The Who, What, When, Why and How of the WRAS Approval Process

By Laura Moorman

With the expansion of the international market place for residential drinking water treatment products, there are more and more questions surrounding what approvals are needed in these international markets and what the approval processes entail. International approval requirements vary by country, so it would be difficult to address them all in a single book, let alone a single article. This article will start with one piece of the international puzzle: the who, what, when, why and how of the WRAS approval process required in the United Kingdom.

The WRAS approval process is a well-defined one, with clear guidance regarding what information and testing is needed to achieve WRAS approval or a WRAS certificate.

The Who

A good starting point for this topic is to ask, "Who is WRAS and who is required to have WRAS approval?"

WRAS is an abbreviation for the Water Regulations Advisory Scheme. WRAS publishes the *Water Fittings Regulations and Northern Ireland Regulations*. WRAS promotes consistent interpretation of the regulations. WRAS can consult with government, manufacturers and installers. WRAS assists in the development of relevant standards and approves and lists water fittings and materials.

Manufacturers intending to sell their products in the United Kingdom and Northern Ireland must determine if WRAS approval is required to sell their product in the U.K. While many products are not required to have WRAS approval, a significant number of end customers and big box stores located in the U.K. are requiring WRAS approval.

What

Now that we know who WRAS is, the next question to ask about the process is, "What kind of testing is needed for WRAS approval?" The answer is that the amount and type of testing needed depends on the product type.

There are two types of approvals: materials approval and product or fitting approval. A material approval is an approval of an individual material. A product or fitting approval is an approval of the fitting or system. Manufacturers of residential water treatment products should keep in mind that complete water treatment systems are considered 'fittings' in WRAS terminology.

A material or system can be approved for hot and cold-water use, or cold-water use.

A material or fitting tested under hot water conditions also qualifies for cold-water use.

Both material and fitting or product approvals require material testing. Product or fitting approvals require mechanical testing in addition to materials testing.

Materials' testing is referred to as the BS6920. The BS6920 or British Standard 6920 consists of five individual tests, listed in Figure 1. Details of these tests are as follows:

Figure 1. BS6920 materials testing

Odor and flavor
Appearance of colorant and turbidity
Growth of aquatic microorganisms (also known as 'microbial' testing)
Extraction of substances harmful to health (also known as 'cytotoxicity')
Extraction of metals

Odor and flavor

The purpose of odor and flavor testing is to determine if a product imparts an odor or flavor when the material is exposed to drinking water. The odor and flavor testing is judged by a three-person panel against a control of tap water.

Appearance of colorant and turbidity

This testing determines if the product causes the water to change color or increase in turbidity. The color is measured using a color spectrum. The product cannot cause an increase in color more than five color units. The turbidity is measured using a turbidimeter, with the pass/fail criteria being that the turbidity of the water cannot increase more than 0.5 NTU after contacting the material.

Figure 2. Interpretation of MDOD results

MDOD result, mg/L	Interpretation
<1.7	Material passes test
1.7 – 2.0	Test extended by two weeks and further MDOD samples are taken
2.0 – 2.9	Re-test is required with two additional material samples
> 2.9	Material fails test

Growth of aquatic microorganisms

Microbial testing determines if a product will promote significant growth of aerobic microorganisms. The length of the test is 7-10 weeks and the pass/fail criterion is based on the mean dissolved oxygen difference (MDOD).

As the growth of aerobic microorganisms increases, oxygen is removed from the test system. This loss is compared with the control system. Samples are taken at weeks five, six and seven, with the MDOD being determined as the mean value from these samples. The evaluation of results is quite complicated and is described in Figure 2.

Figure 3. MAC levels for metals

Metal	MAC µg/L
Aluminum	200
Antimony	10
Arsenic	50
Barium	1,000
Cadmium	5
Chromium	50
Iron	200
Lead	50
Manganese	50
Mercury	1
Nickel	50
Selenium	10
Silver	10

Extraction of substances harmful to health

Cytotoxicity testing is a seven-day test and determines if a product shows toxicity to humans. If a cytotoxic response is detected, two additional samples are tested. If the additional samples show no cytotoxic response, then the material complies. If the additional samples show cytotoxic response, the material fails.

Extraction of metals

The extraction of metals testing determines if metals are leached into the product water. Any metal detected must not exceed the maximum admissible concentration (MAC). For the MAC levels please see Figure 3.

After all five individual tests are successfully completed, a passing test report is issued for that material. That mate-

Figure 4. WRAS mechanical testing requirements

Successful completion of the BS6920 (materials testing)
Pressure testing
Opacity
Identifier

rial has successfully completed the BS6920. For those manufacturers seeking material approvals, testing is complete and the listing review process begins. For those manufacturers seeking fitting or product approvals, mechanical testing begins.

There are various requirements of mechanical testing depending on the system. This article will focus on four basic requirements as described in Figure 4. Details of these testing requirements follow. Products such as water softeners and reverse osmosis systems have additional requirements including, but not limited to, consumption and testing of the faucet.

Figure 5. TAG submission dates for 2006

Wednesday January 18, 2006
Tuesday March 7, 2006
Wednesday April 19, 2006
Tuesday June 6, 2006
Tuesday July 18, 2006
Wednesday September 6, 2006
Tuesday October 24, 2006
Tuesday December 5, 2006

BS6920

Mechanical testing will not commence until all materials have successfully completed the BS6920 testing.

Pressure testing

Pressure testing is required to ensure the product or fitting is watertight. The product or fitting must withstand pressure testing up to 1.5 times the product's rated pressure.

Opacity

The purpose of opacity testing is to ensure the product will not promote microbial growth. Testing ensures light cannot pass through the product.

Identifier

The identifier or label is reviewed to ensure the product is easily identifiable. After successful completion of the BS6920 and mechanical testing, the fitting or product's test reports are sent to the Test and Assessment Group (TAG) of the scheme. The TAG includes representatives from the U.K.'s Water Supply Industry group. The TAG reviews all test reports and identifier and determines if a product or fitting will receive a WRAS approval certificate. The certificate issued is valid for five years and then re-testing is required.

When

Now that you know who and what the WRAS approval process entails, a logical next question for manufacturers is, "When should I start the approval process?" Depending on the when the manufacturer would like to enter the U.K. market, a manufacturer should refer to the cut-off dates for submission to the TAG to determine when to begin the approval process. The TAG meets approximately every eight weeks. The submission dates are available on the website at http://www.wras.co.uk/TAG.htm and are available in Figure 5.

Why

The next question is, "Why would anyone need WRAS approval?" The purpose of WRAS is to prevent the waste, misuse, undue consumption, contamination or erroneous measurement of water. But the real answer to this question is that WRAS approval is needed for market access for many products being sold through retail channels in the U.K.

How

The last question: "How does a manufacturer get started in the WRAS approval process?" There are five laboratories approved for testing for WRAS. To start the approval process, a manufacturer can contact one of the approved laboratories. A parts list of materials is submitted for review. The lab reviews the parts list and a determination is made regarding which materials require testing. Each lab requires the same information and uses a standardized form. The required forms can be found on the WRAS website.

With all of the questions about WRAS approval asked and answered, now you know the who, what, when, why and how of the WRAS approval process. You can begin your journey into international approvals world informed and aware.

About the author

S *Laura Moorman has been a certification project manager and senior certification project manager with NSF International for three years, working with certification of residential drinking water products. Her previous experience was in pharmaceutical sales. Laura has had extensive training in WRAS approvals and test procedures. She has a bachelor's degree in business management from Kent State University, and she can be reached at 1-800-NSF-Mark or e-mail: lmoorman@nsf.org.*

About NSF

S *If all of this seems a bit daunting, please keep in mind that manufacturers wanting a seamless interface can have NSF coordinate the WRAS approval process for them. NSF hopes that this service will help make WRAS approvals easier, whether manufacturers care to understand all the details or not.*