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# INFORMATION

## Information on the evaluation of starting substances for the production of cementitious materials in contact with drinking water

*Version 4*

English translation – only the German document version is binding

Amendments:

- Addition of Chapter 4.2: Requirements for results of migration tests
- Addition of Chapter 4.3: Procedure for an extended test if a migration parameter for cementitious materials is not met
- Addition of an admixture in Chapter 5.4
- Explanation of the further procedure regarding the future European regulation for the materials in contact with drinking water
- Reorganisation of the chapters

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# 1 UBA Evaluation Criteria Document

The DVGW standard W 347 currently regulates testing and assessment of cementitious materials in contact with drinking water. However, the positive list contained therein is not updated. Pursuant to Section 15 (1) of the German Drinking Water Ordinance (TrinkwV), the German Environment Agency is authorised to specify evaluation criteria for materials in contact with drinking water, and thus also for cementitious materials. According to the revised European Drinking Water Directive (EU) 2020/2184, European positive lists for materials and substances in contact with drinking water will be established in the future. For this reason, the German Environment Agency has not published a new national evaluation criteria document for cementitious materials.

For materials the organic components of which exceed 25% (relative to cement content), the cementitious material is considered as filler. Such materials have to be evaluated according to the "Evaluation Criteria Document for plastics and other organic materials in contact with drinking water (KTW-BWGL)" (https://www.umweltbundesamt.de/en/document/evaluation-criteria-document-for-plastics-other-1). The applicable positive list for these coating systems is mentioned in Annex B of the KTW-BWGL. This document has become effective by 21 March 2021. Since that date, for construction or maintenance of installations for the extraction, treatment or supply of drinking water only such organic materials may be used that meet the requirements of this Evaluation Criteria Document.

# 2 Test certificates

Until the European regulation comes into force at 31 December 2026, the hygienic suitability of cementitious materials for contact with drinking water can be proven by a test certificate according to the DVGW standard W 347.

Test certificates according to the DVGW standard W 347 for products falling within the scope of KTW-BWGL (percentage of organic components > 25%) have become invalid since 21 March 2021.

For products which have been proven by 31 December 2026 that they meet the requirements of DVGW standard W 347, a transitional regulation applies in accordance with European regulations. These can still be used for the construction or maintenance of water supply systems until 31 December 2032. Irrespective of this, UBA recommends converting test certificates in accordance with DVGW standard W 347 into new EU certificates as soon as possible. This also minimises the risk that towards the end of the transitional period certification orders may pile up and not all the desired EU certificates are available in time.

# 3 Evaluation of starting substances for the production of cementitious materials

In order to establish an evaluation criteria document for cementitious materials, the German Environment Agency has developed evaluation principles of starting substances for the production of cementitious materials which have been incorporated into the European regulations. The corresponding legal act (Implementing Decision (EU) 2024/365) was published on 23 April 2024 and will come into force on 31 December 2026.

If, until then, evaluations of starting substances for the production of cementitious materials are necessary which are not covered by the DVGW standard W 347, an evaluation by the German Environment Agency is possible. The evaluation will be carried out according to the Implementing Decision (EU) 2024/365.

For an assessment carried out by UBA to be considered for an update of this information in the fourth quarter of 2026, an application must be submitted to UBA until 30 June 2025 at the latest with complete application documents in accordance with Implementing Decision (EU) 2024/365.

An evaluation of a starting substance for the production of a cementitious material carried out by the German Environment Agency can be used to enable a hygienic assessment for contact with drinking water of a cementitious material with this starting substance performed by a certifying body in accordance with the DVGW standard W 347.

UBA assessments that were or will be carried out after 12 July 2021 cannot be considered for the European positive list of organic constituents of cementitious materials of the Implementing Decision (EU) 2024/367. A separate application to the European Chemicals Agency (ECHA) is required for inclusion in the European positive list. The procedure for this is set out in Delegated Regulation (EU) 2024/369. 12 months before the actual application, the intention to apply must be communicated to the ECHA. This is intended to enable manufacturers to cooperate for that.

# 4 Complementary specifications to the requirements for cementitious materials as yet defined in DVGW standard W 347

## 4.1 Formulation assessment

The starting substances listed in the Annex of DVGW standard W 347 are relevant for the production of cementitious materials. In addition to the technical information in fact sheet DVGW W 398 (M), the specifications given in this information are also applicable. In addition, the positive list of Annex III of the Delegated Regulation (EU) 2024/367 can be used. This positive list is binding from 31 December 2026.

In formulation assessment, formulation constituents with mass percentages of less than 0.02% (w/w) related to the proportion of the filler (i.e. cement) need not to be evaluated.

## 4.2 Requirements for results of migration tests

For some substances evaluated by UBA and starting substances of the European positive list of Annex III of the Delegated Regulation (EU) 2024/367, migration restrictions are specified which must be determined in the migration water. This also applies to some substances with a corresponding reference to Regulation (EU) No. 10/2011. If a specific migration limit (SML) is specified for these substances in Regulation (EU) No. 10/2011, $MTC_{tap} = \frac{1kg}{20l}$ SML applies.

To observe a corresponding restriction, the necessary migration test can be carried out in accordance with DVGW standard W 347 or DIN EN 14944-3.

Requirements for cold water testing at 23 °C are met if the maximum concentration ($c_{tap}$) to be expected at the tap for all parameters to be determined meets the requirements for the maximum tolerable concentration ($MTC_{tap}$) in the 3rd migration period (or in the 9th migration period according to chapter 4.3).

The concentrations measured in the migration tests ($c_{measured}$) are converted into maximum expected concentrations at the tap ($c_{tap}$) according to the formula:

$$c_{tap} = \frac{Fc(c_{measured} - c_{blind})}{S/V \quad t}$$

| | |
|---|---|
| $c_{measured}$ | respective element concentration of sample migration trial in µg/l |
| $c_{blind}$ | respective element concentration of the blind trial in µg/l |
| $F_C$ | component-specific conversion factor according to Table 1 in d/dm |
| S/V | the surface-to-volume ratio in $dm^{-1}$, where S is the surface area of the component in $dm^2$, and V the volume brought into contact with the component in $dm^3$ |
| t | contact time in d |

**Table 1: conversion factors ($F_c$)**

| Field of application | Materials and components | Conversion factors $F_c$ in d/dm |
|---|---|---|
| I | Cement mortar linings for cast-iron and steel pipes | 5 |
| II | Concrete pipes ≥ DN 300, concrete containers, cement mortar for containers | 5 |
| III | Tile adhesive, grout, cement mortar linings for fittings, repair mortar for e.g. welds, concrete pipes for raw water conduits, cement mortar coatings on tappings | 0.5 |
| IV | Components in drinking-water protection areas I, II or III | 0.5 |

The requirements are met for all parameters to be determined, if:

$\overline{c}_{tap} \leq$ MTCtap for the third migration period according to DVGW standard W 347or according to DIN EN 14944-3 for the third or ninth migration period according to chapter 4.3 of this information

In addition, the concentrations of the elements to be determined must not show an increasing trend.

*Note:* *There is an increasing trend in the measured concentrations for the formulation-specific requirement parameters, if for example the following criteria are fulfilled simultaneously:*

- *the measured concentration of the relevant migration period exceeds $^1/_{10}$ of the migration limit, and*
- *the measured concentration of the relevant migration period has doubled significantly (i.e. more than can be accounted for by measurement uncertainty) compared to the lowest measured concentration, and*
- *the measured concentration of the relevant migration period is the highest measurement value of the migration series.*

## 4.3 Procedure for an extended test

The specifications of DVGW standard W 347 do not provide a procedure for extended testing. Chapter 9.2.4 of DIN EN 14944-3 provides the option of specifying further migration periods. If the parameters are not met in the 3rd migration period, the test can be extended. The following procedure must be used for this:

**Tabelle 2: Migration periods for the extended test**

| Week | Migration period | Total contact time in days | End of the migration period | Contact time in days per migration | Analysis |
|---|---|---|---|---|---|
| 1 | 0 (pre-treatment) | altogether 7 | Tuesday | 1-3 | No |
| 1 | 1 | 3 | Friday | 3 | Yes |
| 2 | 2 | 6 | Monday | 3 | Yes |
| 2 | 3 | 9 | Thursday | 3 | Yes |
| 3 | 4 | 13 | Monday | 4 | No |
| 3 | 5 | 16 | Thursday | 3 | Yes |
| 4 | 6 | 20 | Monday | 4 | No |
| 4 | 7 | 23 | Thursday | 3 | Yes |
| 5 | 8 | 27 | Monday | 4 | No |
| 5 | 9 | 30 | Thursday | 3 | Yes |

In the extended test, the 9th migration period is to be used for the assessment.

## 4.4 Inorganic surface treatment of cementitious materials

Inorganic surface treatments of cementitious materials can be evaluated as follows:

- Inorganic starting substances for the surface treatment of cementitious materials must comply with the positive list of DVGW standard W 347 (and additional precisions given in this information). Organic dispersions as constituent may be used up to 25% (w/w) as calculated for the formulation. These must comply with the KTW evaluation criteria document and with the restrictions given therein.
- Solutions used for the surface treatment of cementitious materials containing more than 25% (w/w) of organic constituents must be evaluated according to Annex B of the KTW-evaluation criteria. It is presumed that inorganic constituents are considered as fillers in such cases.
- Testing:
  - Testing is conducted according to DVGW standard W 347 or DIN EN 14944 part 1 or 3 employing cement prisms both with and without the waterproofing.
  - Testing of migration water should comprise basic requirements and metals according to DVGW standard W 347. Concerning organic substances, restrictions defined in KTW-evaluation criteria must be complied with.
  - In case of organic constituents exceeding amounts of 25%, testing of microbial growth according to DIN EN 16421 procedure 2 is required.

# 5 Additionally assessed substances

The German Environment Agency, in addition to substances not covered by the positive list of DVGW standard W 347, has evaluated the following substances for manufacture of cementitious materials in contact with drinking water. It should be noted that according to DVWG standard W 347, no admixtures (exceptions are specified in chapter 5.4) are intended for Field of application I "Cement mortar linings for cast-iron and steel pipes ".

## 5.1 Assessed polymers (in addition of annex A.4 of DVGW Standard W 347)

**Table 3: Assessed polymers**

| Substance group | Possible monomer | CAS No | Restrictions |
|---|---|---|---|
| Polycarboxylate ether | Acrylic acid | 79-10-7 | Residual content ‹ 0.05% |
| | Polyethylenglycol 4-vinyloxybutyl ether | 126682-74-4 | Content of oligomers ‹ 1000 Da: ‹ 1%;<br><br>Residual content: Ethylene oxide (CAS Nr.:75-21-8): ‹ 0.0005% |

| | | |
|---|---|---|
| Polyethylenglycolmonoisoprenyl ether | 110412-77-6 | $MTC_{Tap}$: 1 µg/l;<br><br>Residual contents: Isoprenol (CAS Nr. 763-32-6): ‹ 0.02%;<br><br>Ethylene oxide (CAS Nr.:75-21-8): ‹ 0.0005% |
| Polyethylenglycolmonomethallyl ether | 31497-33-3 | Content of oligomers ‹ 1000 Da: ‹ 1%<br><br>Residual contents: Methallylalcohol (CAS Nr.: 513-42-8): ‹ 0.0025%<br><br>Ethylene oxide (CAS Nr.: 75-21-8): ‹ 0.0005% |
| Acrylic acid, monoester with propane-1,2-diol | 25584-83-2 | Residual content ‹ 0.01% |

## 5.2 Preliminary[1] assessed biocides for in-can preservation (PT 6) of dispersions during storage

**Table 4: Preliminary assessed biocides for in-can preservation (PT 6)**

| Substance | CAS Number | Restrictions |
|---|---|---|
| N-(3-Aminopropyl)-N-dodecyl-1,3-propanediamine | 2372-82-9 | 2.5 µg/l |
| 1,2-Benzisothiazol-3(2H)-one | 2634-33-5 | 25 µg/l |
| 2-Methyl-4-isothiazolin-3-one | 2682-20-4 | 25 µg/l |

## 5.3 Ground granulated blast furnace slag (in addition of annex A.1 of DVGW Standard W 347)

Ground granulated blast furnace slag according to DIN EN 15167-1 can be assessed as inorganic additive according to DVGW standard W 347.

[1] Should substance listing according to Regulation (EU) No 528/2012 be dismissed, the biocides N-(3-Aminopropyl)-N-dodecyl propane-1,3-diamine (CAS 2372-82-9); 1,2-Benzisothiazol-3(2H)-one (CAS 2634-33-5) and 2-Methyl-2H-isothiazol-3-one (CAS 2682-20-4) cannot be used any further.

*Justification:*

*As described in tables 3 through 6 given in DVGW standard W 347, inorganic additives must comply with standard DIN 1045-2 which means approval by building/construction authorities. Ground granulated blast furnace slag does not correspond to the original version of DIN 1045-2:2008-08. In Model Administrative Provisions "Technical Building Rules" as compiled by Deutsches Institut für Bautechnik (DIBt; mandated German institution for technical construction issues), complementary to DIN 1045-2:2008-08 it is stated that for ground granulated blast furnace slag according to DIN EN 15167-1:2006 suitability as additive type II is regarded as proven2. Ground granulated blast furnace slag in the sense of DIN EN 15167-1 thus corresponds to DIN 1045-2.*

## 5.4 Admixture for the reduction of chromium-(VI) in application areas I - IV of DVGW standard W 347

The following admixtures can be used to reduce chromium (VI):

**Tabelle 5: Admixture for the reduction of chromium-(VI)**

| Substance | CAS No. | Field of application according to DVGW (A) W 347 | Restrictions |
|---|---|---|---|
| Antimon-(III)-oxide | 1309-64-4 | I - IV | $MTC_{tap}(Sb) = 0.5$ µg/l |
| Iron-(II)-sulfate | 7720-78-7 | I - IV | - |
| Tin-(II)-sulfate | 7488-55-3 | I - IV | - |

## 5.5 Formwork sheeting

There are three options for drinking water hygienic evaluation of formwork sheeting.

1. Evaluation of formwork sheeting according to requirements defined in KTW-BWGL: Starting substances must comply with the positive list of annex A of the KTW-BWGL. The formulation cut-off limit of 0.02% (w/w) related to the sheeting itself can be applied in formulation assessment. Testing and evaluation are in accord with provisions made in the KTW-BWGL.
2. Testing and evaluation of cement-bound prisms which had been in contact with formwork sheeting under consideration according to DVGW standards W 270 and W 347. Starting substances must comply with the positive list of standard W 347.
3. Simplified evaluation procedure: no further requirements for formwork sheeting must be obeyed if the following prerequisites are fulfilled:

   The sheeting material

   - is not thicker than 1mm;

[2] Muster-Verwaltungsvorschrift Technische Baubestimmungen – Ausgabe 2010/2, Anlage 1.51, ergänzend zur DIN 1045 2:2008-08 (only available in German: "Model Administrative Provisions `Technical Building Rules´– Edition 2010/2, Annex 1.51, in addition to DIN 1045-2:2008-08")

- is made of polypropylene (PP) or polyethylene (PE);
- does not contain CMR substances (substances exceeding 0.02% related to formulation);
- does not contain other substances in amounts of more than 3% in the formwork formula (individual substances not more than 0.5%); and
- cement-bound prisms which had been in contact with the formwork sheeting to be evaluated meet the requirements of DVGW standard W 270.

## 5.6 Option for evaluation of drinking water hygiene suitability of carbon fibers in contact with drinking water

Carbon fibers in direct contact with drinking water currently can be evaluated according to the evaluation criteria for enamels and ceramic materials which is provided under the following link: https://www.umweltbundesamt.de/en/document/evaluation-criteria-document-for-enamels-ceramic-0
Starting substances for processing might already be listed as substances in current positive lists of the evaluation criteria for organic materials, polymer specific part (accessible under https://www.umweltbundesamt.de/en/document/polymer-specific-annexes-to-the-evaluation-criteria).

For starting substances not listed therein, it must be secured, according to section 5.2.2 of the general part of the evaluation criteria for organic materials (accessible under https://www.umweltbundesamt.de/en/document/evaluation-criteria-document-for-plastics-other-1), that starting substances, their impurities or reaction and degradation products do not migrate into the drinking water.