

## **Advice Sheet 8**

# **Small Surface Area Products (regulation 31(4)(b))**

**DOCUMENT CONTROL**

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**Version 4.7**

**February 2017**

## 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 Retaining Structures
<b>8.</b>	<b>Small Surface Area (regulation 31(4)(b))</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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# 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. Regulatory Background

Regulation 31(1) of the Water Supply (Water Quality) Regulations 2016<sup>1</sup> states:

*Subject to paragraph (2), a water undertaker shall not apply any substance or product to, or introduce any substance or product into, water which is to be supplied for regulation 4(1) purposes unless one of the requirements of paragraph (4) is satisfied.*

The particular requirement of regulation 31(4) that is considered in this advice sheet, is regulation 31(4)(b) which states:

*(b) that the Secretary of State is satisfied that the substance or product either alone or in combination with any other substance or product in the water is unlikely to affect adversely the quality of the water supplied;*

The Secretary of State is satisfied that substances or products either alone or in combination with any other substance or product in the water is unlikely to affect adversely the quality of the water supplied when:

- a. that product offers only a small surface area contact ratio with the water; and
- b. that the material of which the product is made, despite the small surface area contact with the water, does not give rise to unintended odour/flavour to the water and does not support the growth of microbial organisms<sup>2</sup>.

When products meet these criteria they are permitted to be used under regulation 31(4)(b) of the Regulations.

It is the responsibility of the water undertaker (water supplier) to satisfy themselves whether products come into this category either by reference to the exemplar list in Section 2 of this advice sheet, or by determining, through calculation as shown in 3, whether the contact risk score C of product surface area exposed to water falls into the category for regulation 31(4)(b) usage. In either case the company will have to make an assessment of compliance with criterion (ii) above.

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<sup>1</sup> regulation 31 of the Water Supply (Water Quality) Regulations 2010 in Wales, (and Amendment Regulations 2016 No. 410 (W. 128)), regulation 33 of The Public Water Supplies(Scotland) Regulations 2014 , and regulation 30 of the Water Supply (Water Quality Regulations) (Northern Ireland) 2007

<sup>2</sup> In any event water companies must satisfy themselves as part of their risk assessment that use of the products are not likely to adversely impact the quality of the water particularly in respect of odour and flavour and microbial growth.

## 2. Exemplar List of Small surface area contact ratio Product Types

The following product types, when used in accordance with their normal scope of use, are likely fall under the requirements of regulation 31(4)(b) (and it is not necessary to calculate the contact risk score C). In any event water companies must satisfy themselves as part of their risk assessment that use of the products are not likely to adversely impact the quality of the water particularly in respect of odour and flavour and microbial growth. (for non-metallic materials, meeting the current requirements for odour and flavour and the growth of micro-organisms tests specified in BS6920 parts 2.2.1 & 2.4. is recommended).

- Aerators, agitators and stirrers
- Back-flow prevention valves
- Baffle curtain fixings
- CCTV cameras and associated fittings
- Cementitious anchors
- Construction products - bricks, clay pipes and ceramic materials
- Couplings and joints for pipes, gaskets and jointing compounds and other components used with pipes or assembled products, e.g. in pressure vessels
- Crack injection sealants (not applied to the water contact surface of water retaining concrete structures)
- Expansion joint filler boards
- Expansion joint sealants
- External pipe fittings, e.g. repair collars etc.
- Filter nozzles (including those mounted on filter floors)
- Hydrants and associated fittings
- *In-situ* sensors and probes (including pressure transducers and level sensors), together with their cable coverings
- Intake screens and strainers
- Ladders and submerged gratings and walkways
- Line stops/bungs/plugs
- Mobile and temporary sensors
- Pumps, turbines and generators and associated fittings and materials, including lubricants
- Radio Frequency Identification Devices (RFIDs) fastened onto the surfaces of products to be immersed in water
- Resin and chemical anchors
- Rubber sealing rings for use with water pipelines or in assembled products, e.g. pressure vessels
- Scum boards
- Solvent welded plastics components
- Static mixers
- Security devices
- Taps
- Touch-up coatings, e.g. associated with pipe welds and other factory coated products
- UV disinfection systems components
- Valves (including penstock and butterfly valves) and their lubricants
- Water stops incorporated **into** concrete constructions
- Water meters and associated fittings
- Weir plates

### 3. Products Not Included in the Exemplar List

For other products not included in the above list, or products from the above list used outside their normal scope of use water suppliers should apply the calculation below to determine the contact risk score C.

For each application of the product or material the contact ratio c is calculated as:

$$c = \frac{st}{v} \text{ sec. cm}^{-1}$$

Where:

s = surface area in contact with water in cm<sup>2</sup>

v = static volume of water in contact with surface in cm<sup>3</sup>

t = worst case estimate of the time the water is in contact with the surface in seconds

For multiple uses in one system this becomes:

	Where:
$C = \sum_n c_i$	C = contact risk score
or	$c_i = \text{contact ratio of the } i^{\text{th}} \text{ use}$
$C = \sum_n \frac{s_i t_i}{v_i}$	$s_i = s \text{ calculated for the } i^{\text{th}} \text{ use}$
	$v_i = v \text{ calculated for the } i^{\text{th}} \text{ use}$
	$t_i = t \text{ calculated for the } i^{\text{th}} \text{ use}$
	n = the total number of uses

Some worked examples are given on page 8.

If the contact risk score C is equal to or greater than 100 it is not appropriate to use the product under the provisions of regulation 31(4)(b). The only exception to this is small containers, of 10 litres or less, supplied to consumers in the event of an issue with the supply e.g. an emergency. Where commercially purchased bottled waters are supplied, no further assessment is necessary. Where empty containers are filled by the company then the company should make an assessment of the potential impact on water quality as detailed in the paragraph below.

If the contact risk score C is less than 100 it may be appropriate to use the product under the provisions of regulation 31(4)(b). In these cases the water supplier must satisfy itself as part of its risk assessment that use of the products is not likely to adversely impact the quality of the water, particularly in respect of odour and flavour and microbial growth. (for non-metallic materials, meeting the current requirements for odour and flavour and the growth of micro-organisms tests specified in BS6920 parts 2.2.1 & 2.4. is recommended). Unfortunately, there are no similar test assessments readily available for metallic products. Metallic components of products that conform to a recognised technical specification e.g. a European or national standard, or a water industry specification that will assure fitness for purpose in contact with water, or are supplied specifically for use with drinking water, may be used in small surface area applications under regulation 31(4)(b).

## 4. Worked Examples of Calculations of Contact Risk Score (C)

*2 m of 25 mm diameter communication pipe with a maximum contact time of 16 hours.*

$$\begin{aligned} s &= \pi \times 2.5 \times 200 \\ &= 1,571 \text{ cm}^2 \\ v &= \pi \times 1.25^2 \times 200 \\ &= 982 \text{ cm}^3 \\ t &= 57,600 \text{ sec} \\ c &= 1,571 \times 57,600 / 982 \\ &= 92,148 \text{ sec.cm}^{-1} \end{aligned}$$

Communication pipe therefore should be regulation 31(4)(a) approved.

*Six 100 mm diameter butterfly valves in a distribution system with a maximum contact time of less than a second.*

For each valve:

$$\begin{aligned} s &= 2 \times \pi \times 5^2 && \text{(Note that the valve has two face in contact with the water)} \\ &= 157 \text{ cm}^2 \\ v &= \pi \times 5^2 \times 10 \\ &= 785 \text{ cm}^3 \\ t &= 1 \text{ sec} \\ c &= 157 \times 1 / 785 \\ &= 0.2 \text{ sec.cm}^{-1} \end{aligned}$$

Butterfly valves may be used in accordance with regulation 31(4)(b) and need not be totalled to give an estimate of contact risk score C.

*A break pressure tank of 1 m<sup>3</sup> capacity with five 1 m<sup>2</sup> faces (bottom and four sides) in contact with water and maximum contact time of 20 minutes*

$$\begin{aligned} s &= 5 \text{ m}^2 \\ &= 100 \text{ cm} \times 100 \text{ cm} \times 5 \\ &= 50,000 \text{ cm}^2 \\ v &= 1 \text{ m}^3 \\ &= 100 \text{ cm} \times 100 \text{ cm} \times 100 \text{ cm} \\ &= 1,000,000 \text{ cm}^3 \\ t &= 20 \times 60 \text{ sec} \\ &= 1,200 \text{ sec} \\ c &= 50,000 \times 1,200 / 1,000,000 \\ &= 60 \text{ sec.cm}^{-1} \end{aligned}$$

One such tank in a treatment and distribution system could be used in accordance with regulation 31(4)(b). Two would give a contact risk score C of 120 and products with regulation 31(4)(a) approval should be used.