.	material	glass setup	glass type	PVB - thickness	max. glazing width	EPDM thickness	locking pin	locking plate
4891	ZL5 refined zinc	Mono / VSG 12mm	ESG	0,76mm	600mm	4mm	no	yes or no
4893	ZL5 refined zinc	VSG 16mm	ESG	0,76mm	600mm	2mm	no	yes or no
9082	ZL5 refined zinc	Mono 15mm	ESG		600mm	2/3mm	no	yes or no
4890	ZL5 refined zinc	VSG 12mm	ESG	1,52mm	600mm	4/3mm	no	yes or no
4890	ZL5 refined zinc	VSG 12mm	SPG/TVG	1,52mm	600mm	4/3mm	no	no

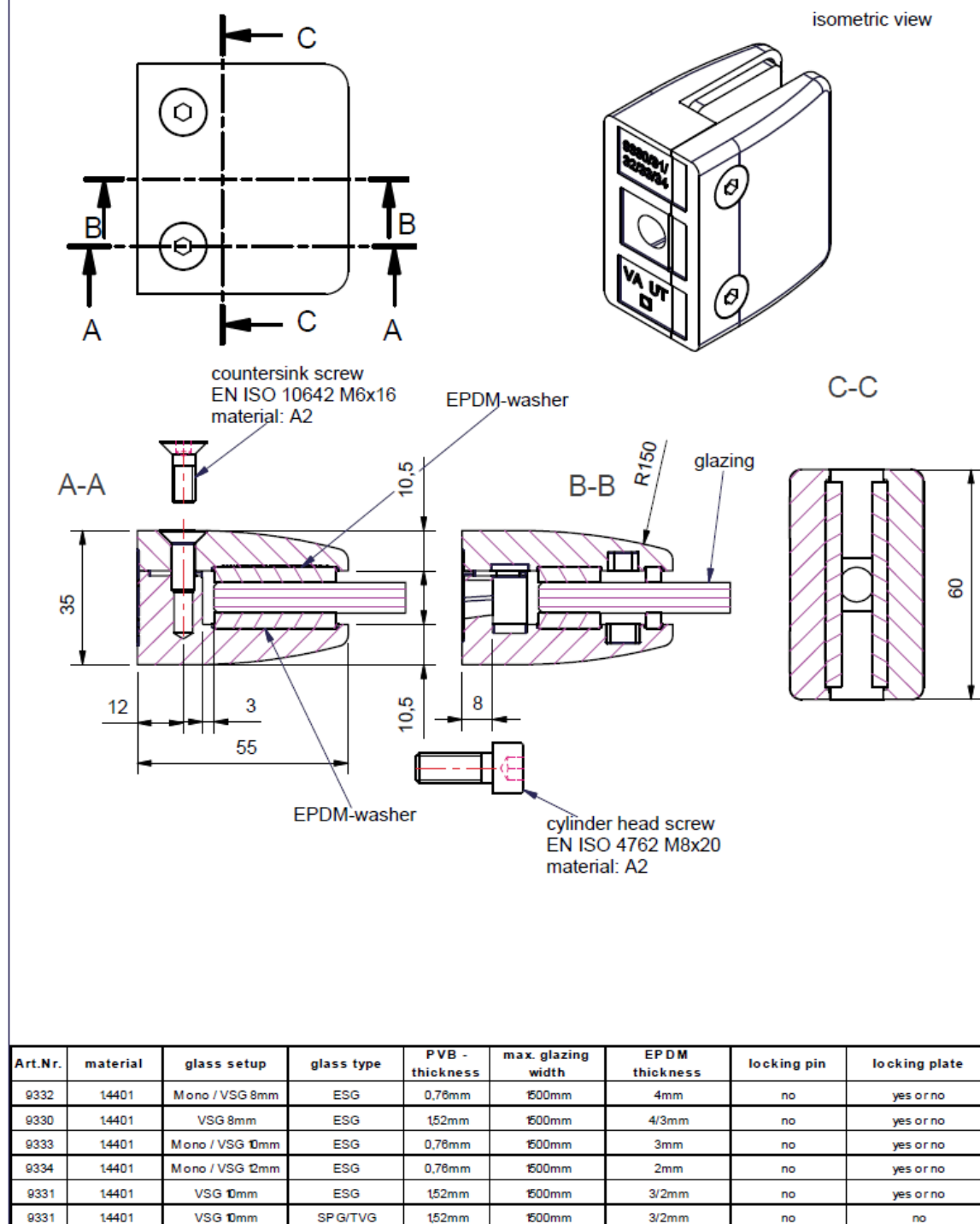




P+S glass clamp

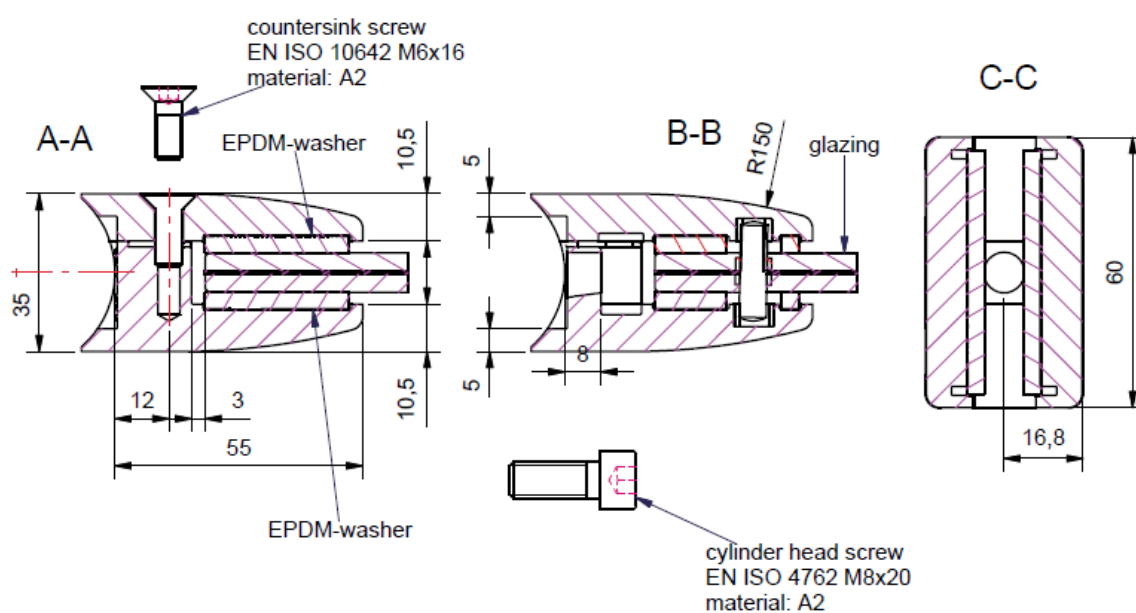
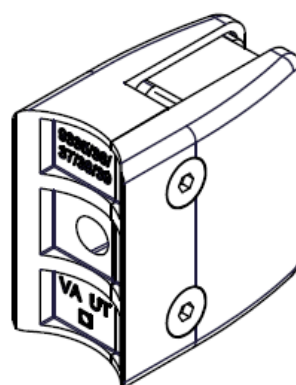
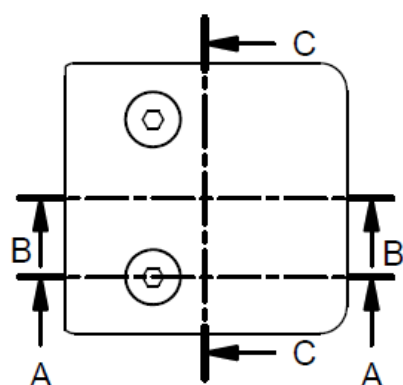


P+S glass clamp



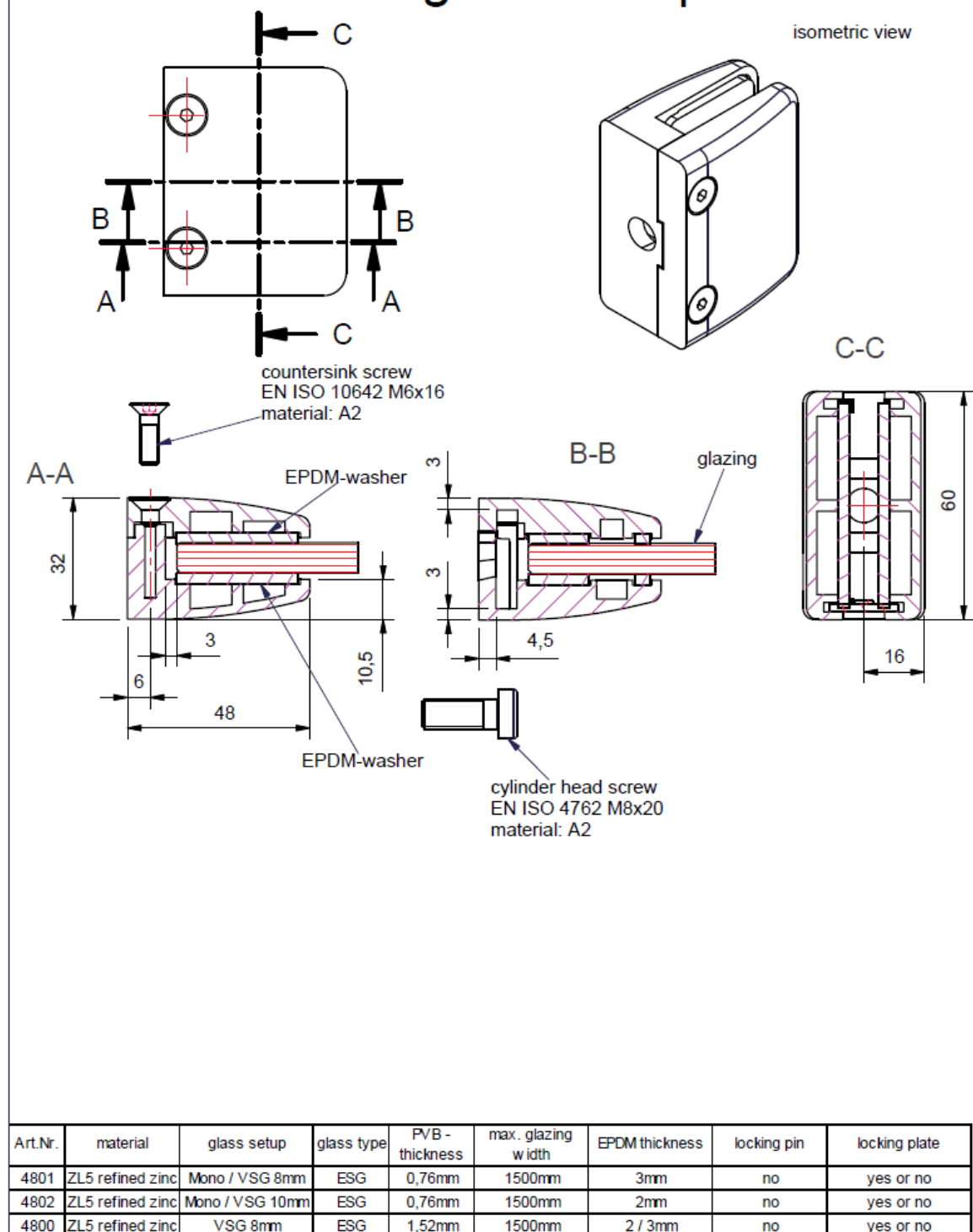
P+S glass clamp

isometric view



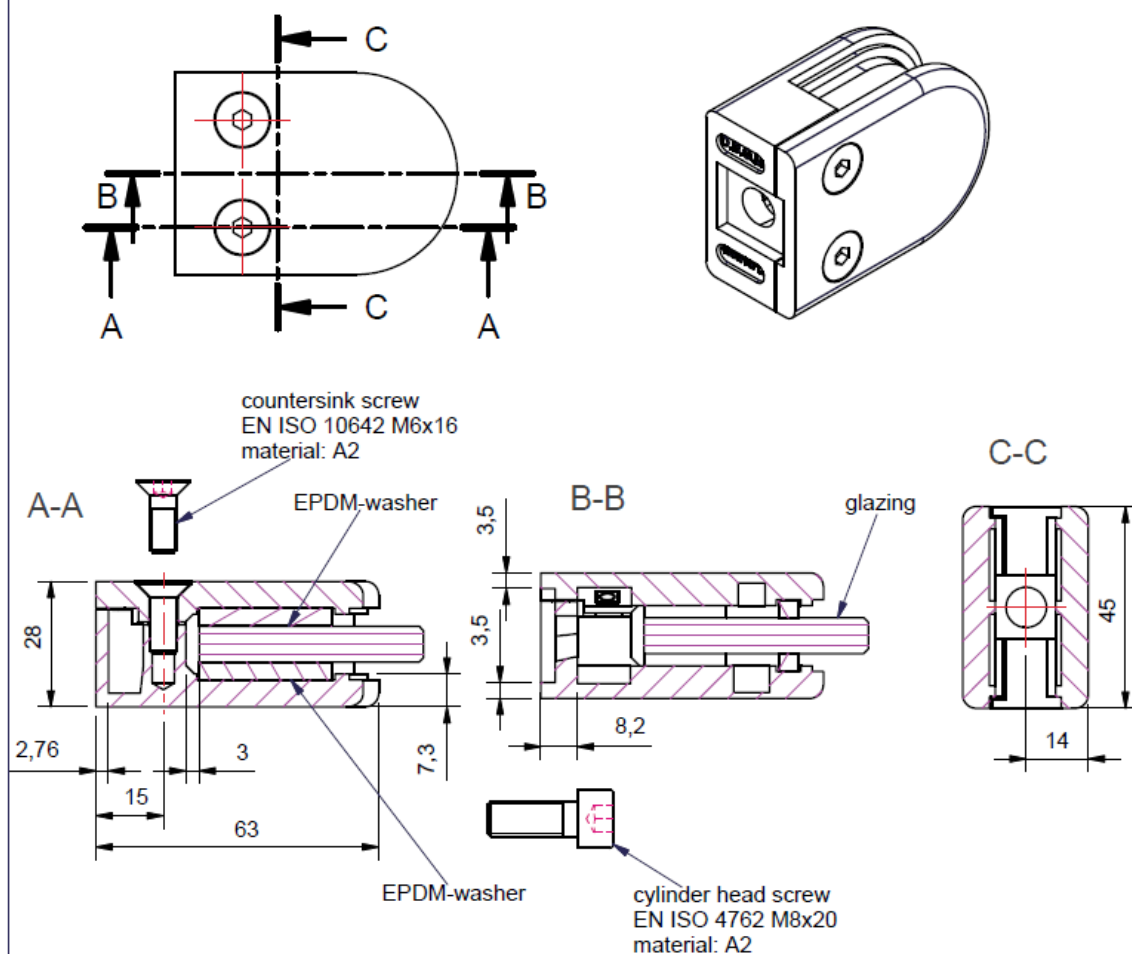
Art.Nr.	material	glass setup	glass type	PVB - thickness	max. glazing width	EPDM thickness	locking pin	locking plate
9336	14401	Mono / VSG 8mm	ESG	0,78mm	1500mm	4mm	no	yes or no
9335	14401	VSG 8mm	ESG	1,52mm	1500mm	4/3mm	no	yes or no
9337	14401	Mono / VSG 10mm	ESG	0,78mm	1500mm	3mm	no	yes or no
9338	14401	Mono / VSG 12mm	ESG	0,78mm	1500mm	2mm	no	yes or no
9339	14401	VSG 10mm	ESG	1,52mm	1500mm	3/2mm	no	yes or no
9339	14401	VSG 10mm	SPG/TVG	1,52mm	1500mm	3/2mm	no	no

P+S glass clamp



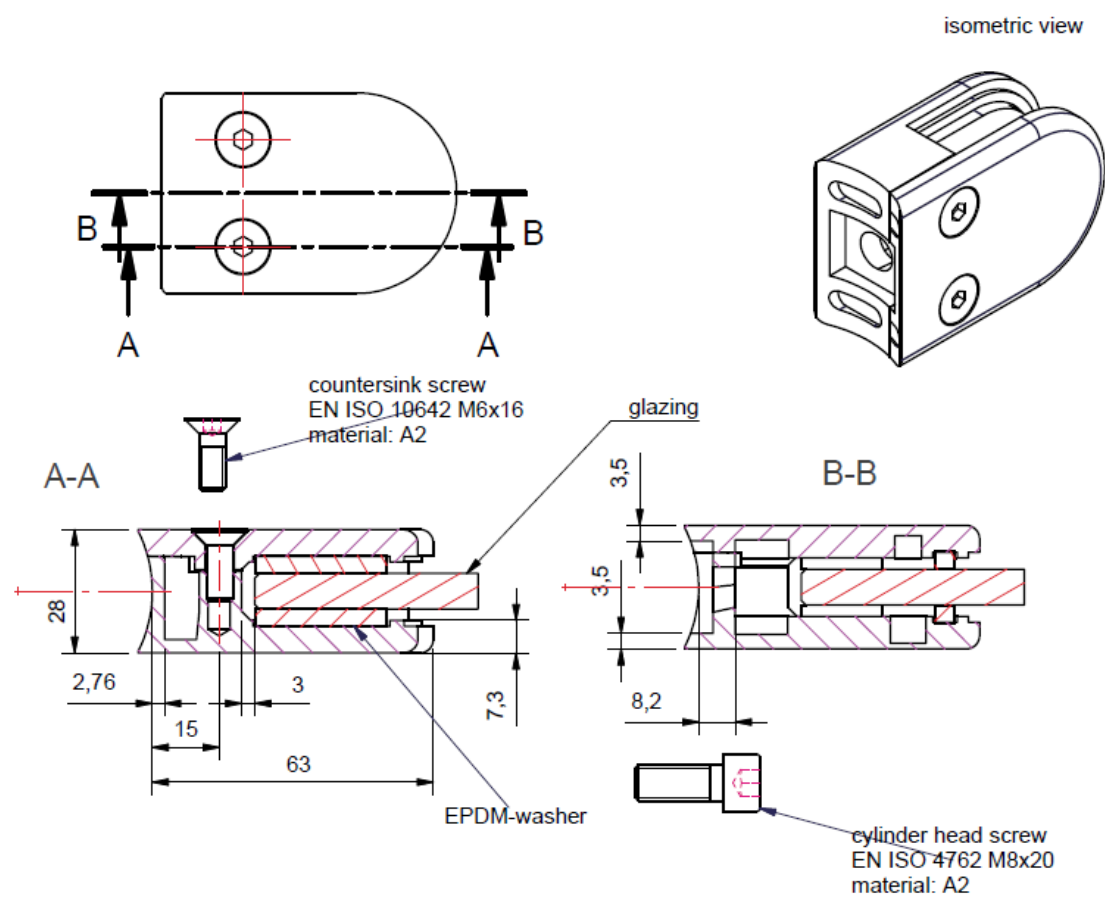
P+S glass clamp

isometric view

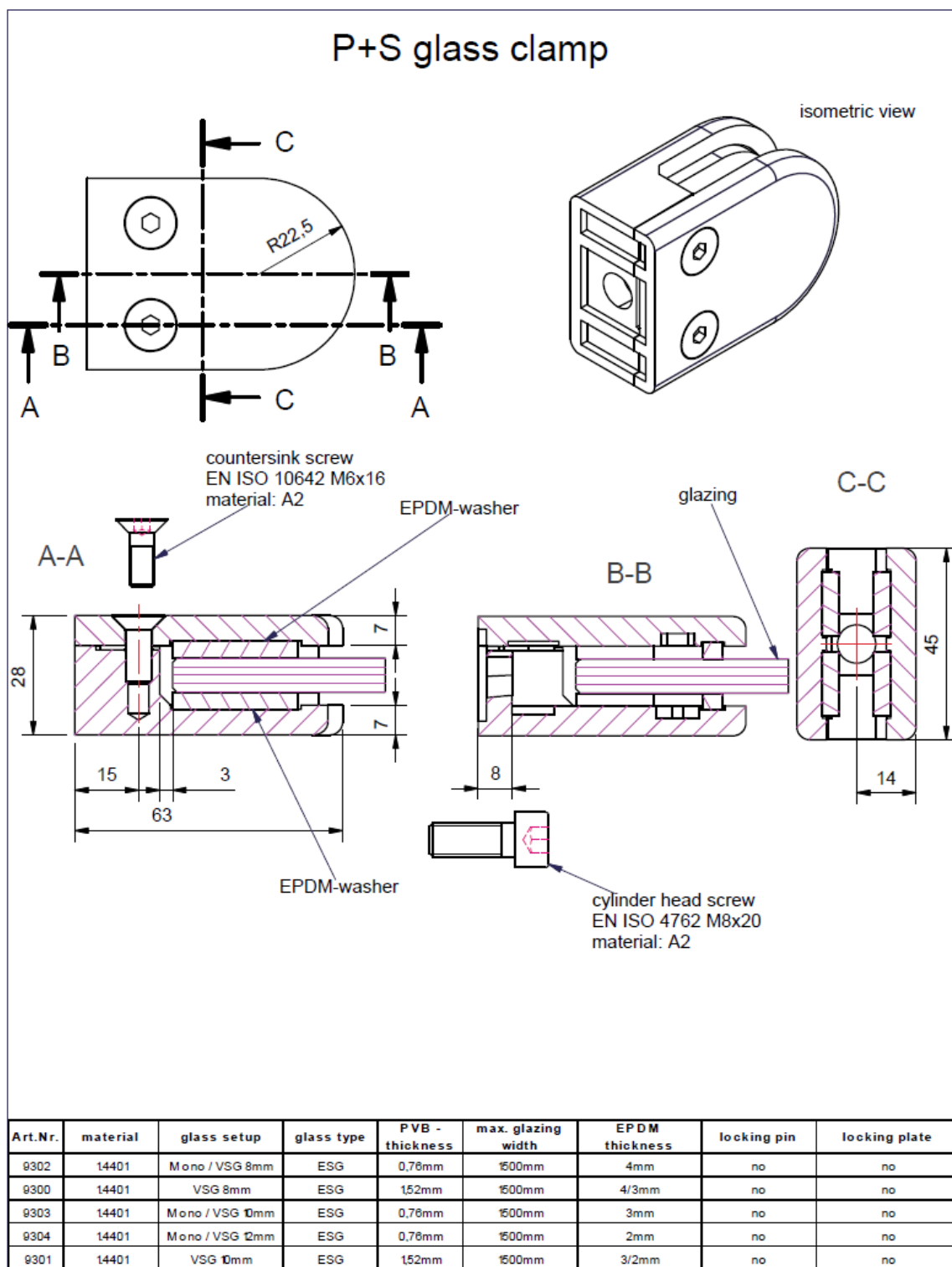


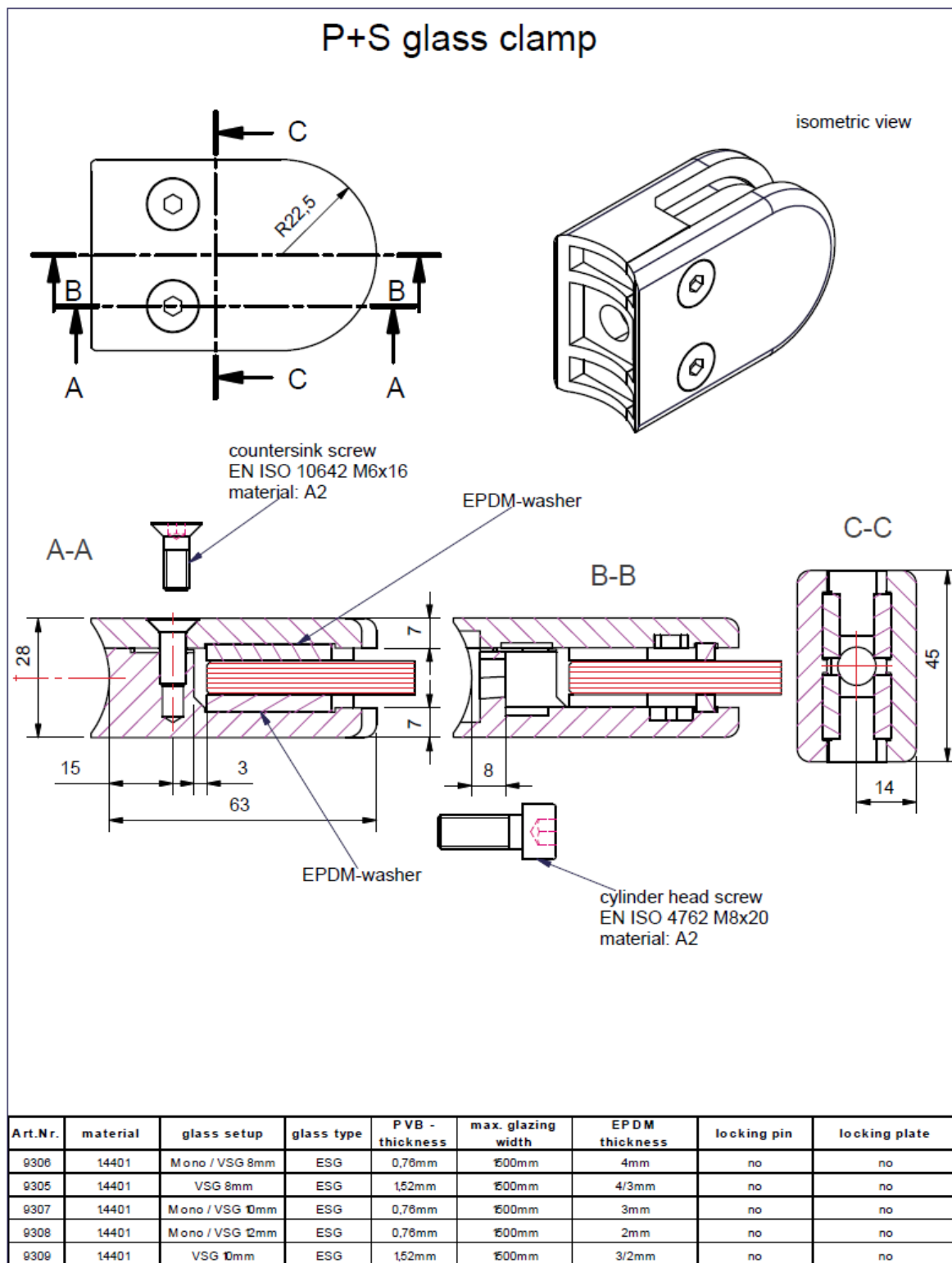
Art.Nr.	material	glass setup	glass type	PVB - thickness	max. glazing width	EPDM thickness	locking pin	locking plate
4808	ZL5 refined zinc	Mono / VSG 8mm	ESG	0,76mm	1500mm	4mm	no	no
4809	ZL5 refined zinc	VSG 8mm	ESG	1,52mm	1500mm	3/4mm	no	no
4810	ZL5 refined zinc	Mono / VSG 10mm	ESG	0,76mm	1500mm	3mm	no	no
4811	ZL5 refined zinc	VSG 10mm	ESG	1,52mm	1500mm	3/2mm	no	no
4812	ZL5 refined zinc	Mono / VSG 12mm	ESG	0,76mm	1500mm	2mm	no	no

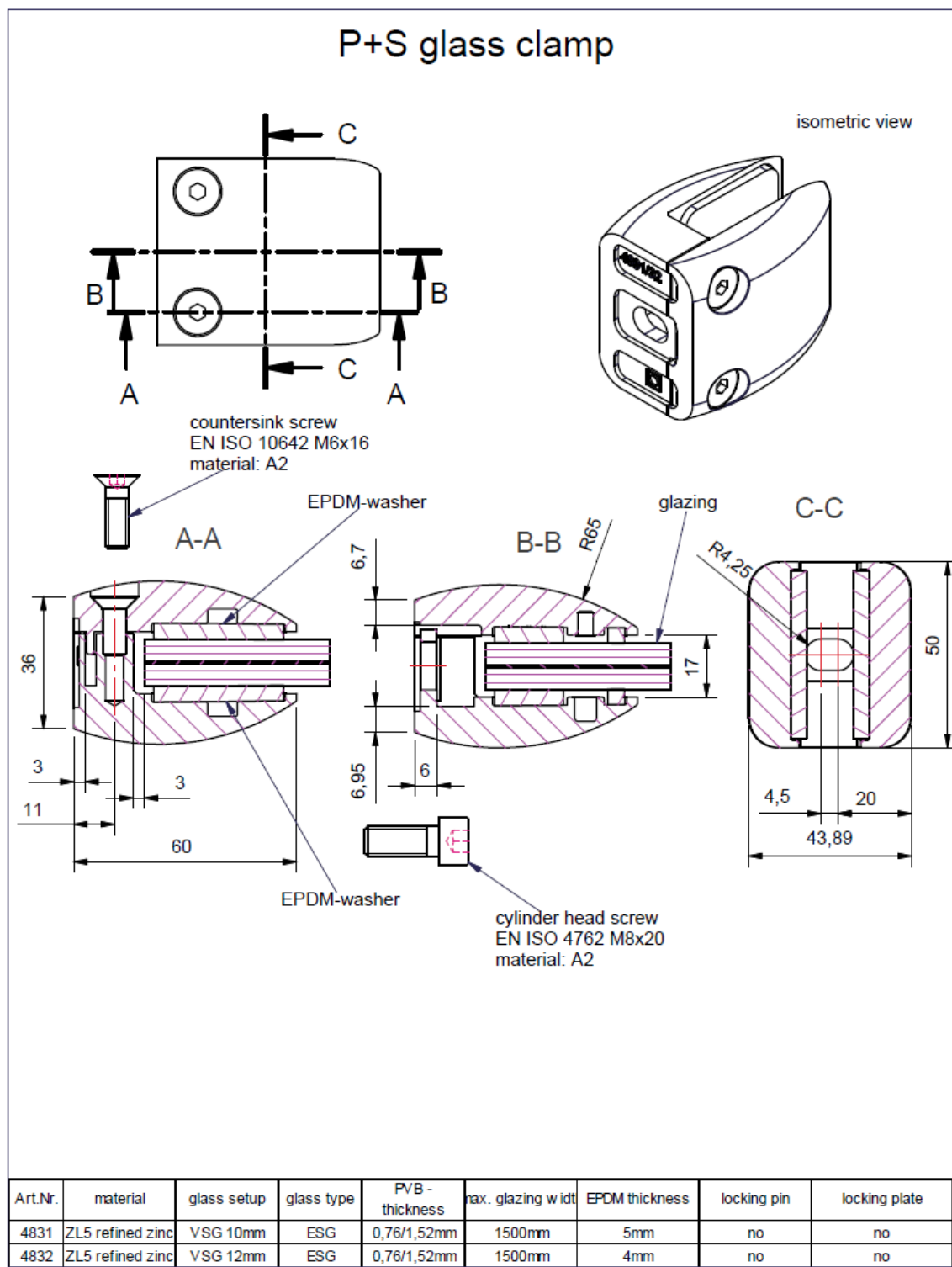
P+S glass clamp

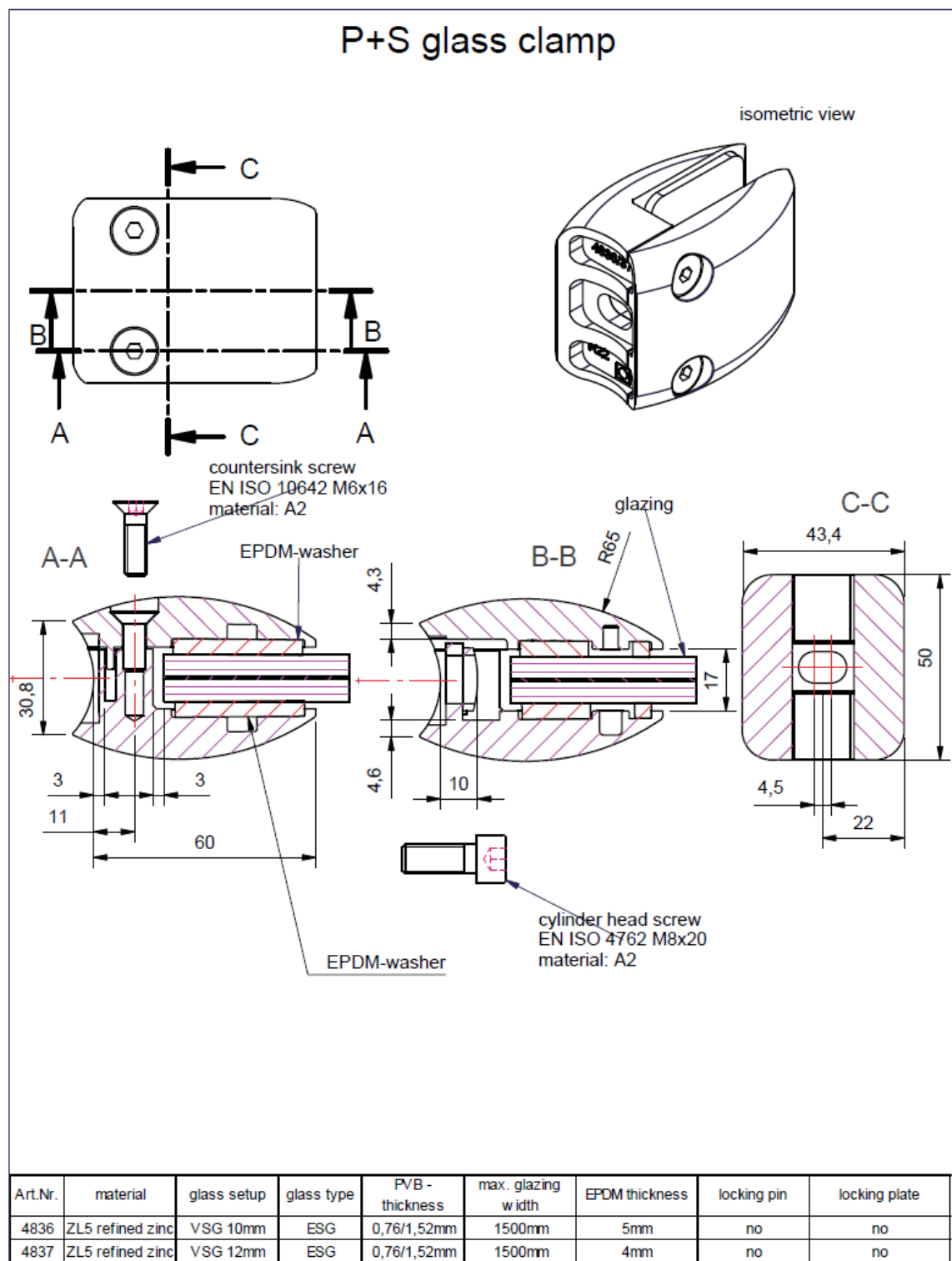


Art.Nr.	material	glass setup	glass type	PVB - thickness	max. glazing width	EPDM thickness	locking pin	locking plate
4842	ZL5 refined zinc	Mono / VSG 8mm	ESG	0,76mm	1600mm	4mm	no	no
4843	ZL5 refined zinc	VSG 8mm	ESG	1,52mm	1600mm	3/4mm	no	no
4852	ZL5 refined zinc	Mono / VSG 10mm	ESG	0,76mm	1600mm	3mm	no	no
4853	ZL5 refined zinc	Mono / VSG 12mm	ESG	0,76mm	1600mm	2mm	no	no
4854	ZL5 refined zinc	VSG 10mm	ESG	1,52mm	1600mm	3/2mm	no	no

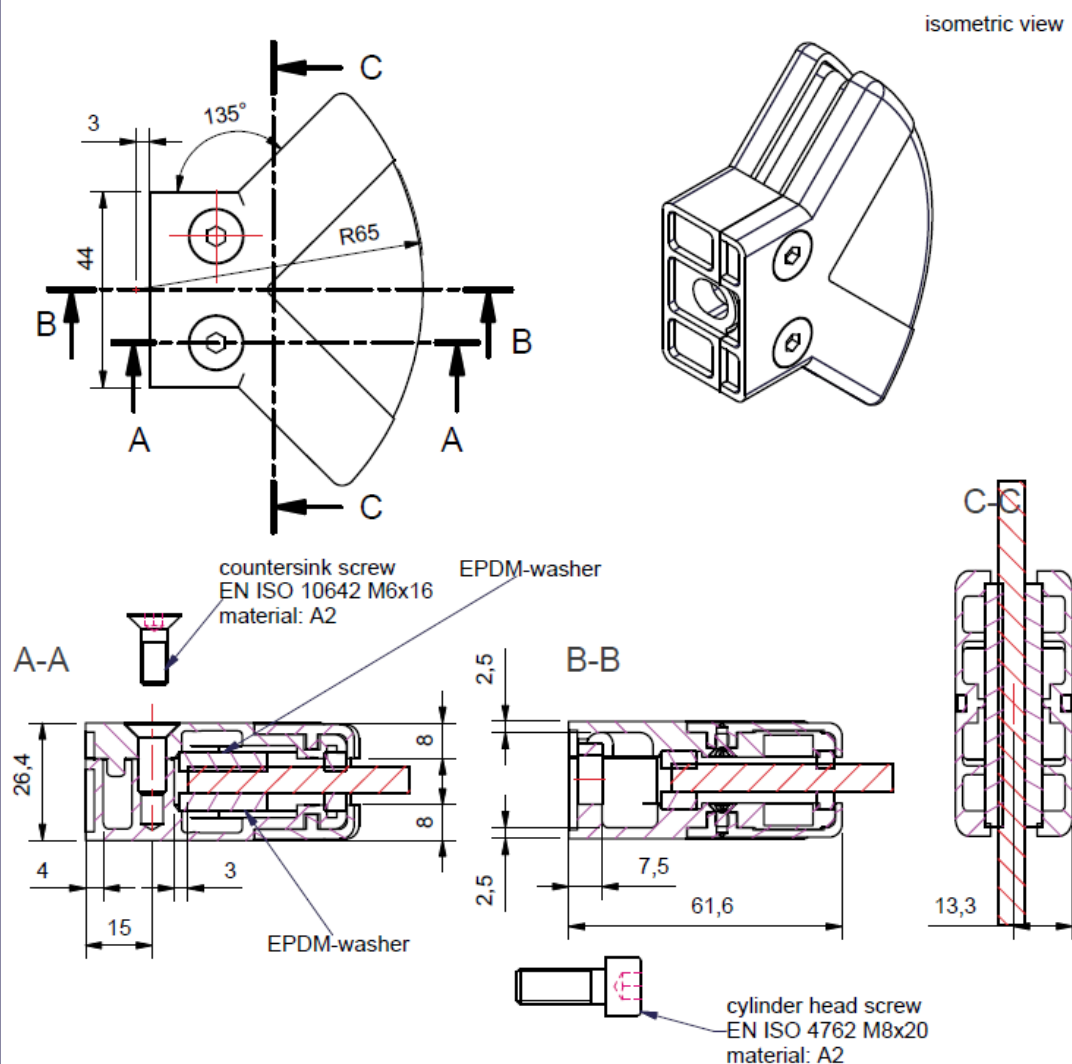






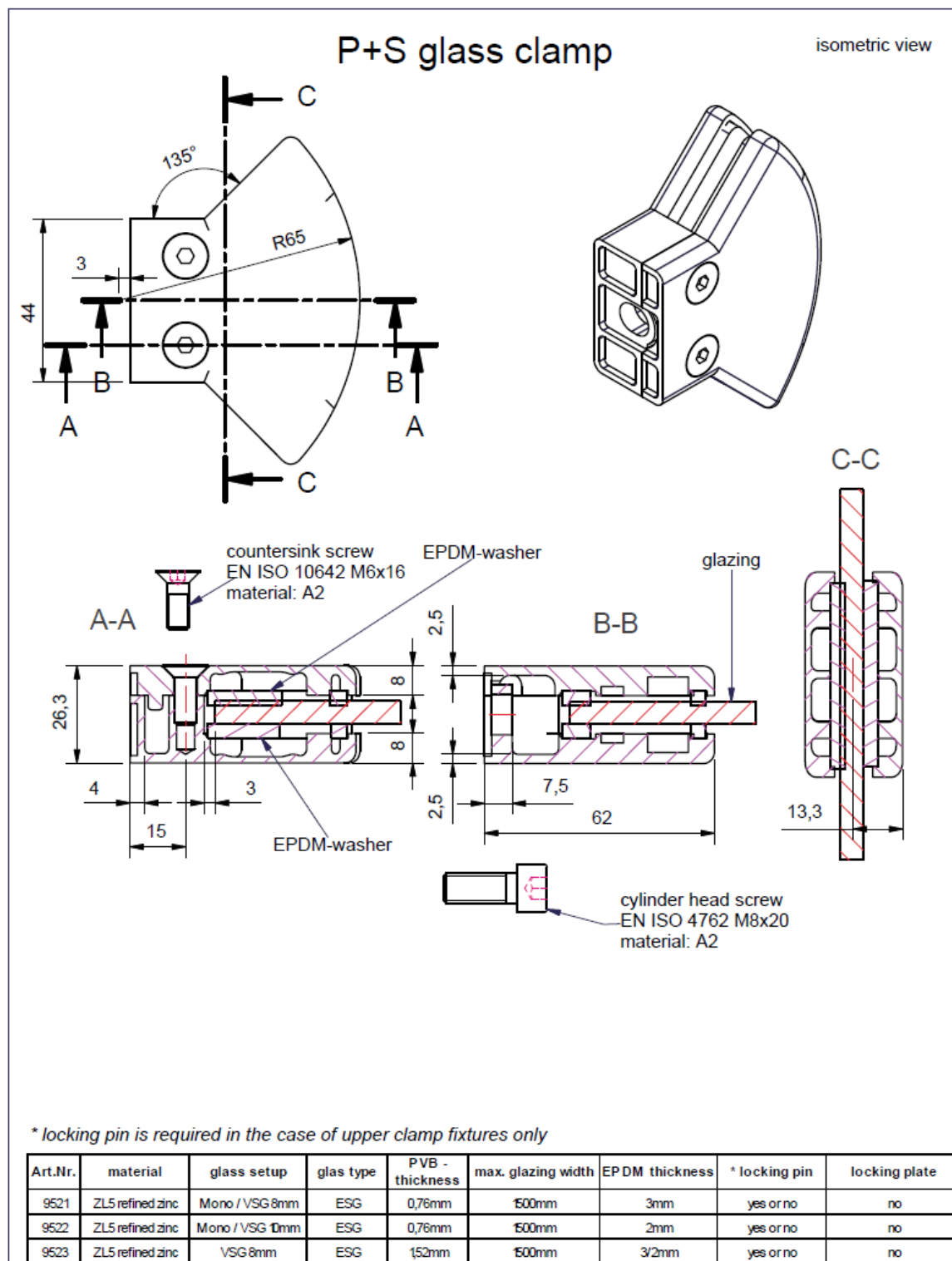


P+S glass clamp

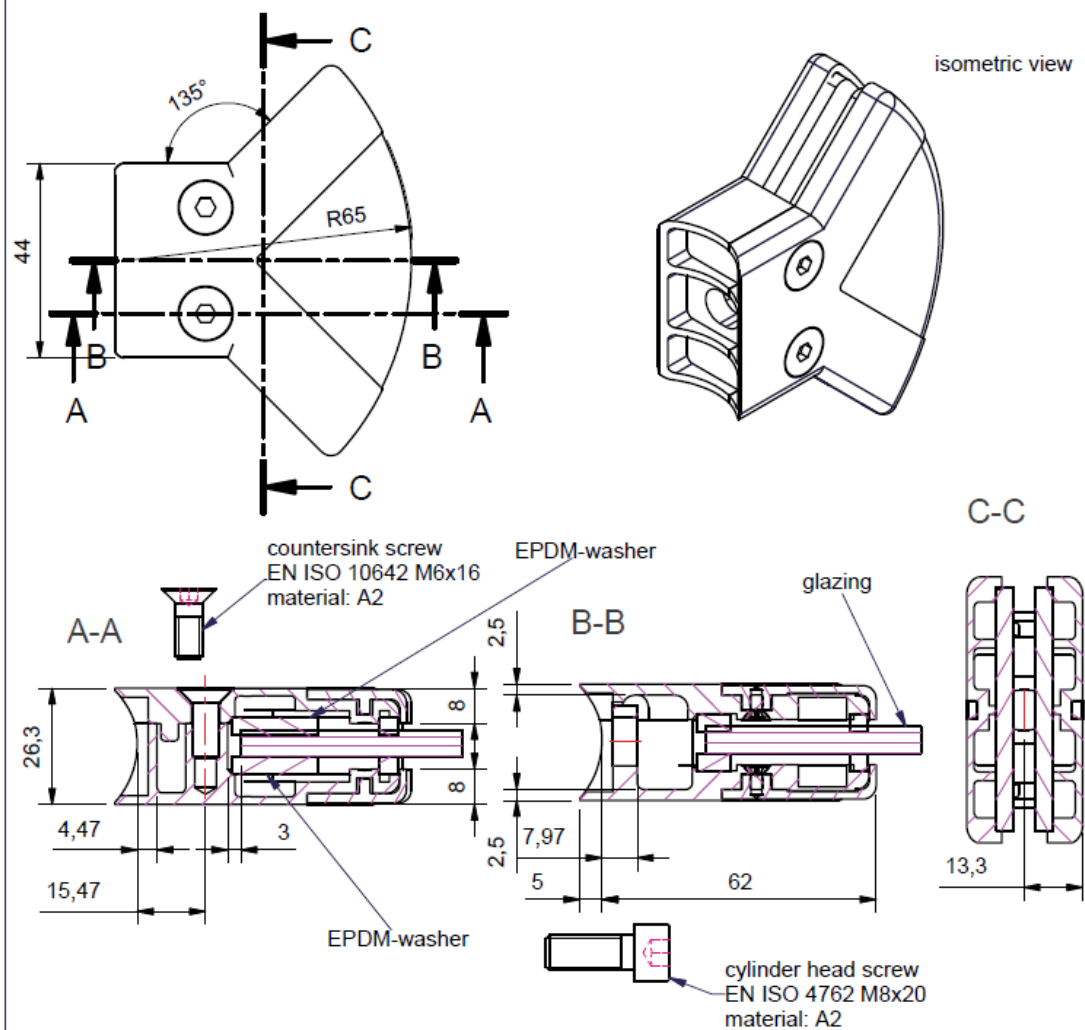


* locking pin is required in the case of upper clamp fixtures only

Art.Nr.	material	glass setup	glass type	PVB - thickness	max. glazing width	EPDM thickness	* locking pin	locking plate
9511	ZLS refined zinc	Mono / VSG 8mm	ESG	0,76mm	1500mm	3mm	yes or no	no
9512	ZLS refined zinc	Mono / VSG 10mm	ESG	0,76mm	1500mm	2mm	yes or no	no
951B	ZLS refined zinc	VSG 8mm	ESG	152mm	1500mm	3/2mm	yes or no	no

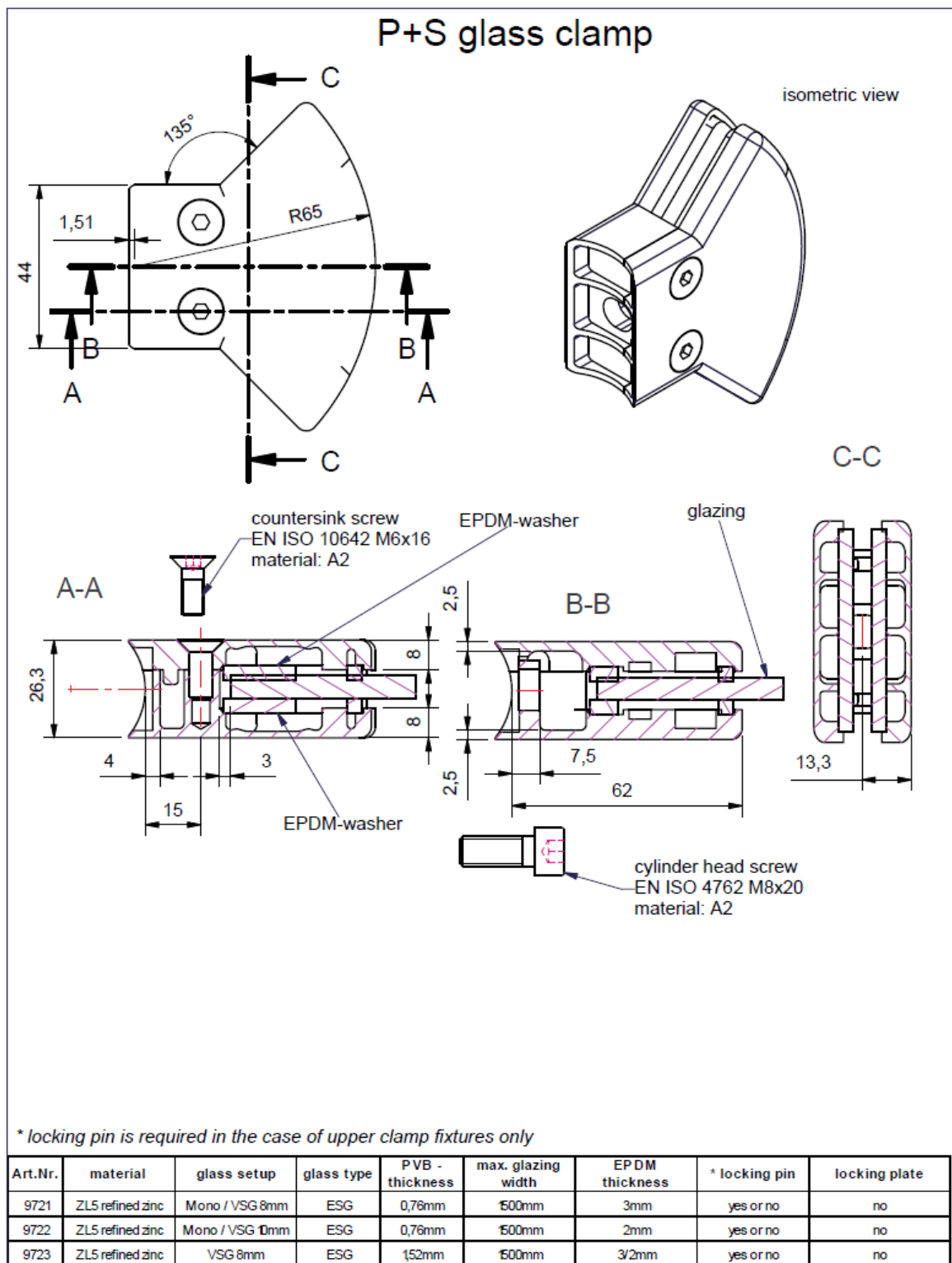


P+S glass clamp

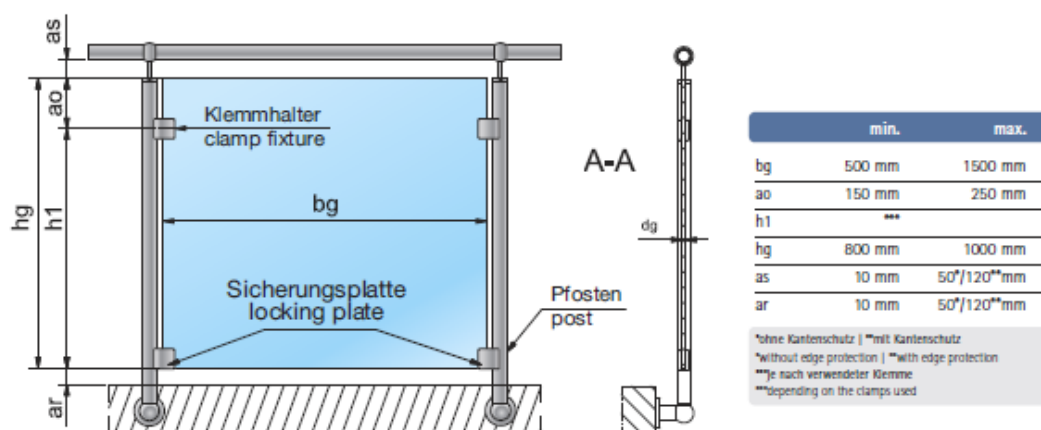
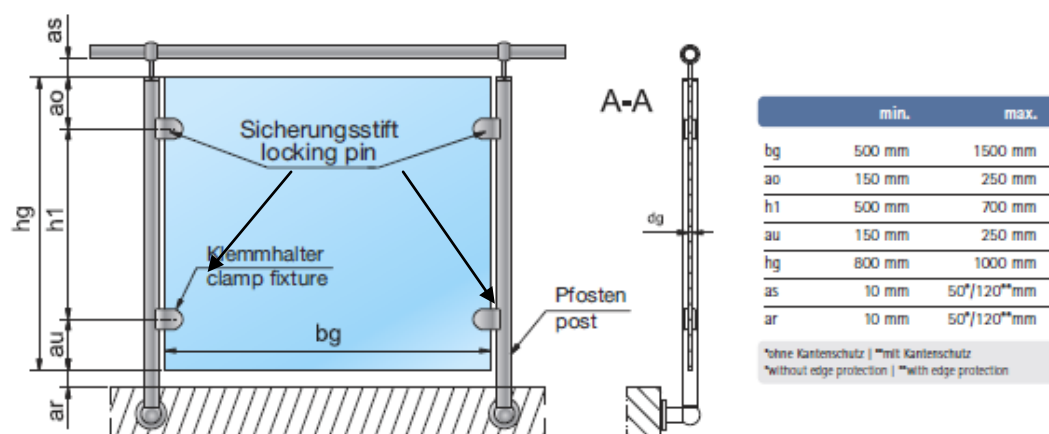
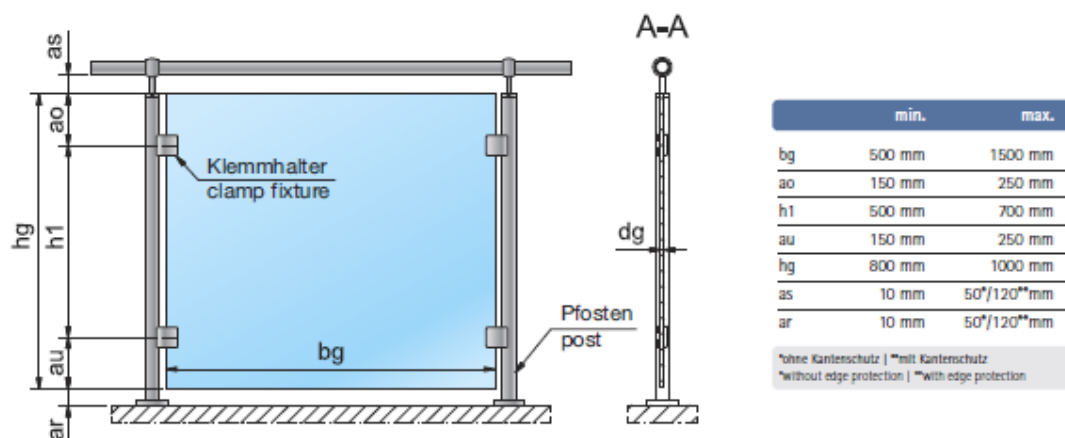


* locking pin is required in the case of upper clamp fixtures only

Art.Nr.	material	glass setup	glass type	PVB - thickness	max. glazing width	EPDM thickness	* locking pin	locking plate
9711	ZLS refined zinc	Mono / VSG 8mm	ESG	0,76mm	500mm	3mm	yes or no	no
9712	ZLS refined zinc	Mono / VSG 10mm	ESG	0,76mm	500mm	2mm	yes or no	no
9713	ZLS refined zinc	VSG 8mm	ESG	1,52mm	500mm	3/2mm	yes or no	no



ANNEX 4 – Dimensions for installation



ANNEX 5 – Wind resistance

Germany:

The following tables were determined by using a global safety factor for the glass strength based on national German provisions (a shear stiffness of the PVB-interlayer between the two panes of the laminated glass has not been taken into consideration):

Glass resistance $R_d = R_k / \gamma_g$:

LSG of float glass (SPG):	45 MPa / 2,0 = 22,5 MPa
heat strengthened glass (TVG):	70 MPa / 2,4 = 29 MPa
thermally toughened glass (ESG):	120 MPa / 2,4 = 50 MPa

The allowable deflection is limited to $L / 100$ of the distance L between supports in the principle direction of load transfer. If required, the allowable deflection shall be in accordance with national standards or regulations.

The tables may also be used for other countries by calculating the wind loads according to national provisions.

Possible glass thickness for external use depending on characteristic wind load and width of glass panes b.

Clamps without locking pin and locking plates (grey boxes are possible)

b= 500 mm												
Charact. wind load	2x5mm SPG	2x6mm SPG	2x4 mm ESG	2x5mm ESG	2x6mm ESG	2x8mm ESG	8mm ESG	10mm ESG	12mm ESG	15mm ESG	2x5mm TVG	2x6mm TVG
2,2 kN/m ²												
1,65 kN/m ²												
1,6 kN/m ²												
1,2 kN/m ²												
1,0 kN/m ²												
0,75 kN/m ²												
b= 750 mm												
Charact. wind load	2x5mm SPG	2x6mm SPG	2x4 mm ESG	2x5mm ESG	2x6mm ESG	2x8mm ESG	8mm ESG	10mm ESG	12mm ESG	15mm ESG	2x5mm TVG	2x6mm TVG
2,2 kN/m ²												
1,65 kN/m ²												
1,6 kN/m ²												
1,2 kN/m ²												
1,0 kN/m ²												
0,75 kN/m ²												
b= 1000 mm												
Charact. wind load	2x5mm SPG	2x6mm SPG	2x4 mm ESG	2x5mm ESG	2x6mm ESG	2x8mm ESG	8mm ESG	10mm ESG	12mm ESG	15mm ESG	2x5mm TVG	2x6mm TVG
2,2 kN/m ²												
1,65 kN/m ²												
1,6 kN/m ²												
1,2 kN/m ²												
1,0 kN/m ²												
0,75 kN/m ²												
b= 1250 mm												
Charact. wind load	2x5mm SPG	2x6mm SPG	2x4 mm ESG	2x5mm ESG	2x6mm ESG	2x8mm ESG	8mm ESG	10mm ESG	12mm ESG	15mm ESG	2x5mm TVG	2x6mm TVG
2,2 kN/m ²												
1,65 kN/m ²												
1,6 kN/m ²												
1,2 kN/m ²												
1,0 kN/m ²												
0,75 kN/m ²												
b= 1500 mm												
Charact. wind load			2x4 mm ESG	2x5mm ESG	2x6mm ESG	2x8mm ESG	8mm ESG	10mm ESG	12mm ESG	15mm ESG	2x5mm TVG	2x6mm TVG
2,2 kN/m ²												
1,65 kN/m ²												
1,6 kN/m ²												
1,2 kN/m ²												
1,0 kN/m ²												
0,75 kN/m ²												

Possible glass thickness for external use depending on characteristic wind load and width of glass panes b.

Clamps with locking pin (grey boxes are possible)

b= 500 mm						
Charact. wind load	2x4 mm ESG	2x5mm ESG	2x6mm ESG	8mm ESG	10mm ESG	12mm ESG
2,2 kN/m ²						
1,65 kN/m ²						
1,6 kN/m ²						
1,2 kN/m ²						
1,0 kN/m ²						
0,75 kN/m ²						
b= 750 mm						
Charact. wind load	2x4 mm ESG	2x5mm ESG	2x6mm ESG	8mm ESG	10mm ESG	12mm ESG
2,2 kN/m ²						
1,65 kN/m ²						
1,6 kN/m ²						
1,2 kN/m ²						
1,0 kN/m ²						
0,75 kN/m ²						
b= 1000 mm						
Charact. wind load	2x4 mm ESG	2x5mm ESG	2x6mm ESG	8mm ESG	10mm ESG	12mm ESG
2,2 kN/m ²						
1,65 kN/m ²						
1,6 kN/m ²						
1,2 kN/m ²						
1,0 kN/m ²						
0,75 kN/m ²						
b= 1250 mm						
Charact. wind load	2x4 mm ESG	2x5mm ESG	2x6mm ESG	8mm ESG	10mm ESG	12mm ESG
2,2 kN/m ²						
1,65 kN/m ²						
1,6 kN/m ²						
1,2 kN/m ²						
1,0 kN/m ²						
0,75 kN/m ²						
b= 1500 mm						
Charact. wind load	2x4 mm ESG	2x5mm ESG	2x6mm ESG	8mm ESG	10mm ESG	12mm ESG
2,2 kN/m ²						
1,65 kN/m ²						
1,6 kN/m ²						
1,2 kN/m ²						
1,0 kN/m ²						
0,75 kN/m ²						

Possible glass thickness for external use depending on characteristic wind load and width of glass panes b.

Clamps with locking plates (grey boxes are possible)

b= 500 mm								
Charact. wind load	2x4 mm ESG	2x5mm ESG	2x6mm ESG	2x8mm ESG	8mm ESG	10mm ESG	12mm ESG	15mm ESG
2,2 kN/m ²								
1,65 kN/m ²								
1,6 kN/m ²								
1,2 kN/m ²								
1,0 kN/m ²								
0,75 kN/m ²								
b= 750 mm								
Charact. wind load	2x4 mm ESG	2x5mm ESG	2x6mm ESG	2x8mm ESG	8mm ESG	10mm ESG	12mm ESG	15mm ESG
2,2 kN/m ²								
1,65 kN/m ²								
1,6 kN/m ²								
1,2 kN/m ²								
1,0 kN/m ²								
0,75 kN/m ²								
b= 1000 mm								
Charact. wind load	2x4 mm ESG	2x5mm ESG	2x6mm ESG	2x8mm ESG	8mm ESG	10mm ESG	12mm ESG	15mm ESG
2,2 kN/m ²								
1,65 kN/m ²								
1,6 kN/m ²								
1,2 kN/m ²								
1,0 kN/m ²								
0,75 kN/m ²								
b= 1250 mm								
Charact. wind load	2x4 mm ESG	2x5mm ESG	2x6mm ESG	2x8mm ESG	8mm ESG	10mm ESG	12mm ESG	15mm ESG
2,2 kN/m ²								
1,65 kN/m ²								
1,6 kN/m ²								
1,2 kN/m ²								
1,0 kN/m ²								
0,75 kN/m ²								
b= 1500 mm								
Charact. wind load	2x4 mm ESG	2x5mm ESG	2x6mm ESG	2x8mm ESG	8mm ESG	10mm ESG	12mm ESG	15mm ESG
2,2 kN/m ²								
1,65 kN/m ²								
1,6 kN/m ²								
1,2 kN/m ²								
1,0 kN/m ²								
0,75 kN/m ²								

ANNEX 6 – Load capacity of glass clamps

The verification for the clamps has to be done separately for each application taking into consideration the specific conditions and national provisions.

R_k is the characteristic value of the load capacity of one clamp. The loading direction is normal to the glazing pane.

$$R_k = 3000 \text{ N}^{*)}$$

^{*)} This value is valid for all clamps according to Annex 1 or Annex 3 of this ETA