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European Assessment Document for

Stone wool elements used for large-scale water storage in civil works

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This European Assessment Document (EAD) has been developed taking into account up-to-date technical and scientific knowledge at the time of issue and is published in accordance with the relevant provisions of Regulation (EU) 305/2011 as a basis for the preparation and issuing of European Technical Assessments (ETA).

Contents

1 SCOPE OF THE EAD

1.1 Description of the construction product

The stone wool elements used for large-scale water storage in civil works (in the following referred to as “stone wool elements”) are made from factory made stone wool batts and placed together on site into a hydrophilic and porous layer in order to establish drainage, infiltration, buffering and delayed discharge.

The elements are placed in a vertical position and can have open channels for the transport of air or water. The channels are drilled through each element in the factory.

This EAD applies to stone wool elements with the following dimensions:

Dimensions	Width: 200 – 2400 mm Length: 200 - 3000 mm Thickness: 30 – 300 mm
Density	50 kg/m^3 – 250 kg/m^3

Table 1.1.1 Range of dimensions and density of the stone wool panels

Figure 1.1.1 Example of the stone wool element (here placed on top of elements in end-use condition)

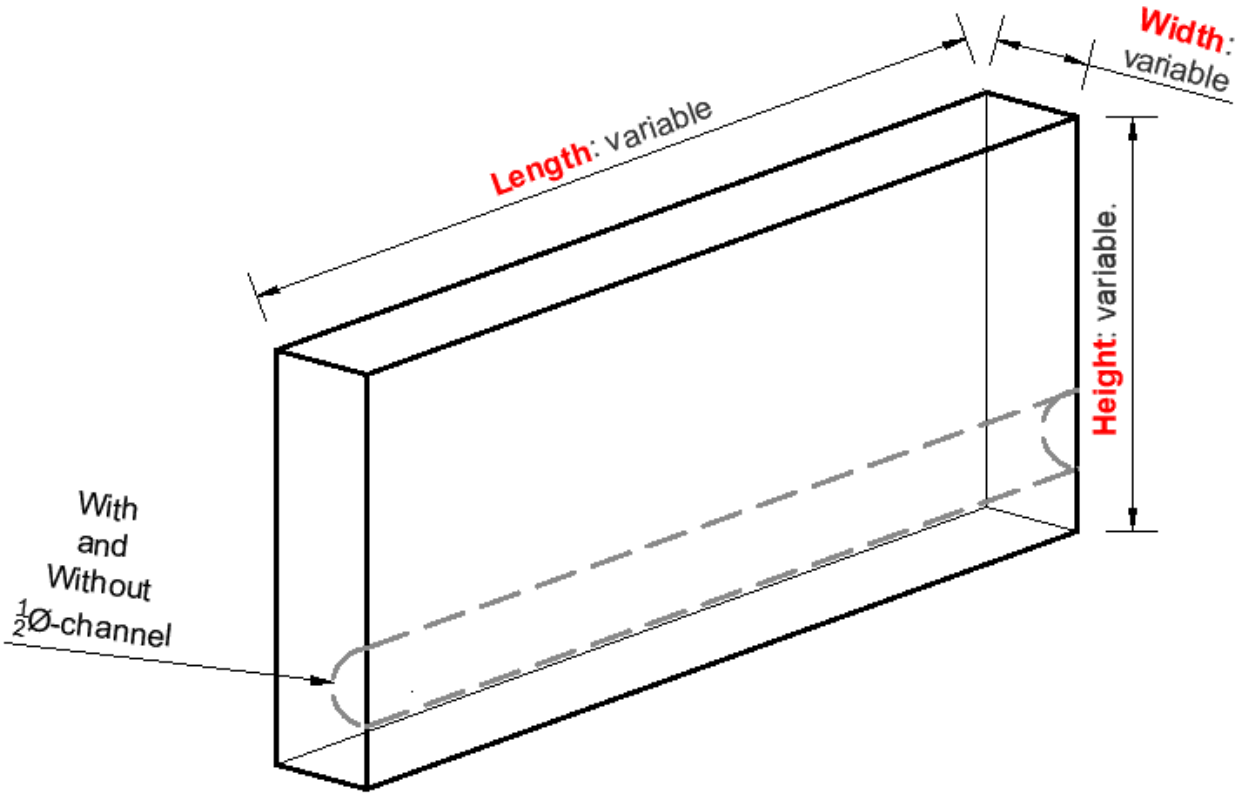

Figure 1.1.2 Schematic drawing of the stone wool element

The stone wool element is not covered by a harmonised European standard.

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary.

It is assumed that the product will be installed according to the manufacturer's instructions or (in absence of such instructions) according to the usual practice of the building professionals.

Relevant manufacturer's stipulations, e.g., regarding the intended end use conditions, having influence on the performance of the product covered by this European Assessment Document shall be considered for the determination of the performance and detailed in the ETA as long as the details of the assessment methods as laid down in this EAD are respected.

1.2 Information on the intended use(s) of the construction product

1.2.1 Intended use(s)

The stone wool elements are used for underground large-scale water storage, drainage and infiltration systems in urbanised areas. The end-use condition consists of several stone wool elements in which rainwater is temporarily stored, possibly supplemented by a filter made up of stone wool elements to catch dirt in the incoming rainwater – see figure 1.2.1.1. In addition, the facility has an outlet to ensure that the water storage is available again in time to be able to store a subsequent storm. This outlet can consist of infiltration of water into the subsurface and/ or delayed discharge via a pipeline to surface water or the sewer system.

Due to above ground traffic the stone wool elements can be subject to cyclic loads.

Figure 1.2.1.1 Examples of the stone wool elements in end use conditions (before covered by soil)

1.2.2 Working life/Durability

The assessment methods included or referred to in this EAD have been written based on the manufacturer's request to take into account a working life of the stone wool elements for the intended use of 40 years when installed in the works (provided that the stone wool elements are subject to appropriate installation (see 1.1)). These provisions are based upon the current state of the art and the available knowledge and experience.

When assessing the product, the intended use as foreseen by the manufacturer shall be taken into account. The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works[1].

The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by EOTA when drafting this EAD nor by the Technical Assessment Body issuing an ETA based on this EAD but are regarded only as a means for expressing the expected economically reasonable working life of the product.

1 The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, as well as on the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than referred to above.

2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

2.1 Essential characteristics of the product

Table 2.1.1 shows how the performance of the stone wool elements is assessed in relation to the essential characteristics.

Table 2.1.1 Essential characteristics of the product and methods and criteria for assessing the performance of the product in relation to those essential characteristics

No	Essential characteristic	Assessment method	Type of expression of product performance
Basic Works Requirement 2: Safety in case of fire			
1	Reaction to fire	2.2.1	Class
Basic Works Requirement 3: Hygiene, health and the environment			
2	Content, emission and/or release of dangerous substances	2.2.2	Description and level
Basic Works Requirement 4: Safety and accessibility in use			
3	Density	2.2.3	Level
4	Water buffer capacity	2.2.4	Level
5	Compression strength (unconfined)	2.2.5	Level
6	Resistance to cyclic loading	2.2.6	Level
7	Compressive creep	2.2.7	Level
Aspects of durability			
8	Freeze-thaw resistance	2.2.8	Level

2.2 Methods and criteria for assessing the performance of the product in relation to essential characteristics of the product

This chapter is intended to provide instructions for TABs. Therefore, the use of wordings such as “shall be stated in the ETA” or “it has to be given in the ETA” shall be understood only as such instructions for TABs on how results of assessments shall be presented in the ETA. Such wordings do not impose any obligations for the manufacturer, and the TAB shall not carry out the assessment of the performance in relation to a given essential characteristic when the manufacturer does not wish to declare this performance in the Declaration of Performance.

2.2.1 Reaction to fire

Assessment method

The stone wool elements shall be tested, using the method(s) relevant for the corresponding reaction to fire class in accordance with EN 13501-1. The stone wool elements shall be classified in accordance with the Commission Delegated Regulation (EU) No 2016/364 in connection with EN 13501-1. The mounting and fixing rules described in EN 15715 shall be followed.

Expression of results

The reaction to fire class shall be given in the ETA.

2.2.2 Content, emission and/or release of dangerous substances

The performance of the product regarding the emissions and/or release and, where appropriate, the content of dangerous substances shall be assessed on the basis of the information provided by the manufacturer[2] after identifying the release scenarios taking into account the intended use(s) of the product and the Member States where the manufacturer intends his product to be made available on the market.

The identified intended release scenarios for this product and intended use with respect to dangerous substances are:

S/W1: Product with direct contact to soil, ground- and surface water

Assessment method

2.2.2.1 Leachable substances

For the intended use covered by the release scenario S/W1, the performance of the product concerning leachable substances shall be assessed.

A leaching test with subsequent eluate analysis shall be performed each in duplicate. Leaching tests of the stone wool element shall be conducted in accordance with EN 16637-2. The leachant shall be pH-neutral demineralised water and the ratio of liquid volume to surface area shall be (80 ± 10) l/m².

Specimens shall be prepared in accordance with clause 8.2 of EN 16637-2.

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2 The manufacturer may be asked to provide to the TAB the REACH related information which shall accompany the DoP (cf. Article 6(5) of Regulation (EU) No 305/2011).

The manufacturer is **not** obliged to:
- provide the chemical constitution and composition of the product (or of constituents of the product) to the TAB, or
- provide a written declaration to the TAB stating whether the product (or constituents of the product) contain(s) substances which are classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the SGDS, taking into account the installation conditions of the construction product and the release scenarios resulting from there.

Any information provided by the manufacturer regarding the chemical composition of the products is not to be distributed to EOTA, to other TABs or beyond.

In eluates of "6 hours" and "64 days", the following biological tests shall be conducted:

- Acute toxicity test with Daphnia magna Straus in accordance with EN ISO 6341.
- Toxicity test with algae in accordance with ISO 15799.
- Luminescent bacteria test in accordance with EN ISO 11348-1, EN ISO 11348-2 or EN ISO 11348-3. These tests are equivalent.

For each biological test, EC20-values shall be determined for dilution ratios 1:2, 1:4, 1:6, 1:8 and 1:16.

If the parameter TOC (total organic carbon) is higher than 10 mg/l, the following biological tests shall be conducted with the eluates of "6 hours" and/or "64 days" eluates:

- Biological degradation in accordance with OECD Test Guideline 301, part A, B or E. These tests are equivalent.

Expression of results

Determined toxicity in biological tests shall be expressed as EC20-values for each dilution ratio. Maximum determined biological degradability shall be expressed as "…% within …hours/days". The respective test methods for analysis shall be specified.

2.2.3 Density

The apparent density of the stone wool element shall be tested in accordance with EN ISO 29470. The apparent density calculated according to clause 8 of EN ISO 29470 shall be given in the ETA.

2.2.4 Water buffer capacity

Assessment method

The water buffer capacity shall be tested according to EN ISO 16535, method 2A with the following test conditions.

Test conditions:

- The waterflow shall be set to a speed in which it will take 10 minutes ± 10 seconds to fill the tank to the defined level to prevent inclusion of air.
- After 24 hours remove the test specimen and transfer it within 5 seconds to a container to prevent drainage. Then weigh the container with the specimen to determine its mass, and subtract the net weight of the container.

Five cubic specimens shall be tested. The test specimens shall have the thickness of the product to be covered by the ETA. The thickness decides the dimensions of the cube. The weight of the dry specimen shall be determined before the test.

Expression of results

The water buffer capacity level shall be stated in the ETA as the increase in weight together with the thickness of the tested specimen.

2.2.5 Compression strength (unconfined)

Assessment method

The unconfined compression strength of the stone wool element shall be tested according to EN ISO 29469 with conditions in accordance with Annex A.

Unconfined compression strength shall be carried out on specimens with the fibre direction corresponding to the direction of the largest permanent stress in conditions typical for the application. Five specimens shall

be tested. The tests are performed on specimens with dimensions specified in the Manufacturers Product Installation Instructions (MPII).

Expression of results

The mean value of the compression strength in kPa together with the thickness of the specimen and the direction of the fibres in the specimen shall be stated in the ETA.

2.2.6 Resistance to cyclic loading

The resistance to cyclic loading of the stone wool element shall be tested according to EN 13793 with the test conditions described in Annex B.

Measurements and reporting requirements of the resistance to cyclic loading shall be carried out on specimens with the fibre direction corresponding to the direction of the largest cyclic stress in conditions typical for the application. Five specimens shall be tested with minimal 3 different stresses selected according to EN13793 clause 7.2

Expression of results

The number of achieved cycles and the force in kPa together with the direction of the fibres in the specimen shall be stated in the ETA.

2.2.7 Compressive creep

Assessment method

The compressive creep of the stone wool element shall be tested according to EN ISO 16534 with the test conditions described in Annex C.

Measurements and report requirements of the compressive creep shall be carried out on specimens with the fibre direction corresponding to the direction of the largest permanent stress in conditions typical for the application (in the Y-direction, see figure A.1). Three specimens shall be tested. The tests are performed on specimens with dimensions specified in the Manufacturers Product Installation Instructions (MPII).

Expression of results

The expression of results is performed according to Annex C. The performance level shall be stated in the ETA as σ_c / $\sigma_{m,m}$ in % and $\varepsilon_{ct,40years}$ in % together with information on the thickness of the specimen and the fibre direction of the stone wool element.

2.2.8 Freeze-thaw resistance

Assessment method

The freeze-thaw resistance of the stone wool element shall be tested according to EN ISO 16546 with the following deviations:

The long-term water absorption test shall be done by total immersion according to EN ISO 16535, method 2A.

The test specimens shall have the thickness of the product to be covered by the ETA. The thickness is decisive for the dimensions of the cube. The number of specimens shall be two for each Y and Z fibre direction – in total 4 specimens.

In case of pausing the freeze-thaw cycle, the specimens shall be stored at room temperature 23± 2°C allowing the specimens to drain freely. Before restarting the test, the specimens shall be totally immersed in water according to EN ISO 16535, method 2A, for 1 hour.

Expression of results

After the freeze-thaw test the reduction in compressive stress of the dry specimens, when tested in accordance with EN ISO 29469 shall be stated in the ETA together with the thickness of the specimen.

3 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

3.1 System(s) of assessment and verification of constancy of performance to be applied

For the products covered by this EAD the applicable European legal act is Commission Decision 1999/472/EC tables 2/5 and 4/5, as amended by Decision 2001/596/EC.

The system is 4 for any use except for uses subject to regulations on reaction to fire.

For uses subject to regulations on reaction to fire the applicable AVCP systems regarding reaction to fire are 1, or 3, or 4 depending on the conditions defined in the said Decision.

3.2 Tasks of the manufacturer

The cornerstones of the actions to be undertaken by the manufacturer of the product in the procedure of assessment and verification of constancy of performance are laid down in Table 3.2.1.

Table 3.2.1 Control plan for the manufacturer; cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Factory production control (FPC) [including testing of samples taken at the factory in accordance with a prescribed test plan]					
1	Reaction to fire	2.2.1	To be defined in control plan	1	Once per 5 years
2	Length	Measurement	To be defined in control plan	1	Every two hours
	Width				Every two hours
	Thickness				Every two hours
3	Water buffer capacity	2.2.4	To be defined in control plan	1	Once per 5 years
4	Resistance to cyclic loading	2.2.6	To be defined in control plan	1	Once per 5 years
5	Compressive creep	2.2.7	To be defined in control plan	1	Once per 5 years

3.3 Tasks of the notified body

The intervention of the notified body under AVCP system 1 is only necessary for reaction to fire for products for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g., an addition of fire retardants or a limiting of organic material).

In this case the cornerstones of the tasks to be undertaken by the notified body under AVCP system 1 are laid down in Table 3.3.1.

Table 3.3.1 Control plan for the notified body; cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Initial inspection of the manufacturing plant and of factory production control					
1	Notified Body will ascertain that the factory production control with the staff and equipment are suitable to ensure a continuous and orderly manufacturing of the stone wool element.	Verification of the complete FPC as described in the control plan agreed between the TAB and the manufacturer	According to Control plan	According to Control plan	When starting the production or a new line
Continuous surveillance, assessment and evaluation of factory production control					
2	The Notified Body will ascertain that the system of factory production control and the specified manufacturing process are maintained taking account of the control plan related to resistance to fire and reaction to fire, taking into account productions stages limiting of organic material and/or the addition of fire retardants.	Verification of the controls carried out by the manufacturer as described in the control plan agreed between the TAB and the manufacturer with reference to the raw materials, to the process and to the product as indicated in Table 3.2.1	According to Control plan	According to Control plan	1/year

4 REFERENCE DOCUMENTS

EN 13501-1:2018	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests
EN 13793:2003	Thermal insulation products for buildings applications – Determination of behaviour under cyclic loading
EN 14933:2007	Thermal insulation and light weight fill products for civil engineering applications – Factory made products of expanded polystyrene (EPS) – Specification
EN 15715:2010	Thermal insulation products – Instructions for mounting and fixing for reaction to fire testing – Factory made products
EN 16637-2:2023	Construction products: Assessment of release of dangerous substances - Part 2: Horizontal dynamic surface leaching test
EN ISO 6341:2012	Water quality - Determination of the inhibition of the mobility of Daphnia magna Straus (Cladocera, Crustacea) - Acute toxicity test (ISO 6341:2012)
EN ISO 11348-1:2008/A1:2018	Water quality - Determination of the inhibitory effect of water samples on the light emission of Vibrio fischeri (Luminescent bacteria test) - Part 1: Method using freshly prepared bacteria (ISO 11348-1:2007+Amd1:2018)
EN ISO 11348-2:2008/A1:2018	Water quality - Determination of the inhibitory effect of water samples on the light emission of Vibrio fischeri (Luminescent bacteria test) - Part 2: Method using liquid-dried bacteria (ISO 11348-2:2008+Amd1:2018)
EN ISO 11348-3:2008/A1:2018	Water quality - Determination of the inhibitory effect of water samples on the light emission of Vibrio fischeri (Luminescent bacteria test) – Part 3: Method using freeze-dried bacteria (ISO 11348-3:2008+Amd1:2018)
EN ISO 16534:2020	Thermal insulating products for building applications – Determination of compressive creep (ISO 16534:2020)
EN ISO 16535:2019	Thermal insulating products for building applications – Determination of long-term water absorption by immersion (ISO 16535:2019)
EN ISO 16546:2020	Thermal insulating products for building applications – Determination of freeze-thaw resistance (ISO 16546:2020)
EN ISO 29469:2022	Thermal insulation products for Buildings applications – Determination of compression behaviour
ISO 15799:2019	Soil quality - Guidance on the ecotoxicological characterization of soils and soil materials
EN ISO 29470:2020	Thermal insulating products for building applications – Determination of the apparent density

ANNEX A: UNCONFINED COMPRESSION TEST (UCS)

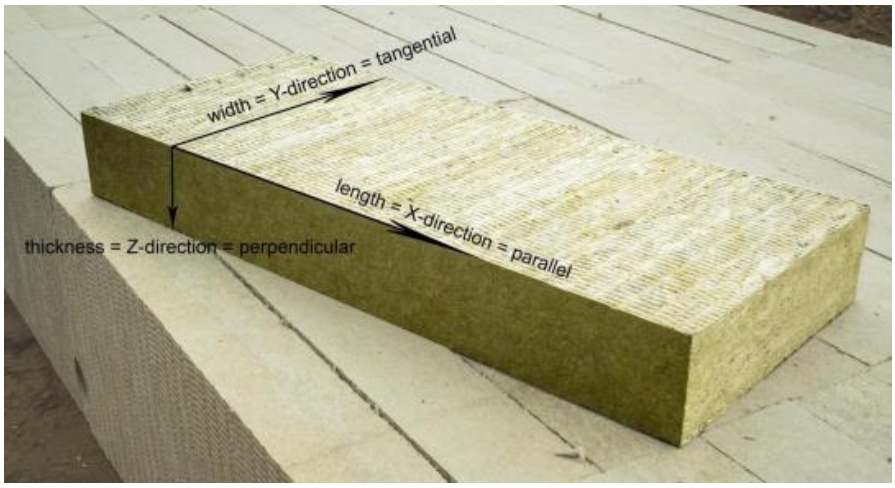

Figure A.1.: Fibre directions stone wool element

A.1 Specimen preparation

Concerning specimen preparation and reporting the following procedures shall be applied:

- The test specimens shall have the thickness of the products as specified in the Manufacturers Product Installation Instructions (MPII) to be covered by the ETA. Their thickness is decisive for the dimensions of the cube.

Reporting shall include:

a. Orientation of fibres with respect to the direction of loading during testing;

b. Specimen dimensions prior to testing. Average height and diameter of specimen (mm);

c. Dry density (Mg/m^3);

d. Mean rate of compression in either mm/min or % strain per minute, in either case, to two significant figures;

e. Unconfined Compressive Strength (kPa);

f. Strain at failure to the nearest 0,1%;

g. Sketch and/or photograph of the specimen showing the type of failure;

h. Plot of vertical stress versus strain;

i. Any deviation from the standardized procedure, unusual conditions or other data that would be considered necessary to properly interpret the results obtained.

ANNEX B: CYCLIC TEST

B.1 Apparatus

In many ways the test equipment for the cyclic test is similar to the test equipment for the unconfined compression test provided the equipment is capable of performing cyclic strength tests. One specimen is tested for each configuration.

B.2 Test conditions

- An initial static load condition shall be applied. The initial static load is equal to the average of the minimum and maximum peak axial cyclic load.
- The stress selection is in accordance with EN 13793/7.2. The compressive strength ,σ_m, or the compressive stress at 10% deformation, σ_{10}, is measured in accordance to EN ISO 29469. The selection of using σ_m or σ_{10} is specified by EN ISO 29469 clause 4. Stress selection shall remain constant during a test.
- The specimen shall cyclically be loaded using a 1 Hz sinusoidal load form. During cyclic loading the changes of axial load and axial deformation with time shall be recorded.
- Cyclic testing shall be terminated up on reaching an accumulated (permanent) axial strain of 5% at σ_{min}or 200.000 cycles whichever occurs first.

B.3 Test parameters

The cyclic stress and strain shall be calculated by using the following equations:

Cyclic stress

$$\sigma_{\max} = \sigma_{av} + \sigma_{cyc} = \frac{\Delta P_{av} + \Delta P_{cyc}}{A} \quad \text{(B.3.1)}$$

$$\sigma_{\min} = \sigma_{av} - \sigma_{cyc} = \frac{\Delta P_{av} - \Delta P_{cyc}}{A} \quad \text{(B.3.2)}$$

$$\sigma_{\alpha v} = \frac{(\sigma_{\max} + \sigma_{\min})}{2} \quad \text{(B.3.3)}$$

$$\sigma_{cyc} = \sigma_{\max} - \sigma_{av} \text{ or } \sigma_{cyc} = \sigma_{av} - \sigma_{\min} \quad \text{(B.3.4)}$$

$$\sigma_{da} = \sigma_{\max} - \sigma_{\min} \quad \text{(B.3.5)}$$

Where:

σ_{max} = peak (maximum) cyclic stress (kPa)

σ_{min} = peak (minimum) cyclic stress (kPa)

σ_{av} = average cyclic stress (kPa). This is the value about which the cyclic stress is applied.

σ_{cyc} = cyclic stress. This is one half of the amplitude of the change in stress over one load cycle.

σ_{da} = double amplitude cyclic stress

P_{av} = average cyclic axial load (kN)

P_{cyc} = cyclic axial load (kN)

A = Specimen diameter at the start of cyclic loading (m^2)

Cyclic strain

$$\varepsilon_{\max} = \frac{\delta_{\max}}{H} \quad \text{(B.3.6)}$$

$$\varepsilon_{\min} = \frac{\delta_{\min}}{H} \quad \text{(B.3.7)}$$

$$\varepsilon_{av} = \frac{\varepsilon_{\max} + \varepsilon_{\min}}{2} \quad \text{(B.3.8)}$$

$$\varepsilon_{cyc} = \frac{\varepsilon_{\max} - \varepsilon_{\min}}{2} \quad \text{(B.3.9)}$$

Where:

ε_{max} = peak (maximum) axial strain (%)

ε_{min} = peak (minimum) axial strain (%)

δ_{max} = peak (maximum) cyclic axial deformation (mm)

δ_{min} = peak (minimum) cyclic axial deformation (mm)

ε_{av} = average cyclic axial strain

ε_{cyc} = cyclic axial strain

H = specimen height at the start of cyclic loading (mm)

The measured stresses and strains during cyclic testing are indicated in Figure B.1 and Figure B.2, respectively. Permanent axial deformation is measured at σ_{min}.The initial minimum axial strain,$\varepsilon_{0,}$ is determined at the first application of σ_{min}.

The minimum axial strain, $\varepsilon_{min,}$ as indicated in Figure B.2, represents the accumulated (permanent) axial strain, $\varepsilon_{ap.}$ The development of accumulated (permanent) axial strain with number of loading cycles corresponds to the lower boundary curve of the axial strain versus number of cycles graph shown in Figure B.2.

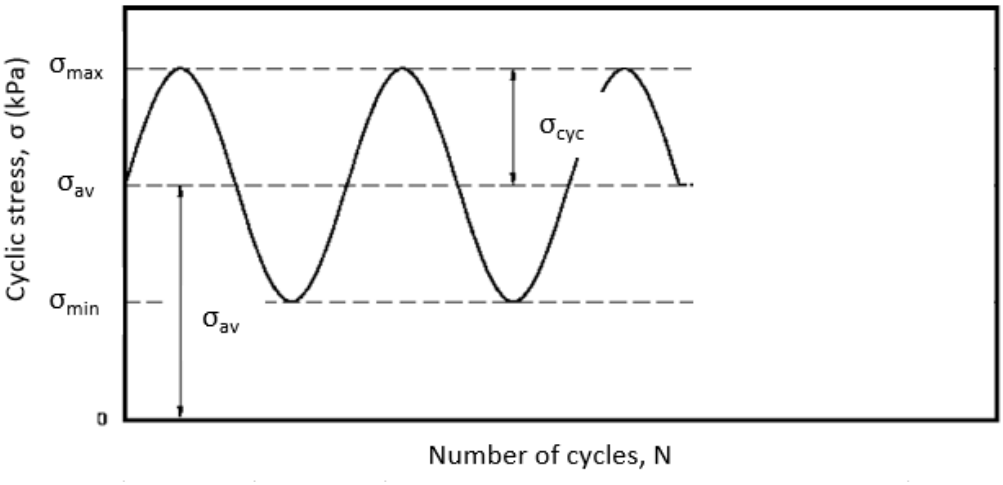

Figure B.1: Definition of pulsating compression stresses in cyclic testing.

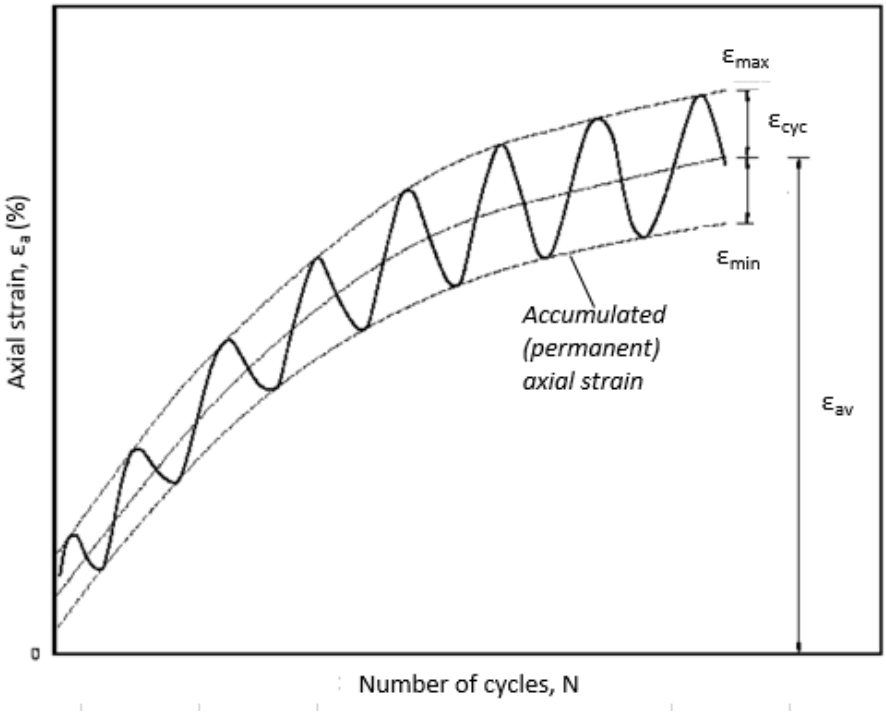

Figure B.2: Definition of axial strains in cyclic testing.

B.4 Reporting

a) Orientation of fibres with respect to the direction of loading during testing;
b) Initial specimen dimensions after mounting on the testing device (mm);
c) Specimen type;
d) Specimen dimensions at the start of shearing (mm);
e) Dry density (Mg/m^3);
f) Maximum cyclic stress σ_{max} (kPa) during cyclic loading;
g) Minimum cyclic stress σ_{min} (kPa) during cyclic loading;
h) The number of cycles performed before the accumulated (permanent) axial strain (ε_{ap}) exceeds 2% at σ_{min}.
i) Plot of cyclic axial strain, ε_a, versus number of cycles, N;
j) Plot of accumulated (permanent) axial strain, ε_{ap}, versus number of cycles, N;
k) Photograph of the sample at the end of shearing.

Five specimens shall be tested with minimal 3 different stresses selected according to EN13793 clause 7.2 By plotting the double amplitude cyclic axial stress against the number of cycles N determined at a predefined permanent axial strain for each specimen (Reporting h))., the allowable cyclic stress shall be determined. The number of cycles achieved is defined as the average double amplitude (see annex B.3) cyclic axial stress that, after a predefined number of cycles, causes a permanent axial strain equal to a predefined value. A graphical illustration on the assessment of the allowable cyclic stress is shown in Figure B.3.

. The predefined number of cycles and predefined permanent axial strain shall be stated in the report. The recommended value of the accumulated (permanent) axial strain is 2%. The recommended predefined number of cycles in the is 100000. A different number of cycles may be selected to match anticipated field conditions.

l) The “allowable cyclic stress” as specified in the Manufacturers Product Installation Information (MPII) for the specific use conditions represented by predefined number of cycles (Figure B.3);
m) Plot of number of cycles *N* versus double amplitude cyclic stress σ_{da} for all tests (Figure B.3).

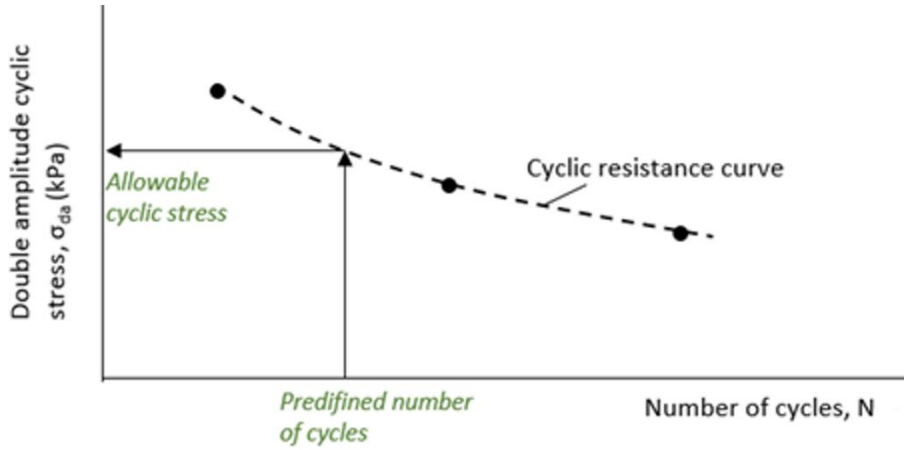

Figure B.3: Assessment of cyclic stress based on data from cyclic tests

ANNEX C: COMPRESSIVE CREEP

C.1 Testing procedure

The compressive creep of the stone wool element shall be tested according to EN ISO 16534 taking into account the deviating specifications mentioned below.

- Compressive creep starts when the deformation gauge readings plotted against the logarithm of time indicate a straight line. The initial deformation of the specimen at the beginning of compressive creep, X_0, shall be subtracted from the deformation measurement at time t, to calculate the deformation of the stone wool element due to creep, X_{ct}, at the time t ($X_{ct} = X_t – X_0$).
- The test shall be carried out at room temperature (~20^0C) which shall be maintained within 3^0C during the tests.
- The stresses for the creep test, σ_c, shall be based on the compressive strength, σ_m, or on the compressive stress, σ_{10}, at 10% strain measured in accordance with 2.2.4, and shall be calculated as follows:
    - —σ_c=0,20×σm or σ_c=0,20×σ10
    - —σ_c=0,40×σm or σ_c=0,40×σ10
    - —σ_c=0,60×σm or σ_c=0,60×σ10
    - —σ_c=0,80×σm or σ_c=0,80×σ10
- The permissible extrapolation for determining the long-term creep deformation shall not be more than 100 times the testing time. For stone wool elements a service life of 40 years shall be considered. For this service life, the minimum testing duration is given in the table below.

- Table C.1. Extrapolation time versus minimum testing time (days)

Extrapolation time [years]	Minimum testing time [days]
40	146

C.2 Reporting

In addition to EN ISO 16534, clause 11, the report shall state:

a) Orientation of fibres with respect to the direction of loading during testing;
b) Dry density (Mg/m³).

c) The recommended value in accordance with figure C.1 of the accumulated (permanent) axial strain is 2%. Figure C.1 is obtained by plotting the relative compressive stress (σ_c/σ_{max}) to the relative deformation extrapolated to 40 years service life logarithmically. σ_{max} is determined by clause 2.2.4

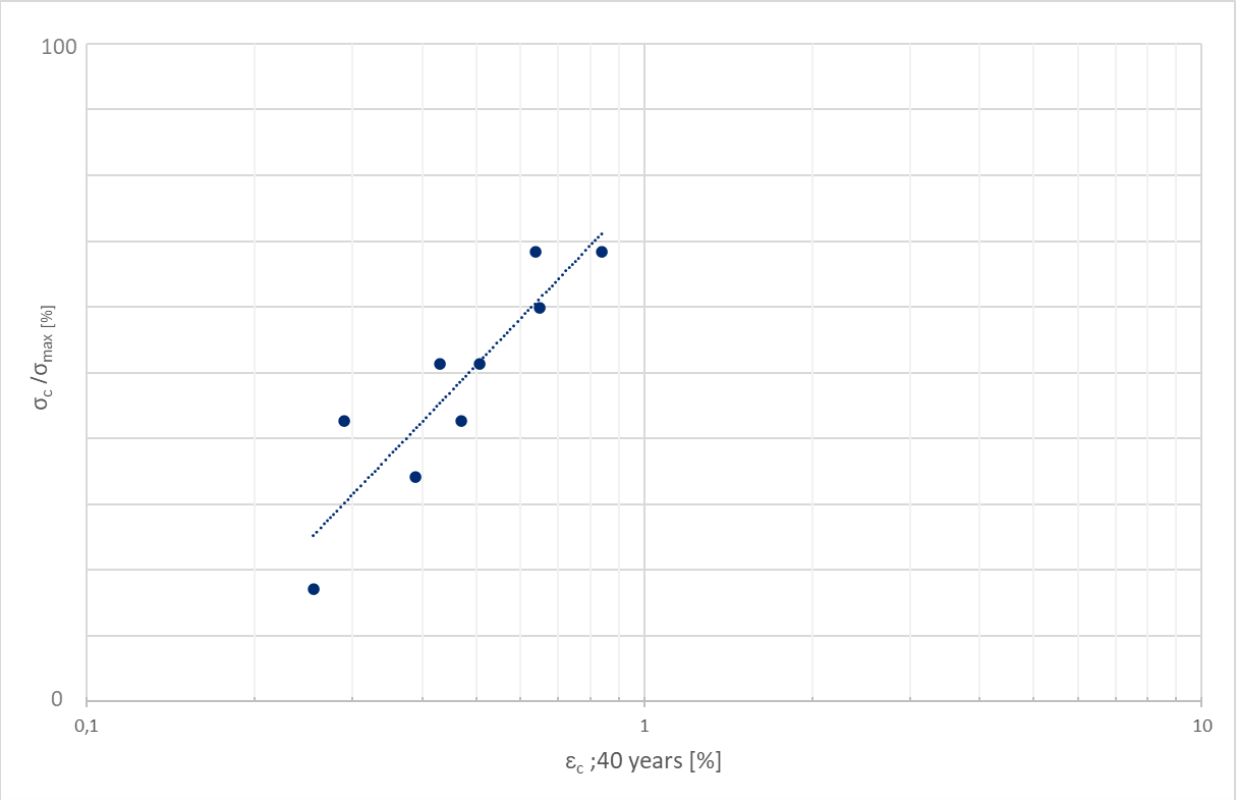

Figure C.1: Assessment of allowable creep stress for 40 years working life based on data from creep tests