

**INFORMATION FOR MANUFACTURERS/
WRAS APPROVAL APPLICANTS/
PLUMBING SYSTEM SPECIFIERS/ USERS**

EPDM FLEXIBLE HOSES



MATERIALS IN CONTACT WITH WATER INTENDED FOR DRINKING AND OTHER DOMESTIC PURPOSES

USE OF EPDM FLEXIBLE 'RUBBER' HOSES

FLEXIBLE HOSES

Some flexible hoses are unsuitable for use with wholesome water, because they support extensive microbial growth, impart a very strong, unpleasant, taste and odour or release toxic substances to the drinking water.

The Water Regulations Advisory Scheme is aware that concerns have been raised by hose and tap manufacturers, health authorities, scientists and plumbing installers regarding the effects of the materials used for some flexible hoses on the quality of water intended for drinking or other domestic purposes. The concerns include the possibility that these materials may encourage the growth of bacteria which can be harmful to health, especially the Legionella bacterium which causes Legionnaires' disease.

Legionnaires' disease is an opportunistic infection of the lung caused primarily by inhaling Legionella bacteria contained in fine water droplets or aerosols. It can be fatal, particularly amongst hospitalised patients who are aged or immuno-compromised. Most reported cases of Legionnaires' disease are associated with water systems in large buildings where temperature and flow patterns allow the bacteria to multiply. These conditions may be found in under-used taps and showers.

THE CAUSE OF CONCERN

Conditions which may favour the growth of Legionella are well documented in the Health and Safety Executive's Approved Code of Practice and Guidance L8, (Legionnaires' disease: The control of legionella bacteria in water systems). These conditions include the leaching of chemicals from plumbing materials in contact with water. The chemicals can be used by bacteria as nutrients for their growth. Bacteria can form biofilms (microbial 'slime') on the material surfaces in contact with the water, and the biofilm can harbour Legionella.

Evidence from scientific investigations of the occurrence of the Legionella bacterium in hospitals has shown that some flexible hoses used to connect washbasin taps to plumbing systems were heavily infected with biofilm which included the Legionella bacteria. Microscopic examination showed that the inner surface of these hoses were roughened and pitted. This was thought to have occurred during the manufacture of the hoses by extrusion of the raw material. The rough inner surfaces and the pits provide ideal places for bacteria to attach and form biofilm, and enable bacteria to survive attempts to disinfect the plumbing systems.

The flexible hoses were made from the elastomer 'ethylene propylene diene monomer' (EPDM) (a synthetic rubber). Tests have shown that some EPDM formulations may result in increased biofilm formation due to the leaching of nutrients.

THE REGULATORY STATUS

The Water Supply (Water Fittings) Regulations 1999 (in England and Wales), the Scottish Water Byelaws (2004) and the Northern Ireland Water Regulations, collectively referred to as “the Regulations”, apply to all plumbing systems in the UK which receive or convey water supplied by a public water supplier. The Regulations require that materials in contact with water intended for domestic purposes (which includes drinking, cooking, bathing, washing) shall not contaminate the water. The Government Guidance¹ to the Regulations states that to meet this requirement, all non-metallic materials should comply with BS6920: “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 LEGAL REQUIREMENT

It is a legal requirement that flexible hoses are assessed by a competent laboratory for their compliance with BS6920: Parts 1 to 3. These tests assess the likelihood of the material being able to support microbiological growth and leach chemicals into the water with which they are in contact – chemicals which might either act as nutrients for bacteria, cause an adverse effect on the aesthetic qualities of the water (e.g. give it taste, odour, colour or turbidity) or be toxic to humans.

Installers (plumbers) and Users (building managers) of water fittings are liable to prosecution for non-compliance with the Regulations. It is essential that unsuitable hoses are not used in wholesome water systems. The safeguard against prosecution, under the Regulations and Health and Safety legislation, for the use of unsuitable fittings leading to harmful effects on health, is to insist on the use of fittings which have been assessed and shown to be satisfactory.

COMPLIANCE & CONTROLS

One widely used assessment system is the WRAS Approval Scheme, in which manufacturers voluntarily submit water fittings and materials for assessment of their compliance with the regulations. The Scheme assesses the results of tests on products and where they are satisfactory, issues a unique approval number for them. Approved products are listed in the WRAS Water Fittings and Materials Directory. This is used widely by fittings specifiers, installers and Water Suppliers’ inspectors to verify that the fittings comply with the requirements of the regulations. The Directory is freely available on the internet via the WRAS website (www.wras.co.uk/directory).

Approvals for flexible hoses lined with EPDM rubber are given in Section 1863 of the Directory. The product entry in the Directory includes a description of the nature and location of the marking which the manufacturer has used on the product, which may be useful in identifying that a particular fitting found in service is a WRAS Approved product. However, because of the limited availability of space on the products for marking, identification can be difficult. There are also examples where unscrupulous manufacturers of poor quality hoses have copied the marking of products in attempts at counterfeiting.

As well as choosing approved products from the Water Fittings and Materials Directory, specifiers and installers are therefore advised to ensure that they purchase approved water fittings from a supplier recognised by the manufacturer and, if necessary, to ask the supplier for evidence of orders and invoices showing that the products supplied have come from the approved manufacturer.

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¹ Guidance Document relating to Schedules 1 and 2 of the Water Supply (Water Fittings) Regulations 1999, Defra, available on the website <http://www.defra.gov.uk/environment/water/industry/wsregs99/guide>