



**APPROVAL OF PRODUCTS
FOR
USE WITH DRINKING WATER**

Advice Sheet 7

Construction Products for Water Company Assets

DOCUMENT CONTROL

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Version 5.0

November 2021

Revision notes –

Version 4 – revised for update of regulations, v4.2 change of address, v4.3 change of address. Version 5.0 – significant revision, restructuring of section 2, removal of references to EU legislation, addition of sections 3.8 and 8, revision of Annex 1 and update of website links.

Preface

This series of advice sheets has been prepared by the Drinking Water Inspectorate (DWI) to provide guidance on the approval process for products for use in contact with water intended for human consumption.

The following advice sheets are currently available:

Advice Sheet	Title
1.	Overview of the Application Process
2.	Instructions for Use (IFU) Requirements
3.	Treatment Chemicals, Filter Media & Ion Exchange Resins
4.	Changes to Approved Products
5.	Products made from Recognised Grades of Materials
6.	Approval of Membrane Filtration Systems & Associated Equipment
7.	Construction Products for Water Company Assets
8.	Small Surface Area Products (Regulation 31(4)(b))
9.	Emergencies – Use of Equipment and Disinfectants
10.	Natural and Traditional Products
11.	Product Re-approval Process

Availability

Copies of the most up-to-date versions of these advice sheets can be freely downloaded from the [DWI website](#).

Application Forms

A series of product type related applications forms are available from the [DWI website](#).

Laboratory Test Protocols

A series of product type related laboratory test procedures are available from the [DWI website](#).

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Table of Contents

Preface.....	2
Table of Contents.....	3
Glossary	4
1. Introduction.....	5
2. Use of Site Applied/Poured Concrete & Cementitious Products.....	5
2.1 Background and Requirements.....	5
2.2 Coatings and Repair Materials.....	5
2.3 Surface Applied Curing Compounds, Liquid Membranes, and Surface Retarders.....	6
2.4 Formwork (shuttering) Release Agents for Concrete.....	6
3. Construction Products used in Association with Water Retaining Structures.....	7
3.1 Background.....	7
3.2 Construction Products – Factory made Cementitious Products	7
3.3 Construction Products used in contact with Raw Water intended for Treatment.....	7
3.4 Construction products - Bricks, Clay Pipes and Ceramic Materials	9
3.5 Water Stops and Related Products.....	9
3.6 Waterproofing Products used on the Outside of Structures.....	9
3.7 Products used in Association with Reservoir Roofs.....	9
3.8 Lubricants.....	10
4. Construction Products used with Drinking Water in Water Treatment Works	11
4.1 Introduction.....	11
4.2 Large-scale Filtration Plant (non-membrane).....	11
4.2.1 Monolithic Filter Floors	11
4.2.2 Filter Underdrains	11
4.2.3 Wash-water Troughs and Launderers for Rapid Gravity Filters.....	11
5. Construction Products used with Wastewater in Water Treatment Works.....	12
5.1 Introduction.....	12
5.2 Existing Products/Plant.....	12
6. Harvesting Rainwater for use as Water Intended for Human Consumption	13
6.1 Background.....	13
6.2 Products	13
6.3 Rainwater.....	13
7. Approval of other Building Materials used in Water Treatment Works	14
8. Products for use in well and borehole construction and installation	
Annex 1. Standards Relating to Constituents of Cementitious Products.....	15

Glossary

The Regulations

The following regulations apply to the approval of substances and products used in the provision of public water supplies within the United Kingdom:

- a) England - regulation 31 of [The Water Supply \(Water Quality\) Regulations 2016](#) (Statutory Instruments 2016 No 614).
- b) Wales – regulation 31 of [The Water Supply \(Water Quality\) Regulations 2010](#) (Welsh Statutory Instrument 2010 No 994 (W.99) - and [Amendment Regulations 2016](#) (No. 410 (W. 129))
- c) Scotland – regulation 33 of [The Public Water Supplies \(Scotland\) Regulations 2014](#)
- d) Northern Ireland – regulation 30 of [The Water Supply \(Water Quality\) \(Amendment\) Regulations \(Northern Ireland\) 2009](#) (Statutory Rules of Northern Ireland 2009 No.246)

Where reference is required to specific regulatory requirements, these are given in footnotes.

The Authorities

Under the relevant regulations water suppliers shall not apply or introduce any substance or product into public water supplies unless the requirements of the relevant regulations are met. One of these requirements is that the substance or product has been **approved** by either the Secretary of State for the Environment Food and Rural Affairs (England), the Welsh Ministers (Wales), the Northern Ireland Assembly (Northern Ireland) or the Scottish Ministers (Scotland); collectively referred to as “the Authorities”.

The List

Under the relevant regulations lists of all the substances and products approved or refused, and of all approvals revoked or modified are published at least once a year:

England and Wales: this list is regularly updated by DWI throughout the year, and includes details of changes to approved products and additions to the List; the list ([the List of Products for use in Public Water supply in the United Kingdom](#)) is posted on the DWI website. Reference to “the List” throughout this publication refers to the most up-to-date version available from the website.

Scotland: a list is published annually by the Scottish Government on their [website](#).

Northern Ireland: in due course the Department for Regional Development (Northern Ireland) will also publish a list.

The Approval of a Product

Approval is based upon consideration as to whether the use of a substance or product will adversely affect the quality of the water supplied, or cause a risk to the health of consumers; no consideration is given to fitness for purpose and approval by the Authorities must not be taken as a favourable assessment of the performance or merits of any substance or product. It is the responsibility of the end user to ensure fitness for purpose.

The approval process for general products used with water intended for human consumption is set out in [Advice Sheet 1](#). Relevant deviations from this process are set out in the appropriate Advice Sheets.

Water Suppliers

These include water undertakers, inset appointees, and water supply licensees; see The Water Act 2003 (Consequential and Supplementary Provisions) Regulations 2005.

1. Introduction

This advice sheet explains when it is necessary to obtain approval for construction products used as water industry assets in contact with drinking water. It also gives information on the associated test requirements for these types of products.

2. Use of Site Applied/Poured Concrete & Cementitious Products

2.1 Background and Requirements

The Drinking Water Inspectorate (DWI) regularly receives enquiries concerning the use of ready-mixed and site-mixed concrete in the construction of water treatment works and water retaining structures.

Under the relevant regulations drinking water suppliers must meet the following requirements for the application or introduction of site-mixed or ready-mixed concrete:

1. They must observe BS 8007:1987 "Code of Practice for design of concrete structures for retaining aqueous liquids" when specifying requirements for the design of water retaining structures in drinking water supply systems, including water treatment works.
2. The chemical identity of cement admixtures must be listed in Section 2.4 "List of Authorised Cement Admixture Components" of [Appendix 2](#) of the "List" published by the DWI Admixtures must be used within the manufacturer's recommended dosage range. Drinking water suppliers or their appointed agents must obtain a declaration for all cement admixtures proposed for use in a concrete mix. The declaration must confirm that the admixture does not contain chemicals other than those given in the "List of Authorised Cement Admixture Components" and that the admixture conforms to relevant European Standards (ENs). If no admixtures are used, then this should be confirmed in writing.
3. All other components of poured concrete must conform to the relevant British Standard corresponding to the European Standard (s) (EN) (see Annex 1 for a list of currently available ENs). In addition, cement and concrete, must conform with the COSHH and CHIP regulations

No further testing would be required, and no approval would be issued for such products. The water company should ensure they are satisfied that the product is suitable for use before bringing into service.

2.2 Coatings and Repair Materials

Cementitious coatings and surface repair materials used in water retaining structures usually contain organic additives and can pose a potentially high risk of leaching into water. Therefore, these products cannot be considered as low risk products but require full approval under the relevant regulations.

2.3 Surface Applied Curing Compounds, Liquid Membranes, and Surface Retarders

These products are sprayed onto damp concrete to modify the way in which the poured concrete cures on site. Since each product is considered on its merits, there are no set test requirements. In the first instance you should write to DWI for advice, enclosing the following documents:

- a) full product formulation and associated Material Safety Data Sheets (MSDS)
- b) an Instructions for Use document ([Advice Sheet 2](#)), including full details of any special washing procedures used to ensure removal of the product after curing has been completed.

2.4 Formwork (shuttering) Release Agents for Concrete

These products are applied onto formwork (shuttering) before concrete is poured into the formwork.

Release agents suitable for use with formwork shall be used in accordance with the appropriate Instructions for Use document, and in accordance with the Civil Engineering Specification for the Water Industry. After curing of the concrete and removal of the formwork has been completed, any special washing procedures or other treatment of the concrete to ensure removal of the formwork release agent must be completed before contact of the new concrete product with drinking water is permitted.

Approval of formwork release agents is required under the relevant regulations.

3. Construction Products used in Association with Water Retaining Structures

3.1 Background

These products include:

- General construction products – factory made cementitious products
- General construction products – bricks, clay pipes and ceramic materials
- Construction products used in contact with raw water intended for treatment for human consumption
- Water stops and related products
- Waterproofing products used on the outside surfaces of water retaining structures
- Products used on the underside of reservoir roofs above the stored water

3.2 Construction Products – Factory made Products

Generally, all products manufactured for large construction work at water company assets require full approval under the regulations, with the minor components required to conform to Regulation 31 (4)(b). DWI have received enquiries about the following two categories and are providing additional guidance.

Factory made cementitious products, such as cement mortar linings to metallic pipes, tanks, concrete pipes, used for the transport and storage of water for human consumption, are considered under the full requirements of the relevant regulations. Where testing is required, procedures for preparing leachates for assessment and analysis are set out in BS EN 14944-1 and 14944-3. The analytical requirements for these leachates will be specified by the Inspectorate.

Factory made metallic products with coatings, such as carbon steel pipes, tanks or tank panels coated with recognised materials, used for the transport and storage of water, are considered under the full requirements of the relevant regulations. Details of how to get approval can be found in [Advice Sheet 5](#) (Approval of products made from recognised materials & from metals).

3.3 Construction Products used in contact with Raw Water intended for Treatment

Where water is abstracted and commences its processing to be made into drinking water is the point at which regulation 31 normally becomes applicable and products/substances that come to contact with that water from that point onwards must be only those permitted under regulation 31 (i.e. regulation 31(3) or regulation 31(4)). This typically includes river/reservoir abstraction products, abstraction from boreholes (well casings and rising main, see section 8), pumps, weirs, screens, etc.

Products/substances which come into contact with the raw water that has commenced on its abstraction for subsequent preparation and distribution as drinking water should satisfy the requirements of regulation 31.

Products that come into contact with raw water prior to this point are varied but can include for example:

- reinforcements for river and reservoir banks
- materials used on the upstream face of dams of impounding and other raw water reservoirs

Such products are intended to clearly provide robustness to raw water storage and transport rather than provide any direct enhancement to the quality of the water supply.

Increasingly, the Inspectorate has received enquiries about other products which are not intended to enhance the preparation or distribution of raw water but are intended to be used for other purposes, for example, devices used to generate electricity such as solar panels and turbines, but nonetheless may still come into contact with the raw water.

In general, the Inspectorate regards products which come into contact with raw water before the water is abstracted for subsequent treatment to produce water intended for human consumption to be outside of the scope of regulation 31, although individual cases may need to be considered differently (for example where a substance such as a chemical may be added to an impounding reservoir to help reduce phosphate content or treat algal blooms).

Where a water company is considering permitting the use of products (that may be outside of the scope of regulation 31) in its raw water sources, such as an impounding reservoir or lake, the Company still needs to consider as part of a risk based approach to the use of the product:

Is the product likely to release any compounds as a result of contact with raw water that could have a subsequent adverse impact on the treated water?

What quality management systems and procedures/processing are in place to control the quality of the ingredients used to make the product?

What analysis has been undertaken to ensure that no compounds of concern to health will leach from the product into water?

Where products are partially or intermittently immersed, possible effects on any leaching resulting from drying out during periods of above water exposure and then subsequently being re-immersed in water must be considered, including effects of exposure to UV-light (sunlight).

What processing will be given to the water before distribution for human consumption to ensure that any contamination originating from the use of these products is completely removed before the water goes into supply?

The above points are particularly relevant where recycled ingredients are used in a product these specific examples may also serve to illustrate potential problems:

Asphalt used in coatings used for upstream face erosion protection of dams -- DWI has made a specific recommendation – “Installation of asphaltic products on dams should be subject to a risk assessment by the water undertaker concerning possible leaching of polycyclic aromatic hydrocarbons and odour and flavour causing chemicals from the coating, and the ability and capacity of the downstream treatment process to deal adequately with the leaching of such compounds.”

Lead release from plastic piling made from recycled PVC-U double glazing frames

A range of compounds of potential concern released from recycled rubber compounds and products, from the use of old vehicle tyres to protect landing stages and jetties etc.

Where there are concerns it would be prudent to analyse leachates from several different batches of products made from re-cycled materials for unsuspected substances leaching into water from the tyres – leachates to be prepared in accordance with BS EN 12873-1 and analysed for GC-MS general survey as set out in BS EN 15768. Consideration may also be given to possible effects on the odour and flavour of water (BS 6920-2.2.1 testing).

3.4 Construction products - Bricks, Clay Pipes and Ceramic Materials

These products may be used in contact with water intended for human consumption providing the products will be suitable for the proposed use and the drinking water supplier has carried out a risk assessment concerning their possible impacts on water quality (e.g. release of metals), without approval under the relevant regulations.

However, applications for approval of plastic under-drains should be submitted to the Regulation 31 Enquiries section of DWI in the usual way.

Associated cementitious products that are applied in-situ, including repair materials, grouts and sealants, must be approved under 31(4)(a), unless the surface area is small (see advice sheet 8). For example, products used in sealing construction or expansion joints will generally have small surface area.

3.5 Water Stops and Related Products

These products are incorporated into water retaining structures at the time of construction, or used for subsequent repairs, to prevent water loss in the event of minor mechanical failures of the structures, or to prevent water loss through movement of joints. When correctly installed there will be minimal contact of these products with water intended for human consumption. These products may be considered to be of low-risk – see [Advice Sheet 8](#).

3.6 Waterproofing Products used on the Outside of Structures

These products are used on the outside surfaces of water retaining structures and their roofs, to prevent ingress of groundwater or other contaminated water. They are not for use in continuous contact with water intended for human consumption and do **not** fall under the requirements of the relevant regulations.

3.7 Products used in Association with Reservoir Roofs

These products, usually included in the roof structure to provide a waterproofing barrier, are not normally in direct contact with water intended for human consumption. The only risk of contamination of water intended for human consumption arises through either the mechanical failure of the structure or draining of condensate forming on the inner surface of the roof of reservoirs into the water below. They can be used in four different ways:

- a. on the outer (top) surface of the roof – normally the only risk of contamination of water is as a result of the mechanical failure of the roof – no testing is required
- b. encased within the structure of the roof or on the outer surface – normally the only

risk of contamination of water is as a result of the mechanical failure of the roof – no testing is required

- c. on the inner surface above, but not in direct contact with water – in this case condensate may form on the inner surface of the roof and drain back into the water
- d. on the inner surface of the roof but in direct or intermittent contact with water

Since the first three of these situations do not involve direct continuous contact with water intended for human consumption, they do **not** fall under the requirements of the relevant regulations. In the first three situations, however, some limited testing may be appropriate – BS 6920 Odour and Flavour and Growth of Aquatic Microorganisms Tests – particularly in the case of products used on the inside of reservoir roofs.

In the last case (d), where the inner surface of the roof will be in continuous or intermittent contact with water, such products come within the scope of the relevant regulations and approval will be necessary.

3.8 Lubricants

There are three main areas of use of lubricants during which they may come in contact with water intended for human consumption. These uses and the possible impact on water quality are as follows:

- a) Oils used in pumps - to be effective these will be contained by double seals and not in direct contact with water - mechanical failure of the seals will lead to contamination of the water together with mechanical failure of the pump.
- b) Lubricants used on sludge scrapers (e.g. DAF processes) - these are used minimally and the water is always subject to further treatment
- c) Greases used on valves - only a small surface area of these will be in contact with water

In most normal circumstances there will be no contact between the lubricant and the water and so the lubricant will not fall within the scope of regulation 31. On this basis, DWI considers that, provided the water company can satisfy itself that the lubricants:

- 1) are fit for the proposed use, **and**
- 2) are used in accordance with the manufacturer's or supplier's Instructions for Use, **and**
- 3) either have met the requirements of the odour and flavour plus growth of aquatic microorganisms tests of BS 6920, or are of "food grade" they may be used without further evaluation or testing.

If a company develops a new use where a lubricant is applied or introduced into drinking water then the company should seek advice from DWI.

4. Construction Products used with Drinking Water in Water Treatment Works

4.1 Introduction

This section gives advice on construction products likely to be encountered on water treatment works

4.2 Large-scale Filtration Plant (non-membrane)

4.2.1 Monolithic Filter Floors

The complete filter floor assemblies are usually subject to evaluation under relevant regulations.

However all non-metallic water contact components used in the construction of these filter floors, e.g. filter floor supports, filter nozzles, air scour distribution pipework, and the under-side support material for the concrete filter floor, are considered to be low-risk products due to their limited contact with water (either small surface area and/or transient contact time) – see [Advice Sheet 8](#). These components should meet the requirement of BS 6920 odour and flavour assessment and the growth of aquatic microorganisms test.

The guidance given in Section 2 of this Advice Sheet applies to concrete monolithic floors when ready-mixed and site-mixed concrete are used.

Approved filter floors are listed in Section E.2 of the [Full List of Approved Products](#) for use in Public Water Supply.

4.2.2 Filter Underdrains

Most filter underdrains made from non-metallic material(s) require evaluation under the full requirements of the relevant regulations. Approved underdrains are listed in Section E.2 of the List of Approved Products.

4.2.3 Wash-water Troughs and Launderers for Rapid Gravity Filters

These components are reviewed on the basis of surface area and contact time considerations and, in most cases, are considered to represent a low-risk – see [Advice Sheet 8](#) and should meet the requirement of BS 6920 odour and flavour assessment and the growth of aquatic microorganisms test. For further advice please contact the Regulation 31 team.

5. Construction Products used with Wastewater in Water Treatment Works

5.1 Introduction

DWI has received a growing number of queries concerning products used solely in contact with wastewater within a water treatment works that might subsequently be recovered and recycled to the head of the works. The following guidance is provided for drinking water suppliers concerning the approval issues under the relevant regulations in relation to these uses.

5.2 Existing Products/Plant

When considering existing installed construction products in current use with wastewater, where the wastewater may now be recovered and re-cycled to the head of the treatment works, the following considerations need to be taken into account:

- existing products in contact with wastewater would probably have released any compounds of concern into water during their initial stages of in-service use and may not now represent a possible source of contamination to the recovered water.
- recovered water, returned to the head of works would be subject to significant dilution and subsequent full treatment within the treatment works.

It is the responsibility of the drinking water supplier to undertake an appropriate risk assessment on the proposed recycling of the recovered wastewater using existing construction products, taking into account the nature of these products, their in-service history, and the possibilities of contamination of the recovered/recycled water, including from water and wastewater treatment chemicals used within the treatment process. The water supplier must undertake a review of the likely impact any such contamination may have on the existing water treatment process(es) and the quality of the final treated water.

5.3 New Products

DWI has agreed that all new construction products installed in a water treatment works in association with the recovery and subsequent recycling of wastewater to the head of the works, must meet the following requirements:

- all new pipe work, tanks etc associated with the recovery and transfer of wastewater back to the head of the works shall conform with the full requirements of the relevant regulations
- smaller surface area components and fittings, e.g. valves and pumps, are considered to be relatively low-risk products and should conform to the requirements of regulation 31(4)(b) ([Advice Sheet 8](#))

6. Harvesting Rainwater for use as Water Intended for Human Consumption

6.1 Background

Rainwater has been collected, stored, and subsequently used as a source for drinking water for centuries, especially in arid areas of the world. Recently the Inspectorate has received some enquiries about such harvesting in the United Kingdom as part of water conservation strategies. The following guidance is provided to assist drinking water suppliers (and their suppliers) in undertaking risk assessments about such possible recycling of rainwater.

6.2 Products

Consideration has been given to the collection of rainwater and subsequent transfer to the “head of works”. Within England and Wales all products used for the collection and transport to the head of works are in scope of the relevant regulations; this would include products/materials in contact with the rainwater and would take into account:

- Collection surfaces
- Transport (channels, pipes) to the “head of works”
- Storage tanks

Where new collection and transfer products are to be installed for this purpose they should meet the requirements of regulation 31, see appropriate sections within this document.

6.3 Rainwater

The water source (the collected rainwater) will be classed as a new source and will need to meet the necessary requirements of appropriate national regulations for new sources.

7. Approval of other Building Materials used in Water Treatment Works

From time-to-time DWI has been asked about the approval of general building materials used in Water Treatment Works, even if these are not in direct contact with drinking water.

General building materials, including building roofing materials e.g. asphalt roofing membranes, fibre cement tiles, fibreglass roof finishes and timber products are NOT considered by the DWI, since none of these are used in continuous contact with water intended for human consumption, and, therefore do not require approval under the relevant regulations.

Thus, DWI will only consider products used in direct and continuous contact with water intended for human consumption. The materials used to construct/refurbish buildings on water treatment works do not come into this category.

8. Products for use in well and borehole construction and installation

DWI provides the following guidance on the use and approval of materials and products used in the construction of wells and boreholes:

- Sealants used in the head-works generally represent a Regulation 31(4)(b) use
- The packing (gravel) used between the borehole sides and the screen is not of concern. However, gravel used shall meet the requirements of the appropriate BS EN standard.
- Mild steel components require approval where used as well casings and rising mains. Please see Regulation 31 letter R31-01/2021 (https://cdn.dwi.gov.uk/wp-content/uploads/2021/05/13084935/Reg31Let_120520.pdf) .

Note: these components will not contain organic impurities and the water soluble inorganic impurity content should be very small.

- Stainless steel products require approval where used as well casings and rising mains. Other stainless steel components would fall within the requirements of regulation 31(4)(b)
- Rising mains fall within Regulation 31(4)(a) – products approved under Regulation 31(4)(a) are listed on the DWI website - <https://cdn.dwi.gov.uk/wp-content/uploads/2020/12/01151233/soslistcurrent-200121.pdf>
- Non-metallic well screens – since these may fall within Regulation 31(4)(a), products will be considered on an individual basis taking into account the proposed use as set out in the Instructions for Use documentation.
- Full specifications of all of the main construction materials (e.g. PVC-U and ABS components, flexible hoses etc.) need to be submitted to DWI for further consideration under Regulation 31 (4)(a).
- Other components of the installation, e.g. pumps, depth probes, level switches and power cables fall within Regulation 31(4)(b)

Annex 1. Standards Relating to Constituents of Cementitious Products

European Standard	Title
(h)EN 197-1	Cement – Part 1: Composition, specifications and conformity criteria for common cements
EN 206	Concrete –Specification, performance, production and conformity
(h)EN 413-1	Masonry Cement – Part 1: Composition, specifications and conformity criteria
(h)EN 450-1	Fly ash for concrete – Part 1: Definition, specifications and conformity criteria
(h)EN 934-2	Admixtures for concrete, mortar and grout – Part 2: Concrete admixtures. Definitions, requirements, conformity, marking and labelling
(h)EN 934-3	Admixtures for concrete, mortar and grout – Part 3: Admixtures for masonry mortar. Definitions, requirements and conformity
(h)EN 934-4	Admixtures for concrete, mortar and grout – Part 4: Admixtures for grout. Definitions, requirements and conformity
(h)EN 934-5	Admixtures for concrete, mortar and grout – Part 5: Admixtures for sprayed concrete. Definitions, requirements and conformity criteria
(h)EN 1504-8	Products and systems for the protection and repair of concrete structures – Definitions, requirements, quality control and evaluation of conformity
(h)EN 12878	Pigments for the colouring of building materials based on cement and/or lime. Specifications and methods of test
(h)EN 13055	Lightweight aggregates
(h)EN 13263-1	Silica fume for concrete – Part 1: Definitions, requirements and conformity criteria
(h)EN 14216	Very low heat special cements – Composition, specifications and conformity criteria
(h)EN 14647	Calcium aluminate cement – Composition, specifications and conformity criteria for calcium aluminate cement
EN 14889-1	Steel fibres
EN 14889-2	Polymer fibres
EN15167-1	Ground granulated blast furnace slag for use in concrete, mortar and grout — Part 1: Definitions, specifications and conformity criteria