



Guidance on the Application Requirements for Non-metallic Materials and Components Within Products

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Appendix A: Guidance on the Requirements for Approval of Non-Metallic Materials in Products Version Control Summary		
Version	Issue Date	Summary of change(s)
WRAS.Appr-213 Ver 1.0		
Ver 2.0		
Ver 3.0		
Ver 4.0	26 Nov 2024	complete revision to reflect current WRAS Requirements. Removal of re-approval testing requirements. Clarification of BPR and GB BPR as both are required if product used throughout UK.

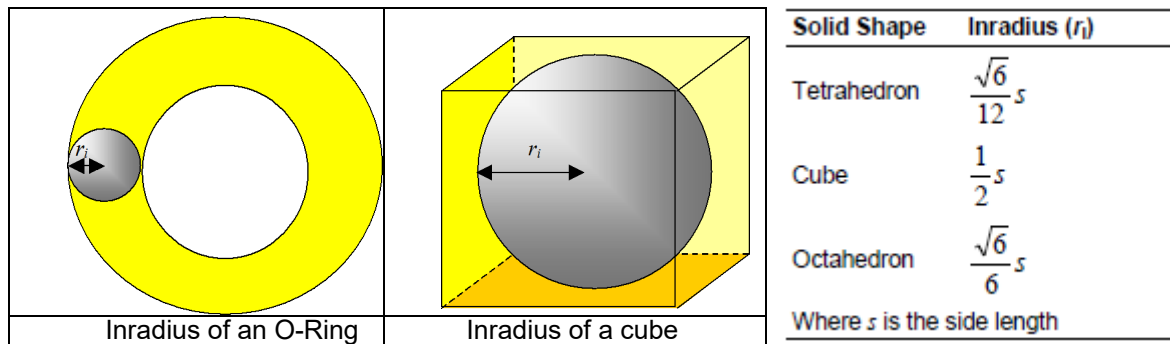
Introduction

1. Non-metallic materials are used in a wide variety of different water fittings and assemblies. However, some materials can produce effects on the odour, flavour, colour or turbidity of the water. Non-metallic materials may also release toxic metals or soluble organic chemicals into the water. If they support microbial growth, materials may give rise to unsatisfactory microbiological quality of the water or may release metabolic products which cause odour, flavour, colour or turbidity or may result in slimes or flakes of microbial growth in the water.
2. Applications for WRAS approval for fittings or appliances must include evidence of the suitability of non-metallic materials which are likely to be in contact with water which is required to be wholesome.
3. The test methods and criteria used by WRAS to assess non-metallic materials are described in BS 6920: 2000 "Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of water." The tests in BS 6920 have been developed to reproduce the most exacting conditions that a material might be likely to meet during its service life in contact with potable water.
4. WRAS uses five tests contained within BS 6920 to show that a non-metallic material does not:
 - Impart odour or flavour on the water (BS6920-2.2),
 - Cause change in the appearance of the water (colour, turbidity) (BS6920-2.3),
 - Promote microbial growth (MDOD test) (BS6920-2.4),
 - Leach substances harmful to human health into the water (cytotoxicity) (BS6920-2.5), or
 - Leach toxic metals into the water (BS6920-2.6).
5. Satisfactory results for these tests do not guarantee that the material cannot cause adverse water quality effects, if circumstances favour it. It is only an indication that the material is less likely to cause unwanted water quality effects than materials which have not passed the tests, and it does not signify fitness for purpose.

Evidence of Suitability

6. When seeking WRAS approval for a product there are two routes by which the non-metallic components can be shown to comply with the requirements for acceptability of their effect on water quality:
 - 1) By using a WRAS Approved Material, e.g. material or 'O' rings or WRAS Approved Product, e.g. a check valve.
 - a. A Material Approval for a raw material is usually accepted for a component providing the material and the manufacturing method for the component is the same as the approval. Components made from POM, PPO & PPE materials sometimes require additional testing, please refer to paragraph 14.
 - b. A Material Approval for a raw material or component is usually accepted for other, differently shaped components made using the same material and manufacturing method, unless the approval includes a caveat stating otherwise.

- c. In the case of elastomeric materials and components the inradius is the radius of the sphere inscribed in a given solid (as shown below).



An in-radius size tolerance of $\pm 5\text{mm}$ is applied to the in-radius size included on the approval, provided that the component within the product is made using the same method as included on the approval, unless the approval includes a caveat stating otherwise. As an example, an approval for injection moulded material 'a' with an in-radius of 1.0mm will usually be accepted for an injection moulded seal, made using material 'a', with an in-radius of between 0.0mm & 6.0mm.

- d. Already-approved site or factory applied coatings and paints when used in accordance with the approval (including instructions on the appropriate substrates, undercoats and primers), require no additional testing.
- e. If changes have been made to the Approved Material or Approved Product (see paragraph 7 below) then advice on the testing which may be required should be sought from WRAS.
- 2) By submitting a test report including successful and appropriate testing against BS6920:2014 ('Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'), performed by a WRAS recognised laboratory.
- Such reports must be less than 5 years old, based on the earliest date of issue of the report, on the day the application for Product Approval is presented for approval.
 - If changes have been made to the tested material or component since testing was performed (see paragraph 7 below), then advice on the testing which may be required should be sought from WRAS.
 - A sample should be no more than 12 months old on the date of receipt by the laboratory and testing of that sample should commence within no more than 12 weeks of its receipt. If in exceptional circumstances these conditions cannot be met, please contact WRAS, prior to commencing testing, for further advice.

Changes to materials or components

7. Any changes must be notified to WRAS before being made. Changes which can all alter the results of BS 6920 testing may include, but are not limited to:
- changes in formulation,
 - method of manufacture,
 - addition of pigments,
 - changes in the percentages of fillers used,
 - introduction of processing aids, and

- f. change of suppliers,
8. For test requirements when changes are made please contact WRAS.

Arrangements for Testing

General requirements

9. BS6920-1:2014 requires the samples used for testing to be manufactured material or components drawn from representative production batches that have received no other treatment.
10. BS6920-1:2014 does not permit testing of whole products which are mechanically joined, e.g. a tap headwork.
11. Testing should be carried out at one of the WRAS recognised test laboratories, a list of which can be found on the WRAS website:
12. www.wrasapprovals.co.uk/material-approvals/contact_details_for_laboratories/.

Temperature of Testing

13. A material or component which is likely to be in contact with water should be tested at the maximum temperature of its intended use.

Components made from Acetal (POM) or polyphenylene oxide (PPO) & polyphenylene ether (PPE) materials

14. Acetal and polyphenylene materials, when formed into components, can cause water quality problems when in contact with hot water. Additional testing is required on any component made from WRAS Approved or BS6920 compliant acetal/POM or PPO/ PPE used in the following circumstances:
 - The component will be used with hot water (>30°C) and
 - The component will be used in a terminal fitting (a water outlet device) and
 - The component has a water contact surface area of greater than 3,000 mm² (based on a minimum draw off of 200 mL resulting in a surface area of greater than 15,000 mm² l⁻¹).
15. Components made from acetal/POM materials require a Cytotoxicity test
16. Components made from PPO/PPE require testing for Odour & flavour.
17. Where ranges of sizes of components are produced by the same manufacturing process and in the same manufacturing site only the component with the largest surface area need be tested.

Hoses and Tubing

18. BS 6920 specifies additional requirements which hoses and tubing must meet.
19. These are given in BS 6920-2.2.2 'Method of testing odours and flavours imparted to water by multi-layered hoses and pipes', and BS 6920-2.2.3 'Method of testing odours and flavours imparted to water by hoses for conveying water for food and drink preparation', as appropriate.

Water Treatment Chemicals and Filtration Media

20. DWI publishes a 'List of Relevant European Standards - British Standards BS EN for Chemicals used for Treatment of Water'. Water treatment chemicals and filtration media (except ion exchange resins) shall meet the requirements of the relevant European Standard given in this list.
21. Activated Carbon Blocks shall undergo testing against BS 6920-2.2.1 (Odour and flavour of water) and BS 6920-2.6 (Extraction of metals).

Specific Substances

22. Materials and components containing asbestos, coal-tar bitumen or PVC containing lead-based stabilisers are not accepted.
23. Materials and components petroleum or asphaltic bitumen are not accepted for use on water-retaining structures with large surface area:volume ratio such as lining of pipes and cisterns in contact with wholesome water but may be accepted for use where there is only a small surface area in contact with water, e.g. taps, valves and pipe connectors.
24. Materials and components comprising solely of Silicon Carbide require an Extraction of Metals test.
25. Naturally occurring diamond, sapphire, ruby and quartz materials (including Agate) require an Extraction of metals test. Synthetic sapphire, ruby and quartz materials do not require testing.

Biocides: Materials and components including a biocide/active substance may require authorisation under the Biocidal Products Regulation (BPR/GB BPR). It is up to applicant to check that it conforms with all the appropriate regulations. Applicants should check whether their product is covered under the BPR/GB BPR and if so should ensure that the active substance(s) in their biocidal products are under review or already approved and that they have made any necessary application for Product Authorisation under the BPR/GB BPR. Any subsequent approval will indicate that the product falls under the scope of the GB Biocidal Products Regulations and EU Biocidal Products Regulations.

Information on the BPR and GB BPR, including how to check the status of an active substance, how and when to apply for product authorisation and what actions need to be taken whilst an active substance is still under review, is available on the Health and Safety Executive website at www.hse.gov.uk/biocides.

WRAS requires that approval holders contact WRAS should the status of the active substance/s change during the lifetime of the approval. If a decision is made to reject the change, or not to approve the active substance/s the original WRAS Material Approval will be withdrawn from the WRAS Directory and the material will no longer be able to claim WRAS approval.

26. **Natural Materials/ components:** The applicant should make WRAS aware when a material or component includes a natural ingredient such as cellulose.

Approvals of products including such a material or component will state:

"This product incorporates a natural ingredient. Please note that water companies will evaluate the evidence provided and may ask for more information and they reserve the right to refuse installation".

27. **Magnets** comprising metallic magnetic component contained within a matrix of ceramic material (usually strontium or barium oxides) require an Extraction of metals test. Magnets encapsulated in a non-metallic material require full BS 6920 testing. Other types of magnets (e.g. those comprising of metallic materials) are not appropriate for BS 6920 testing.

These are accepted in products in contact with wholesome water providing they don't contain prohibited materials (e.g. lead or bitumen) or give rise to obvious detrimental effect on water quality (e.g. rusting).

28. **Recycled and Regrind Materials:** materials or components which incorporate a recycled ingredient will require additional testing. WRAS will also require information on the source of the recycled ingredients and evidence to demonstrate full traceability of the recycled material.

Products containing clean "regrind" material from the production process are not deemed to be made from recycled material, however, the sample submitted for testing must contain the maximum "regrind" content that is used.

Applicants with products containing materials or components made using recycled and/or regrind materials should contact WRAS for the full requirements.