WRAS

WATER REGULATIONS ADVISORY SCHEME

WRAS Material Guidance

A guide for Manufacturers, Suppliers and Test Laboratories on the Application Requirements for WRAS Material Approval

Version 4.4: Issued 21st November 2016

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Below are details of the amendments made to previous versions:

NATURE OF AMENDMENT	SECTION/SUB-SECTION OF GUIDANCE
Additional information	Introduction
Amendment to Version 3.0	Section 7.2
Amendment to Version 3.0	Table 1 footnote 7 clauses b, d, f & g
Amendment to Version 4.0	Table 1 – Clause n - footnote 7 removed from EXS Table 1 footnote 7 changed to - Required at 23°C only, when approval is sought for a temperature higher than 23°C AND where the existing approval has been issued against the 2000 dated version of BS6920-1.
Amendment to Version 4.1	Section 4.2 updated to include the provision for Secondary Material Re-approval
Amendment to Version 4.1	Section 4.2 updated to include the provision for Secondary Material Re-approval
Amendment to Version 4.2	Section 7.7 updated to include requirements for name and Cas No. of the biocide, as well as the company name and address of the supplier of the biocide.
Amendment to Version 4.3	Section 7.7 updated to indicate no testing can be commenced until information has been cleared by WRAS, revised requirements and conditions of approval (if granted)

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1 INTRODUCTION

WRAS Material Approval demonstrates that a product satisfies the requirements of Schedule 2 Paragraph 2 (1) of the Water Supply (Water Fittings) Regulations 1999, Scottish Water Byelaws 2004 & the Water Supply (Water Fittings) Regulations (Northern Ireland) 2009.

….'*no material or substance, either alone or in combination with any other material or substance or with the contents of any water fitting of which it forms a part, which causes or is likely to cause contamination of water shall be used in the construction, installation, renewal, repair or replacement of any water fitting which conveys or receives, or may convey or receive, water supplied for domestic or food production purposes.*' ….

The Regulations are typically in effect between the boundary of a property and the point of discharge.

Usually only non-metallic materials which will be in direct contact with wholesome water provided by the water supplier for domestic purposes (drinking, bathing, washing or cooking) will be considered for WRAS Material Approval.
WRAS Material Approval will only be granted to materials which have satisfied the requirements of BS 6920:2000/2014 Parts 1 and 2, together with Part 3 for hot water usage. "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." No standard of any other EEA State includes the same suite of tests, although individual tests may be considered as providing evidence for an equivalent level of performance. Further advice on the equivalence of other standards is available from the Water Regulations Advisory Scheme"

1.1 Non-metallic materials

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 can cause odour, flavour, colour or turbidity, result in slimes or flakes of microbial growth in the water and might pose a health risk to vulnerable people.

The test methods and criteria used by WRAS to assess non-metallic materials are described in BS 6920: 2000/2014 "Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of water." The tests in BS 6920 have been developed to reproduce typical conditions that a material might be likely to meet during its service life in contact with wholesome water.
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.

2 WRAS MATERIAL APPROVALS

WRAS Material Approvals are only granted to products which meet the Scheme's acceptance requirements and fully satisfy the appropriate BS 6920 testing criteria. A WRAS material approval is valid for up to five years on the basis that there will be no change in formulation, or to the source or nature of ingredients or in the method or site of manufacture or method of application during the lifetime of the approval.

A condition of WRAS Approval is that no modification shall be made to the product without first notifying the Scheme and submitting details of the proposed modification for consideration by WRAS. Failure to comply with this condition will invalidate an approval and result in its removal from the Water Fittings and Material Directory.

2.1 Scope of WRAS Material Approvals

Samples submitted for WRAS Material approval can take the form of finished components or specially moulded blocks or plaques.

Components manufactured from WRAS approved thermoplastic materials can be used in fittings seeking WRAS fittings approval, usually without any further BS 6920 testing providing that there has been no change to the formulation and the manufacturing processes are the same as those used in the preparation of the test sample.

Components made from WRAS approved thermosetting materials in particular rubbers or elastomers may require additional testing when used in fittings seeking WRAS fittings approval. Components made using the same process from the same material but of different sizes, thicknesses or shapes from that which is listed may require some additional testing to demonstrate that these differences have not caused any change in the material acceptability. Please contact WRAS for clarification.

2.2 Validity of WRAS Material Approvals

The WRAS Material Approval number is based on the date on the front of the test report (providing the testing within the report has been carried out within the last 12 months) and expires five years after this date. Where a report is re-issued with amendments, the approval number is based on the earliest date on the report.

Only those products identified and listed in the approval are covered by the scope of the approval.

The approval is valid for materials or components manufactured and used/installed during the lifetime of that approval ONLY whilst the approval remains current.

The approval holder is the company named in Section 2.1 of the M2 Application Form and it is that company that 'owns' the approval.

3 APPLICATION PROCESS

3.1 Application File

The application file will include, where available, the following:

- A completed application form
- The relevant test reports i.e. BS 6920 test reports. Where the company name on the test report differs from the company that is applying for the approval, WRAS will require written permission from the company for the approval holder to use the report.
- Instruction and data safety sheets where required
- Completed purchase order requisition form (which gives WRAS the details to include on the invoice).

3.2 Application Form

All applications for WRAS Material Approval must be submitted using the official WRAS application form (M2 for initial applications, MA3 for re-approvals and M3 for secondary approvals).

When the application is presented to WRAS the information provided must be current, with the application form having been completed in the last 12 months.

The application form must be signed by the Applicant (ideally a director in the company) and must not be signed by the Agent on behalf of the Applicant.

4 RENEWAL OF WRAS MATERIAL APPROVALS – AUDIT TESTING

Materials approvals issued by the Scheme are valid for a maximum of five years. All WRAS approved materials are listed in the online Water Fittings and Materials Directory. All expired approvals are deleted within a month of their expiry date.

All approval holders will be notified by the Scheme, in writing, of the need to seek re-approval when one year of their current listing remains.

Please note that it is the responsibility of the Approval Holder to ensure continuity of approval. WRAS Ltd. accepts no liability for the delay in granting approval where this is caused by circumstances outside of its control.

Rather than repeat all five tests needed for new approvals, existing approval holders may be able to renew their approvals on the basis of satisfactory limited testing. To benefit from this arrangement a number of conditions have to be considered including:

- The age of the previous test reports;
- Whether there have been any changes in the test requirements;
- Whether there has been a revision of the test method or requirements of BS 6920
- Whether there have been any changes, including material composition/formulation, method of manufacture, alternative suppliers and changes to ingredients and/or their proportions.

Only after consideration of all the facts can it be decided what tests will be sufficient to demonstrate on-going conformity with BS 6920.

4.1 Acceptability of audit testing

Full testing will be necessary when an approval has expired more than two years previously.

4.2 Audit Test Requirements

Re-approval

WRAS Material Approvals are valid for a maximum of five years. In order to gain re-approval further BS6920 testing is always necessary. The extent of the testing is based on information declared within the completed MA3 application form.

Where the material or component has not altered in any way, including ingredients and their proportions, suppliers of raw ingredients and site and method of manufacture, in the majority of cases the audit test requirements are identified in Appendix C. Please note that the audit test requirements are included for information purposes only. Audit testing must not be performed without written test requirements from WRAS.

Where an approval holder seeks re-approval audit test requirements are issued by WRAS. These are valid for 12 months, provided the information submitted in the MA3 remains identical.

Secondary Material Re-approval

For approval holders who have obtained a WRAS Material approval through the Secondary approval route, but find that the primary approval holder is no longer planning to seek re-approval, (so will have no new approval to base another Secondary approval upon), or simply wish to obtain their own primary approval, WRAS will offer the opportunity for (potentially limited) audit test requirements.

A reminder will be sent out to all approval holders a year prior to the expiry of the approval. This includes an accompanying letter detailing the re-approval process along with the MA3 form that must be completed in full in the relevant section. (Only one section needs to be completed, but the entire form must be returned to WRAS). In addition to the MA3 form Secondary material approval holders are required to provide the following additional information:-

A declaration from the primary approval holder on their company letterhead paper, signed and dated, making reference to:
PRIMARY APPROVAL NUMBER: (INSERT 7 DIGIT WRAS MATERIAL APPROVAL NUMBER)
BS 6920 TEST REPORT REFERENCE ASSOCIATED WITH THE PRIMARY APPROVAL: (INSERT BS 6920 TEST REPORT OF PRIMARY MATERIAL)
PRIMARY APPROVAL MATERIAL: (INSERT PRIMARY MATERIAL TRADE NAME(S))
SECONDARY APPROVAL MATERIAL: (INSERT SECONDARY MATERIAL TRADE NAME(S))

- Indication they supply the primary material to be re-branded as the Secondary material to the Secondary approval holder (full company name and address of Secondary approval holder must be included)
- The declaration must give authorisation for the Secondary approval holder to use the BS6920 test report to gain audit test requirements which will allow them to seek their own re-approval.

The following statement must also be included:
We **(insert Primary approval company name)** the primary approval holder are aware that it is a condition of a WRAS Material Approval that **NO** changes or modifications are made to an Approved Material(s) during the lifetime of the approval, without first notifying WRAS Ltd.
As we supply the Secondary approval holder **(insert Secondary approval company name here)**, we acknowledge that if any changes or modifications are made to the material(s) named above and supplied to the Secondary approval holder, we must notify the Secondary approval holder so that they may inform WRAS Ltd.
It is understood that WRAS Ltd. must be provided with full details of the proposed change(s) so that WRAS Ltd. may consider the necessary testing required, and that failure to comply with this condition will immediately invalidate a previously granted Approval.

If the Secondary approval holder wants to make additions or modifications (that are not covered in table 1 of the Guidance) WRAS require full formulation details (ingredients and percentages) existing and new so that a decision can be made on the necessary testing. Where this information cannot be provided full testing is required on all additional or modified materials.

4.3 Consecutive WRAS Material Approvals

Applicants may apply for re-approval at any time during the lifetime of an approval. Approvals will be allowed to run consecutively if the re-approval is granted in the last nine months of validity (of the existing approval) providing that this does not conflict with the guidelines for processing applications.

The new approval number starts the month after the original expires. As an example an approval number beginning 0804 will be valid until April 2013. Therefore the new approval number would begin May 2013 (1305) and expire May 2018. WRAS Ltd. inform the approval holder that they should use the approval number beginning with 0804 until April 2013 and the new approval number, beginning 1305 from May 2013.

5 DIRECTORY ENTRIES, ALTERATIONS/ADDITIONS, SECONDARY APPROVALS & COMPONENTS MANUFACTURED FROM APPROVED MATERIALS

5.1 Water Fitting and Material Directory Entries

All WRAS Material Approvals will be added to the on line Water Fitting and Material Directory within ten working days of them gaining approval.
All expired approvals will be deleted within one month of their expiry date.

5.2 Tradenames

In order for a WRAS Material Approval to be issued the material or component must be accompanied by a unique trade-name/reference/identifier that refers only to the tested material or component and distinguishes it from any other material or component that the company may sell.

5.3 Alterations and additions to an existing approval

These are considered on a case by case basis and the information required by WRAS varies depending upon the request. Please refer to the scheme for advice.

5.4 Changes in name/designation of tested and/or listed products

If the name and/or designation of a tested product is changed after the issue of the test report, the test laboratory are not required to issue an amended report.
Upon receipt of a formal declaration from the applicant detailing the changes the Scheme shall amend their records (and any listing in the Water Fittings and Materials Directory).

5.5 Restrictions to additions

There are no restrictions to the number of revisions that can be made to an approval provided that the conditions of the Scheme are satisfied.
Revisions to an existing approval can be made at any time during the lifetime of a valid approval.

5.6 Secondary Approvals

Approval holders may request secondary approvals for their factors i.e. where an approved material or component is rebranded and sold by a second company. These requests will be considered upon receipt of the following information:

- a completed M3 application form (which requires permission from Primary Approval Holder)
- Instruction and safety data sheets where appropriate

Please note that the expiry date of a secondary approval will be the same as that of the original.

5.7 **Consecutive Secondary Approvals**

A Secondary Approval may only ever be issued based on a valid and current Primary Approval. Some Primary Approvals may not yet be valid as a consecutive approval may have been issued (Please refer to section 4.3 – Consecutive WRAS Material Approvals).

If an application for a Secondary Approval is made prior to the consecutive primary Approval becoming valid, then the Secondary Approval will only be granted if the secondary applicant already has a Secondary Approval based on the current and valid primary, i.e. if you are applying for renewal of an existing Secondary Approval.

5.8 **Approval of pipe & fittings**

Pipe & fittings cannot appear on one approval as this may suggest that approval has been granted to the system.

6 TEST REQUIREMENTS

WRAS uses five tests contained within BS 6920 to show that a non-metallic material or component does not:

- Impart odour or flavour on the water (Section 2.2);
- Cause change in the appearance of the water (colour, turbidity) (Section 2.3);
- Enhance microbial growth (MDOD test) (Section 2.4);
- Leach substances harmful to human health into the water (cytotoxicity) (Section 2.5);

or

- Leach metals into the water (Section 2.6).

6.1 Increasing the temperature of an existing approval

For materials tested and already approved further testing is necessary at the chosen higher temperature. Please refer to Table 1 (i).

6.2 Modifications or changes to existing approvals

It is a condition of WRAS Material Approval that the Scheme be notified of any proposed modifications/changes to a WRAS Approved material or component.

Failure to comply with this condition will invalidate the approval and result in its removal from the Water Fittings & Materials Directory.

Modifications and/or changes include, but are not limited to:

a.) the addition of pigments. Refer to Table 1 (a).
b.) changes in the percentages of fillers. Refer to Table 1 (j).
c.) introduction of processing aids. Please refer to WRAS for further information.
d.) changes to suppliers of ingredients. Refer to Table 1 (k).
e.) alternative suppliers of raw ingredients. Refer to Table 1 (k).
f.) changes to the manufacturing method. Refer to Table 1(l).
g.) changes to the site of manufacture. Refer to Table 1 (m).
h.) change in processing conditions after a test failure. Refer to Table (n).

6.3 Components manufactured from approved materials

The Scheme will accept applications for approval of components manufactured from WRAS Approved Materials. Refer to Table 1 (o). Please note that the additional testing must be performed whilst the base material possesses a valid approval. The WRAS approval number for the component will be based on the date of the component test report and expires five years after this date.

6.4 **Approval of Product Ranges**

Applicants must provide full details of the range of products to be covered by an approval.

Colours:

Where the only variation between products in a range is the colour i.e. the products are made from the same basic formulation, using the same manufacturing conditions (both the method and site of manufacture) and suppliers of raw ingredients, approval of the range may be obtained by full testing of one sample, usually the natural, and limited testing of various coloured samples. Please refer to table 1(a) or contact the Scheme for clarification.

Elastomers:

Ranges of elastomeric materials/components differing in Shore hardness.

WRAS offers approval for such ranges which differ in Shore hardness. Where this is achieved by changing the relative concentrations of the ingredients (i.e. no additional or substitute ingredients) and/or changing the curing conditions, the test requirements set out in Table 1 (b) apply.

Where a change in Shore hardness is required for an existing rubber material, provided that no changes in the nature of the ingredients used, then the test requirements set out in Table 1 (c) apply.

Ranges of elastomeric materials/component differing in size:

WRAS offer approval for such ranges which differ in size, providing that the formulation, supplier of raw ingredients and manufacturing conditions (both the method and site of manufacture) are identical. Please refer to Table 1 (d) for test requirements.

Ranges of differently sized elastomeric components which also differ in Shore hardness:

WRAS offer approval for ranges of components which differ in both size and Shore hardness providing both the site and method of manufacture remain identical. Please refer to Table 1 (f) for test requirements.

Ranges of elastomeric components differing in shape only:

WRAS offer approval for such ranges made from the same base material and considers each shape (e.g. 'O' rings, gaskets, seals or bellows) to be a separate range. Accordingly, each differently shaped component must undergo testing.

Full testing shall be performed on one of the shapes. Limited testing, namely Odour and Flavour and Growth of Micro-organisms shall be performed on each of the other, differently shaped components.

Subsequently, it is the choice of the Applicant whether they wish for these components to appear on one approval or whether they wish to apply for separate approvals for each differently shaped component.

Where there is a range of elastomeric components which differ in shape & size, shape &

shore hardness or shape, size and shore hardness please refer to WRAS Ltd. for written test requirements. The laboratory shall not commence testing until WRAS Ltd. have issued requirements

Thermoplastics:

Ranges of thermoplastic products which vary only in filler content:

WRAS offer approval for ranges of thermoplastic products which vary only in filler content, providing that the formulation, suppliers of raw ingredients (detailed information of the ingredients and their proportions must be submitted to WRAS) and manufacturing conditions (both the method and site of manufacture) remain the same. Please refer to Table 1 (g) for test requirements.

6.5 **Products manufactured at more than one site**

The Scheme will consider applications for approval of products manufactured at more than one site.

Full BS6920 testing must be carried out on a material/component manufactured at one of the sites (site A).

Where there are additional manufacturing sites or where there are additional manufacturing sites but suppliers or raw ingredients differ from those used at site A then please refer to Table 1(h).

6.6 **Change to the site of manufacture affecting and existing approval**

If an approval holder wishes to change the site of manufacture of a WRAS Approved Material/component then further testing will be necessary. Please refer to Table 1(m).

In addition the approval holder should supply the following information to WRAS in the form of a written statement on company headed paper which is signed and dated by the Applicant (ideally a Director within the company) and must not be signed by an Agent on behalf of the Applicant:

a.) Full postal address of the new site.
b.) Date of the proposed move and when manufacturing will begin.
c.) Details of any changes in the sources of ingredients.
d.) Details of any changes in the manufacturing process, including those providing efficiency.
e.) Details of the quality management system in place at the new site.

7 SPECIFIC PRODUCT INFORMATION

7.1 Specific substances not approved by the scheme

a.) Products containing asbestos, coal-tar bitumen or PVC containing lead-based stabilisers.

b.) Silicon dioxide/Quartz based materials since they are very unlikely to leach appreciable concentrations of any concern into the water. Some naturally occurring quartz may however be contaminated with very low concentrations of metals and require an Extraction of Metals test. Please contact the Scheme for further advice.

c.) Fluids for indirect heating systems.

d.) Treatment chemicals, including Hydrogen Peroxide.

e.) Tungsten Carbide (an inorganic compound containing equal parts of tungsten and carbon atoms). The relevant section (5590) of The Water Fittings and Materials Directory was withdrawn on 30th November 2011.

7.2 Filtration media & water treatment chemicals

Activated carbon material used in treatment units within buildings should meet the requirements of the appropriate BS EN standard for their use in water treatment e.g. BS EN 12903, 12915 (Part 1 or 2) and 14456.

Where there is no appropriate BS EN standard, the Scheme will approve filtration media where it can be demonstrated that they will be used within building water systems.

Filtration media and water treatment chemicals used by water supply companies and organisations are covered by a separate approval scheme operated by the Drinking Water Inspectorate (Regulation 31 of the Water Supply (Water Quality) Regulations.

Activated carbon blocks based upon a plastic matrix are not covered by a relevant BS EN Standard and should undergo an Odour and Flavour of Water Test (BS 6920-2.2.1) and a test for polycyclic aromatic hydrocarbons (PAH's). In addition, cut 10 sections (each of approximately equal size) from the block so that the total weight is 1 gramme. Immerse these sections in 1 litre of test water (shaken or stirred) for a 24 hour period. Filter the extraction water through a 0.45 micron filter and perform an Extraction of Metals Test (BS 6920-2.6).

7.3 Waterproofing membranes for treated water reservoir roofs

The Scheme will only consider applications for these products where they fall under the remit of the Water Supply (Water Fittings) Regulations 1999, Scottish Water Byelaws 2004 & the Water Supply (Water Fittings) Regulations (Northern Ireland) 2009 and will be used in direct contact with wholesome water or are intended to be used where condensation forming on them may come into contact with wholesome water.

Membranes used by water supply companies and organisations are covered by a separate approval scheme operated by the Drinking Water Inspectorate (Regulation 31 of the Water Supply (Water Quality) Regulations).

7.4 **Magnets – Test Requirements**

Magnets will only be approved by the Scheme where they are either encapsulated or coated with a non-metallic material.

Magnets comprising metallic magnetic component contained within a matrix of ceramic material (usually strontium or barium oxides): extraction of metals.

Magnets encapsulated in a non-metallic material: full BS6920 parts 1-3 testing of the coating.

The coating may be applied to the actual magnet or a glass plate.

Other types of magnets (e.g. comprising metallic materials) are not appropriate for BS6920 testing or WRAS Approval. These are accepted in fittings in contact with wholesome water provided they don't contain prohibited materials, e.g. lead or bitumen, or give rise to obvious detrimental effect on water quality, e.g. rusting.

7.5 **Other Metallic Materials**

In the absence of a satisfactory test method for assessing the effects of metallic products upon water quality the Scheme does not consider applications for WRAS Material approval of metallic materials.

7.6 **Ceramic & vitreous enamel based products**

Any of these products which do not contain organic ingredients, either because they are not present in the formulation or would have be lost due to firing or sintering should be tested for conformity with the requirements of clause 8 of BS 6920-1:2000/2014 in accordance with BS 6920-2.6 (extraction of metals). No other tests are required.

7.7 **Biocides/Active substances**
(Materials incorporating a biocide with one or more active ingredient(s))

Due to the introduction of the EU Biocidal Products Regulations (BPR), the applicant will need to provide the following supporting information.

This information **must** be presented to WRAS prior to the commencement of testing and must be in the form of a statement, signed and dated, on company headed paper:

- The name and CAS number of the active substance/s.
- The product type (PT) that this active substance/s falls under for your material. (It must be appropriate for the intended use).
- Has/Have the active substance/s been submitted for review under the EU Biocidal Products Regulations (BPR). (A requirement of the BPR before 1st Sept 2015 where the active substance/s is/are present as a biocidal function. Transitional measures for treated articles make it a requirement of the BPR before 1st Sept 2016). What was the result of assessment?
- The supplier/suppliers of the active substance/s (company name and address) and whether they are participating in the review programme for the active substance/s under the required product type. (A requirement of the BPR before 1st Sept 2015 where the active substance/s is/are present as a biocidal function. Transitional measures for treated articles make it a requirement of the BPR before 1st Sept 2016).

If all of the above are satisfied (and the active substance/s is/are being assessed for the product type appropriate to your material), but no decision is made on the active substance/s WRAS will offer a full 5-year approval.

If all of the above are satisfied, but the decision has been made not to approve the active substance/s then WRAS will be unable to offer approval.

If a decision is made during the lifetime of the WRAS approval, (granted from the date of the test report for 5 years), to approve the active substance/s for the product type appropriate to your material the WRAS material approval will last the full five years.

If a decision is made to reject or not to approve the active substance/s the WRAS material approval will be withdrawn from the WRAS Directory 180 days after this decision and the material will no longer be able to claim WRAS approval.

Please also kindly be aware that WRAS considers it the approval holders obligation to contact WRAS should the status of the active substance/s change during the lifetime of the approval.

This is WRAS's current understanding of the EU Biocidal Product Regulations (BPR), should any of the above information/requirements change WRAS will inform you as soon as possible. WRAS also reserve the right to withdraw a WRAS approval if either the BPR requirements change and dictate that WRAS should do so.

If the Scheme indicates that the product is suitable for WRAS Approval and the growth of aquatic microorganisms test is required, testing shall include the extra reference container specified in Clause 10.1.2 of BS 6920-2.4:2000/2014.

7.8 Products made from recycled materials

The Scheme will only consider applications for WRAS approval of recycled materials if it can be satisfactorily demonstrated that the source, quality and nature of the ingredients together with the manufacturing process or application overcome any concerns regarding inconsistency.

A decision regarding acceptability will be made by the Approvals & Enquiries Manager and be based upon the documentary evidence supplied by the applicant, which includes the following:

a.) Details of the sources of the recycled ingredients, which must include

- evidence to demonstrate full traceability of the recycled material, including the product formulation of the recycled material; and
- an outline of any analytical quality checks undertaken; and
- details of any Quality Systems covering these materials.

b.) Details of any treatments given to them before re-use.

The Scheme reserves the right to withhold approval if the information given does not provide an adequate safeguard to the reproducibility of the material.

When approved materials containing recycled ingredients are used in the manufacture of finished products which are subsequently submitted for inclusion in the Directory, the Scheme reserves the right to request an annual retest of a fresh batch of the material/product in the Odour and Flavour of Water Test and for any other parameter of concern.

For approval purposes one batch of the final material containing the recycled ingredient(s) shall be tested and shown to conform with all the test requirements. In addition two further (random) sets of test samples shall be taken from the manufacturers' premises by either the test laboratory, or by an accredited quality management assessor/organisation; these shall be tested in the odour and flavour of water test, to provide evidence of consistency of the product.

7.9 **Use of 'regrind' materials**

Full testing of "virgin" 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 will be used.

Where recycled sprues and runners from thermoplastics moulding operations are recycled into products designed for use with drinking water the following test requirements shall be implemented –

either - test example pieces moulded from 100% regrind of the sprues and runners for odour and flavour, MDOD and cytotoxicity - satisfactory test results would cover the use of 100% reground material *plus* lower percentages of regrind material, e.g. 50%

or - test example pieces moulded from, say 50% regrind material, in the same tests - use permitted *only* for this percentage or less of regrind material.

7.10 **Additives including fillers & pigments**

These cannot be tested in their own right; test samples should be made from the material into which they are incorporated.

7.11 **Lubricants**

The Scheme approves both high and low viscosity lubricants giving satisfactory results when tested in accordance with clause 6.6 of BS 6920-2.1.

7.12 **Graphite based products**

The Scheme will approve graphite products giving satisfactory results when tested in accordance with clause 6.10.2 of BS 6920-2.1.

7.13 **Products containing antioxidants**

Applicants should declare the use of antioxidant and the test laboratory must report any odours or flavours detected in samples of these products to the Scheme.

Applicants who wish to seek approval of products containing the antioxidant 6,6'-di-t-butyl-4,4'-thiodi-m-cresol are advised to contact the Scheme.

7.14 **Solvent cements**

In the case of solvent cements used in the assembly of plastic pipe systems it is likely that small areas of the cement may be in contact with water. In addition there are three issues which have to be taken into account when these products are tested.

a.) Dissolved/suspended solids in the cement which are left on the surface as the solvent(s) evaporate
b.) High boiling point solvents which are slow to evaporate from the cement and may still be present when the product is put into contact with drinking water.
c.) Substances which dissolve into the cement from the fittings during application and are subsequently left as solids as the solvents evaporate.

Testing

Solvent cements therefore shall not be tested as dry films of cement on glass plates after evaporation of the solvents but shall be tested as follows;

1) Apply the cement to a pipe or recommended fitting for which they are designed (with a surface area of 15,000mm²) – paint the solvent cement onto an area of 1,000mm² and allow the test piece to cure for a minimum of 60 minutes or the manufacturer's recommendations.

The final test results will cover the solvent cement only and not the pipe or fittings.

Expression of results

In addition to the normal requirements of both BS6920 and WRAS Materials Guidance, include a full description of sample preparation and cure (time and temperature) & the following statement –

`The product has been tested at the reduced surface area of 1,000mm² in 1 litre of test water and under these conditions, it was found to comply with the requirements of Part 1 of BS6920.

N.B. The product has not been assessed for compliance with the requirements of BS6920 at the normal surface area of 15,000mm² in 1 litre of test water, it has been tested at a reduced surface area in accordance with the WRAS Material Guidance document section 7.14.

7.15 **Waterstops**

WRAS will consider granting approval of water stops where they are in contact with wholesome water AND used within the boundary of a property and therefore fall under the remit of Water Supply (Water Fittings) Regulations 1999, Scottish Water Byelaws 2004 & the Water Supply (Water Fittings) Regulations (Northern Ireland) 2009.

These materials are for use in concrete reservoirs and similar structures, constructed in accordance with the design criteria of BS EN 1992-3:2006 (Design of concrete structures – Liquid retraining and containing structures) with respect to normal frequency of joints. The materials should be tested at a reduced surface area to volume ratio of 1000mm² per litre as specified in BS 6920: Part 1.

This information will be included on any subsequent approval.

7.16 **Bituminous Based Products**

WRAS will consider granting approval of petroleum or asphaltic bitumen but NOT coal tar bitumen.

Materials listed in this section are not approved for use for contact with water that is required to be wholesome on large water retaining structures such as lining of pipes or water storage cisterns. Products of this nature may be approved for applications such as taps, valves and pipe connectors only. This information will be included on any subsequent approval.

7.17 **Anaerobic Adhesives**

Following concerns relating to the testing of Anaerobic Adhesives when applied to brass fittings as specified in BS 6920-2.1:2000/2014 (clause 7.7), the following approach is to be taken when testing such products;

1.) Use stainless steel fittings to prepare test pieces – using the appropriate curing conditions for stainless steel, but make sure that the test reports clearly highlight that stainless steel couplings were used in place of the brass couplings specified in BS 6920-2.1:2000/2014 (clause 7.7).
2.) WRAS will remove the curing conditions from the approvals listed in section 5520 of The Water Fittings & Materials Directory and add, to the section title that 'these products are to be applied and cured in strict accordance with the manufacturer's instructions'.

7.18 **Cementitious products incorporating blast furnace slag**

When an application for approval of a cementitious product, incorporating blast furnace slag is received, WRAS Ltd. will require further information prior to deciding whether approval is to be granted:

a.) The source of the slag, including the name/s and address/es of the furnaces.
b.) Whether the ingredients that go into the furnace/s remain constant and how this is achieved.
c.) Quality documents/certificates that the blast furnace/s may have.

8 SITE APPLIED PRODUCTS

Definition of Site Applied: These products are applied on site, typically where they will be used, after which they undergo some form of change or cure before they are suitable for use in contact with water and where conditions affecting its application may vary widely if uncontrolled.

8.1 Curing

Product samples, including all primer and undercoats, prepared by the test laboratory should be prepared and cured in accordance with clause 7 of BS 6920-2.1 (standard curing conditions).

The soaking and flushing arrangements applied must be the minimum identified in the manufacturer's instructions and WRAS will request a copy of these instructions before an approval is granted.

Curing shall take place in temperature controlled incubators or refrigerators with appropriate thermostats. Since volatile solvents etc will be released from many products during the curing regime, appropriate climatic cabinets, including the provision for regular air changes within the cabinets, shall be used for the curing of such products. If critical to product cure and/or performance the relative humidity shall be controlled during the cure period and recorded in the final product report. When transportation of samples is required detailed records of the method of transportation and temperature control of the sample container shall be made, together with a record of the temperature of the test samples at the start and end of the transportation period.

NOTE - the **minimum** specification for a suitable curing incubator shall include temperature control ±2°C, humidity control of ±10% of that specified by the manufacturer/supplier plus the facility for continuous extraction/air exchange from the cabinet during the curing of solvent containing coatings and sealants.

Jointing materials, solders and fluxes for plumbing systems shall not be cured for periods greater than 24 hours.

8.2 **Non-standard curing conditions (other than those specified in clause 7 of BS 6920-2.1)**

The Scheme may accept a manufacturers request to apply non-standard curing conditions, other than those specified in clause 7 of BS 6920-2.1, but only if it can be demonstrated to the Scheme's satisfaction that these cure conditions can be obtained on site, in practice in the UK.

These must be achievable on site including under typical United Kingdom winter conditions. If the product will not cure under these typical conditions on site, the instructions for application of the product should clearly state this. If elevated temperatures are required to achieve the necessary degree of cure of the product, clear statements must be included in the Instructions (product data sheet) as to how the appropriate temperature(s) will be achieved and maintained throughout the curing period.

WRAS must be notified prior to commencement of testing if non standard curing conditions are to be used.

When a sample has been prepared and cured, using non-standard curing conditions, but in accordance with the manufacturer's instructions for use, a note drawing the attention of the Scheme to the non-standard curing conditions used shall be added to the final test report along with full details of the actual conditions applied. In addition a copy of the manufacturer's instructions for use must be supplied with the application.

New Approvals with curing curves

WRAS will request instructions issued to users that include a curing curve showing the relationship between curing temperature and time.

The instructions issued to users (product data sheet) must include a date and issue number.

Full BS6920 testing shall be done on samples made under the lowest recommended/most onerous curing conditions (lowest temperature and shortest recommended time at that temperature).

In addition test samples made using the highest recommended or achievable curing conditions (highest temperature and shortest recommended time at that temperature) for "on site" application of the product in the United Kingdom (including the use of heaters etc. where required) shall be assessed in the odour and flavour of water test (BS 6920-2.2.1).

The subsequent approval shall be granted for all curing conditions referenced in the curve.

If these two sets of tests give satisfactory results, then the following statements shall be included on the subsequent approval:

`The end user must ensure that the product is cured in accordance with cure curves provided by the approval holder in their Instructions dated XX XX XX, issue no xxxxxxx`.

And;

`This material is only approved for the curing conditions that appear on the approval. If the cure conditions are varied from those specified on the approval then the material is not covered by the scope of the approval`.

New Approvals – no curing curves available

Where the potential approval holder of the site applied product is unable to provide information relating to curing conditions at a range of temperatures, they shall be made aware that approval will only be applicable to the product when cured as tested (usually using the standard curing conditions specified in clause 7.2 of BS6920-2.1).

The Scheme may accept a manufacturers request to apply non-standard curing conditions, other than those specified in clause 7 of BS 6920-2.1, but only if it can be demonstrated to the Scheme's satisfaction that these cure conditions can be obtained on site, in practice in the UK.

WRAS must be notified prior to commencement of testing if non standard curing conditions are to be used.

The subsequent approval shall make reference to the tested curing conditions and in addition the following statement included:

`This material is only approved for the curing conditions that appear on the approval. If the cure conditions are varied from those specified on the approval then the material is not covered by the scope of the approval`.

Existing approved site applied products

WRAS will write to existing approval holders to advise them of the new approach. Where testing has been performed on one sample using specific curing conditions then the approval will already reference those curing conditions. An amended approval letter will then be issued to include the statement -

`This material is only approved for the curing conditions that appear on the approval. If the cure conditions are varied from those specified on the approval then the material is not covered by the scope of the approval`.

WRAS will inform the approval holder that should they wish to have approval of their product for application using other curing conditions then further testing, based on curing curves will be necessary.

Full BS6920 testing shall be done on samples made under the lowest recommended/most onerous curing conditions (lowest temperature and shortest recommended time at that temperature).

In addition test samples made using the highest recommended or achievable curing conditions (highest temperature and shortest recommended time at that temperature)

for “on site” application of the product in the United Kingdom (including the use of heaters etc. where required) shall be assessed in the Odour and Flavour of Water Test (BS 6920-2.2.1).

If these two sets of tests give satisfactory results, then the subsequent approval shall be granted for all curing conditions referenced in the curve & the following statements shall be included on the subsequent approval:

`The end user must ensure that the product is cured in accordance with cure curves provided by the approval holder in their Instructions dated XX XX XX, issue no xxxxxxx`.

And;

`This material is only approved for the curing conditions that appear on the approval. If the cure conditions are varied from those specified on the approval then the material is not covered by the scope of the approval`.

Assuming the testing is successful, it is the approval holders choice as to whether they wish to apply for a new five-year approval (the existing approval will be removed once the new approval is granted) or extend the scope of their existing approval.

If the approval holder wishes to apply for a new five-year approval payment on a pro-rata basis will be requested on based on remaining whole years.

If the approval holder wishes to extend the scope of their existing approval WRAS will not charge a fee (please note the laboratory will charge for the testing performed).

Re-approvals

Approval holders will have the choice as to whether to apply for a new approval based on the scope of the existing/expired approval or to extend the scope of the existing/expired approval.

Where the new approval is to be based on the scope of the existing/expired approval standard audit tests (where appropriate) shall be requested on a sample manufactured using the same curing conditions as the existing/expired approval.

Should an approval be subsequently granted the approval letter will include the statement:

`This material is only approved for the curing conditions that appear on the approval. If the cure conditions are varied from those specified on the approval then the material is not covered by the scope of the approval`.

Where the approval holder wishes to extend the scope of the approval to have approval of their product for application using other curing conditions then further testing, based on curing curves will be necessary.

Full BS6920 testing shall be done on samples made under the lowest recommended/most

onerous curing conditions (lowest temperature and shortest recommended time at that temperature).

In addition test samples made using the highest recommended or achievable curing conditions (highest temperature and shortest recommended time at that temperature) for "on site" application of the product in the United Kingdom (including the use of heaters etc. where required) shall be assessed in the Odour and Flavour of Water Test (BS 6920-2.2.1).

The subsequent approval shall be granted for all curing conditions referenced in the curve.

If these two sets of tests give satisfactory results, then the following statements shall be included on the subsequent approval:

`The end user must ensure that the product is cured in accordance with cure curves provided by the approval holder in their Instructions dated XX XX XX, issue no xxxxxxx`.

And;

`This material is only approved for the curing conditions that appear on the approval. If the cure conditions are varied from those specified on the approval then the material is not covered by the scope of the approval`.

8.3 **Commencement of testing**

ALL the tests to be carried out must commence **IMMEDIATELY** once the cure period is completed, or in the case of cementitious products **ONLY**, within 1 working week of completion of the pre-conditioning soaks.
Retesting - if it is necessary to undertake ANY retesting, this shall only be undertaken on freshly prepared and cured samples.

8.4 **Product samples prepared on site: witnessed by test laboratory staff.**

Some products can only be prepared and/or applied using specialised equipment. In these cases the test laboratory shall witness the preparation of the test samples and shall then transport these samples back to the laboratory for curing and subsequent testing.

9 FACTORY APPLIED PRODUCTS (including potting resins etc.)

Definition of Factory Applied: a product which is applied and cured (if appropriate) under carefully controlled conditions as part of a manufacturing process in a factory or workshop.

9.1 Preparation and curing of samples

These products shall be prepared and cured by the manufacturer or supplier and tested as received without any further curing or treatment. To ensure that the samples provided are typical of normal production they shall be drawn from the production line wherever possible and the following additional information provided to the test laboratory and Scheme:

a.) date of preparation of samples and/or product batch number (where available)
b.) mode of preparation
c.) curing conditions

This information shall be included in the final test report and in the Scheme's records. If the sample has been specially prepared for test purposes this shall be stated in the test report together with all relevant details. For more information see clause 6 of BS 6920-2.1:2000/2014.

As it is not a requirement of BS6920-2.1, in addition the applicant shall provide the following information to WRAS –

- number and thickness of coats applied (including primers)
- method of application of the product
- ambient temperature at the time of preparation
- date of preparation of the sample, cure conditions
- substrate onto which the product has been applied and whether the product was prepared in accordance with the application instructions.
- where products are made from more than one part, description of the parts and how these were mixed.
- a copy of the instructions issued to users

The approach applied to Site Applied Products (including scope of approval, test requirements and the use of generic statements) shall also be taken with Factory Applied Products.

10 TEST LABORATORIES

Test reports will only be accepted from suitably accredited test laboratories recognised by the Scheme.

Please refer to Material Guidance Appendix A – Test Laboratory Accreditation & Procedures.

11 TEST REPORTS

Please refer to Material Guidance Appendix B – Testing and Reporting for requirements.

11.1 Validity of Test Reports

BS 6920 testing of materials must have been completed no more than two years before the date when the report is presented to WRAS.

Where the test report is over two years old the decision as to whether to grant approval lies with The Approvals and Enquiries Manager. For the purpose of WRAS Material Approval BS6920 test reports are valid for a maximum of five years.

12 SAMPLES

The Scheme does not consider it to be appropriate to grant WRAS Material Approval to a product that will not come into direct contact with wholesome water in building water systems. Therefore before commencing testing if there is any question about the nature of the product or its suitability for WRAS Material Approval advice must be sought from WRAS.

Samples must reflect the actual conditions of manufacture. The method used to manufacture the tested sample will be included on any subsequent approval and only this method will be covered by the scope of the approval. Materials/components made from the same material using a different manufacturing method will require further testing (please refer to Table 1, l & m).

When seeking approval of a component, samples must be provided for testing in component form, for example o-rings, gaskets or hoses.
When seeking approval of a compound or sheet material, specially moulded sheets or plaques may be used.

Granules and pellets shall NOT be tested.

12.1 Age of sample

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 the Scheme, prior to commencing testing, for further advice.

12.2 Sample surface area

All materials tested for use with drinking water are normally tested using a sample surface area/volume ratio specified in BS 6920 Section 2.1.

Whilst some materials used in fittings will be exposed to water at a lower surface area/volume ratio, the standard ratio must be applied unless:

a.) Otherwise specified in BS6920-2.1 (Samples for testing),
b.) With specific dispensation, prior to commencement of testing, granted by WRAS.
c.) The material or component falls into one of the categories specified in section 12.3 (Reduced surface area testing)

12.3 **Reduced surface area testing (not specified in BS6920-2.1)**

These materials will be tested at a reduced surface area to volume ratio of 1000mm²/l. This information will be included on any subsequent approval.

a.) Solvent cement used to join pipe and fittings.

b.) Waterstops – these materials are for use in concrete reservoirs and similar structures, constructed in accordance with the design criteria of BS EN 1992 with respect to normal frequency of joints.

c.) Jointing and gasket products as specified in BS6920-2.1/6.12 – Jointing and gasket products in this instance are those manufactured from compressed fibre or cut from a sheet material exposing a cut edge which would be exposed to wholesome water.

12.4 **Whole Product Testing**

To ensure that consistent assessment is maintained the Scheme does not accept whole product, testing, i.e. water quality testing cannot be carried out on a complete valve or tap.

12.5 **Hoses, Pipes and Tubes: Odour & Flavour testing**

Multi layered hoses, pipes and tubes must be tested, for possible effects on the odour and flavour of water, in accordance with BS 6920 – 2.2.2 & 2.2.3:2000/2014 as appropriate, i.e. in their final form.

13 FAILURES

13.1 Failures - Retest requirements

Where BS6920-1 (Specification) does not specify any retest requirements please refer to WRAS.

WRAS should first be contacted where a product fails testing and/or retesting and the applicant intends to modify the product in order to satisfy the requirements of BS6920.

WRAS will request an explanatory statement from the client and if appropriate, the test laboratory giving the likely cause of the failure of the first set of samples and the action that will be taken in order to prevent a further failure occurrence.

The statement should be on company headed paper, signed and dated, and contain the following information;

a.) Test report reference and date.
b.) Name of tested material and/or component.
c.) The likely cause of the failure/s.
d.) The action that will be taken in order to prevent a further failure occurrence.

Where applicable WRAS will then issue further test requirements based on the information contained in the above statement and advice given by the Scientific Advisor. The extent of retesting is at the discretion of WRAS and decided on a case by case basis.

If a sample of a material or component fails in any test, or for any other reason further testing is requested by the Scheme, either untested or fresh samples of the product must be used for further testing in accordance with BS 6920.

Where any retest has to be undertaken using more than one set of samples, e.g. Odour and Flavour of water or the Growth of Aquatic Microorganisms tests (duplicate), the sets of samples must be sourced from different batches (with different manufacturing/production batch numbers).

Samples for retest must be identical to, as far as is practicable, the samples that failed the testing, e.g. identical dimensions (and in-radius in the case of elastomers), Shore hardness, colour, suppliers of raw ingredients, flushing and soaking used where applicable, curing times and temperatures where applicable, and method of manufacture and/or application. Please note that this is not an exhaustive list and where any doubt arises please refer to the Scheme.

If the retest is successful, then ALL test results (including failure results) shall be included in the final report.

13.2 **Retest Failures**

Where no modifications are made to the material/component (formulation, suppliers of raw ingredients and site & method of manufacture) and it fails the retest then the Scheme considers this to be an outright failure and shall be reported to the Scheme.

Where a product fails testing and/or retesting and the applicant intends to modify the product in order to satisfy the requirements of BS6920 then WRAS should first be contacted.

13.3 **Audit Test Failures**

Any failure of an audit test shall be reported to the Scheme by the Test Laboratory.

Where a product fails testing and the applicant intends to modify the product in order to satisfy the requirements of BS6920 then WRAS should first be contacted. Additional testing may be required.

13.4 **Failure of High Temperature Testing**

The Scheme will accept retesting using lower temperature test conditions if a product fails to conform to one or more of the high temperature tests (Part 3 of BS 6920). Both results should be included in the final test report rather than in a separate supplementary report.

14 TECHNICAL ADVICE

The formal route for all technical queries from the test laboratories or their clients and the Scheme is via the Administrators of WRAS. The accredited laboratories may approach the Scheme informally on behalf of clients, but the outcome of all such contacts and decisions must be confirmed in writing through the Scheme. Communications relating to the operation of accredited laboratories and to individual tests may be made (on a confidential basis) in writing to the Scheme.

Where the technical query relates to materials which are either used or may be used in products tested under Regulation 31 of the Water Supply (Water Quality) Regulations 2000/2014 (previously Regulation 25 of the Water Supply (Water Quality) Regulations 1989), also seek advice from the Drinking Water Inspectorate (DWI).

TABLE 1 – TESTING REQUIREMENTS

Table reference	Query or proposed change	Tests required				
		O&F	APP	GMO	EXS	EM
a	Change in pigmentation affecting an existing approval/addition of same material but different colour					
	Change from 'natural' colour to either white or black	✔			✔ [7]	
	Change from 'natural' colour to any other colours	✔			✔ [7]	✔
	Change from one colour to another	✔			✔ [7]	✔
	Change from white to black	✔			✔ [7]	
	Change from any colour/black/white to 'natural' colour	✔		✔	✔ [7]	
b	Elastomeric materials/components – new approval of a range where the only variation between the elastomers is the Shore hardness					
	Softest version	✔	✔	✔	✔	✔
	Hardest version	✔		✔		
c	Elastomeric materials/components – change of Shore hardness (achieved using the same ingredients in different concentrations or curing conditions) affecting an existing approval					
	Addition of a lower (softer) shore hardness	✔	✔	✔	✔	✔
	Addition of a higher (harder) shore hardness	✔ [4]		✔ [4]	✔ [7]	
d	Elastomeric materials/components – new approval of a range which differ in size					
	Largest in-radius	✔	✔	✔	✔	✔
	Smallest in-radius	✔				
e	Elastomeric materials/components – addition of a size/s affecting an existing approval					
	Addition of a larger in-radius	✔		✔	✔	
	Addition of a smaller in-radius	✔			✔ [7]	
f	Elastomeric materials/components – new approval of a range which differs in size and Shore hardness					
	Largest in-radius and softest Shore hardness	✔	✔	✔	✔	✔
	Smallest in-radius and hardest Shore hardness	✔		✔		
g	Thermoplastics – new approval of a range of thermoplastics which differ only in filler content					
	Sample with highest filler content	✔	✔	✔	✔	✔
	Sample with lowest filler content	✔				

h	Materials/components manufactured at more than one site Full BS6920 testing to be performed on a material/component manufactured at one of the sites (Site A)					
h	Additional manufacturing site (Site B) but ALL ingredients are from same suppliers/sources using the same manufacturing conditions/methods as those used at Site A. Perform on sample manufactured at Site B:	✔		✔ 2	✔ 7	
	Additional manufacturing site (Site B) but suppliers/sources of raw ingredients differ (same manufacturing conditions/methods) from those used at site A. Perform on sample manufactured at Site B:	✔	✔	✔	✔	✔ 6
i	Increasing the permitted water temperature of an existing approval	✔	✔		✔	✔
j	Addition of increase in concentration of a filler/reinforcing agent, e.g. glass, talc or carbon black	✔		✔	✔ 7	✔
	Decrease in concentration of a filler/reinforcing agent, e.g. glass, talc or carbon black	✔			✔ 7	
k	Changes to/or alternative supplier of the main polymer in a thermosetting plastic elastomeric material.	✔		✔	✔	
	Changes to/or alternative supplier of the main polymer in a thermoplastic material.	✔			✔ 7	
	Changes to/or alternative supplier of any other ingredient.	✔		✔ 5	✔ 7	✔ 1
l	Change in the method of manufacture of an approved thermoplastic or thermosetting plastic material.	✔		✔ 5	✔ 7	
	Change in the method of manufacture of an approved elastomeric material.	✔		✔	✔	
m	Change of manufacturing site affecting an existing approval					
	Change in manufacturing site but ALL ingredients are from same suppliers/sources using the same manufacturing conditions/methods as the original manufacturing site.	✔		✔ 2	✔ 7	
	Change in manufacturing site but suppliers/sources of raw ingredients differ (same manufacturing conditions/methods) from those at original manufacturing site.	✔	✔	✔	✔	✔ 1
n	Change in processing conditions after a test failure – no changes in ingredients, their source/supply on concentration.	✔	✔ 3	✔	✔ 3	✔
o	Components manufactured from a WRAS Approved Material					
	Components made from a WRAS Approved plastic material	✔		✔ 5	✔ 7	✔ 1
	Components made from a WRAS Approved rubber/elastomeric material	✔		✔	✔ 7	✔ 1

1: Only required for pipes & hoses.

2: Where the growth of microorganisms test performed on the material/component manufactured at Site A gave a result of >1.7mg/l this test is also necessary on a sample manufactured at Site B.

3: **Only if the cause of a previous failure.**
4: **To be performed on the largest in-radius (thickest) sample (where the approval includes a range of sizes).**
5: **Only where the GMO performed on the Approved Material gave a result of >1.7mg/l.**
6: **For any colour excluding black, natural, grey and white.**
7: **Required at 23°C only, when approval is sought for a temperature higher than 23°C AND where the existing approval has been issued against the 2000 dated version of BS6920-1'**

APPENDIX A – TEST LABORATORY ACCREDITATION & PROCEDURES

1 ACCREDITATION OF TEST LABORATORIES

1.1 UKAS Accreditation:

For the purposes of WRAS materials approval the Scheme will only accept reports which have been undertaken by a suitably accredited laboratory, which had accreditation for BS 6920 testing at the time that the test work was undertaken and which is recognised by the Scheme. Accreditation is required to provide assurance to the Scheme that the test laboratory is competent at carrying out, in an accurate and reproducible manner, the tests which are to be used for WRAS Approval.

Test laboratories therefore need to show accreditation for the specific tests which WRAS Approval will rely upon i.e. BS 6920:2000/2014 and any subsequent revisions.

Accreditation in accordance with BS EN ISO/IEC 17025 (2005) is required for the specific tests.

Accreditation should be by the United Kingdom Accreditation Service (UKAS), or by an equivalent overseas body which is subject to the multilateral agreement accepted by the European co-operation for Accreditation (EA), the International Accreditation Forum (IAF), or the International Laboratory Accreditation Co-operation (ILAC).

Test laboratories which regularly submit applications shall maintain their accreditation and provide WRAS with a copy of their current accreditation on an annual basis.

It is recommended that laboratory testing procedures be carried out in accordance with Regulation 16 of the Water Supply (Water Quality) Regulations 2000/2014 and 'Water quality – Guide to analytical quality control for water analysis' – DD ENV ISO 13530:1999, as appropriate.

1.2 **Laboratory testing experience:**

The laboratory will have to satisfy both UKAS and the Scheme concerning the following points.

- *Odour and flavour of water* - a description of their current experience in the field of organoleptic assessments, together with details of their staff meeting the requirements for Odour and Flavour Panellists as set out in clause 8 BS 6920-2.2.1:2000/2014.
- *Appearance of water (colour & turbidity)*: as set out in BS 6920 - 2.3:2000/2014
- *Growth of aquatic microorganisms: inoculum and test water* - all the appropriate analytical data to demonstrate that both their inoculum and test waters comply with the requirements of clauses 7.2 and 7.3 of BS 6920-2.4:2000/2014 over a three month period (on the basis of weekly testing).
  In addition evidence shall be submitted to demonstrate that the test water conforms with the requirements of clause 7.3 over a twelve month period - most of this information should be available from the local water supplier.
- *Growth of aquatic microorganisms: dissolved oxygen determinations* - the mean dissolved oxygen results obtained from the evaluation of six separate samples of paraffin wax and glass in accordance with BS 6920-2.4:2000/2014
- *Substances of concern (Cytotoxicity) testing* - details of current tests performed involving the manipulation and culture of human or animal cell lines.
- *Extraction of metals analytical methods* - details of the methods and equipment used to analyse for those metals detailed in Table 1 of Part 1 of BS 6920, together with the limits of detection achievable.
- *Staff* - the names, qualification and experience of the Laboratory Manager, the Testing Officer who shall be responsible for samples submitted for test against BS 6920, and the analysts who would undertake any part of the procedures.

1.3 **Recognition by the scheme:**

Before ANY test reports are accepted by the Scheme as the basis of approval for materials the laboratory shall take part in an inter-laboratory trial, covering at least four materials, in the Odour and Flavour (BS 6920-2.2.1) and in the Growth of Aquatic Microorganisms (BS 6920-2.4) Tests. The results of this trial shall be submitted to the Scheme for consideration.

On the basis of a satisfactory outcome to this trial the Scheme will grant a provisional accreditation for a period of one year. During this period the Scheme may request that the laboratory takes part in other inter-laboratory trials with other accredited laboratories covering other aspects of BS 6920 testing and the Scheme's procedures.

The Scheme reserves the right to inspect the laboratory and interview the Testing Officer and Laboratory Manager; the interviews shall include consideration of the general competence to offer proper advice to clients of the Scheme, together with familiarity with the Water Supply (Water Fittings) Regulations 1999, Scottish Water Byelaws 2004 & the Water Supply (Water Fittings) Regulations (Northern Ireland) 2009.

All test reports issued by the laboratory during this provisional period will be submitted to the Scheme before any decision is made to list the products covered by the reports. During this provisional period the laboratory shall not be accredited to perform audit tests on products holding a current listing in the Water Fittings and Materials Directory.

2 RELOCATION OF EXISTING ACCREDITED LABORATORIES

2.1 If any of the Scheme's accredited Materials Testing Laboratories relocates, other than to a different building within the same complex, the following procedures shall be followed.

2.2 **Notification:**
The laboratory shall notify the Scheme, in confidence, of the move as soon as the new site is known. Preferably three months notice of relocation should be given.

2.3 **Inoculum Water:**
Clause 7.2 of BS 6920-2.4:2000/2014: If a new source of inoculum water has to be used it shall be selected in accordance with this clause.

Once one or more suitable sources have been identified, tests shall be undertaken to demonstrate that comparable results are obtained with both the new and old inoculum waters when testing a variety of materials, and that the new inoculum will meet the criteria specified in BS 6920, Section 2.4 throughout a period of 12 months (covering seasonal variations).

2.4 **Test Water:**
Clause 7.3 of BS 6920-2.4:2000/2014: Conformity with the requirements of this clause shall be shown by analytical results obtained over a twelve month period - most of this information should be available from the local water supplier.

2.5 **Comparability Trials:**
It shall be shown that comparable results are obtained in the two locations by testing a variety of materials in parallel (at both sites). Where this is not practical, the accreditation of the laboratory shall be suspended from the time of the move until it has participated in an inter-laboratory trial organised by the Scheme; during this period of suspension it shall not issue reports in connection with the Scheme's requirements.

2.6 **Accreditation:**
The laboratory shall apply for and obtain UKAS accreditation for BS 6920 tests at the new location. Upon the satisfactory completion of all testing necessary or requested, the Scheme shall be notified of the results, and if appropriate, will they advise of the test laboratory that their accreditation will continue at the new site.

3 INTER-LABORATORY TRIALS

3.1 **Participation:**

All test laboratories recognised by the Scheme shall take part in inter-laboratory trials as required by the WRAS. A laboratory will not be recognised until satisfactory results have been obtained in inter-laboratory trials.

3.2 **Test Samples:**

WRAS requests that sufficient samples of materials which give borderline results for either odour/flavour or for their ability to support the growth of microorganisms be retained by test laboratories for use in inter-laboratory trails.

3.3 **Analysis:**

Each laboratory shall test each material in both the odour and flavour of water test and in the growth of aquatic microorganisms test, together with any other tests requested by the Scheme. Final results, in the form of formal reports, shall be submitted to the WRAS who will collate all results together and submit them to for scientific evaluation.

4 LABORATORY ASSESSMENT

The Scheme reserves the right to visit and re-assess accredited laboratories; such assessment visits will normally be undertaken by a representative of the Scheme, together with a support scientist.

5 SUBCONTRACTING

If a laboratory is unable to undertake one or more of the Scheme's tests for whatever reason, arrangements shall be made for the test(s) to be undertaken by another of the Scheme's laboratories, on their behalf. In addition testing of extracts from products in accordance with Sections 2.3 and 2.6 of BS 6920, may be sub-contracted to other UKAS accredited laboratories (who have these analytical determinants covered by their UKAS scope of accreditation and by membership of a laboratory proficiency testing service). In accordance with UKAS requirements subsequent test reports shall contain a statement indicating which test(s) were subcontracted and the reference number of the UKAS laboratory used.

6 LABORATORY RECORDS

6.1 Submission file:

The laboratory shall maintain a file on each submission.
This file shall contain the following information -

a.) A completed laboratory application form and WRAS application where provided by the client.
b.) Copies of all relevant correspondence, including all correspondence with the Scheme.
c.) All relevant test data and a copy of the final report.

6.2 Register of samples:

The laboratory shall maintain a register of samples submitted for testing within the context of the Scheme. This register shall include the following information –

a. date of receipt of the test samples
b. laboratory reference number
c. brief sample description
d. name of submitting organisation
e. tests undertaken
f. date of issue of the test report
g. overall pass/fail summary
h. method of manufacture of test sample

6.3 Health and Safety Considerations:

Where full Health & Safety data is not provided odour and flavour of water test should not be undertaken until satisfactory test results have been obtained in the cytotoxicity (BS 6920-2.5) and if appropriate on the basis of the nature of the test material, an extraction of metals BS 6920 test procedures (BS 6920-2.6).

Each test laboratory shall maintain a record of Health and Safety information relating to site applied product test samples. Where full formulation details and supporting Material Safety Data Sheets (MSDS) are not provided with the test samples the laboratory shall obtain –

a.) Information to show whether any substances named in the current edition of the Health and Safety Executive publication EH40 - Occupational Exposure Limits are known to be, or might be, contained within the material/product.
b.) Information as to whether the material/product is known to or suspected to contain known or suspected carcinogenic, mutagenic or tetragenic compounds or asbestos.

7 OPERATIONAL DIFFICULTIES

If any laboratory experiences operational difficulties which could have an impact upon analytical quality control (e.g. changes in personnel or laboratory location, failure of equipment, including incubators), the Scheme must be notified of this immediately and in confidence. The Scheme is empowered to instruct the laboratory on actions to be taken to ensure that their standards are achieved and maintained.

8 ADVICE TO CLIENTS

A laboratory shall endeavour to ensure that all advice given to clients conforms to the current policies of the Scheme, including all aspects of confidentiality concerning information gained testing products for other clients.

APPENDIX B – TESTING & REPORTING

1 TESTING

Samples shall be prepared and tested in accordance with the methods detailed in BS 6920, Parts 1 to 3.

1.1 Variation:

An accredited test laboratory shall not use any other test procedure for evaluating samples within the context of the Scheme unless specifically requested to do so by the Scheme. Any agreed variations shall be documented in the final test report.

1.2 Lapsed time and leachate sequence:

To maintain the requirements of both the Scheme and BS 6920 the following points shall apply to the preparation of test leachates/extracts in ALL tests except for the Extraction of Metals Test (BS 6920-2.6)

a.) Extraction sequence. If a break occurs start the sequence again using fresh test samples.

b.) Analysis. Except for the analysis of extracts for metals (these extracts are stabilised with acids) start the analysis of all extracts on the day they are collected; do not store extracts for more than 8 hours before analysis. If this is not possible discard the extracts and then prepare a fresh sequence of extracts using fresh test samples.

1.3 Extracts assessed:

Apart from most Site Applied Products (see note b below) always assess and report the results obtained for the first leachate/extract in each of the following leaching tests - Odour and Flavour, Appearance, Cytotoxicity and Extraction of Metals. If a failure is found using this first leachate, then assess the subsequent extracts, as appropriate, in accordance with the appropriate section of BS 6920.

NOTES

a.) If the first leachate from a material has a detectable odour, for Health and Safety reasons the test laboratory should NOT assess it for flavour; the final (seventh) extract should normally be assessed for both Odour and Flavour.

b.) in the case of most Site Applied Products (and in accordance with the guidance given in the Introduction to BS 6920-2.2.1 Odour and Flavour of Water – General method of test), flavour assessments should only be done on test extracts after a satisfactory result from the cytotoxicity test (BS 6920-2.5) has been obtained. Since it is often impractical to set up two sets of Site Applied Product test samples prepared and cured several days apart, it is therefore usually not possible to assess and report the odour and flavour of the first extract, but only the final (seventh) ones.

1.4 **Validation of extraction of metals test results:**

Control data is required for reagent blanks, duplicates and "spikes" to provide information on background contamination, and on analytical precision and accuracy of the methods used during analysis of each batch of extracts. Validation testing shall include analysis of synthetic test solutions containing the metals to be determined (using a minimum of three concentrations between the maximum admissible concentration [Table 1 of BS 6920-1] and the reporting limit) as a check on the total error of the technique.

1.5 **Extraction of metals test controls results:**

The laboratories shall maintain records of the analytical control data for procedural blanks, duplicates and spiked samples, including details of detection limits, reproducibility and accuracy. This information shall be made available, if required, to the client, the Scheme, or the DWI.

2 SPECIFIC TESTING REQUIREMENTS

2.1 **Products based upon or containing bentonite:**

Problems can occur in testing these products especially relating to –

a.) cytotoxicity failures
b.) failures in the appearance of water test - due to dissolution of the bentonite into the test water.
c.) overall problems of the unsuitable nature of some of these products for BS 6920 tests.

Testing requirements for products containing Bentonite:

- Elastomeric seals: full BS 6920 testing using the appropriate surface area/volume test ratio.
- Other products: seek advice WRAS.

3 REPORTING REQUIREMENTS

All test reports should follow the reporting requirements of the appropriate section of BS 6920 and must give the full test results for each test.

If you base the test requirements upon table 1, please include the following statement in the report, to show that reference to the Scheme has NOT been made - "Note for the Water Regulations Advisory Scheme (WRAS): the tests carried out on the samples of this product are based upon the table 1 'Testing requirements' and include the clause the testing has been performed against. The Scheme has not been consulted."

3.1 BS 6920:2000/2014 test reports:

Samples shall be prepared, described and tested in accordance with the methods detailed in BS 6920, Parts 1 to 3.

The tests are concerned with demonstrating that materials and components will not lead to deterioration in the quality of water, and thus contravene the Water Supply (Water Fittings) Regulations 1999, Scottish Water Byelaws 2004 & the Water Supply (Water Fittings) Regulations (Northern Ireland) 2009.

Materials and components which have been tested by WRAS recognised test laboratories and found to satisfy:-

- Odour and flavour of water: as set out in BS 6920-2.2.
- Appearance of water: as set out in BS 6920-2.3
- Growth of aquatic microorganisms: as set out in BS 6920-2.4
- Substances of concern (Cytotoxicity) testing: as set out in BS 6920-2.5
- Extraction of metals analytical methods – as detailed in Table 1 of Part 1 of BS 6920-2.6, together with the limits of detection achievable.

can apply for a WRAS Material approval which, if granted will be valid for up to five years.

3.2 REPORTING – ADDITIONAL REQUIREMENTS

In addition to the reporting requirements set out in the appropriate section (s) of BS 6920 Parts 2 and 3, each report shall contain the following statements, as appropriate –

a) ALL REPORTS

"The results specified in this report relate only to the sample(s) of this product submitted for testing. Any changes in the nature or source of ingredients and the process of manufacture or application could affect the suitability of this product for use in contact with wholesome water."

AND

"We would draw to your attention that reports issued by the accredited test laboratories do not of themselves constitute approval by the Water Regulations Advisory Scheme or the test laboratory. Applicants will be formally notified of their WRAS approval number by the Scheme if their application has been successful."

AND

"Materials and products intended for use by a public water supply organisation in the preparation or conveyance of water may need to satisfy more comprehensive toxicological requirements as specified by the Drinking Water Inspectorate. These additional requirements are necessary to ensure Water Company usage conforms with Regulation 31 of the Water Supply (Water Quality) Regulations 2000/2014."

AND

- in all "pass" reports - ***either*** " ..... is suitable for use with cold but not hot water" ***or*** " ..... is suitable for use with hot (up to [insert extraction temperature]°C) and cold water."

- in all "failure" reports - ***either*** "..... is unsuitable for use with wholesome water" ***or*** "..... is unsuitable for use with hot water".

Test reports submitted to the Scheme must include the following information:
Trade name and grade designation of the material used to make the test piece. This information is vital if the test report is going to have any value for approval of the material used. Ensure that all test reports contain this information.

- date of manufacture
- batch details
- the method used to manufacture the test sample
- the method used to prepare the sample where applicable
- the conditions used to cure the sample where applicable
- the site of manufacture
- inradius in the case of any elastomeric/TPEs sample(s)
- Shore hardness where applicable
- description of sample

b) AUDIT REPORTS

Audit test reports shall include reference to the existing/previous WRAS Material Approval number and where appropriate shall include the reference and date of the letter from the Scheme identifying the audit tests requirements together with a statement that the work included in the report was undertaken in accordance with this letter.

A copy of each Audit Report shall be sent directly by the laboratory to the Scheme, regardless of the test outcome.

Do NOT include any conclusion in Audit Test reports stating whether (or not) the test sample(s) met the Scheme's criteria as decisions concerning on-going conformity are made by the Scheme.

Amendments and additions to Test Reports

When reports are reissued to take into account errors/omissions, results of additional tests or for other reasons the laboratory shall:

- issue a complete amended report with a statement added below the original date of issue of the report stating - "Reissued with correction/additional data/etc (as appropriate) : (date)."

Reissued reports containing the results of further tests shall always include all previous results.

3.3 **VARIANCE AND CAUSES FOR CONCERN**

The test laboratory shall draw to the attention of the Scheme either any variance in the testing procedures, or any cause for concern relating to any product by the inclusion of a final paragraph commencing "NOTE FOR THE WATER REGULATIONS ADVISORY SCHEME..."

3.4 **HIGH TEMPERATURE TESTS NON-COMPLIANCE**

If a material/product fails in one or more of the high temperature tests (Part 3 of BS 6920) and then it is retested and passes using a lower temperature BOTH sets of results shall be included in the test report.

3.5 **RUBBER HARDNESS**

The hardness of a rubber material must be recorded in a test report.

Differences in the hardness of a particular rubber formulation are achieved by one or both of the following actions

a.) changes in the proportions of ingredients, e.g. increased carbon, increased oil concentration and/or

b.) changes in the cure and post cure system and temperature and /or duration used.

These changes can have a marked effect on the performance of the rubber compounds in the BS 6920 tests.

APPENDIX C – AUIDIT TEST REQUIREMENTS

FOR INFORMATION PURPOSES ONLY, PLEASE CONTACT WRAS FOR AUDIT TEST REQUIREMENTS
WHERE A MATERIAL OR COMPONENT IS COLOURED (I.E. NOT WHITE OR BLACK) AN EXTRACTION OF METALS TEST MAY BE NECESSARY.

	Title	Sub-title	Nature	OFW	APP	GMO	EXS	EM	Comment
5010	Acetal	Components	Thermoplastics	Yes			Yes		
5015	Acetal	Material Only	Thermoplastics	Yes			Yes		
5020	Acrynlonitrile Butadiene Styrene Copolymer (ABS)		Thermoplastics	Yes					
5022	Carbon		Other	Yes				Yes	
5023	Ceramic		Other					Yes	
5026	Coatings, Paints & Linings	Factory Applied Concrete Coatings	Other	Yes		Yes			
5028	Coatings, Paints & Linings	Factory Applied Metal Coatings	Other	Yes		Yes			
5030	Coatings, Paints & Linings	Factory Applied Pipe & Metal Coatings	Other	Yes		Yes			
5034	Coatings, Paints & Linings	Factory Applied Tank Coatings	Other	Yes		Yes			
5038	Coatings, Paints & Linings	Site Applied Concrete Coatings	Other	Yes		Yes			
5040	Coatings, Paints & Linings	Site applied Metal Coatings	Other	Yes		Yes			
5042	Coatings, Paints & Linings	Site Applied Pipe & Fittings Coatings	Other	Yes		Yes			
5044	Coatings, Paints & Linings	Site Applied Sheet Lining Materials	Other	Yes		Yes			
5046	Coatings, Paints & Linings	Site Applied Tank Coatings	Other	Yes		Yes			
5050	Concrete, Cement & Mortar	Accelerators & Retarders	Other	Yes		Yes			
5053	Concrete, Cement & Mortar	Water Reducers & Air Entrainers	Other	Yes		Yes			
5055	Concrete, Cement & Mortar	Waterproofers	Other	Yes		Yes			

5057	Concrete, Cement & Mortar	Curing Compounds	Other	Yes		Yes			
5059	Concrete, Cement & Mortar	Corrosion Inhibitor	Other	Yes		Yes			
5062	Concrete, Cement & Mortar	Permeability Reducers	Other	Yes		Yes			
5063	Concrete, Cement & Mortar	Repair Materials	Other	Yes		Yes			
5065	Concrete, Cement & Mortar	Synthetic Latex Modifiers	Other	Yes		Yes			
5070	Epoxy Compound		Other	Yes					
5075	Fibre		Other	Yes	Yes	Yes			
5090	Fluxes		Other	Yes					
5100	Gland Packings		Other	Yes		Yes			
5110	Glass Reinforced Concrete (GRC)		Other	Yes					
5120	Glass Reinforced Plastics (GRP)	Components	Thermoset	Yes		Yes			
5125	Glass Reinforced Plastics (GRP)	Material Only	Thermoset	Yes		Yes			
5130	Graphite	Components	Other					Yes	
5135	Graphite	Material Only	Other					Yes	
5150	Ion Exchange Resin		Other	Yes					
5160	Lubricants		Other	Yes		Yes			
5165	Magnetic Material - Injection Moulded		Other	Yes					Clarification of the type of magnetic material is required. For a metallic magnet EM only. Where magnetic material is mixed with a plastic material and where a magnet is contained within a plastic material, O&F and EM.
5170	Metal Filters		Other					Yes	
5175	Nylon	Components	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5180	Nylon	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5200	Polybutylene		Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5205	Polybutylene Terephthalate		Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.

5210	Polycarbonate	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5220	Polyether Ether Ketone		Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5223	Polymethyl Methacrylate	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5224	Polyethersulphone	Components	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5225	Polyethersulphone	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5235	Polyether Polyurethane	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5240	Polyethylene	Components	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5245	Polyethylene	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5246	Polyethylene Terephthalate (PET)		Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5255	Polyphenylene Sulphide (PPS)	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5256	Polyphenylsulfone		Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5257	Polyphthalamide	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5260	Polypropylene	Components	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5265	Polypropylene	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.

5270	Polystyrene	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5272	Syndiotactic Polystyrene (sPS)		Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5280	Polysulphone	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5295	Polytetrafluoroethylene (PTFE)	Material Only	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5296	Polytetrafluoroethylene (PTFE) and (ETFE) Thermoplastic	Copolymer	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5300	Polyvinylchloride (PVC, PVC-U and CPVC)	Components - only lead free PVC-U listed in this section	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5305	Polyvinylchloride (PVC, PVC-U and CPVC)	Material Only - only lead free PVC-U listed in this section	Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5307	Polyvinylidine Fluoride		Thermoplastics	Yes					Where a customer is seeking approval for a range, the amounts of filler may differ. In these cases: OFW on least and greatest amounts of filler. EM on each colour, excluding black, grey & white.
5308	Repair Material		Other	Yes					
5310	Release Agents		Other	Yes		Yes			
5311	Resin Anchors		Other	Yes					
5460	Sealants - Flat Faced Joints	Epoxide	Other	Yes					
5470	Sealants - Flat Faced Joints	Polyethylene Foam	Thermoplastics	Yes					
5480	Sealants - Flat Faced Joints	PTFE	Thermoplastics	Yes					
5495	Sealants - Flat Faced Joints	Polysulphide	Other	Yes		Yes			
5500	Sealants - Flat Faced Joints	Silicone	Other	Yes					
5510	Sealants - Screwed Joints	General	Other	Yes					
5520	Sealants - Screwed Joints	Anaerobic adhesives	Other	Yes					
5530	Sealants - Screwed Joints	PTFE	Thermoplastic	Yes					

5550	Sealants - Screwed Joints	Silicone	Other	Yes					
5560	Solvent Cements		Other	Yes					
5582	Thermoset Moulding Compounds		Thermoset	Yes		Yes			
5585	Thermoplastic Moulding Compound		Thermoplastic	Yes					
5248	Polyphenyleneoxide (PPO)	Components	Thermoplastics	Yes					
5250	Polyphenyleneoxide (PPO)	Material Only	Thermoplastics	Yes					
5253	Polyphenylene Ether	Material Only	Thermoplastics	Yes					
5315	Rubbers	General - components	Other	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5320	Rubbers	General - material only	Other	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5330	Rubbers	Butyl - Material only	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5350	Rubbers	Ethylene propylene (EP) components	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5355	Rubbers	Ethylene propylene (EP) - material only	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5360	Rubbers	Ethylene propylene diene monomer (EPDM) - components	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5365	Rubbers	Ethylene propylene diene monomer (EPDM) - material only	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5370	Rubbers	Fluorocarbon - Components	Elastomer	Yes					Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.

5375	Rubbers	Fluorocarbon - material only	Elastomer	Yes					Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5380	Rubbers	Natural or isoprene - material only	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5390	Rubbers	Nitrile (acrylonitrile butadiene) - Components	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5395	Rubbers	Nitrile (acrylonitrile butadiene) - Material Only	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5399	Rubbers	Polyester/polyether elastomer components	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5400	Rubbers	Polyester/polyether elastomer material only	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5410	Rubbers	Silicone components	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5414	Rubbers	Silicone material only	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5420	Rubbers	Styrene butadiene (SBR)	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5450	Sealants - Flat Faced Joints	Butyl Rubber	Elastomer	Yes		Yes			Where a customer is seeking approval for a range, carry out OFW and GMO on the largest inradius and lowest Shore hardness. Repeat OFW & GMO on smallest inradius and highest Shore hardness. Carry out EM where material includes lead acetate as part of their cure system.
5021	Bituminous Based Products	Small surface area contact only	Other	Yes					

5140	Hoses & Tubing		Not defined	Rubber & Plastic		Rubber		Rubber	For plastic hoses, carry out OFW only. For rubber hoses carry out OFW & GMO & EM
5172	Miscellaneous		Not defined						
5215	Polyester	Components	Not defined	Yes		Yes			
5217	Polyester	Material Only	Not defined	Yes		Yes			
5297	Polyurethane	Material Only	Not defined	Yes		Yes			
5298	Polyurethane	Components	Not defined	Yes		Yes			
5440	Sealants - Flat Faced Joints	General	Not defined						
5490	Sealants - Flat Faced Joints	Polyurethane	Not defined	Yes		Yes			
5505	Sealants - Flat Faced Joints	Waterstops	Seek advice						

OFW Odour & Flavour of Water (O/F)
AW Appearance of water (APP)
GMO Growth of microorganisms (MDOD)
EXS Extraction of substances which may be harmful to human health (Cytotoxicity)
EM Extraction of Metals (M)