



European Technical Approval ETA-08/0179

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung
Trade name

Maichenplast U 1,5 mm
Maichenplast U 1.5 mm

Zulassungsinhaber
Holder of approval

Maichenplast GmbH
Oberbrühlstraße 7
87700 Memmingen
DEUTSCHLAND

Zulassungsgegenstand
und Verwendungszweck

Dichtungsbahn "Maichenplast U 1,5 mm" als Abdichtungsmittel von
Auffangwannen und Auffangräumen in Anlagen zur Lagerung
wassergefährdender Flüssigkeiten

*Generic type and use
of construction product*

*Plastic sheet "Maichenplast U 1.5 mm" for the lining of collecting
basins and collecting rooms for the storage of liquids hazardous to
water*

Geltungsdauer:
Validity:

5 October 2012

vom
from

2 July 2013

bis
to

verlängert
extended

24 April 2013

vom
from

24 April 2018

bis
to

Herstellwerk
Manufacturing plant

Herstellwerk Nr. 1

Diese Zulassung umfasst
This Approval contains

19 Seiten einschließlich 9 Anhänge
19 pages including 9 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 products¹, modified by Council Directive 93/68/EEC² and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council³;
 - *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 1998⁴, as amended by Article 2 of the law of 8 November 2011⁵;*
 - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC⁶.
- 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.

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

(1) The plastic sheets "Maichenplast U 1.5 mm" are made of plasticized polyvinyl chloride.

(2) The plastic sheets are made with plain surface on both sides with a nominal thickness of 1.5 mm. The plastic sheets are laid loosely on the prepared ground and joined by welding to a lining of collecting rooms passable by pedestrians.

1.2 Intended use

(1) The plastic sheets are intended for use as a lining of collecting basins and collecting rooms inside as well as outside of buildings for the storage of liquids according to Annex 1.

(2) The plastic sheets may be installed at normal environmental, structural element and material temperatures (usually within a range of +5 °C to + 40 °C) and used at temperatures between -20 °C and +70 °C. When lining collecting rooms the annual mean value of the relative humidity must not exceed 60 %.

(3) The provisions made in this European technical approval are based on an assumed working life of the plastic sheets of 10 years (if the sheets are installed at outdoor exposure) respectively 25 years (if the sheets are covered or installed in buildings), provided that the conditions laid down in sections 4.2, 5.1 and 5.2 for the installation, packaging, transport, storage, use, maintenance and 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 product and methods of verification

2.1 Essential requirement N° 2: Safety in case of fire

The plastic sheets meet the requirements of the Class E according to EN 13501-1⁷.

2.2 Essential requirement N° 3: Hygiene, health and environment

2.2.1 Composition

(1) The chemical composition respectively formulation of the plastic sheets and the description of the production process are confidential and deposited with Deutsches Institut für Bautechnik in the technical documentation⁸ to this European technical approval.

(2) The product characteristics of the plastic sheets including the appropriate verification methods are given in Annex 2.

⁷ EN 13501-1:2007+A1:2009 Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests

⁸ The technical documentation of this European technical approval is deposited with Deutsches Institut für Bautechnik and shall be made available to the approved bodies, who are involved in the procedure of conformity attestation, for the fulfilment of their tasks.

2.2.2 Release of dangerous substances

(1) According to the manufacturer's declaration the plastic sheets taking account of the EU database⁹ do not contain any dangerous substances.

(2) In addition to the specific clauses of this European technical approval 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.

2.2.3 Properties

(1) The plastics sheets are impermeable and resistant to the liquids given in Annex 1 for the load levels "high" (class S3) respectively "medium" (class S2) (definition of the load levels see Annex 1).

(2) The plastic sheets

- are resistant against aging and weather influence,
- are resistant against micro-organisms,
- are passable by pedestrians for maintenance purposes and
- meet the requirement of the class "sb1" for the slipping behaviour.

3 Evaluation and attestation of conformity and CE marking

3.1 System of attestation of conformity

According to the communication of the European Commission¹⁰ system 2+ of the attestation of conformity applies. In addition, according to the communication of the European Commission¹⁰ system 3 of the attestation of conformity applies with regard to reaction to fire.

These systems of attestation of conformity are defined in the following:

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.

System 3: Declaration of conformity of the product by the manufacturer on the basis of:

(a) Tasks for the manufacturer:

- (1) factory production control;

(b) Tasks for the approved body:

- (2) initial type-testing of the product.

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

⁹ References in Guidance Paper H: A harmonised approach with regard to the handling of dangerous substances according to the Construction Products Directive, Brussels 18 February 2000.

¹⁰ Letter of the European Commission of 01/08/2005 to EOTA.

3.2 Responsibilities

3.2.1 Tasks for the manufacturer

3.2.1.1 Factory production control

(1) 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.

(2) The manufacturer may only use initial, raw and constituent materials stated in the technical documentation of this European technical approval.

(3) The factory production control shall be in accordance with the control plan¹¹ relating to the European technical approval ETA-08/0179 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.

(4) 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

(1) The manufacturer shall, on the basis of a contract, involve bodies which are approved for the tasks referred to in section 3.1 in the field of plastic sheets for the lining of collecting basins and collecting rooms for the storage of liquids hazardous to water 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 bodies involved.

(2) The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this European technical approval ETA-08/0179.

3.2.2 Tasks for the approved bodies

3.2.2.1 Initial type-testing of the product with regard to reaction to fire

(1) The approved body shall perform the

- initial type-testing of the product

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

(2) The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

3.2.2.2 Initial inspection of factory and continuous surveillance

(1) The approved body shall perform the

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

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

(2) The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

(3) 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.

¹¹ 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) 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 delivery. 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,
- essential properties:
 - reaction-to-fire class,
 - use inside/outside of buildings,
 - resistance to media shall be given with the number of the media group and the classes of the load levels and
- class of slipping behaviour in case of fire.

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

4.1 Manufacturing

(1) The plastic sheets are produced at the manufacturing plant N° 1 in accordance with the production process, which is stated in the technical documentation to this European technical approval.

(2) The European technical approval is issued for the plastic sheet on the basis of agreed data and information (formulation and production process), deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged.

(3) Changes to the product or production process, which could result in this deposited data and 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 Installation

4.2.1 Conditions for the installation

The design takes the following into account:

- The substrate for the plastic sheets is to be manufactured based on EN 14879-1¹² and shall already have the specified bottom slope. Edges and channels shall be carried out sharp-edged.
- Penetration of ground moisture, ground and seepage or other water from the back side into the works has to be avoided. If ground moisture, ground and seepage or other water occur, the works have to be sealed in accordance with the national provisions of the Member States.

¹² EN 14879-1:2005-09 Organic coating systems and linings for protection of industrial apparatus and plants against corrosion caused by aggressive media – Part 1: Terminology, design and preparation of substrate

- During the installation of the plastic sheets the nature of the concrete substrate has to satisfy the requirements of EN 14879-1¹², section 4.2.2. These may be achieved by a treatment of the concrete substrate according to sections 4.2.2.3.2 and 4.2.2.4 of this standard. Furthermore the installation of separating layer and/or levelling course such as screed and/or geotextile with a mass per unit area of at least 400 g/m² is also possible. Masonry as a substrate is suited for plastic sheets, if it satisfy the requirements of EN 14879-1¹², section 4.2.1.9.
- In case of collecting basins and collecting rooms to be repaired, the requirements of EN 14879-1¹², section 4.2.1.9 shall be met accordingly.
- Deviating from the provisions mentioned above, in case of collecting basins and collecting rooms to be repaired, the crack widths up to 1.5 mm are permissible instead of crack widths according to EN 14879-1¹², section 4.2.1.2. Larger cracks shall be back-filled appropriately.
- The stability of the collecting basin or collecting room is to be verified before installation.

4.2.2 Installation

(1) The installation of the plastic sheets is carried out by firms only who (including their specialists) are authorised and trained by the manufacturer. Further requirements for the installing firm can result from national provisions of the Member States.

(2) The fitness of the installed plastic sheets can only be assumed, if the processing is in accordance with the conditions of this European technical approval and in accordance with the installation instruction of the manufacturer laid down in the technical documentation. The installation instruction shall address the following items:

- structural conditions as to substrate, for new and rebuilt constructions
- required work steps for the lining of collecting basins (e.g. lining of parts of areas)
- method of joining plastic sheets including preparation, conditioning and protection of joining areas
- test for joints
- re-working and repairing at the lining
- protecting the lining edges against separating from underground

(3) The plastic sheets are to be laid loose and unstressed with a cover of at least 8 cm (see Annex 5). The connections shall be such that no cruciform joint can occur and T-intersections are minimised. During the erection work on the plastic sheets it shall be made sure that damage of the plastic sheets is excluded. When laying outdoors, measures for storm protection of the laid sheets shall be taken.

(4) Welding of the plastic sheets occurs by means of the heated wedge or hot gas seam welding. The welding shall be carried out by personnel having a valid qualification testing according to EN 13067¹³ material group 6, sub-group 6.1 to 6.3 only, as well as the national provisions of the Member States. The joints are to be tested and recorded according to the national provisions of the Member States.

(5) The construction details shall correspond to Annexes 4 - 9.

(6) The confirmation of compatibility of the lining of collecting rooms installed at the mounting site with the provisions of this European technical approval as well as the installation instructions by the manufacturer contained in the technical documentation shall occur by the installing firm according to section 4.2.2 (1) with a manufacturing record (see Annex 3).

4.3 Responsibilities for the ETA holder

(1) It is the responsibility of the holder of approval to make sure that all those who use the plastic sheets will be appropriately informed about the specific conditions according to sections 1, 2, 4, and 5 including the annex to this ETA and the not confidential parts of the technical documentation to this ETA.

(2) The number of the ETA shall be given on the packaging (enclosed label) and on the plastic sheets (stamping or labeling at least each 5th running meter) readily identifiable and durably accompanied by the name of the ETA holder and the batch number.

(3) The holder of approval shall oblige the executing company to durably designate each collecting basin and/or each collecting room with the following information (supplied labels shall be used thereby):

For the lining of this collecting room

Plastic sheets: Maichenplast U 1.5 mm

Batch Number:

Number of approval: ETA-08/0179

Holder of approval: Maichenplast GmbH

Oberbrühlstraße 7

87700 Memmingen/Germany

carried out on:

carried out by:

was used.

For repairing damage only materials indicated in the European technical approval in accordance with indications of the holder of approval shall be used!

5 Indications to the manufacturer

5.1 Packaging, transport and storage

Packaging, transport and storage of the plastic sheets shall be carried out so that the serviceability is not affected. The storage of the plastic sheets shall be foreseen on a flat substrate free of stones, taking into account that direct superimposing of the rolls is to be avoided. The plastic sheets shall be protected against direct solar radiation.

5.2 Use, maintenance, repair

(1) In order to ensure the fitness for use of the plastic sheets after installation in the works the measures described in sections (2) to (5) are recommended. It is the task of the ETA holder to make sure that all parties involved are adequately informed.

(2) Leaked out liquids hazardous to water are as fast as possible recognised and removed from the sealing surface at the latest after the load level according to Annex 1.

(3) Firms according to section 4.2.2 (1) only are charged with repair works; they may use only materials indicated in this European technical approval in accordance with the installation instruction being part of the technical documentation of the holder of approval.

(4) Damaged surfaces are covered with rounded cut-outs. The minimum overlapping on the edges shall be 10 cm. The cut-outs are made over the entire seams area according to technical rules by means of the hot gas welding. The continuous faulty seams and such with continuous irregularity shall be rejoined or covered along the length with sheet strip made of "Maichenplast U 1.5 mm" of at least 0.6 m width, joined on both sides according to technical rules.

(5) If the whole area of the imperfection to be repaired exceeds 30 %, an expert person decides according to section 6 (4), whether repairing is still admissible. In case of more reworking, the recurring inspections according to section 6 (5) shall be repeated by an expert person.

6 Recommendations for the operator of a storage facility

(1) Reference is made to the necessity of a permanent surveillance by the operator of the facility in accordance with the requirements of the national regulations of the Member States.

(2) The operator of a storage facility commissions only firms with maintenance, repair and cleaning of the lining according to section 4.2.2 (1).

(3) The operator of a storage facility shall initiate inspections (commissioning inspection, recurring inspection) depending on national regulations by expert persons. The inspections shall be executed in accordance with section 6 (4) and section 6 (5).

(4) Prior to commissioning and following any significant modifications inspections are carried out only by expert persons. Further requirements for the expert personnel can result from national regulations of the Member States. The inspections shall be executed as follows:

- The inspection for fitting the tank and respectively prior to commissioning is carried out in the presence of an expert representative of the firm according to section 4.2.2 (1) and of the operator of the facility.
- The thickness of the plastic sheets to be laid should be tested randomly before installation. If a thickness arises which does not fulfil the requirements of Annex 2, the respective sheet shall be discarded and replaced by a new one corresponding to the requirements.
- An expert person checks the execution of the sealing according to plan for compatibility with the provisions of the European technical approval and the compliance with the official obligations and conditions. He examines the necessary verifications and the records relating to type, scope and result of the tests according to the construction of the works.
- If partial testing of single laid sections is not intended or was not possible, he checks the lining visually for obvious defects and damage, faultless execution of the joints, edges protection, covering as well as their connections on other parts of the works of the collecting rooms.

(5) Recurring inspections shall be executed as follows.

- The recurring inspections are carried out only by expert personnel. Further requirements for the expert personnel can result from national regulations of the Member State.
- The lining is spot-checked visually of their condition. The details of dashes 3 and 4 in section 6 (4) shall apply accordingly.
- If damage of lining will be observed during the recurring inspections, corrective measures shall be taken.

Uwe Bender
Head of Department

beglaubigt:
Herschelmann

List of the liquids, the plastic sheet "Maichenplast U 1.5 mm" is impermeable and chemically resistant to, for load level "high" (class S3) (this is equivalent to maximum admissible load duration up to 3 months):

Liquids	Media group
<ul style="list-style-type: none"> ▪ heating oil EL (according to DIN 51603-1) ▪ Unused combustion engine oils ▪ Unused vehicle gear oils ▪ Mixture of saturated and aromatic hydrocarbons with an aromatic content ≤ 20 wt.-% and a flash point > 55 °C 	3
<ul style="list-style-type: none"> ▪ used combustion engine oil and ▪ used automotive transmission oil with a flash point > 55 °C	4c

Urea with a maximum of 32.5 vol.-% in aqueous solution (e.g. AdBlue)

List of liquids, the plastic sheet "Maichenplast U 1.5 mm" is impermeable and chemically resistant to, for load level "medium" (class S2) (this is equivalent to maximum admissible load duration up to 72 hours):

Liquids	Media group
Diesel fuel (according to EN 590) with a maximum of 5 vol.-% biodiesel fuel (according to EN 14214)	3a
Diesel fuel (according to EN 590) with a maximum of 20 vol.-% biodiesel fuel (according to EN 14214)	3b

Maichenplast U 1.5 mm

Lists of liquids

Annex 1

Product characteristics of "Maichenplast U 1.5 mm"

Properties	Unit	Test procedure	Characteristic values
Thickness	mm	EN 1849-2	1.5 (+0.2 mm/-0.1 mm/minimum value 1.3 mm)
Appearance	--	EN 1850-2	Free of defects, like bubbles, pores, rips, inhomogeneities
Density	g/cm ³	EN ISO 1183-1	1.34 ± 0.02
Tensile strength at break	MD	EN 12311-2 test specimens TYPE B test speed v = 500 mm/min	19 ± 15 %
	CMD		19 ± 15 %
Elongation at break	MD		350 ± 20 % (relative)
	CMD		350 ± 20 % (relative)

Classes

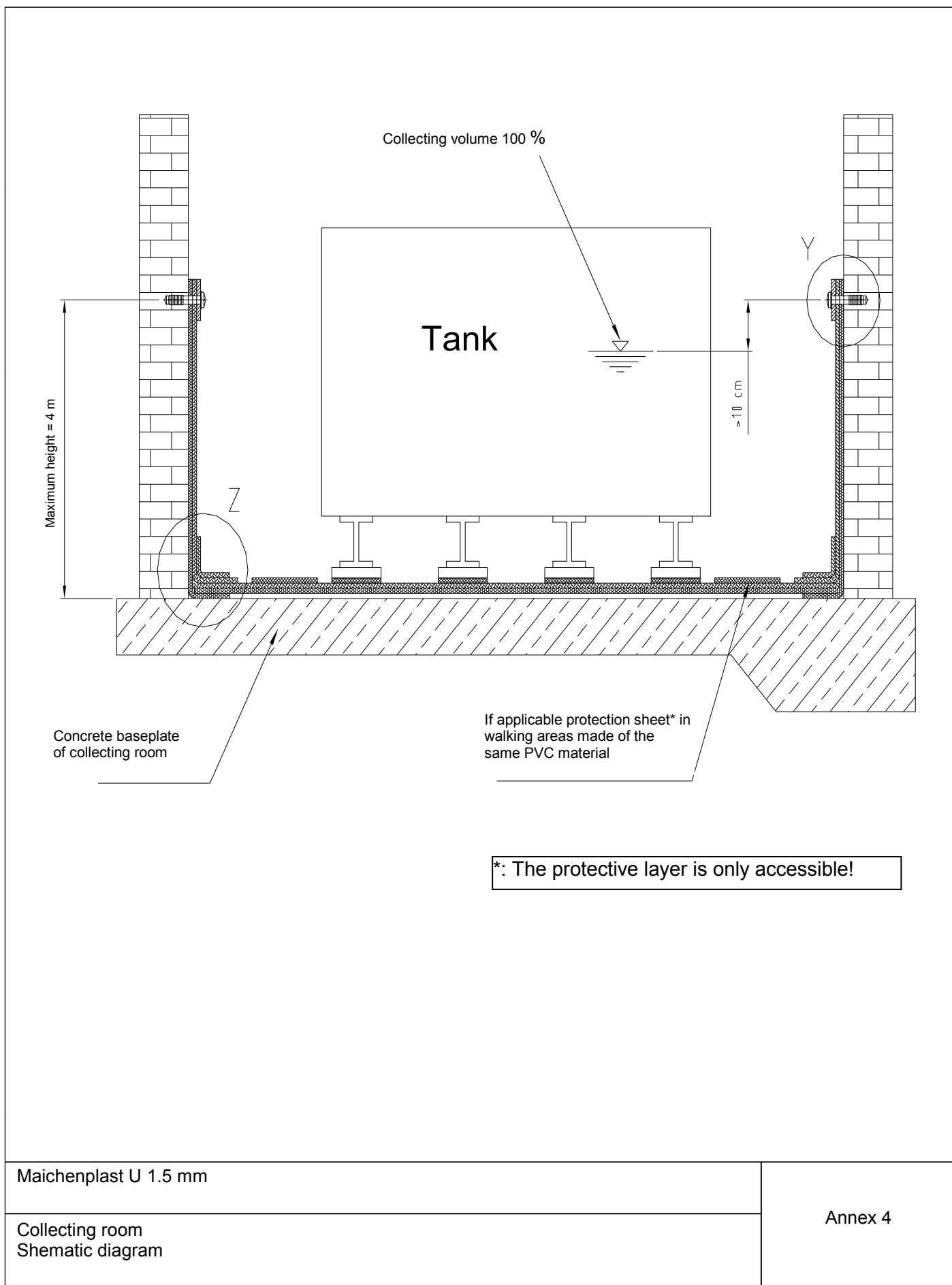
Reaction to fire class 'E' according to EN 13501-1
Slipping behaviour in case of fire: Class 'sb1'

Maichenplast U 1.5 mm

Product characteristics and classes

Annex 2

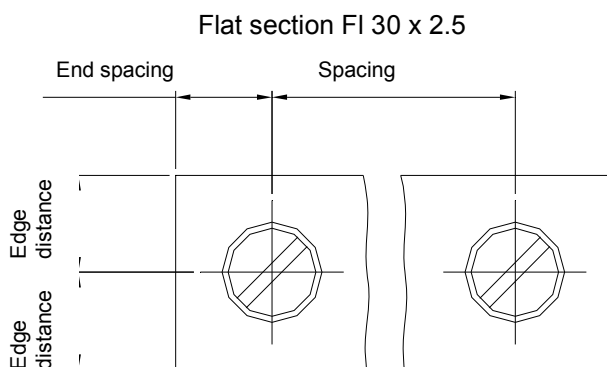
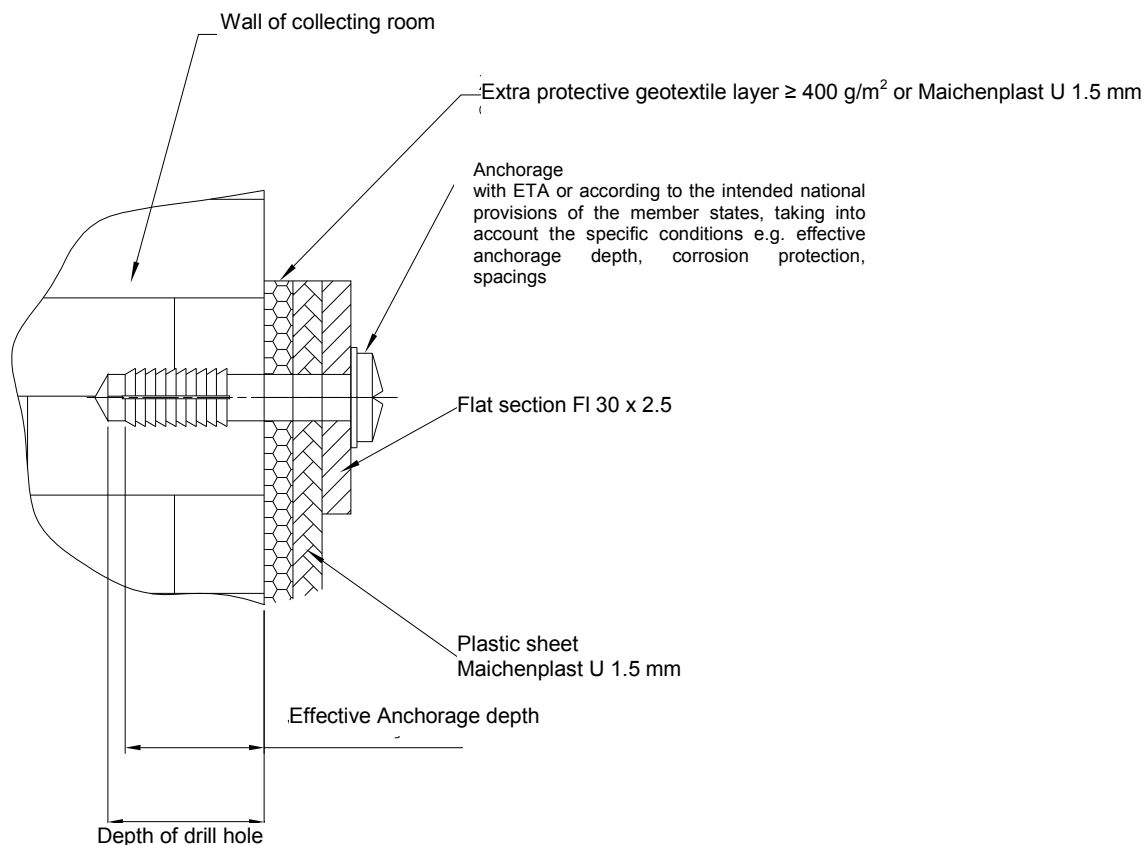
Serial No.	Confirmation by the executing company	
1	Object	
2	Material on stock:.....	
3	Lining with (Trade name/Type/Thickness/Batch Number)	
4	Approval: ETA No:..... of (date):	
5a	Manufacturer of the plastic sheets: (holder of approval)	
5b	Executing company	
5c	Period of construction:	
		Confirmation
6	The specialized staff of the executing company was informed by the manufacturer of the plastic sheets about the adequate processing	
7	Judgment before producing the lining:	
	a) Structural conditions according to ETA is given	
8	Control of the installation	
	a) Test certificates of the welders according to EN 13067 are available	
	b) Test records of welding are available (workshop/site)	
Remarks:		
		Date:
		(Company)
Maichenplast U 1.5 mm		Annex 3
Confirmation by the executing company		



Lap joint without air-channel (single weld)



Liner thickness d	= 1.5 mm
Front free overlap (\ddot{U}_1)	= 0 to 5 x d
Total overlap (\ddot{U})	≥ 80 mm
Weld width b	≥ 30 mm



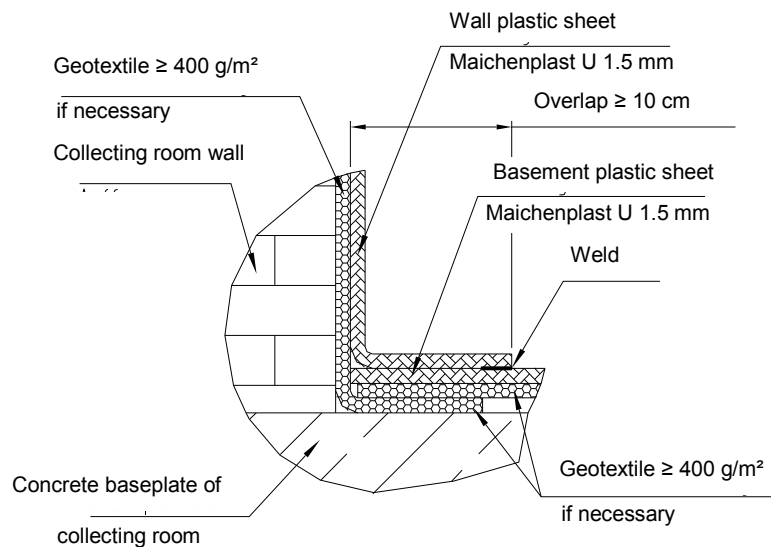
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Maichenplast U 1.5 mm

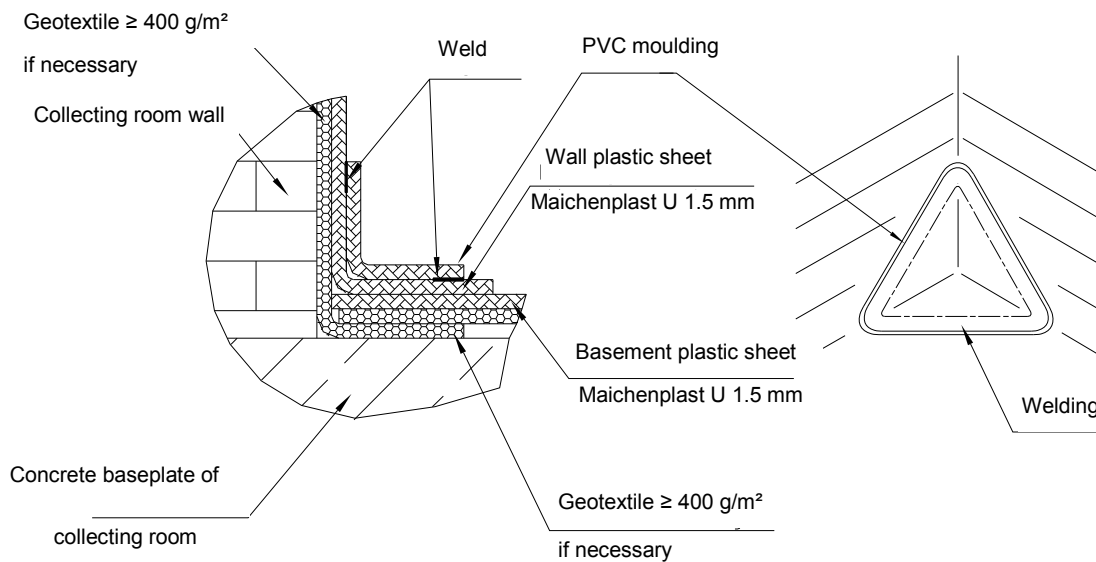
Upper end fixing
(Detail "Y")

Annex 6

Design of fillet joints wall/basement



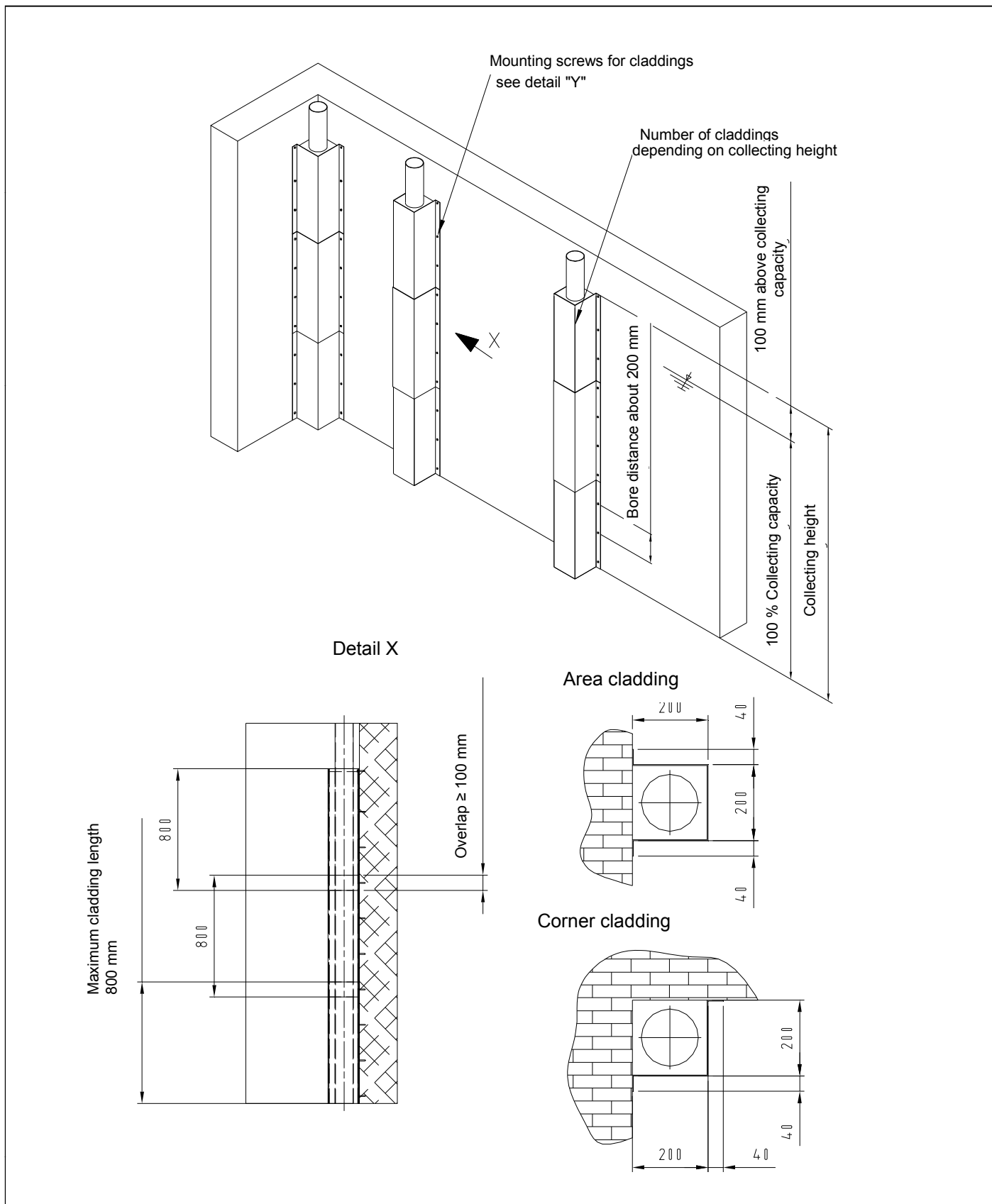
Design of corner joints wall/basement



Maichenplast U 1.5 mm

Design of fillet and corner joints
(Detail "Z")

Annex 7

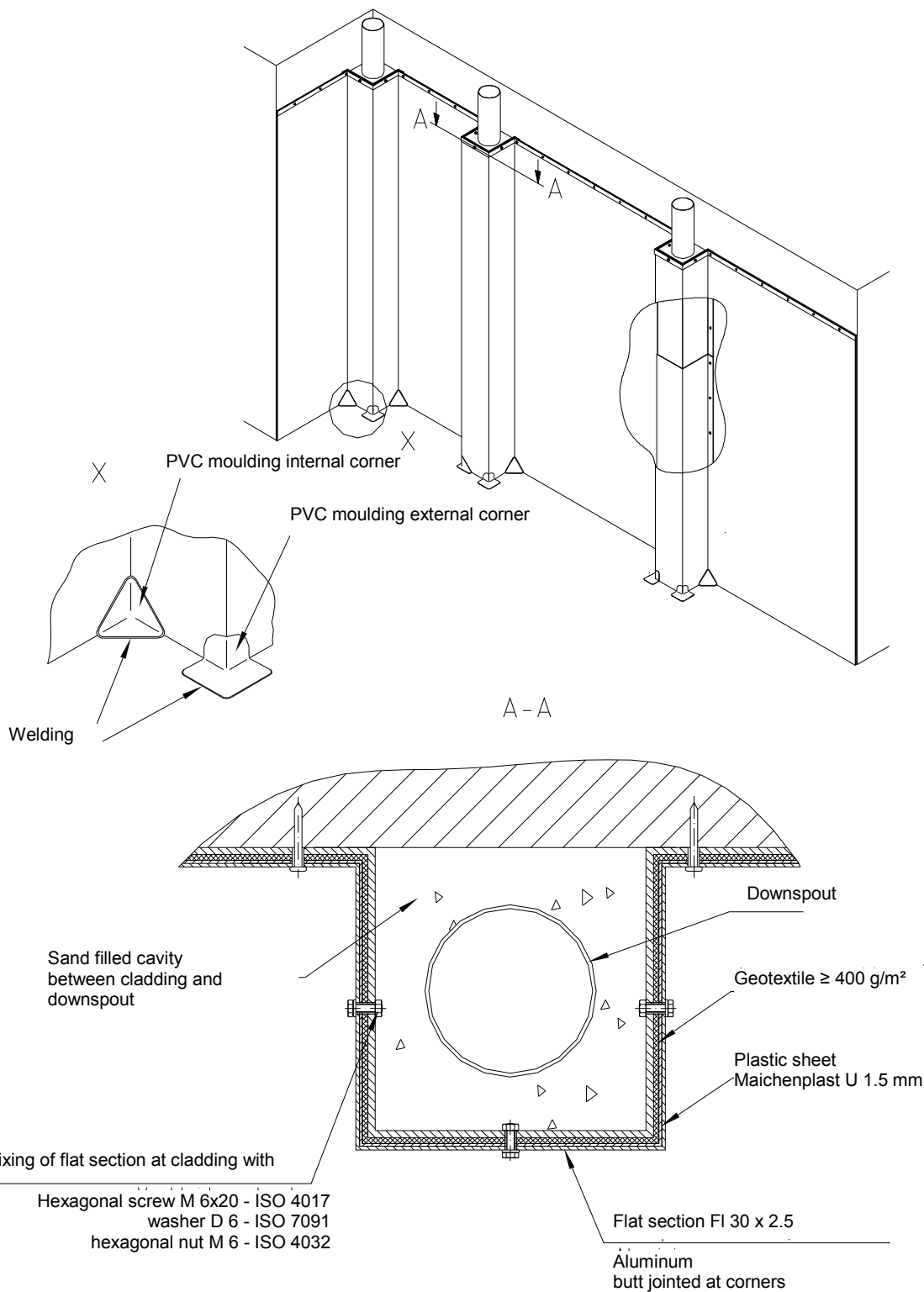


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Maichenplast U 1.5 mm

Area and corner cladding for downspouts
(pictured without geotextile and plastic sheet)

Annex 8



Electronic copy of the ETA by DIBt: ETA-08/0179

Maichenplast U 1.5 mm

Area and corner cladding for downspouts
(pictured with geotextile and plastic sheet)

Annex 9