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Authorised and notified according to Article 10 of the 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

MEMBER OF EOTA

## European Technical Approval ETA-12/0364

Trade name:	ARDEX S 1-K Watertight covering system
Holder of approval:	ARDEX GmbH Friedrich-Ebert-Strasse 45 D-58453 Witten Telephone +49 2302 664 0 Telefax +49 2302 664 375 Internet <a href="http://www.ardex.de">www.ardex.de</a>
Generic type and use of construction product:	Liquid applied watertight covering kit for wet room floors and walls
Valid from: to:	2012-10-18 2017-10-18
Manufacturing plant:	ARDEX GmbH Friedrich-Ebert-Strasse 45 D-58453 Witten
This European Technical Approval contains:	11 pages including 1 annex which form an integral part of the document



European Organisation for Technical Approvals

Europæisk Organisation for Tekniske Godkendelser

## **I LEGAL BASIS AND GENERAL CONDITIONS**

1 This European Technical Approval is issued by ETA-Danmark A/S 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>, as amended by Council Directive 93/68/EEC of 22 July 1993<sup>2)</sup>.
- Bekendtgørelse 559 af 27-06-1994 (afløser bekendtgørelse 480 af 25-06-1991) om ikrafttræden af EF direktiv af 21. december 1988 om indbyrdes tilnærmelse af medlemsstaternes love og administrative bestemmelser om byggevarer.
- 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>3)</sup>.
- EOTA Guideline for European Technical Approvals, ETAG No 022 *Watertight covering kits for wet room floors and/or walls*, Edition April 2007

2 ETA-Danmark A/S is authorized to check whether the provisions of this European Technical Approval are met. For this purpose a notified body shall execute twice a year surveillance, judgement and assessment of factory production control. Checking will 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 ETA-Danmark A/S pursuant to Article 5(1) of Council Directive 89/106/EEC.

1) Official Journal of the European Communities N° L40, 11 Feb 1989, p 12.

2) Official Journal of the European Communities N° L220, 30 Aug 1993, p 1.

3) Official Journal of the European Communities N° L 17, 20 Jan 1994, p 34.

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 ETA-Danmark A/S. 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 This European Technical Approval is issued by ETA-Danmark A/S in English. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

## II SPECIAL CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

### 1 Definition of product and intended use

#### General

ARDEX S 1-K is a liquid applied one component membrane kit which serves as a watertight covering for wet room floors and walls beneath a wearing surface.

The kit consists of the following components:

#### Primer

ARDEX P 2D Primer is a solvent free polymer dispersion primer, for use on moisture sensitive substrates. The primer is intended to have a significant additional function in limiting the water vapour permeability of the kit. The primer is used where national provisions requires a damp proof membrane.

#### Membrane

The membrane is a one component system consisting of ARDEX S 1-K solvent free liquid membrane on polymer dispersion base.

#### Reinforcement

The reinforcements are ARDEX SK 12 Tricom, ARDEX SSB 11 and ARDEX SFB 10, which are used to bridge cracks and joints, and in connection between the floor and the wall and in corners. Alternatively, the connection between the floor and the wall and in corners can be reinforced with ARDEX SK 90 Tricom, ARDEX SK 270 Tricom, ARDEX IH 15 and ARDEX UH 15. Pipe penetrations are reinforced with ARDEX SK-W Tricom 120 x 120, ARDEX SK-R Tricom 200 x 200, ARDEX SK-S Tricom 150 x 150, ARDEX RM 12/22 or ARDEX RM 40/60. For reinforcement around floor gullies and/or large pipe penetrations ARDEX SK-F Tricom 425 x 425, ARDEX SK-G Tricom 350 x 350, ARDEX SK-B Tricom 100-200, ARDEX STA 40 x 40, ARDEX STA 40 x 120, ARDEX STA 40 x 240 or ARDEX Tätningsmått 35 x 35 cm are used. The reinforcement is not intended to cover the entire floor and wall covering, but is used over joints and in corners and around pipe penetrations and floor gullies.

#### Adhesives

Adhesives covered by this ETA are: ARDEX X 7 G Flex, ARDEX X 7 G Plus, ARDEX X 701 F, ARDEX X 77, ARDEX X 77 S, ARDEX X 77 W, ARDEX X 78, ARDEX X 78 S, ARDEX X 78 W, ARDEX X 32, ARDEX S 9, ARDEX Ditra FBM, ARDEX S 48, ARDEX WA, ARDEX EG 8

#### Kit build-up

The kit is constructed as follows:

- a layer of minimum 160 g/m<sup>2</sup> to 250 g/m<sup>2</sup> ARDEX P 2D Primer in one or two applications

depending on substrate and required water vapour tightness

- reinforcement of in- and out going corners in walls, over joints or cracks in the substrate, around pipe penetrations, floor gullies and along the connection between floor and wall with ARDEX SK 12 Tricom, ARDEX SSB 11 and ARDEX SFB 10. Alternatively, the connection between the floor and the wall and in corners can be reinforced with ARDEX SK 90 Tricom, ARDEX SK 270 Tricom, ARDEX IH 15 and ARDEX UH 15. Pipe penetrations are reinforced with ARDEX SK-W Tricom 120 x 120, ARDEX SK-R Tricom 200 x 200, ARDEX SK-S Tricom 150 x 150, ARDEX RM 12/22 or ARDEX RM 40/60. For reinforcement around floor gullies and/or large pipe penetrations ARDEX SK-F Tricom 425 x 425, ARDEX SK-G Tricom 350 x 350, ARDEX SK-B Tricom 100-200, ARDEX STA 40 x 40, ARDEX STA 40 x 120, ARDEX STA 40 x 240 or ARDEX Tätningsmått 35 x 35
- at least 1100 g/m<sup>2</sup> one component ARDEX S 1-K distributed evenly over the surface in at least two applications
- a layer of ceramic tiles adhered to the kit with tile adhesive (ARDEX X 7 G Flex, ARDEX X 7 G Plus, ARDEX X 701 F, ARDEX X 77, ARDEX X 77 S, ARDEX X 77 W, ARDEX X 78, ARDEX X 78 S, ARDEX X 78 W, ARDEX X 32, ARDEX S 9, ARDEX Ditra FBM, ARDEX S 48, ARDEX WA, ARDEX EG 8).

Note that the above mentioned amount of ARDEX S 1-K corresponds to a dry film thickness of 0,5 mm (see section 2.4.7.3).

#### Intended use

The intended use of the covering kit is:

1. watertight covering for use beneath a wearing surface, normally in the form of tiles, on substrates of wood based panels, gypsum boards, fibre cement boards, cement bonded boards, watertight boards made from a polystyrene core with a cement based glass fibre reinforced covering and concrete, i.e. moisture sensitive substrates, which are flexible and with jointing and susceptible to cracking

The kit can be used with the following types of floor gullies:

Circular and rectangular gullies made from stainless steel or plastic type PE, with flange for adhesion of the membrane or with clamping ring or with collar

2. Indoor applications, where the liquid applied kit is not exposed to temperatures (i.e. temperature of structure) below 5 °C and above 40 °C, in the following uses:

- Floor and wall surfaces with only occasional direct exposure to water, e.g. at a good distance from shower or bathtub.
- Floors and walls in shower areas or around bathtubs used for a few showers daily, e.g. in ordinary dwellings, multi-family houses and hotels
- Floor and wall surfaces with exposure to water more frequent or of longer duration than normally anticipated in dwellings, e.g. public wet rooms, schools and sport facilities.

**Assumed working life**

The assumed intended working life of the kit for the intended use is 25 years, provided that they are subject to appropriate installation, use and maintenance.

An “assumed intended working life” means that it is expected that, when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the essential requirements.

The indications given as to the working life of the boards cannot be interpreted as a guarantee given by ARDEX GmbH or ETA-Danmark A/S.

## 2 Characteristics of product and assessment

ETAG	Characteristic	Assessment of characteristic
	<b>2.1 Mechanical resistance and stability</b>	Not relevant.
	<b>2.2 Safety in case of fire</b>	
2.4.1	Reaction to fire	<b>Euroclass F*</b>
	<b>2.3 Hygiene, health and the environment</b>	
2.4.2	Dangerous substances	No dangerous materials **) <p>According to the manufacturer's declaration the component joint bridging sleeve "ARDEX SK-S/-R TRICOM" contains DEHP, which is included in Annex XIV of the Regulation (EC) No 1907/2006 (REACH)</p>
2.4.3.	Vapour permeability	The vapour permeability of the ARDEX S 1-K membrane with primer when tested at 23°C and RH 93 → 50 %. <p><b>The <math>s_d</math> value of the kit applied to the gypsum board is 60,0 m, which is equivalent to <math>Z_p = 3,06 \times 10^{11} \text{ Pa s m}^2/\text{kg}</math> with 250 g/m<sup>2</sup> ARDEX P 2D in two applications (90 g/m<sup>2</sup> and 160 g/m<sup>2</sup>) and approx. 1100 g/m<sup>2</sup> ARDEX S 1-K in two applications</b></p> <p><b>The <math>s_d</math> value of the kit applied to the gypsum board is 32,0 m, which is equivalent to <math>Z_p = 1,66 \times 10^{11} \text{ Pa s m}^2/\text{kg}</math> with 160 g/m<sup>2</sup> ARDEX P 2D in one application and approx. 1100 g/m<sup>2</sup> ARDEX S 1-K in two applications</b></p>
2.4.4	Moisture resistance	
	Water tightness	<b>Watertight</b> according to EN 14891
	Crack bridging ability	<b>Assessment category 2:</b> Crack width 0,75 mm
	Bond strength	ARDEX S 1-K with ARDEX P 2D Primer and the following tile adhesives; ARDEX X 7 G Flex, ARDEX X 7 G Plus, ARDEX X 701 F, ARDEX X 77, ARDEX X 77 S, ARDEX X 77 W, ARDEX X 78, ARDEX X 78 S, ARDEX X 78 W, ARDEX X 32, ARDEX S 9, ARDEX Ditra FBM, ARDEX S 48, ARDEX WA, ARDEX EG 8 on a concrete substrate all comply with <p><b>Assessment category 2:</b> Bond strength &gt; 0,5 MPa</p> <p>ARDEX S 1-K with ARDEX P 2D Primer and the following tile adhesives; ARDEX X 7 G Flex, ARDEX X 7 G Plus, ARDEX X 701 F, ARDEX X 77, ARDEX X 77 S, ARDEX X 77 W, ARDEX X 78, ARDEX X 78 S, ARDEX X 78 W, ARDEX X 32, ARDEX S 9, ARDEX Ditra FBM, ARDEX S 48, ARDEX WA, ARDEX EG 8 on substrates***) of calcium silicate boards, gypsum boards, fibre cement boards, cement based boards and watertight boards made from a polystyrene core with a cement based glass fibre reinforced covering comply with <p><b>Assessment category 2:</b> Bond strength &gt; 0,5 MPa</p></p>

ETAG para.	Characteristic	Assessment of characteristic
	Scratching resistance	No performance determined
	Joint bridging ability	ARDEX S 1-K with ARDEX P 2D Primer and with either ARDEX SK 12 Tricom, ARDEX SSB 11 or SFB 10 Reinforcement comply with <b>Assesment category 2:</b> Watertight
	Water tightness around penetrations	ARDEX S 1-K with ARDEX P 2D Primer and ARDEX Reinforcement as described in section II.1 *****) comply with <b>Assesment category 2:</b> Watertight
	<b>2.4 Safety in use</b>	
2.4.5	Slipperiness	Not relevant
	<b>2.5 Protection against noise</b>	Not relevant
	<b>2.6 Energy economy and heat retention</b>	Not relevant
	<b>2.7 Related aspects of durability and serviceability</b>	
2.4.6.1	Resistance to temperature	<b>Assessment category 2:</b> Bond strength > 0,5 Mpa  Crack bridging ability after ageing: 1,1 kg/m <sup>2</sup> membrane ARDEX S 1-K applied in two layers (equivalent thickness of membrane = 0,5 mm) <b>Assessment category 2: Crack width 0,75 mm</b>
2.4.6.2	Resistance to water	<b>Assessment category 2:</b> Bond strength > 0,5 MPa
2.4.6.3	Resistance to alkalinity	<b>Assessment category 2:</b> Bond strength > 0,5 MPa
2.4.6.6	Resistance to mechanical wear	Not relevant
2.4.7.1	Cleanability	Not relevant
2.4.7.2	Repairability	No performance determined
2.4.7.3	Thickness	The required weight (wet) of the ARDEX S 1-K membrane is 2,1 kg/m <sup>2</sup> pr. mm dry thickness of the layer  The minimum thickness of the membrane shall be 0,5 mm.
2.4.7.4	Applicability	Applicable

\*) The kit is classified as B2 according to DIN 4102 part 1.

\*\*) In accordance with <http://europa.eu.int/comm/enterprise/construction/internal/dangsub/dangmain.htm> 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 EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

\*\*\*) The assessment of the fitness for use of the kit on the generic description of the boards is based on test on the following specified substrates in addition to concrete according to EN 1323; Knauf gypsum wet room board (TOP 2000 Super), Rigips dry board, Sperrholz plywood, Spanplatte V100 chipboard, Gipsdiele gypsym plasterboard, cellular concrete blocks, LUX Elements building board foam panel

\*\*\*\*\*) In accordance with the provisions of ETAG 022 part 1 – Annex A, the kit has been tested with three types of floor gullies; three circular gullies, one made from stainless steel with a flange for floors with a membrane, one in PP plastic without a clamping ring and one in PP plastic with a clamping ring type KL/150

### 3 Attestation of Conformity and CE marking

#### 3.1 Attestation of Conformity system

According to the decision 2003/655/EC of the European Commission system 2+ for the procedure of the attestation of conformity (Annex III, clause 2(ii) first possibility of Directive 89/106/EC) applies to the watertight covering kit.

There is no declared fire performance, and hence the Decision 2003/655/EC of the European Commission with regard to reaction to fire is not relevant.

The system of attestation of conformity is 2+ is defined as follows.

- a) Tasks for the manufacturer:
  - (1) Factory production control,
  - (2) Initial type testing of the product,
  - (3) testing of samples taken at the factory in accordance with a prescribed test plan
- b) Tasks for the notified body:
  - (1) Initial inspection of the factory and the factory production control,
  - (2) Continuous surveillance

#### 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 ETA.

The factory production control shall be in accordance with the appropriate part of the control plan<sup>1</sup> which is confidential part of the MTD. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with ETA-Danmark.

The manufacturer may only use initial materials according to the MTD. He shall inspect or control the

initial materials on acceptance according to the control plan.

The factory production control follows the identifying properties of the components and the example of the control plan as given in ETAG 022 part 1.

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

The records shall include at least the following information:

- name of the product and of the initial materials,
- type of inspection or control,
- date of manufacture of the product, batch N° if needed, and date of inspection or control of the product or of the initial materials,
- result of inspections or controls and, as far as applicable, comparison with the requirements,
- signature of the person responsible for the factory production control.

The records shall be kept for at least five years. On request they shall be presented to ETA-Danmark.

Details concerning extent, type and frequency of the tests or inspections to be performed within the scope of the factory production control shall correspond to the control plan which is part of the MTD to this ETA.

##### 3.2.1.2 Initial type-testing of the product

The initial type-testing refers to the product properties stated in the appropriate part of the control plan to this ETA. It follows the example of the control plan as given in ETAG 022 part 1.

If the verifications underlying this ETA have been furnished on samples from the current production, these will replace the initial type-testing.

Otherwise the necessary initial type-testing shall be carried out according to the provisions of the control plan and observance of the required property values shall be ascertained by the manufacturer.

After changing the production process or starting the production in another manufacturing plant the initial type-testing shall be repeated.

##### 3.2.1.3 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body/bodies which is/are notified for the tasks referred to in section 3.1(b) in the field of the product in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in section 3.2.2 shall be handed over by the manufacturer to the notified body/bodies involved.

The manufacturer shall make a declaration of

<sup>1</sup> The "control plan" is a confidential part of the MTD to this ETA and deposited with ETA-Danmark. It contains the required information on the factory production control and on the initial type-testing. As far as this is relevant to the tasks of the notified body involved in the procedure of attestation of conformity the control plan will be handed over to the notified body. See section 3.2.2.

conformity, stating that the product is in conformity with the provisions of this ETA and shall mark the product with the CE mark according to clause 3.3.

### **3.2.2. Tasks of notified bodies**

#### **3.2.2.1 Initial inspection of the factory and of factory production control**

The appropriate part of the control plan states the information on the properties which have to be controlled by the notified body involved for initial inspection of factory and factory production control. The notified body has to control the devices and equipments and the documentation of the factory production control of the manufacturer when starting the production.

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

The notified 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 ETA.

After changing the production process or starting the production in another manufacturing plant the initial inspection of factory and factory production control shall be repeated. The notified body shall issue a new EC certificate of conformity of the factory control stating the conformity with the provisions of this ETA.

#### **3.2.2.3 Continuous surveillance, assessment and approval of factory production control.**

The appropriate part of the control plan states the information on the product properties which have to be checked by the notified body involved. The frequency of this tasks should be once a year.

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

In cases where the provisions of this ETA and its control plan are no longer fulfilled the certification body involved shall withdraw the certification of conformity and inform ETA-Danmark without delay.

### **3.3 CE marking**

The CE marking<sup>2</sup> shall be affixed on the packaging of the kit of the watertight membrane "ARDEX S 1-K" or its accompanying documents.

The letters "CE" shall be followed by the identification number of the notified body, and be accompanied by the following additional information:

- name and address or identifying mark of the manufacturer,
- last two digits of the year in which the CE marking was affixed,
- number of the EC certificate for the factory production control,
- number of the European technical approval,
- number of the European technical guideline.

The components shall be specified as belonging to the composite waterproofing kit "ARDEX S 1-K".

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<sup>2</sup> Notes on the CE marking are stated in Guidance Paper D "CE marking under the Construction Products Directive", Brussels, 01 August 2002



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

### **4.1 Manufacturing**

All materials shall be manufactured by ARDEX GmbH or by subcontractors under the responsibility of ARDEX GmbH

The European Technical Approval is issued for the product on the basis of agreed data/information, deposited with ETA-Danmark, 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 ETA-Danmark before the changes are introduced. ETA-Danmark 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 Design and dimensioning**

The fitness for the respective use of the watertight membrane results from the characteristic values and categories.

The supplementing statements of the manufacturer stated in the MTD for design and application of the watertight system for creating a watertight covering under wearing surface for floors and walls in indoor wet areas shall be considered.

### **4.3 Installation**

The fitness for use of the watertight membrane can be assumed only, if the installation is carried out according to the installation instructions stated in the MTD by the manufacturer, in particular taking account of the following points:

- installation by appropriately trained personnel,
- installation of only those components which are specified components of the kit,
- installation with the required tools and adjuvant, precautions during installation,
- inspecting the substrate surface for cleanliness and correct treatment,
- inspections during installation and of the finished watertight membrane and documentation of the results.

The information as to the handling of waste products shall be observed.

### **4.4 Manufacturers responsibility**

It is the manufacturer's responsibility to make sure that all those who utilize the kit will be appropriately informed about the specific conditions according to sections 1, 2, 4, and 5 including the annexes to this ETA and the not confidential parts of the MTD deposited to this ETA.

## **5 Indications to the manufacturer**

### **5.1 Packaging, transport and storage**

Information on:

- Packaging
- transport and
- storage

are given in the MTD.

### **5.2 Use, maintenance and repair**

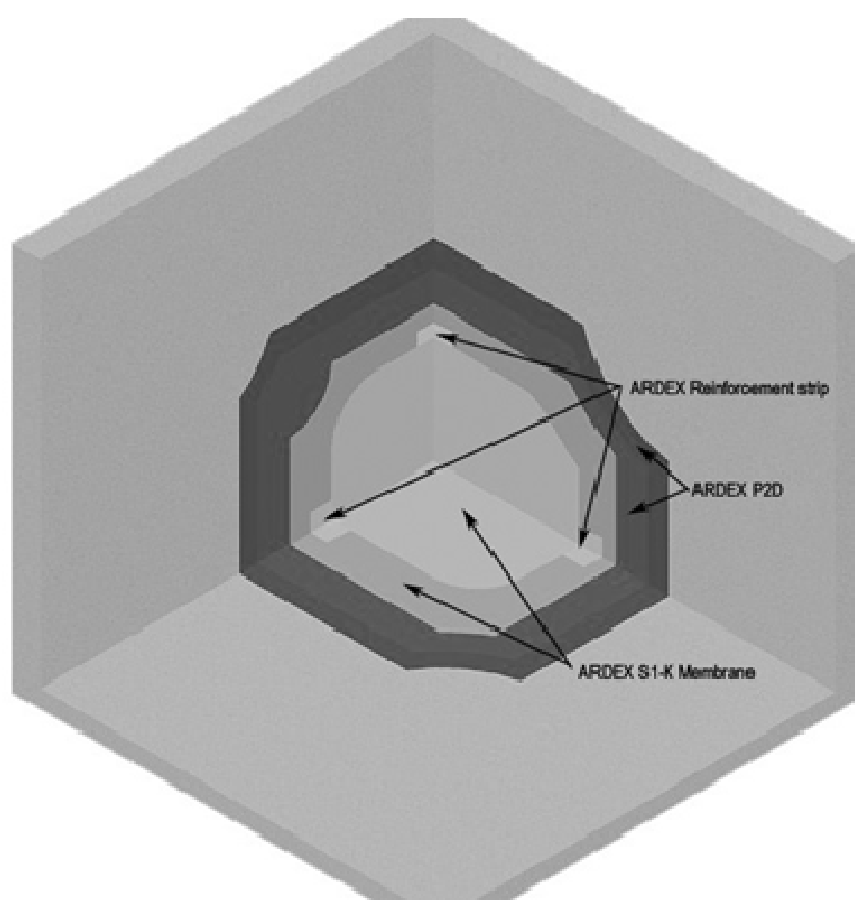
Information on:

- Use
- maintenance
- repair

are given in the MTD.



Thomas Bruun  
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ARDEX S 1-K watertight covering kit	Annex 1 of European Technical Approval ETA-12/0364
Principle build-up of the kit	