

# **DRINKING WATER INSPECTORATE**

**REFERENCE: DWI 70/2/168**

## **MAIN REPORT:**

**RESEARCH CONTRACT “UPDATING  
REGULATORY PROTECTION OF WATER SUPPLY  
AGAINST CONTAMINATION BY BACKFLOW (Part A)  
AND REVIEWING REGULATORS’ SPECIFICATIONS  
AGAINST EN STANDARDS”(Part B)**

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## **1.0 BACKGROUND**

### **1.1 Part A: Updating Regulatory protection of water supplies against contamination by backflow**

The Water Supply (Water Fittings) Regulations 1999 (the Regulations) protect public water supplies against waste, misuse, excessive consumption and contamination within plumbing installations of domestic and commercial properties. The Regulations replaced the Water Byelaws, made by the former public sector water undertakers.

Schedule 6 of the Regulations define, in broad terms, 5 fluid risk categories (1-5) depending on the risk the fluid poses if it were to flow back into the water supply system. Definitions of the fluid types are given in Appendix 1 (the original tender document). Examples of installations where each fluid type occurs are given in the Departmental Guidance.

Information on appropriate backflow protection fittings is contained in the Department's Guidance. Use of Guidance, rather than Regulations, allows more flexible amendment than would be the case under Regulations.

The Departmental Guidance is not exhaustive, as it had been envisaged that clarification of fine detail would be in subsequent guidance. This approach is consistent with CEN Standard EN1717 (the European Standard on backflow protection). This is because the EN does not directly link risk to product specifications and does not always clearly distinguish risk classes. However this approach is not ideal in terms of practical application. From a practical point of view a clearer link between examples of installation, the fluid risk category and the type of backflow protection required, or deemed appropriate would be helpful.

The objective is to develop guidance that clearly links type of installation and risk classification with the type of protection required. It is envisaged that this updated guidance will provide authoritative technical advice on obligations for public protection against backflow and will address both whole site and secondary backflow protection.

### **1.2 Part B: Reviewing Regulators' Specifications against EN Standards**

The Regulations permit use of fittings subject to certain approval criteria. One criterion is meeting an appropriate harmonised European standard (i.e. an EN); another is to conform to a specification approved by the regulator (i.e. as detailed in the document Regulators' Specification). As more En's become available, the Regulators' Specifications may become obsolete.

The objective is to assess the current and likely future status of ENs in relation to the Regulators' Specifications.

## **2. OBJECTIVES**

### **2.1 The objectives of this contract in respect of backflow protection (Part A) are:**

- i) identify specific backflow protection devices appropriate for particular installation situations using as models the, UK DoE Backsiphonage report, Water Byelaws Guide Schedules A and B, Australian National Plumbing and Drainage code AS 3500.1: 1992 and systems in use in the USA IAPMO UPC National Plumbing Code 1995.
- ii) incorporate into the output currently accepted applications against fluid category.
- iii) ensure that the output is in a format suitable for inclusion in the Guidance and provide advice as to how to include it.
- iv) provide administrative and technical support for a meeting to be arranged by the project manager to review the project output and to revise the project report in accordance with the agreed findings of the review.

## **2.2 The objectives in respect of reviewing En's and Regulators' Specification (Part B) are:**

- i) prepare tables that list all product specifications, whether that be a UK Regulators' Specification or an EN.
- ii) ensure listing of UK Regulators' specifications, includes the Department's for WCs and backflow protection devices, and all others which were adopted from the Water Regulations Advisory Scheme.
- iii) identify any Regulators' Specification, which have been, or are in the process of being, superseded by CEN European Standards, including information on planned or actual implementation dates and on whether the EN/draft EN meets all existing UK Regulators' Specification.
- iv) assess whether, and to what extent, the requirements of the Regulators' Specification may exceed, or fail to meet, what can reasonably be justified on grounds of water conservation and protection against contamination, such as by what may be construed as requirements for lifetime fitness for purpose.

Note: the objectives of this project do not address the fitness for purpose issues of materials in contact with drinking water.

## **3. PROJECT APPRECIATION**

### **3.1 Part A Updating Regulatory protection of water supplies against contamination by backflow**

It has long been realised that available guidance upon the appropriate backflow protection required for protecting the water supply from a downstream risk covers only a fraction of the installations and processes in use within the UK. However there is a lot of information available upon individual risks that can be collated from various sources, these primarily being the Water Industry Committees, including the WRAS Test Assessment Group, Technical Support Group and the Technical Committee. Other sources of data on category of risk and appropriate level of protection utilised include Australian Standards and the American Code of Practise. The information collated is presented in a tabular format with products grouped within generic industry sectors and the more specific installations presented in a separate table.

The tables are presented in a format suitable for inclusion in the Water Supply (Water Fittings) Regulations Guidance and the report includes how best to undertake this.

### **3.2 Part B reviewing Regulators' Specifications against EN Standards**

After identifying the 87 notified Regulator's Specifications, a further 129 Specifications have been identified that make up the published Regulators' Specifications. As part of this review all 216 Regulators' Specifications have been reviewed.

WRc-NSF has prepared tables that list all Regulators' Specifications and the standards referred to; the corresponding European Standards including draft European Standards are referenced if available and indicate if the EN meets the existing Regulators' Specifications. The BSi web site and the Technical index website were used as a basis for ensuring up to date standards and information is referred. Some of the Regulators' Specifications are obsolete and can be withdrawn immediately; these obsolete Regulators' Specifications are highlighted within the tables.

A separate report (compilation) deals with the comparison between the old Regulators' Specifications reference and the new EN document along with justification of the requirement on the grounds of water conservation and protection against backflow.

## **4. CONCLUSIONS**

### **4.1 Part A: Updating Regulatory protection of water supplies against contamination by backflow**

Whilst updating the guidance upon regulatory protection of water supplies against contamination by backflow it became apparent that the United Kingdoms current approach to the type of device that can be used to protect against a given risk or installation as required by the tender document is adequate and requires no further clarification. It is considered that ample clarification is given in Schedule 6 of the Regulations upon the appropriate backflow prevention devices that can be used to protect the Water Supply against a given fluid risk. In America and Australia the type of backflow preventer too be used in high risk situations (our fluid 5 risk) is always stipulated, the reasons being:

- Large range of more complex backflow preventers, especially atmospheric devices.
- Mechanical backflow valves are used to protect the water supply from the highest risk fluids.

It is assumed that because of these two points that America and Australia define the installation and exact type of device(s) to be used to protect the water supply within specific installations. In future, if more complex valves are available and mechanical devices are allowed to protect against Fluid Category 5 (FC5) within the Regulatory requirements, then consideration should be given to more closely specifying exact valves to be used for particular high risk installations.

Allowing mechanical backflow preventers (RPZ valves) to protect the water supply from high risk installations (fluid 5) at the boundary of a property is already being implemented by the Water Industry Information and Guidance document 9-04-05. This document suggests that a fluid 4 backflow preventer can be used to protect the whole site from high risk fluids with certain caveats attached and with point of use protection still required.

Comments received from the Water Industry request that mechanical devices be considered to protect against fluid category 5 risk (see clause 5.4 8).

The Backflow matrix Table 1 was compiled from examples of fluid risk from the UK, Australia, USA and Europe, the contractor has interpreted the defined risk category and attenuated that risk to a fluid risk category 1 to 5 as defined in the Water Supply (Water Fittings) Regulations 1999. Table 1 was then circulated to the Water industry for comment, the matrix was then amended as a consequence of the comments received and is presented as Table 2 (see clause 5.5) and the questions raised by the Water Industry are set out in clause 5.4.

A final backflow matrix was then produced and is presented as Table 3.

The backflow matrix or list of installations and the appropriate fluid risk category is not considered to be exhaustive and will produce a certain amount of debate within the Water Industry, as comparisons will be made with the published guidance within the Water Supply (Water Fittings) Regulations 1999. The contractor believes that the number and type of installations presented within the matrix will be beneficial in helping the Water Industry enforce the Regulations in a consistent fashion and to help the public to clearly understand their responsibilities when complying with the Water Supply (Water Fittings) Regulations 1999.

### **4.2 Part B: Reviewing Regulators' Specifications against EN Standards**

Whilst reviewing the Regulators' Specifications against European Standards it became apparent that for some generic product groups, particularly backflow protection devices, the number of published or soon to be published standards is considerable. Unfortunately in other generic product groups the publication of European Standards is disappointingly low. A number of the published EN valve standards that have been produced allow for a

leakage rate, whereas the existing Regulators' Specifications require products to be leaktight. In these cases the procedure from the European Standard has been suggested as a replacement with a caveat attached but that the requirement or criteria from the existing Regulators' Specifications is maintained.

When reviewing the European Standards that encompass the majority of the Regulators' Specifications it became apparent that European Standards exceed the number of requirements required by the current Regulators' Specifications. The European Standards generally require flowrate, pressure drop, dimensional, material requirements and acoustic testing, whereas the Regulators' Specifications address only prevention of contamination and water conservation. It is considered that if the Regulators' Specifications require that a product must comply with the requirements of the full European Standard then this would impose additional testing and cost upon a product that has no relevance to the essential requirements of the Water Supply (Water Fittings) Regulations 1999. As an example the cost of WRAS approval for a pillar tap would be approximately £950, the cost of testing against EN200 including the acoustic requirement would be approximately £2500.

As part of this review the contractor, after discussions with the DWI project manager agreed that only the exact clauses within the European Standards should be referenced within the proposed Regulators' Specifications.

Maintaining the Regulators' Specifications will also allow innovative devices to be accommodated if a system of producing new Regulators' Specifications was introduced.

Table 4 indicates that there are a total 216 test procedures, of these there are 104 test procedures relating to backflow prevention and WC suites of which 25 have been deleted as they refer to criteria that have been superseded by the Regulators' Specifications for WC suites or the appropriate European Standards for backflow. From the 216 procedures, 47 test procedures have been deleted, 70 have been compiled, 7 require fully amending (12 amendments total) or replacing references to reflect the up to date reference to the appropriate standard. The remaining 92 test procedures are considered to be current and therefore require no amendment.

The conclusions of this review of the Regulators' Specifications are as follows.

Number of Published Regulators' Specifications	216
Number of Regulators Specifications Deleted	47
Number of Regulators Specifications Deleted/compiled	70
Number of Regulators Specifications Amended	7 (12)
Number of Regulators Specifications Current	92
Number of Regulators Specifications Compiled	18 (compiled from EN's)
<b>Total number of Regulators' Specifications</b>	<b>117</b>

## **5. PART A: UPDATING REGULATORY PROTECTION OF WATER SUPPLIES AGAINST CONTAMINATION BY BACKFLOW**

### **5.1 Backflow Matrix comparing the installation with the fluid risk category**

The fluid categories and the examples given associated with the installation or process presented as examples/guidance within Schedule 2 Section 6.1 of the Water Supply (Water Fittings) Regulations 1999 have now been published for 5 years and were originally derived from the guidance given within the Water Byelaws Guide. WRc-NSF have been contracted to expand the Guidance to include recent decisions made by the Water Industry and to use guidance available in Australia, America and Europe.

The method of categorising the fluid of risk, and therefore the type of device to be used varies greatly between the UK and the other countries, the main difference being the use of mechanical backflow prevention devices to protect the water supply against the highest level of risk.

The fluid categories and the associated installations and processes compiled from available guidance are presented in the backflow matrix Table 1.

### 5.1.1 Australia

The fluid categories are classified as a low, medium or high risk with greater emphasis being placed upon the use of testable devices and registered air breaks for the medium to high-risk installations. The installation of these testable devices requires prior approval and registration of the installation and accompanied with testing and reporting after installation along with an agreed maintenance regime in place and retesting of the device at intervals not exceeding 12 months. The testable devices include double check valves and anti vacuum valves, and as the UK these devices generally only protect the water supply from a medium fluid risk. The RPZ valve is however used to protect the water supply from high risk fluids/installations as well as the registered air break.

When determining the appropriate UK fluid category for the examples given in AS/NZS 3500.1.2 the following assumptions have been made: -

<b>Australian Risk Category</b>	<b>UK Fluid Category</b>
Low	Fluid 2
Medium	Fluid 3
High	Fluid 4/5

When determining the level of risk, the probability of piping change, neglect, and incorrect use of equipment is considered resulting in a higher level of deemed risk.

### 5.1.2 America

The Federal Government under the Safe Drinking Water Act (SDWA) 42 USC 300j-26, has jurisdiction over the public health aspects of the drinking water supply, however the State Governments also have jurisdiction over matters of public health related to the supply of water. The State requirements cannot relax the Federal requirements but they can be more stringent and they can impose additional Regulations. The American Waterworks Association publication (Third Edition) has been used as source material to verify the level of risk with fluids/installations at the boundary for a particular industry/installation. The fluid categories are classified as low hazard and high hazard. The American system places a greater fluid protection rating on mechanical backflow preventers with similar conditions placed upon the installation of these types of devices.

When determining the appropriate UK fluid category for the examples given by AWWA the following assumptions have been made: -

<b>AWWA Recommendation</b>	<b>UK Fluid Category</b>
Air Gap	Fluid 5
RPZ valve	Fluid 4
Air Gap or RPZ valve	Fluid 4/5
Double check valve	Fluid 3

### 5.1.3 Europe

European Standard BS EN 1717 has been published and identifies a limited number of installations and the appropriate fluid of risk. The examples given are limited and are rather generic although the fluid of risk is the same as used within the UK.

## 5.2 Table 1 Backflow Matrix fluid categories and the associated installations and processes

Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document	Aus category	AS/NZ 3500.1.2	DEFRA Guidance	AWWA M14	BS EN 1717	WRc-NSF recommend
<b>Agricultural and Horticultural.</b>						
Antibiotic Injectors	High	Fluid 4/5	Fluid 5	Fluid 4/5		Fluid 5
Fertilizers, herbicides, nematicides, insecticides and weedicides Injected or siphoned <b>RA</b>	High	Fluid 4/5	Fluid 4	Fluid 4/5		Fluid 4/5
Fogging and cleaning sprays with chemical injection	High	Fluid 4/5	Fluid 4/5	Fluid 4/5		Fluid 4/5
Drinking nipples and troughs	High	Fluid 4/5	Fluid 5	Fluid 4/5		Fluid 5
Irrigation System no injection, outlets <150mm (UK no fertilisers or insecticide)	Medium	Fluid 4	Fluid 4	Local		Fluid 4
Irrigation Systems no injection, outlets <150mm. (UK no distinction for testable)	Low	Fluid 3 testable				
Permeable pipes (other than domestic)			Fluid 5	Fluid 4/5		Fluid 5
Permeable pipes (domestic)						Fluid 3
Commercial hydroponics systems			Fluid 5	Fluid 4/5		Fluid 4
Agricultural shows/festivals with written agreement on conditions of use < 1 month			Fluid 3			Fluid 3
<b>Industrial and Commercial</b>						
Fogging and cleaning spray equipment with chemical injection or additives	High	Fluid 4/5	Fluid 4/5			Fluid 5
Pan washing apparatus (UK commercial)	High	Fluid 4/5	Fluid 5			Fluid 5
Weed and Pest spraying and water catFluid 3e tanks	High	Fluid 4/5				
Mixing of chemicals (USA <b>RA</b> , low level fluid 3) <b>RA</b>	High	Fluid 4/5	Fluid 4	Fluid 3/4/5		Fluid 3/4/5
Portable and mobile tankers	High	Fluid 4/5	Fluid 5	Fluid 4/5		Fluid 5
Chemical dispensers (high toxicity)	High	Fluid 4/5	Fluid 5		Fluid 5	Fluid 5
Chemical Dispensers (low toxicity) <b>RA</b>	Medium	Fluid 4	Fluid 4	Fluid 3		Fluid 3/4
(Commercial Heating) Coils and jackets in heat exchangers – unsealed and toxic	Medium	Fluid 3	Fluid 4			
Commercial heating in non domestic properties <45KW (150 000Btu/hr)			Fluid 4			Fluid 3
Commercial heating in non domestic properties >45KW (150 000Btu/hr)			Fluid 4			Fluid 4
Commercial heating systems temporary rapid fill			Fluid 3			Fluid 3
(Domestic Heating) Coils and jackets in heat exchangers – sealed and non-toxic	Low	Fluid 3	Fluid 3			Fluid 3
Water plus anti corrosion					Fluid 3/4	
Central heating water with no additives					Fluid 3	
Photographic processing machines (no developer mixing)	Low	Fluid 3	Fluid 3			Fluid 3
Photographic processing machines (developer mixing)			Fluid 5			Fluid 5
Electro-plating, degreasing, descaling, stripping, pickling etc tanks, vats & vessels <b>RA</b>	High	Fluid 4/5	Fluid 5	Fluid 3/4/5		Fluid 5
Commercial laundries	High	Fluid 4/5	Fluid 5	Fluid 4/5	Fluid 5	Fluid 5
Clean-in-place systems (i.e. internal chemical cleaning takes						
Chemical cleaning without dismantling equipment (USA <b>RA</b> ) <b>RA</b>	High	Fluid 4/5	Fluid 5	Fluid 3/4/5		Fluid 3/4/5
Industrial process water which has been recirculated	High	Fluid 4/5	Fluid 5	Fluid 4/5		Fluid 5
Industrial and teaching laboratories	High	Fluid 4/5	Fluid 5			Fluid 5
Aircraft facilities <b>RA</b>	Medium	Fluid 4	Fluid 5			Fluid 5
Secondary school laboratories (including fume cupboards)	Medium	Fluid 4	Fluid <5			Fluid 4
Water filtration equipment	Low	Fluid 3	Fluid 3			Fluid 3
Butchery and meat trades			Fluid 5			Fluid 5
Slaughterhouse equipment			Fluid 5			Fluid 5
Vegetable washing			Fluid 5	Fluid 4/5		Fluid 5
Commercial dishwashing			Fluid 5	Fluid 4/5		Fluid 5
Commercial dishwashing pre rinse hose and trigger			AUK3	Fluid 4/5		Fluid 4
Rinsing water for dishes and utensils					Fluid 3	Fluid 3
Industrial cisterns/plant/chemicals			Fluid 5	Fluid 4/5		Fluid 5

<b>Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document</b>	Aus category	AS/NZ 3500.1.2	DEFRA Guidance	AWWA M14	BS EN 1717	WRc-NSF recommend
Dyeing equipment <b>RA</b>			Fluid 4	Fluid 4/5		Fluid 4/5
Industrial disinfection			Fluid 4			Fluid 4/5
Car washing and degreasing plants			Fluid 4			Fluid 4
Brewery and distillation plant <b>RA</b>			Fluid 4	Fluid 3/4		Fluid 3/4
Commercial clothes washing plants			Fluid 4	Fluid 4/5		Fluid 4
Water storage for agricultural purposes			Fluid 5	Fluid 4/5		Fluid 5
Pressure washing using bib tap connection, risk assessment required (Commercial)			Fluid 4			Fluid 4/5
Pressure washers domestic use (check and vac breaker)						Fluid 3
Reservoirs				Fluid 4/5		Fluid 5
Water from another source (not water company)			Fluid 5	Fluid 5		Fluid 5
Autoclaves <b>RA</b>				Fluid 3/4		Fluid 3/4
Steam facilities <b>RA</b>				Fluid 3/4/5		Fluid 3/4/5
Food service including packing, food service and restaurants				Fluid 4/5		Fluid 5
Dairies				Fluid 4/5		Fluid 5
Chemical plants <b>RA</b>	High	Fluid 4/5	Fluid 5			Fluid 4/5
Metal finishing plants (USA <b>RA</b> )	High	Fluid 4/5	Fluid 5	Fluid 3/4/5		Fluid 4/5
Petroleum processing or storage plants <b>RA</b>	High	Fluid 4/5	Fluid 5			Fluid 4/5
Radioactive material processing plants or nuclear reactors	High	Fluid 4/5	Fluid 5			Fluid 5
Car and plant washing facilities (USA <b>RA</b> )	High	Fluid 4/5	Fluid 5	Fluid 3/4/5		Fluid 4/5
Abattoirs	High	Fluid 4/5	Fluid 5			Fluid 5
Factories using processing or manufacturing toxic chemicals	High	Fluid 4/5	Fluid 5			Fluid 5
Chemical laboratories (all labs excluding schools)	High	Fluid 4/5	Fluid 5			Fluid 5
Pathology laboratories	High	Fluid 4/5	Fluid 5			Fluid 5
Sanitary depots	High	Fluid 4/5				Fluid 5
Universities <b>RA</b>	High	Fluid 4/5				Fluid 3/4/5
Food and beverage processing plants	Medium	Fluid 4	Fluid 4			Fluid 5
Static caravan holiday homes and park homes <b>RA</b>	Medium	Fluid 4				Fluid 3/4/5
Caravan parks touring and motor caravans, temporary connection			Fluid 3			Fluid 3
Caravan parks, different levels, secondary backflow protection required			Fluid 3			Fluid3
Marinas <b>RA</b>	Medium	Fluid 4		Fluid 4/5		Fluid 4/5
Premises with grey water re-use systems				Fluid 4/5		Fluid 5
Dairies <b>RA</b>			Fluid 4			Fluid 4/5
Refrigeration equipment			Fluid 4			Fluid 4
Cement batching/plants. 6 month inspection			Fluid 4			Fluid 4
Oil and gas production and transportation				Fluid 4/5		Fluid 5
Paper and paper product production <b>RA</b>				Fluid 4/5		Fluid 4
Swimming pool water				Fluid 4/5	Fluid 5	Fluid 5
Ponds				Fluid 4/5	Fluid 5	Fluid 5
Premises with an alternative water supply*	High	Fluid 4/5	Fluid 5	Fluid 4/5		Fluid 5
Premises where inspection is restricted	High	Fluid 4/5				Fluid 5
Piers, docks and other waterfront facilities <b>RA</b>	High	Fluid 4/5		Fluid 4/5		Fluid 4/5
Sewage treatment plants and sewage lift stations	High	Fluid 4/5	Fluid 5	Fluid 4/5		Fluid 5
<b>Hospitals – Medical</b>						
Equipment used for handling, mixing, measuring and processing chemical and microbiological substances	High	Fluid 4/5	Fluid 5			Fluid 5
Dental Console	Low	Fluid 3	Fluid 5			Fluid 5
Haemodialysis machines (UK Home)	Low	Fluid 3	Fluid 3			Fluid 3
<b>NOTE: Veterinary equipment is rated as for hospital-medical</b>						
Dissecting rooms in hospitals and medical building	High	Fluid 4/5	Fluid 5	Fluid 4/5		Fluid 5
Mortuary equipment used in funeral parlours, mortuaries,			Fluid 5	Fluid 4/5		Fluid 5

<b>Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document</b>	Aus category	AS/NZ 3500.1.2	DEFRA Guidance	AWWA M14	BS EN 1717	WRc-NSF recommend
Autopsy areas	High	Fluid 4/5	Fluid 5	Fluid 4/5		Fluid 5
Utility rooms where other than hand basins are installed	High	Fluid 4/5		Fluid 4/5		Fluid 5
Operating theatres in hospitals and medical buildings	Medium	Fluid 4	Fluid 5	Fluid 4/5		Fluid 5
Dental and medical surgeries	Low	Fluid 3	Fluid 5	Fluid 4/5		Fluid 5
Medical or dental equipment with submerged inlets			Fluid 5	Fluid 4/5		Fluid 5
Laboratories			Fluid 5	Fluid 4/5		Fluid 5
Bedpan washers			Fluid 5	Fluid 4/5	Fluid 5	Fluid 5
Clothes washing for health care use			Fluid 5	Fluid 4/5	Fluid 5	Fluid 5
Clothes washing machine no health care						Fluid 3
Renal Dialysis, maintenance regime, consult with Water Company			Fluid 4	Fluid 4/5		Fluid 4
Cross connect NHS, mains to pumped distribution, connect as short as possible, reg flushing			Fluid 3			Fluid 3
Dishwashing nursing homes, <b>on-site healthcare provided</b>			Fluid 5			Fluid 5
Dishwashing care homes /sheltered housing no healthcare <b>RA</b>			Fluid 4			Fluid 3/4
<b>Fixtures and Appliances</b>						
Bidet (UK ascending spray)	High	Fluid 4/5	Fluid 5		Fluid 5	Fluid 5
With clean-in-place systems	High	Fluid 4/5		Fluid 4/5		Fluid 5
Ice making machines			Fluid 2			Fluid 2
Fixtures used for food preparation e.g. Sinks	Low	Fluid 3	Fluid 5	Fluid 4/5		Fluid 5
Fixtures used for ablutions e.g. Baths, bidet's (over rim), basins, showers	Low	Fluid 3	Fluid 3		Fluid 3	Fluid 3
Baths & showers in residential accommodation, risk assessment required			Fluid 3			Fluid 3
Clothes and dishwashing machines for domestic use, including offices and hair salons			Fluid 3		Fluid 5	Fluid 3
Domestic washing machines at dog and cat kennels			Fluid 5		Fluid 5	Fluid 5
Laundry troughs not health care	Low	Fluid 3			Fluid 5	Fluid 4
Hair salons basins or troughs	Low	Fluid 3	Fluid 3			Fluid 3
Carbonated drink dispensing machines	Low	S/S Fluid 3	Fluid 3			Fluid 3
Hot and cold water mixing ( <b>not applicable to tap assemblies</b> )			Fluid 2		Fluid 2	Fluid 3
Drink-dispensing equipment, vending machines, coffee machines	Low	Fluid 3	Fluid 3		Fluid 2	Fluid 3
Sanitary dump points <b>Disposal</b>	High	Fluid 4/5				Fluid 5
Food storage tanks, vats and vessels with clean-in-place systems	High	Fluid 4/5	Fluid 5	Fluid 4/5		Fluid 5
Steam ovens pressurised			Fluid 5	Fluid 4/5	Fluid 2	Fluid 4
Steam ovens un-pressurised			Fluid 3	Fluid 4/5	Fluid 2	Fluid 3
Dry cleaning, closed circuit cooling system			Fluid 2			Fluid 2
Glass washing (drinking glasses) in bars, clubs etc counter top			Fluid 3		Fluid 3/4	Fluid 3
Bottle washing apparatus (USA R/A)			Fluid 4	Fluid 3/4/5		Fluid 4
<b>Hose Attachment Outlets</b>						
External hose taps – domestic premises	Low	Fluid 3	Fluid 3			Fluid 3
Flexible connections over domestic fixtures (excluding sinks and bidets)	Low	Fluid 3	Fluid 3			Fluid 3
Flexible connections over domestic sinks and bidets			Fluid 5			Fluid 5
<b>Hose taps located within an area provided with zone protection, but not connected downstream of the zone protection device</b>						
Flexible connect over commercial, industry or hospital fixtures	Low	Fluid 3	Fluid 5			Fluid 5
Laboratory outlets excluding schools	Low	Fluid 3	Fluid 5			Fluid 5
Non-domestic hose union taps <b>RA</b>			Fluid 5			Fluid 5
Hose union taps at dog and cat kennels			Fluid 5			Fluid 5
Domestic hand held fertiliser spray			Fluid 3			Fluid 3
Commercial/domestic irrigation with sprinkler heads 150mm above ground level			Fluid 3			Fluid 3
Flushing water prior to commissioning max supply 25mm			Fluid 3			Fluid 3

Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document	Aus category	AS/NZ 3500.1.2	DEFRA Guidance	AWWA M14	BS EN 1717	WRc-NSF recommend
Swimming pools domestic, hose union tap, self closing trigger			Fluid 3		Fluid 5	Fluid 3
Swimming pools commercial, hose union tap, self closing trigger, agreement required			Fluid 4		Fluid 5	Fluid 4
<b>Water Supply Systems Permanently Attached</b>						
Steam Boilers	Low	Fluid 3		Fluid 4/5		Fluid 4
Cooling towers*	High	Fluid 4/5		Fluid 4/5		Fluid 5
Steam clarifier	Medium	Fluid 4		Fluid 4/5		Fluid 4
<b>Water Treatment Systems</b>						
Deminalising equipment using ion-exchange resins with acid and alkali regeneration	High	Fluid 4/5			Fluid 2	Fluid 3
Plants with auxiliary-non-potable water supplies	High	Fluid 4/5	Fluid 5			Fluid 5
Potable water in reclaimed water plants	Low	Fluid 3		Fluid 5		Fluid 5
Chlorinators RA	Medium	Fluid 4				Fluid 4
In-line water softeners and filters (UK Domestic)	Low	Fluid 2	Fluid 2		Fluid 2	Fluid 2
Commercial softening plant (salt regeneration only)			Fluid 3		Fluid 2	Fluid 3
Commercial softening plant using other than salt			Fluid 4		Fluid 2	Fluid 4
Grey water recycling systems/rainwater collection			Fluid 5	Fluid 4/5		Fluid 5
Sewage treatment			Fluid 5	Fluid 5	Fluid 5	Fluid 5
<b>Fire Services</b>						
Direct connection to public water supply only No additives or booster pumps	Low	Fluid 2	Fluid 2	Fluid 3		Fluid 2
Direct connection with additives or additional pressurisation			Fluid 4	Fluid 3		Fluid 4
Fire hose reels, where there is a possibility of being used for purposes other than fire fighting	Medium	Fluid 3		Fluid 4		Fluid 4
Fire storage tank (open top)	Low	Fluid 3	Fluid 5	Fluid 5		Fluid 5
Fire storage tank (Hygienic)	Low	Fluid 3	Fluid 5	Fluid 5		Fluid 4
Fire sprinkler system domestic without anti freeze solution, protection at every branch			Fluid 2	Fluid 3		Fluid 2
Fire sprinkler system domestic flow through (wholesome mtl's used)				Fluid 1		Fluid 2
Fire sprinkler system with anti freeze solution			Fluid 4	Fluid 4		Fluid 4
Fire Hydrants RA, if no R/A then RPZ				Fluid 4		
Key marked as BLUE denotes change from accepted fluid in the UK						
Key marked as RA require a risk assessment to verify fluid risk level						
Key marked as green denotes recommendation to remove reference (no UK equivalent)						

### 5.3 Consultation upon the Updated Regulatory protection of water supplies against contamination by backflow

The backflow matrix Table 1 was presented to the Water Regulations Advisory Schemes Technical committee at its February 2005 meeting for discussion and comment. It was agreed that any additional guidance that could be provided upon the risk classification of fluids and or installations would be welcome and agreed that the proposed guidance be distributed to the Water Industry for their comment. After consultation with WRAS the matrix was distributed for comment.

Comments received from the consultation are listed in clause 5.4 and Table 2. The Backflow Matrix was then amended accordingly. The amended Backflow Matrix is presented as Table 3.

### 5.4 Further comments/questions received from the UK Water Industry

The contractor's responses to the comments/questions are in italics.

1. Whilst it is clear that there are times when a hard-and-fast rule may not necessarily apply in a given circumstance, it is felt that if "Risk Assessment" is not to become more than a convenient alternative to actually making any viable Industry decision, there

must be some effort put into creating a methodology to support Risk Assessment options.

*This report and the subsequent guidance for fluid categories against particular risks is part of the ongoing guidance provided by DEFRA to support the Water Industry in its enforcement of the Water Supply (Water Fittings) Regulations 1999. Further guidance upon risk assessment is the responsibility of individual Water Companies or indeed WRAS to produce; also the WRAS Best Practice Manual lays down procedures, which could be used.*

2. Concerning the risk assessment will guidelines be issued to Companies with regard to Chemical Plants, Metal Finishing Plants?

*As contractor's response above (1).*

3. I feel that using comparisons with USA risk assessments is inappropriate. In the USA there are far stricter controls on the plumbing installers and operations than we have here. Local, State and Federal law, which is actively enforced, unlike the UK, supports their lower risk philosophy.

*The comparisons with the USA are primarily to identify types of installations to include within the UK list of installations; the fluid category level is of secondary interest with the UK view being paramount. The contractor agrees with the comments regarding the stricter controls on the installations.*

4. Thought must be given to ensuring that any determinations on Fluid Categories are consistent across the numerous pieces of documentation that we have available to us. We have Chemical Fluid Category Lists, Fluid Category Lists tied to SICE Codes, Fluid Categories tied to specific pieces of equipment, Fluid Categories tied to specific uses of water, ..... We need some joined up thinking to make sure we aren't creating conflicts within our own Guidance.

*Agree there is a multitude of available information and some of it will be contradictory, individual Water Companies are responsible for issuing guidelines within their own company and this will lead to conflicting interpretations of the suitable fluid risk category. The guidance from this report will be available from the WRAS or DEFRA website and must be considered as authoritative and is intended to be used as guidance by the individual Water Companies.*

5. Are these changes to be retrospective, or can we accept that if the installation was legal at the time of inspection then it can continue to be used ad-indefinitum?

*The guidance is not retrospective.*

6. I have reservations about some of the items that have been relaxed i.e. Permeable Hoses Domestic. Domestic gardeners are renowned for putting some nasty ingredients on the soil to improve growth.

*The use of permeable pipes in the domestic situation has always been a cause for concern and will continue to be an anomaly when selecting the appropriate fluid category and device to protect the water supply. If a fluid 4 rating was imposed then almost all installations of the permeable pipe will be inappropriately installed, possibly without any backflow protection fitted. If a fluid 3 rating is imposed then the manufacturers of the hose may be convinced to supply a double check valve with the hose and therefore encourage the installation of some form of backflow protection.*

7. Are we saying that Commercial dish washing pre rinse hose and trigger must now have a BA or AF device?

*Yes, this is a relaxation of the present requirements that categorise commercial dish washing machines as a fluid category 5.*

8. We should be looking to be more in line with America or Europe and be allowing mechanical devices to cover more of the high risk areas instead of increasing to fluid 5 risk either by introducing more category 5 risks or risk assessments which go up to risk 5 (approx 23 potential extra class 5 risks in the matrix)

The acceptance of mechanical devices to protect the water supply from fluid 5 risks requires further consideration by the Regulator.

9. Would it not be better to separate the individual plant/fitting from the premise i.e.?

<u>Fitting</u>	<u>Premises or Site</u>
Antibiotic injectors	Dairies
Autoclaves	Reservoir's
Photographic processing machines	Universities
Etc	Etc

*This would be an exhaustive task requiring an intimate knowledge of all industries.*

10. While Premises or Sites may have a fluid category risk assigned to them this should not exclude the use of a lesser risk protector at the point of use by using risk assessment.

*Absolutely, a particular premise might be initially categorised as a fluid 5 risk, after inspection of the actual risk the property and its internal supply might be downgraded to a fluid category 4 or less. The Guidance on industry properties is offered as a starting point only; risk assessment will then determine the final fluid risk level.*

*Different risk factors may apply to protection of drinking water within the premises, for which the building operator has liabilities under the workplace and similar Regulations and backflow into the public supply.*

11. Generally the list seems OK in principle, but (and there's always a but) some of the entries seem to contradict each other and some seem a little strange. I've put some comments against the matrix and added some comments at the bottom. The problem we've got is that we've now got a number of "Risk Matrices" now which, when used all together, can end up classing everything as a 5 risk if you're not careful. And we need to make sure all of our documents tie up.

*Comments as given in 4. Any comments in the matrix will be considered.*

12. If you are producing this matrix in isolation then I am afraid it will open to challenge and subjectivity.

*Agree, this consultation with the Water Industry will ensure that the matrix has not been produced in isolation.*

13. The industry some years ago produced the attached guide around SICE codes and similar business activities in readiness for the Regulations. Whilst I appreciate some of the activities may need a closer look your matrix appears to be a little lightweight as the SICE code guide is far more detailed with many more inclusions.

*The use of SICE codes was considered and was rejected as the generic groups presented in the SICE codes were too generic and offered no real detail to the types of plant within that generic industry. The SICE codes can be used as a starting point but would certainly involve a risk assessment to determine the exact fluid risk.*

14. I feel that this document may be relied upon to prompt the decision making process for applying point of use, whole site and zone backflow protection, as it has been funded by Government.

*Agree, whole site and zonal protection is part of the work to be undertaken within this report, however the Water Industry is now considering the draft proposal through the WRAS Technical Committee and is now carrying forward these important areas of*

*backflow prevention. Consequently the issues related to zone and wholesite protection will now not be covered by this report (as agreed with the DWI contact manager).*

## 5.5 Table 2 Compiled Comments Received from the Water Industry

Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document	DEFRA Guidance	WRc-NSF recomment	Agreed action from WI comments	Water Industry comments
<b>Agricultural and Horticultural.</b>				
Antibiotic Injectors	Fluid 5	Fluid 5		
Fertilizers, herbicides, nematicides, insecticides and weedicides Injected or siphoned RA	Fluid 4	Fluid 4/5		*Will require information on these so they can be risk assessed *Regs guide shows insecticide and fertilizer as FC5
Fogging and cleaning sprays with chemical injection	Fluid 4/5	Fluid 4/5		
Drinking nipples and troughs	Fluid 5	Fluid 5		
Irrigation System no injection, outlets <150mm above soil level (UK no fertilisers or insecticide)	Fluid 4	Fluid 4		*We should say "above soil level". *Table 6.1e and G15.9 has this as a FC5 *Include extra heading for less than 150mm
Permeable pipes (other than domestic) on the ground	Fluid 5	Fluid 5		*In contact with/ or below ground level, need to define better *Have 2 cats for permeable pipe, domestic and commercial Fluid 4
Permeable pipes (other than domestic) below ground			Fluid 5	
Permeable pipes (domestic) on the ground		Fluid 3		*In contact with/ or below ground level, need to define better *Disagree – soil contaminations are a big a risk in a domestic garden as they are on a commercial one. Indeed – it is higher than an organic commercial garden. *Should be FC4 *Should be FC5
Permeable pipes (domestic) below ground			Fluid 4	
Commercial hydroponics systems RA	Fluid 5	Fluid 4/5	Fluid 4/5 RA	*If system is ground level or underground it should remain as Fluid 5 *More information required and suggest RA
Temporary Agricultural shows/festivals with written agreement on conditions of use< 1 month	Fluid 3	Fluid 3		*It is assumed this means temporary sites. Permanent show grounds used for different types of shows are a different matter – and may need to be considered as Category 5
Permanent Agricultural shows/festivals sites RA			Fluid 4/5	
<b>Industrial and Commercial</b>				
Fogging and cleaning spray equipment with chemical injection or additives RA	Fluid 4/5	Fluid 5	Delete	*Why FC5 when most chemicals are FC3 or 4, should be RA *Not prescriptive, delete
Pan (Delete pan) washing apparatus (UK commercial)	Fluid 5	Fluid 5		*Does this mean BED pan washing? If so 5 is right, if it's cooking pan washing it doesn't match other references to catering equipment mentioned elsewhere *What is pan washing?
Mixing of chemicals (USA RA, low level fluid 3) RA	Fluid 4	Fluid 3/4/5		Remove ref to USA
Portable and mobile tankers (foodstuff)	Fluid 5	Fluid 5	Fluid 3	*Carrying milk, water, and flour? Need to define
Portable and mobile tankers wholesome water			Fluid 3/4/5	RA could be fluid 3/4/5
Potable and mobile tankers other RA			Fluid 3/4/5	
Chemical dispensers (high toxicity)	Fluid 5	Fluid 5		*We need a clear definition of Low and High toxicity. We used to use LD50 but that fell into disrepute. We need something readily available for Regs Officers to reference. *As above
Chemical Dispensers (low toxicity) RA	Fluid 4			*We need a clear definition of Low and High toxicity. We used to use LD50 but that fell into disrepute. We need something readily available for Regs Officers to reference.

Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document	DEFRA Guidance	WRc-NSF recomm	Agreed action from WI comments	Water Industry comments
		Fluid 3/4	Agree??	*As above
Commercial heating in non domestic premises <45kW (150,000 Btu/hr) design output	Fluid 4	Fluid 3		Delete Commercial
Commercial heating in non-domestic premises >45kW (150,000 Btu/hr) design output	Fluid 4	Fluid 4		Delete commercial
Commercial heating systems temporary rapid fill (First fill new system)	Fluid 3	Fluid 3		*Does this include refilling a system after it has been fully or partially drained?
(Domestic Heating) Coils and jackets in heat exchangers – sealed and non-toxic	Fluid 3	Fluid 3		
Water cooled air conditioning units with no additives	Fluid 2	Fluid 2		
Photographic processing machines (no developer mixing)	Fluid 3	Fluid 3		*Should be FC4 both processing machines classified the same as regs guide page 6.3
Photographic processing machines (developer mixing)	Fluid 5	Fluid 5	Fluid 4	*Should be FC4 both processing machines classified the same as regs guide page 6.3 *Should be FC4, is the reason the developer?
Electro-plating, degreasing, descaling, stripping, pickling etc tanks, vats & vessels <b>RA</b>	Fluid 5	Fluid 5		
Commercial laundries <b>non clothes</b>	Fluid 5	Fluid 5	Delete	*Why have 2 definitions see commercial clothes washing plant below, should be FC4 *I understood that we had determined laundries in Universities and CFE's were only Category 4? *Should be FC4 *Should be FC4 Delete covered elsewhere
Commercial clothes washing <b>machine no healthcare</b>	Fluid 4	Fluid 4		*Why have 2 definitions see commercial laundries above *But Laundries are a Category 5? *To be RA, dependent upon what is being washed. Be specific no healthcare
Chemical cleaning without dismantling equipment <b>RA</b>	Fluid 5	Fluid 3/4/5		*More information is required.
Industrial process water which has been recirculated	Fluid 5	Fluid 5		Should be RA
Industrial and teaching <b>Universities</b> laboratories <b>RA</b>	Fluid 5	Fluid 5		*Are not teaching laboratories in schools a Category 3 (or 4 max)? Remove teaching and replace with universities.
Aircraft facilities <b>RA</b>	Fluid 5	Fluid 5	Delete	*What does this include? Not prescriptive, delete
Secondary school laboratories (including fume cupboards) <b>RA</b>	Fluid <5	Fluid 4		*Should remain Fluid 5, subject to RA *Are these not considered a Category 3 or 4 already? Should apply to all schools
Water filtration equipment <b>RA</b>	Fluid3	Fluid 3	Fluid 2/3/4/5	*I assume this is cartridge filters and not anything larger – some sites have full filtration plants just like Water Companies.
Butchery and meat trades	Fluid 5	Fluid 5		Re title as the risk is meat contact
Slaughterhouse equipment	Fluid 5	Fluid 5		
Vegetable washing	Fluid 5	Fluid 5		
Commercial dishwashing <b>machine no healthcare</b>	Fluid 5	Fluid 5	Fluid 4	*Should be FC4 as regs *Should be FC4 as regs For non healthcare use
Commercial dishwashing having a pre rinse hose and trigger	AUK3	Fluid 4		Add words pre wash
Rinsing water for dishes and utensils <b>after cleaning</b>		Fluid 3		*This is assumed to be post-wash and not pre-wash water? *What is the difference from above?
Industrial cisterns/plant/chemicals <b>RA</b>	Fluid 5	Fluid 5	Fluid 3/4/5	*This should be RA

Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document	DEFRA Guidance	WRc-NSF recomm	Agreed action from WI comments	Water Industry comments
Dyeing equipment <b>RA</b>	Fluid 4	Fluid 4/5	Fluid 3/4/5	*Why put this up to FC4/5
Industrial disinfection <b>RA</b>	Fluid 4	Fluid 4/5		*More information required.
Car washing ( <b>Delete and degreasing plants</b> )	Fluid 4	Fluid 4		*Aren't these Category 4/5 below? *Should be RA as they could be fitted with recycling plant <b>Vehicle wash</b>
Car washing with recycled water facility			Fluid 5	<b>Vehicle wash</b>
Plant washing and degreasing facilities (USA <b>RA</b> )	Fluid 5	Fluid 4/5		*But they're a Category 4 elsewhere? *Regs say FC4 *RA as recycled plant could be used. <b>Delete plant washing</b>
Brewery and distillation plant <b>RA</b>	Fluid 4	Fluid 3/4		*What would come under FC3 in the brewery Use the words associated plant to cover all areas of use
Water storage for agricultural purposes	Fluid 5	Fluid 5		
Pressure washing using bib tap connection, risk assessment required ( <b>Commercial</b> ) <b>RA</b>	Fluid 4	Fluid 4/5		
<b>Pressure washers domestic use (check and vac breaker)</b>		Fluid 3		*Should a DCV be the more appropriate backflow device? <b>Add hand held as the risk increases when dropped.</b>
Reservoirs <b>All RA</b>		Fluid 5	<b>Delete</b>	*What sort of reservoir surface water, fire fighting, below ground, above ground. *Does this include service water reservoirs which are covered and should be to drinking water std <b>Not prescriptive, delete</b>
Water from another source (not water company) <b>RA</b>	Fluid 5	Fluid 5	<b>RA</b>	*This should be risk assessed FC3/4/5 *Should be Fluid 5 (normally have air breaks)
Autoclaves <b>RA</b>		Fluid 3/4	Fluid 3/4/5	<b>Could be f15</b>
Steam facilities <b>Industrial use RA</b>		Fluid 3/4/5		*Needs clarification as what the steam facility is
Food service including packing, food service and restaurants		Fluid 5	<b>Delete</b>	*Does this include the high street sandwich bar *Would this include cafes and takeaways <b>Not prescriptive, delete</b>
<b>Cafes, sandwich bars etc as domestic use but RA</b>			<b>Delete</b>	<b>Not prescriptive, delete</b>
Dairies <b>RA</b>		Fluid 5	Fluid 4/5	*Copied below and with a FC4/5
Chemical plants <b>RA</b>	Fluid 5	Fluid 4/5	Fluid 3/4/5	*Most chemicals are FC3/4
Metal finishing plants (USA <b>RA</b> )	Fluid 5	Fluid 4/5		*More information
Petroleum processing or storage plants <b>RA</b>	Fluid 5	Fluid 4/5		*Stay as FC5
Radioactive material processing plants or nuclear reactors	Fluid 5	Fluid 5		
Abattoirs	Fluid 5	Fluid 5		
Factories using processing or manufacturing toxic chemicals <b>RA</b>	Fluid 5	Fluid 5	Fluid 4/5	*Should RA, delete factories, applies to all premises
Chemical laboratories (exc. School labs) <b>RA</b>	Fluid 5	Fluid 5	Fluid 4/5	*Should RA
Pathology laboratories (all labs)	Fluid 5	Fluid 5		
Sanitary depots ( <b>waste disposal, processing</b> )		Fluid 5		*Define better *What is meant by Sanitary depots

Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document	DEFRA Guidance	WRc-NSF recomm	Agreed action from WI comments	Water Industry comments
Universities,		FI 3/4/5	Delete	Delete covered elsewhere
Food and beverage processing plants RA	Fluid 4	Fluid 5	Fluid 4/5	*Why upgrade to FC5
Caravan parks – static caravan holiday homes and park homes RA		Fluid 3/4/5	Fluid 3	*Aren't these just houses that are wheeled into position? Why treat them any differently than a normally built house? *Should be FC3 as domestic properties, why different to touring vans below This should apply to each caravan etc.
Caravan parks – touring and motor caravans, temporary connection	Fluid 3	Fluid 3		*Should be Fluid 5 due to emptying cess
Caravan parks, (delete different levels,) secondary backflow protection required All Caravan parks, toilet waste emptying points and adjacent hose union taps	Fluid 3	Fluid3	Delete Fluid 5	*This should apply to all caravan parks Delete covered by comment 2 up
Marinas (canal, river and port) RA		Fluid 4/5		*Does this include canals where the filling of boats can be a FC3
Premises with grey water re-use systems		Fluid 5		
Dairies RA Delete all row	Fluid 4	Fluid 4/5		*Copied above as FC5
Refrigeration equipment RA	Fluid 4	Fluid 4	Fluid 3/4	*Should be RA as FC3/4
Cement batching plants (RPZ valve 6 month testing)	Fluid 4	Fluid 4		*Why 6 month testing instead of 12 months, WRAS decision
Cement batching plant - Tarmac Dry Silo Mortar dry mix mortar silo unit (aka Silomate)		Fluid 3		
Oil and gas production and transportation		Fluid 5		*Raised from FC 3 to 5 why? Safety
Paper and paper product production RA		Fluid 4		
Swimming pool water		Fluid 5		*Completely disagree, FC4 would be more acceptable
All Ponds		Fluid 5		*Any pond, domestic and commercial
Premises with an alternative water supply*	Fluid 5	Fluid 5	Delete	Not prescriptive, delete
Premises where inspection is restricted (all premises domestic and commercial)		Fluid 5	Delete	*I assume this also means on Domestic Premises (alteration and extension.) Not prescriptive, delete
Piers, docks and other waterfront facilities RA		Fluid 4/5	Delete	*Does this include canals and rivers Not prescriptive, delete
Sewage treatment plants and sewage lift stations	Fluid 5	Fluid 5		Should be pumping station
Laundry troughs not health care		Fluid 4	Delete	*What are laundry troughs? Delete
Hospitals – Medical facilities NOTE: Veterinary & dental equipment is rated as for hospital-medical				Add facilities and dental
Equipment used for handling, mixing, measuring and processing chemical and microbiological substances	Fluid 5	Fluid 5		Not distributed for comment
Dental Console	Fluid 5	Fluid 5		Not distributed for comment
Haemodialysis machines (UK Home)	Fluid 3	Fluid 3		Not distributed for comment
Dissecting rooms in hospitals and medical building	Fluid 5	Fluid 5		Not distributed for comment
Mortuary equipment used in funeral parlours, mortuaries,	Fluid 5	Fluid 5		Not distributed for comment

Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document	DEFRA Guidance	WRc-NSF recomm	Agreed action from WI comments	Water Industry comments
Autopsy areas	Fluid 5	Fluid 5		Not distributed for comment
Utility rooms where other than hand basins are installed		Fluid 5		Refer to sluice room
Operating theatres in hospitals and medical buildings	Fluid 5	Fluid 5		Not distributed for comment
Dental and medical surgeries	Fluid 5	Fluid 5	Delete	Specified in title delete
Medical or dental equipment with submerged inlets	Fluid 5	Fluid 5		Not distributed for comment
Laboratories	Fluid 5	Fluid 5		Not distributed for comment
Bedpan washers	Fluid 5	Fluid 5		Not distributed for comment
Clothes washing for health care use	Fluid 5	Fluid 5		Not distributed for comment
Clothes washing machine no health care (nurses accommodation)		Fluid 3		This should refer to nurses accommodation
Renal Dialysis, maintenance regime, consult with Water Company	Fluid 4	Fluid 4		Not distributed for comment
Cross connect NHS, mains to pumped distribution, connect as short as possible, reg flushing	Fluid 3	Fluid 3	Fluid 4	Should be fluid 4
Dishwashing nursing homes, on-site healthcare provided	Fluid 5	Fluid 5		Not distributed for comment
Dishwashing care homes /sheltered housing no healthcare RA	Fluid 4	Fluid 3/4		Not distributed for comment
<b>Fixtures and Appliances</b>				
Bidet (UK ascending spray)	Fluid 5	Fluid 5		Delete ref to UK
Ice making machines	Fluid 2	Fluid 2		Not distributed for comment
Fixtures used for food preparation e.g. Sinks	Fluid 5	Fluid 5		Not distributed for comment
Fixtures used for ablutions e.g. Baths, bidet's (over rim), basins, showers	Fluid 3	Fluid 3		Risk for non-healthcare use.
Baths & showers in residential accommodation, RA	Fluid 3	Fluid 3		Not distributed for comment
Clothes and dishwashing machines for domestic use, including offices and hair salons	Fluid 3	Fluid 3		Not distributed for comment
Domestic washing machines at dog and cat kennels (animal healthcare use)	Fluid 5	Fluid 5		Only applies to animal use products
Hair salons basins or troughs	Fluid 3	Fluid 3		
Carbonated drink dispensing machines	Fluid 3	Fluid 3		
Hot and cold water mixing (Delete not applicable to tap assemblies)	Fluid 2	Fluid 3	Fluid 2	*Should be RA as depends on the process it is supplying; *Why should the industry want a higher FC than DEFRA, FC2 is fine. *Why upgraded from FC2 to FC3 and what's the difference to tap assemblies
Drink-dispensing equipment, vending machines, coffee machines	Fluid 3	Fluid 3		*Why put this up to FC3
Sanitary dump points Disposal		Fluid 5		
Food storage tanks, vats and vessels with clean-in-place systems RA	Fluid 5	Fluid 5	Delete	*Should be RA for FC4/5 *Does this include milk storage as the term clean in place system is as milk storage systems Not prescriptive, delete
Steam ovens pressurised	Fluid 5	Fluid 4	Fluid 5	*Should remain FC5
Steam ovens un-pressurised	Fluid 3	Fluid 3		

Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document	DEFRA Guidance	WRc-NSF recomm	Agreed action from WI comments	Water Industry comments
Dry cleaning, closed circuit cooling system	Fluid 2	Fluid 2		
Washing (drinking glasses) in bars, clubs etc counter top	Fluid 3	Fluid 3		*Should be FC5 Re title
Bottle washing apparatus RA	Fluid 4	Fluid 4		
<b>Hose Attachment Outlets</b>				
External hose taps – domestic premises, hand held use	Fluid 3	Fluid 3		Add words hand held
Flexible connections over domestic fixtures (excluding sinks and bidets, toilets)	Fluid 3	Fluid 3		*What about hoses over showers, washbasins and baths *We should include baths and toilets here! *Should WC's be included
Flexible connections over domestic sinks, bidets and toilets	Fluid 5	Fluid 5		*We should include baths and toilets here! *Should WC's be included
(i) flexible connect over commercial, industry or hospital fixtures	Fluid 5	Fluid 5	Delete	*Presumably this also includes ARJO baths? Yes Covered elsewhere, delete
(ii) Laboratory outlets (exc. School labs) RA	Fluid 5	Fluid 5	Fluid 3/4/5	*This should be RA for FC4/5
Non-domestic hose union taps RA	Fluid 5	Fluid 5	Fluid 3/4/5	*Should be RA for FC3/4/5
Hose union taps at dog and cat kennels, animal grooming parlours	Fluid 5	Fluid 5		*What about hose union outlets in poodle parlours and animal grooming, require extra entry
Domestic hand held fertiliser spray	Fluid 3	Fluid 3		
Commercial/domestic irrigation with sprinkler heads 150mm above soil level	Fluid 3	Fluid 3		*NO – should say "above soil level". Window boxes and hanging baskets are a big problem.
Flushing water prior to commissioning max supply 25mm	Fluid 3	Fluid 3		Add words newly installed
Swimming pools domestic, hose union tap, self closing trigger	Fluid 3	Fluid 3		*But pool water is a Category 5
Swimming pools commercial, hose union tap, self closing trigger, agreement required	Fluid 4	Fluid 4		*FC3 *But pool water is a Category 5 *Farms allow FC3 backflow if fitted with a trigger and prior agreement why should this situation differ.
<b>Water Supply Systems Permanently Attached</b>				
Steam Boilers		Fluid 4		
Cooling towers*		Fluid 5		
Steam clarifier		Fluid 4		*Clarifier?
<b>Water Treatment Systems</b>				
Demineralsing equipment using ion-exchange resins with acid and alkali regeneration		Fluid 3		
Plants with auxiliary-unwholesome water supplies	Fluid 5	Fluid 5		*Unwholesome water supply
Potable water in reclaimed water plants unwholesome		Fluid 5		*Unwholesome water supply
Chlorinators RA		Fluid 3/4		*More information required This could be a fluid 3

Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document	DEFRA Guidance	WRc-NSF recomm	Agreed action from WI comments	Water Industry comments
In-line water softeners, filters and conditioners (UK Domestic)	Fluid 2	Fluid 2		*Do you mean softeners, water filters or water conditioners, need better definition.
Commercial softening plant (salt regeneration only)	Fluid 3	Fluid 3		
Commercial softening plant using other than salt	Fluid 4	Fluid 4		
Grey water recycling systems/rainwater collection	Fluid 5	Fluid 5		
Sewage treatment	Fluid 5	Fluid 5		
<b>Fire Services</b>				*We need to make sure anything in this list matches whatever the final requirements become in the various industry documents and BS's
Direct connection to public water supply only no additives or booster pumps	Fluid 2	Fluid 2		Add heading for dedicated fire main and hydrants in high risk premises
Direct connection to public water supply, with additives or additional pressurisation	Fluid 4	Fluid 4		
Fire hose reels, where there is a possibility of being used for purposes other than fire fighting <b>RA</b>		Fluid 4	Fluid 4/5	*Description too broad, all hose reels can be used for other purposes, FC3 should suffice *Should be RA up to FC5
Fire storage tank (open topped <b>unsealed</b> )	Fluid 5	Fluid 5		*What if a lid or cover is in place, sealed or unsealed may be a better definition
Fire storage tank (hygienic, <b>screened outlets etc</b> )	Fluid 5	Fluid 4		*Should remain 5 as stagnant water. Also needs s.c. Valve from parent pipework *What does hygienic mean
Fire sprinkler system domestic without anti freeze solution, protection at every branch	Fluid 2	Fluid 2		
<b>Fire sprinkler system – domestic, flow through (wholesome materials used)</b>		Fluid 2		*What are wholesome materials, compliant materials are a better description.
Fire sprinkler system with anti freeze solution	Fluid 4	Fluid 4		
Key marked as <b>BLUE</b> denotes change from accepted fluid in the UK				Key marked as black if WI comments considered and rejected, in this column only
Key marked as <b>RED</b> denotes comments agreed and actions as a result of comments				
Key marked as <b>RA</b> require a risk assessment to verify fluid risk level				

## 5.6 Table 3 Final Backflow Matrix comparing the installation with the fluid category

After compiling the Water industry comments and amending the guidance as highlighted in table 2 the contractor presents the final backflow matrix table 3, as guidance for the appropriate fluid risk category for a particular installation or process for commercial and industrial use. DWI and DEFRA need to confirm the content of this matrix before publication.

<b>Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document</b>	<b>DEFRA Guidance</b>
<b>Agricultural and Horticultural.</b>	
Antibiotic Injectors	Fluid 5
Fertilizers, herbicides, nematicides and insecticides, injected or siphoned <b>RA</b>	Fluid 4/5
Fertilizers <b>RA</b>	Fluid 3/4/5
Copper Sulphate	Fluid 3
Drinking nipples and troughs	Fluid 5
Irrigation System no injection, outlets <150mm above soil level (no fertilisers or insecticide)	Fluid 4
Irrigation System no injection, outlets >150mm above soil level (no fertilisers or insecticide)	Fluid 3
Permeable pipes (in other than domestic premises)	Fluid 5
Permeable pipes (in domestic premises)	Fluid 4
Commercial hydroponics systems <b>RA</b>	Fluid 4/5
Temporary Agricultural shows/festivals with written agreement on conditions of use< 1 month	Fluid 3
Permanent Agricultural shows/festivals sites <b>RA</b>	Fluid 4/5
<b>Industrial and Commercial</b>	
Mixing of chemicals <b>RA</b>	Fluid 3/4/5
Portable and mobile tankers (foodstuff) <b>RA</b>	Fluid 3/4/5
Portable and mobile tankers wholesome water <b>RA</b>	Fluid 3/4/5
Potable and mobile tankers other <b>RA</b>	Fluid 3/4/5
Chemical dispensers (high toxicity)	Fluid 5
Chemical Dispensers (low toxicity) <b>RA</b>	Fluid 3/4
Heating in non domestic premises<45kW (150,000 Btu/hr) design output	Fluid 3
Heating in non-domestic premises >45kW (150,000 Btu/hr) design output	Fluid 4
Commercial heating systems temporary rapid fill (First fill new system)	Fluid 3
(Domestic Heating) Coils and jackets in heat exchangers – sealed and non-toxic	Fluid 3
Water cooled air conditioning units with no additives	Fluid 2
Photographic processing machines (no developer mixing)	Fluid 3
Photographic processing machines (developer mixing)	Fluid 4
Electro-plating, degreasing, de-scaling, stripping, pickling etc tanks, vats & vessels	Fluid 5
Commercial clothes washing machine (no Healthcare)	Fluid 4
Chemical cleaning without dismantling equipment <b>RA</b>	Fluid 3/4/5
Industrial process water which has been recirculated <b>RA</b>	

<b>Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document</b>	<b>DEFRA Guidance</b>
	Fluid 4/5
Industrial and universities laboratories	Fluid 5
School laboratories (including fume cupboards) <b>RA</b>	Fluid 4
Water filtration equipment <b>RA</b>	Fluid 2/3/4/5
Butchery meat contact	Fluid 5
Slaughterhouse equipment	Fluid 5
Vegetable washing	Fluid 5
Commercial dishwashing machine, no healthcare	Fluid 4
Pre wash rinse hose and trigger for dishwashing	Fluid 5
Rinsing water for dishes and utensils after cleaning	Fluid 3
Industrial cisterns/plant/chemicals <b>RA</b>	Fluid 3/4/5
Dyeing equipment <b>RA</b>	Fluid 3/ 4/5
Industrial disinfection <b>RA</b>	Fluid 3/4/5
Vehicle washing plant	Fluid 4
Vehicle washing plant with recycled water facility	Fluid 5
Degreasing facilities <b>RA</b>	Fluid 4/5
Brewery and distillation plant <b>RA</b>	Fluid 3/4
Water storage for agricultural purposes	Fluid 5
Pressure washing using bib tap connection, risk assessment required (Commercial) <b>RA</b>	Fluid 4/5
Pressure washers (hand held outlet) domestic use	Fluid 3
Water from another source (not water company)	<b>RA</b>
Autoclaves <b>RA</b>	Fluid 3/4/5
Steam facilities Industrial use <b>RA</b>	Fluid 3/4/5
Dairies <b>RA</b>	Fluid 4/5
Chemical plants <b>RA</b>	Fluid 3/4/5
Metal finishing plants <b>RA</b>	Fluid 4/5
Petroleum processing or storage plants <b>RA</b>	Fluid 4/5
Radioactive material processing plants or nuclear reactors	Fluid 5
Abattoirs	Fluid 5
Processing, manufacturing or using toxic chemicals <b>RA</b>	Fluid 4/5
Chemical laboratories (exc. School labs) <b>RA</b>	Fluid 4/5
Pathology laboratories (all labs)	Fluid 5
Sanitary depots (waste disposal, processing)	Fluid 5
Food and beverage processing plants <b>RA</b>	Fluid 4/5
Caravan parks – supply connection to individual static caravan holiday homes and park homes <b>RA</b>	Fluid 3
Caravan parks – touring and motor caravans, temporary connection	Fluid 3
All Caravan parks, toilet waste emptying points and adjacent hose union taps	Fluid 5
Marinas (canal, river and port) <b>RA</b>	Fluid 3/4/5

<b>Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document</b>	<b>DEFRA Guidance</b>
Premises with grey water re-use systems	Fluid 5
Connections to drains	Fluid 5
Cement batching plants (RPZ valve 6 month testing)	Fluid 4
Cement batching plant - Tarmac Dry Silo Mortar dry mix mortar silo unit (aka Silomate)	Fluid 3
Oil and gas production and transportation	Fluid 5
Paper and paper product production <b>RA</b>	Fluid 4/5
Swimming pool water	Fluid 5
All Ponds	Fluid 5
Premises with an alternative water supply	Fluid 5
Sewage treatment plants and sewage pumping stations	Fluid 5
<b>Hospitals – Medical facilities</b> NOTE: Veterinary & dental equipment is rated as for hospital-medical	
Equipment used for handling, mixing and processing chemical and microbiological substances	Fluid 5
Dental Console	Fluid 5
Haemodialysis machines (Home)	Fluid 3
Dissecting rooms in hospitals and medical building	Fluid 5
Mortuary equipment used in funeral parlours, mortuaries,	Fluid 5
Autopsy areas	Fluid 5
Sluice room for water disposal	Fluid 5
Operating theatres in hospitals and medical buildings	Fluid 5
Baths and showers in healthcare premises	Fluid 5
Medical or dental equipment with submerged inlets	Fluid 5
Laboratories	Fluid 5
Bedpan washers	Fluid 5
Clothes washing for health care use	Fluid 5
Clothes washing machine no health care (nurses accommodation)	Fluid 3
Renal Dialysis, maintenance regime, consult with Water Company	Fluid 4
Cross connect NHS, mains to pumped distribution, connect as short as possible, regular flushing	Fluid 4
Dishwashing nursing homes, on-site healthcare provided	Fluid 5
Dishwashing care homes /sheltered housing no healthcare <b>RA</b>	Fluid 3/4
<b>Fixtures and Appliances- General</b>	
Bidet ascending spray	Fluid 5
Ice making machines	Fluid 2
Fixtures used for food preparation e.g. Sinks	Fluid 5
Fixtures used for ablutions e.g. Baths, bidet's (over rim), basins, showers non healthcare	Fluid 3
Baths & showers in residential accommodation, <b>RA</b>	Fluid 3
Clothes and dishwashing machines for domestic use, including offices and hair salons	Fluid 3

<b>Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document</b>	<b>DEFRA Guidance</b>
Washing machines at dog and cat kennels (animal welfare use)	Fluid 5
Hair salons basins or troughs	Fluid 3
Carbonated drink dispensing machines	Fluid 3
Hot water	Fluid 2
Drink-dispensing equipment, with ingredients	Fluid 3
Drink-dispensing equipment no ingredients	Fluid 2
Sanitary disposal equipment	Fluid 5
Steam ovens pressurised	Fluid 5
Steam ovens un-pressurised	Fluid 3
Dry cleaning, closed circuit cooling system	Fluid 2
Counter top glass washing machine	Fluid 3
Bottle washing apparatus <b>RA</b>	Fluid 4
<b>Hose Attachment Outlets</b>	
External hose taps – domestic premises, hand held hose	Fluid 3
Flexible connections over domestic fixtures (excluding sinks and bidets, toilets)	Fluid 3
Flexible connections over domestic sinks, bidets and toilets	Fluid 5
Laboratory outlets (exc. school labs)	Fluid 5
Non-domestic hose union taps <b>RA</b>	Fluid 3/4/5
Hose union taps at dog and cat kennels, animal grooming parlours	Fluid 5
Domestic hand held fertiliser spray	Fluid 3
Commercial/domestic irrigation with sprinkler heads 150mm above soil level	Fluid 3
Flushing newly installed pipework prior to connection, max supply 25mm	Fluid 3
Swimming pools domestic, hose union tap, self closing trigger	Fluid 3
Swimming pools commercial, hose union tap, self closing trigger, agreement required	Fluid 4
<b>Water Supply Systems Permanently Attached</b>	
Steam Boilers	Fluid 4
Cooling towers	Fluid 5
Steam calorifier	Fluid 4
<b>Water Treatment Systems</b>	
Demineralising equipment using ion-exchange resins with acid and alkali regeneration	Fluid 3
Plants with auxiliary-unwholesome water supplies	Fluid 5
Potable water in reclaimed water plants unwholesome	Fluid 5
Chlorinators	Fluid 3
In-line water softeners, filters and conditioners (UK Domestic)	Fluid 2
Commercial softening plant (salt regeneration only)	Fluid 3
Commercial softening plant using other than salt	Fluid 4
Grey water recycling systems/rainwater collection	Fluid 5

Installations compiled from DEFRA guidance and examples of installations given in AS/NZ 3500.1.2 and AWWA M14 document	DEFRA Guidance
Sewage treatment	Fluid 5
<b>Fire Services</b>	
Dedicated fire main, direct connection to public water supply only no additives or booster pumps	Fluid 2
Dedicated fire main, direct connection to public water supply, with additives or booster pumps	Fluid 4
Dedicated fire hose reels	Fluid 3
Fire hose reels, where there is a possibility of being used for purposes other than fire fighting RA	Fluid 4/5
Fire storage tank (open topped unsealed)	Fluid 5
Fire storage tank (hygienic, screened outlets etc)	Fluid 4
Fire sprinkler system without anti freeze solution, protection at every branch	Fluid 2
Fire sprinkler system – flow through (wholesome materials used)	Fluid 2
Fire sprinkler system with anti freeze solution	Fluid 4
Hydrants (abattoir) supply to	Fluid 5
Key marked as <b>RA</b> require a risk assessment to verify fluid risk level	

## 5.7 Format of the Backflow Matrix for publication

The contactor agreed as part of this research contract to ensure that the format of the backflow guidance is in a format suitable for inclusion into the Guidance and provide guidance on how to include it.

The contractor after discussions with the DWI project manager has agreed that WRc-NSF will consult with WRAS to include this backflow guidance within the WRAS website and if required provide DEFRA or the DWI with this guidance in any format it requires.

## 5.8 Whole Site and Zone Backflow Protection

The contactor agreed as part of this research contract to address both whole site and secondary backflow protection. The contractor after discussions with the DWI project manager has agreed that the WRAS Technical Committee and its Installation and Guidance document 9-04-05 issue 2 are now addressing this issue. The Technical Committee has tasked a working group to address the Water Industry concerns about implementation, responsibilities and ramifications for maintenance of whole site backflow prevention devices.

## 6. CONCLUSIONS PART A UPDATING REGULATORY PROTECTION OF WATER SUPPLIES AGAINST CONTAMINATION BY BACKFLOW

Whilst updating the guidance on Regulatory protection of water supplies against contamination by backflow it became apparent that the current method of specifying the type of backflow device that can be used to protect against a given risk or installation as required by the tender document is adequate and requires no further clarification. It is considered that ample clarification is given in Schedule 6 of the Regulations upon the appropriate backflow prevention devices that can be used to protect the Water Supply against a given fluid risk. In America and Australia the type of backflow preventer too be used in high risk situations (our fluid 5 risk) is always stipulated, the reasons being:

- Large range of more complex backflow preventers, especially atmospheric devices.
- Mechanical backflow valves are used to protect the water supply from the highest risk fluids.

It is assumed that because of these two points that America and Australia define the installation and exact type of device(s) to be used to protect the water supply within specific installations. In future, if more complex valves are available and mechanical devices are allowed to protect against FC5 within the Regulatory requirements, then consideration should be given to more closely specifying exact valves to be used for particular high risk installations.

Allowing mechanical backflow preventers (RPZ valves) to protect the water supply from high risk installations (fluid 5) at the boundary of a property is already being implemented by the Water Industry Information and Guidance document 9-04-05. This document suggests that a fluid 4 backflow preventer can be used to protect the whole site from high risk fluids with certain caveats attached with point of use protection still required.

Comments received from the Water Industry request that mechanical devices be considered to protect against fluid category 5 risk (see clause 5.4 8.).

The Backflow Matrix Table 1 was compiled from examples of fluid risk from the UK, Australia, USA and Europe, the contractor has interpreted the defined risk category and attenuated that risk to a fluid risk category 1 to 5 as defined in the Water Supply (Water Fittings) Regulations 1999. Table 1 was then circulated to the Water industry for comment, the matrix was then amended as consequences of the comments received and is presented as Table 2 (see clause 5.5) and the questions raised by the water industry are set out in clause 5.4.

A final Backflow Matrix was then produced and is presented as Table 3 (see clause 5.6).

The final Backflow Matrix or list of installations and the appropriate fluid risk category is not considered to be exhaustive and will produce a certain amount of debate within the Water Industry, as individuals will compare the Backflow Matrix with the published guidance for the Water Supply (Water Fittings) Regulations 1999. The contractor believes that the number and type of installations presented within the Backflow Matrix will be beneficial in helping the Water Industry enforce the Regulations in a consistent fashion and in addition help the public clearly understand their responsibilities when complying with the Water Supply (Water Fittings) Regulations 1999.

## **7. PART B: REVIEWING REGULATORS' SPECIFICATIONS AGAINST EN STANDARDS**

The Water Supply (Water Fittings) Regulations 1999 prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard i.e.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the Regulator.

Many fittings (and products) are thereby specified under 4 (d), Regulators' Specifications, to ensure that they are of an appropriate quality and are suitable for the circumstances and function for which they are used.

The review of the existing Regulators' Specifications, especially with regard to updating references to associated EN's and similar; simplification; and updating references

generally. That includes identifying those parts of standards, which are for the express purposes of the Regulations, as opposed, for example, to fitness for purpose generally.

## **7.1 Proposed format of the future Regulators' Specifications**

The format of the Regulators' Specifications needs to be considered as it was envisaged that with the publication of European Standards that the Regulators' Specifications would be deleted and reference made wholly to the appropriate European Standard in its entirety as a means of ensuring compliance with the essential requirements of the Water Supply (Water Fittings) Regulations 1999. However if a reference to the complete European Standard is made then additional test requirements will be imposed over and above those imposed by the existing Regulators' Specifications as European Standards generally require flowrate, pressure drop, dimensional, material requirements and acoustic testing. European Standards always exceed the number of requirements than those required by the existing Regulators' Specifications (but do not necessarily ensure the essential requirements of the Water Regulations are satisfied). European Standards ensure fitness for purpose, whereas the Regulators' Specifications are restricted to preventing contamination and to conserving water. If the Regulators' Specification requires a product to comply with the complete European Standard then this will impose additional expense and bureaucracy upon manufacturers with no additional benefit for water conservation or backflow prevention for the Water Industry or the consumer.

As an example the cost of WRAS approval for a pillar tap would be approximately £950, the cost of testing against EN200 including the acoustic requirement would be approximately £2500.

As part of this review the contractor after discussions with the DWI project manager agreed that only the exact clauses within the European Standards should be referenced within the proposed Regulators' Specifications.

It is envisaged that the Regulator must have a mechanism in place that requires water products to satisfy minimum performance requirements; at present the Regulator relies upon the Regulators' Specifications. If these Specifications are deleted then the Regulator must introduce another mechanism that requires water related products to meet minimum performance criteria. Any new Regulatory mechanism will certainly require notification to the EU and agreement by all member states. This need to retain the Regulators' Specifications can be best illustrated by the protracted discussions required during the production of the European standard EN 997 WC pans and WC suites. The working group responsible for the production of the standard ignored the UK requirements and practices including the maximum flush volume and published the standard in 1999. As the Regulators' Specifications are Regulatory requirements and as such are required to be included or accommodated within the European standard. After correspondence from the UK delegation and with the backing of CEN, the working group was instructed to include the UK Regulatory requirements within the standard, and was subsequently re-printed in 2003. Without the UK requirements being Regulatory (Regulators' Specifications) the UK requirements would have been ignored.

The Contractor recommends that the Regulators' Specifications rather than be deleted make reference only to the exact clause(s) within a European Standard and accompanied with a statement that the product must meet this requirement to verify compliance with the Water Supply (Water Fittings) Regulations. The Regulators' Specifications will not specify the exact test procedure or any acceptance criteria, as the European Standard document will include all this information.

## **7.2 Obsolete Standards**

If the status of a standard is classified as obsolescent then the associated test procedure will be retained, as there may in the future be a need to manufacture components to that standard that can be installed in existing water systems.

This is particularly true of components used with tube for below ground use. According to BS 1555: 1997, a Standard which is classified as “Obsolescent” and is no longer updated, but it is retained to provide for the servicing of existing equipment that is expected to have a long working life.

### **7.3 New Plastic Pipe Materials and Joints**

The number of European Standards published in the last 5 years for plastic tube and joints has been considerable. These Standards need to be produced as new pipe and joints are developed.

These new materials and joints need to be introduced or recognised by the Regulators’ Specifications. They can be introduced/recognised in one of three ways

- i) Production of new Regulators’ Specifications
- ii) Amend the existing Regulators’ Specifications to be more generic to encompass all types of tube and fittings,
- iii) The standards to be deemed as equivalent. This equivalence approach would be based upon the performance requirements (as they apply to water conservation and prevention of contamination Regulation 4(2) (c)) being deemed equivalent and therefore considered to be appropriate.

European Standards that require introduction or recognition are presented in Appendix B of this report.

### **7.4 Additions**

Whilst identifying current standards it became apparent that a number of Regulators’ Specifications did not include all the appropriate standards, the main reason for this being the introduction of a standard for an additional product for a generic group. The following Regulators’ Specifications require additions to the requirements:

- 1111.2 Add reference to BS 1212 pt4
- 1112.1 Add reference to BS EN 1254 pt’s 1, 2, 3 and 4 (allows for deletion of 1113.1)
- 1112.6 Add reference to BS EN 12201 pt5 table 3
- 1112.7 Add reference to BS 1212 pt4 clause 16.1
- 1211.4 Add reference to BS 1212 pt4
- 1212.3 Add reference to BS EN 61770 clause 9.1.6
- 1312.9 Add reference to BS EN 1254 pt3 clause 5.5
- 1314.7 Add reference to BS EN 1254 pt3 clause 5.4

### **7.5 Justification for amending and deleting test procedures**

As part of producing this review of the Regulators’ Specifications the proposed amendments that are made to the Specifications are to be justifiable in that they provide a benefit for Water Conservation or prevention of contamination. However the degree of Water Conservation that can be achieved by products connected to the domestic supply may be extremely small per product installed, but the number of products installed countrywide will be enormous. Therefore benefits of zero leakage being a Regulatory requirement can have an extremely large impact upon water conservation countrywide.

Justification for amending the test procedures includes the removal of references to withdrawn or superseded Standards these being either BS or BS EN documents. If references are made to superseded or withdrawn Standards then these will be highlighted in the index table and the appropriate Standard referenced. If the test procedure within the up to date standard is more onerous than the test procedure already available and the procedure is still considered valid then the existing test procedure can be retained but the reference to the withdrawn or superseded Standard number should be removed from the Specification. A further option that requires consideration is that the new more onerous

procedure could be offered as an alternative test and therefore encompass the up to date standard. This approach is considered appropriate in ensuring that progressive enhancement of product standards do not impose excessive demands upon water products that do not produce benefits of Water Conservation or contamination.

The principles of the Water Supply (Water Fittings) Regulations 1999 ensure that all products or installations **do not**

1. Waste Water
2. Misuse Water
3. Unduly Consume Water
4. Contaminate Water

When a product standard is being developed the performance characteristics of the product are essential for the production of the standard but could be considered excessive when utilised as criteria for ensuring compliance with the Water Regulations. Because of this the review of the test procedure with a more onerous test from an up to date standard will only be suggested if it is considered appropriate.

## 7.6 Deleted Test Procedures

There are a total of 47 test procedures that need to be deleted. The comment in italics is the justification for deletion.

- 1111.12** This is a closure test for bidet combination tap assemblies.  
*This test is identical to 1111.5 and 1111.7 duplication is not required.*
- 1112.12** This is a porosity test.  
*The Regulators Specification on backflow prevention 1111.21/23/24 has superseded this test.*
- 1113.1** This is a joint effectiveness test to ensure that all joints in an assembly are watertight after being subjected to an internal pressure.  
*The test is exactly the same as that in procedure 1112.1. Procedure 1113.1 can be consolidated into procedure 1112.1 by adding the reference to capillary and compression fittings see 1112.1 (m) and adding to the requirement and the principle "The Body and any joints".*
- 1113.4** This is a water tightness test at positive and negative pressure.  
*This test has been superseded by The Regulators' Specifications on backflow prevention, procedure 1111.21.*
- 1211.10** This is an endurance test.  
*This test has been superseded by The Regulators' Specifications on backflow prevention, procedure 1211.24.*
- 1211.11** This is a sealing test.  
*This test has been superseded by The Regulators' Specifications on backflow prevention, procedure 1211.25.*
- 1212.5** This is a fatigue test.  
*The test refers to WIS document 4-32-06 and is considered to be an excessive requirement.*

- 1212.11** This is an elevated temperature test.  
*This test is already incorporated within procedure 1211.22.*
- 1212.12** This is a thermal shock test.  
*This test is already incorporated within procedure 1211.22*
- 1311.2** This is a deflection test for plastic floats for float operated valves.  
*It is considered that measuring the deflection of the float when subjected to hot water does not produce significant benefit for water conservation and that the endurance test 1212.4 ensures that the float can withstand elevated temperatures.*
- 1311.3** This is a deflection prevention inspection of backing plates for use with float operated valves.  
*This test is considered to have no relevance to the Water Regulations.*
- 1312.6** This is a deformation test for WC's.  
*This test has been superseded by the Regulators' Specifications for WC suites.*
- 1312.8** This is a deformation test for flushing cisterns for urinals.  
*This test is considered to not produce insignificant benefit for water conservation.*
- 1313.2** This is an impact test for WC's and urinal flushing cisterns.  
*This test has been superseded by the Regulators' Specification for WC suites.*
- 1313.4** *This is a valve opening test and is incorporated in procedure 1111.10*
- 1314.5** This is a compression/impact test for WC flushing cisterns.  
*This test has been superseded by the Regulators' Specification for WC suites.*
- 1314.6** This is a body-bending test.  
*This test has been superseded by the Regulators' Specification on backflow prevention, procedure 1312.15.*
- 1314.8** This is a multiple tension test and is not incorporated in the European Standard.  
*The single tension test is incorporated into procedure 1314.7*
- 1315.2** This is a torque test.  
*This test is considered to be inappropriate and torque requirements for a product should be specified by the manufacture.*
- 1315.4** This is a torque test.  
*This test is considered to be inappropriate, as it does not produce any benefits to water conservation.*
- 1315.5** This is a torque test.  
*This test is considered to be inappropriate, as it does not produce any benefits to water conservation.*

- 1315.6** This is a torque test.  
*This test is considered to be inappropriate, as it does not produce any benefits to water conservation.*
- 1411.2** *This is a corrosion protection requirement and is adequately covered by procedure 1411.1.*
- 1512.7** This is a consumption test for WC suites.  
*This test has been superseded by the Regulators Specifications for WC suites.*
- 1611.1** This is a contamination requirement re the number of joints within the primary coil,  
*This requirement is not included within the European Standard and is not considered worthwhile.*
- 1611.5** This is a requirement for a means of connection or disconnection to be provided on valves and fittings.  
*This test is considered to not produce any benefits to water conservation.*
- 1611.6** This is a backflow prevention test for type A & B air gaps.  
*This test has been superseded by the Regulators' Specification on backflow prevention procedures 2213.1 & 2213.12 respectively.*
- 1611.7** This is a flushing test for WC suites.  
*This test has been superseded by the Regulators Specifications for WC suites.*
- 1611.10** This is a visual inspection upon the means of operation of the valve.  
*There is no requirement for this within the Water Supply (Water Fittings) Regulations 1999.*
- 1612.1** This is a water tightness test on the siphonic apparatus of a WC.  
*This test has been superseded by the Regulators' Specifications for WC suites.*
- 1711.2** This is an operating efficiency test.  
*This procedure is not referenced for any product that is listed within the existing test criteria.*
- 2211.1** This is a practical air gap test for fire sprinkler cisterns.  
*This procedure has been superseded by procedures 2213.1 and 2213.12.*
- 2212.1** This is an air gap test Type B.  
*This test has been replaced by the Regulators Specification air gap AG procedure.*
- 2212.7** *This is a vacuum test and has replaced by the Regulators Specification for air gaps `AG`.*
- 2212.8** *This is a vacuum test for washing machines and has been replaced by the Regulators Specification air gap AG procedure 2212.3.*

- 2212.9** *This is a vacuum test and is not referred to in the European Standard.*
- 2212.12** *This is a vacuum test and is not referred to in the European Standard.*
- 2213.4** This is a contamination test (air gaps).  
*This test has been superseded by the Regulators' Specifications for AUK 2 air gap see Procedure 2213.18.*
- 2213.9** *This is a pressure differential test and has been replaced by the Regulators Specification for backflow prevention 1111.16.*
- 5011.1** This is a measurement of linear dimensions.  
*This procedure does not produce any significant benefit for water conservation. The essential requirements for measuring linear dimensions will be specified within the appropriate test procedure document.*
- 5011.2** This is a flushing test for WC suites.  
*This test has been superseded by the Regulators' Specifications on WC suites*
- 5011.3** *This is a dimensional requirement and has been superseded by the Regulators Specification for backflow.*
- 5011.5** This is a measurement of dimensions within a WC suite.  
*This test has been superseded by the Regulators' Specifications on WC suites.*
- 5021.1** This is a measurement of linear dimensions.  
*This procedure does not produce any significant benefit for water conservation.*
- 5021.2** This is a measurement of linear dimensions.  
*This procedure does not produce any significant benefit for water conservation.*
- 5031.1** *This is a capacity requirement and has no relevance to the Water Regulations.*
- 5031.2** *This is a capacity requirement and has no relevance to the Water Regulations.*

## **7.7 Amended Procedures**

The amended Regulators' Specifications listed below incorporate both partial amendments to standard references and complete amendments to the procedures. Some of the Specifications incorporate a large number of references to British and European Standards; a partial amendment will involve amendment to a small number of references. Regulators' Specifications 1111.1 has 10 references to Standards, one of the references is out of date and requires amendment.

- 1111.1** Reference to BS 5155, this standard has been withdrawn and replaced with BS EN 593. This standard allows the valve to have a leakage rate.  
**Action**, replace standard reference to refer to BS EN 593 clause 6.2 but maintain the old requirement i.e. no leakage.

- 1112.1** Reference to BS 3456, this standard has been withdrawn and replaced with BS EN 60335.2.35, refer to clause 22.102.  
Reference to BS 5071, this standard has been withdrawn and replaced with BS EN 60335.2.75, refer to clause 22.7.  
Reference to BS 5155, this standard has been withdrawn and replaced with BS EN 593; refer to clause 6.2 and BS EN 12266-3.
- 1112.2** Reference to BS 843, this standard has been withdrawn and replaced with BS EN 60335.2.21, refer to clause 22.101.  
Reference to BS 5258 pt1, this standard has been withdrawn and replaced with BS EN 483, refer to clause 7.2.3.  
Reference to BS 5258 pt7, this standard has been withdrawn and replaced with BS EN 89, refer to clause 7.2.3.  
Reference to BS 5258 pt8, this standard has been withdrawn and replaced with BS 7977 pt2, refer to clause 7.1.3.
- 1112.4** Reference to BS 2871, this standard has been withdrawn and replaced with BS EN 1057, refer to clause C2.
- 1112.8** Reference to BS 3456 pt3, this standard has been withdrawn and replaced with BS EN 60335.2.35, refer to clause 22.102.
- 1113.2** Reference to BS 864 pt5, this standard has been withdrawn and replaced with BS EN 1254 pt3, refer to clause 5.1 and 5.3.  
Reference to BS 4346 pt2, this standard has been withdrawn and replaced with BS EN 1452 pt5, refer to clause 4.3.
- 1212.1** Reference to BS 7491 pt1 and 2, this standard has been withdrawn and replaced with BS EN 13280, refer to Appendix H.
- 1311.5** Reference to clause 8.2, replace text and refer to clause 7.3 and Annex E.
- 1312.1** Reference to clause 8.1.1/2, replace text and refer to clause 7.2 and Annex D.
- 1321.1** Reference to BS 2871 pt1, this standard has been withdrawn and replaced with BS EN 1057, refer to clause 6.5, 8.5 and Appendix B.
- 1512.5** Reference to BS 3999 pt11, replace text with Regulation for domestic washing machines as G29.3.
- 3212.2** Flush volume for urinal replace text with Regulation for urinals as G25.12 and G25.13.

## **7.8 Observations**

The proposed amendments to the Regulators' Specifications have been directly taken from the appropriate BS, BS EN or prEN document, because this approach has been taken, it is assumed that the UK manufacturers and their trade organisations have had the opportunity to comment upon the technical content of the documents. Therefore the proposed changes made to the procedures and the requirements of the Regulators' Specifications are no different from those found within published documents and as such it is felt that liaison with industry and BSi is inappropriate at this time. The existing Regulators' Specifications make lots of inappropriate references to WRc and to the Water Byelaws; all these inappropriate references must be removed.

## 7.9 Overview

It can be seen from the Index to the test procedure document 7.10, Table 4 that there are a total 216 test procedures. From these there are 104 test procedures relating to backflow prevention and WC suites of which 25 have been deleted as they refer to criteria that have been superseded by the Regulators' Specifications for WC suites or the appropriate European Standards for backflow. From the 216 procedures, 47 test procedures have been deleted, 70 have been compiled, 7 require fully amending (12 amendments total) or replacing references to reflect the up to date reference to the appropriate standard. The remaining 92 test procedures are considered to be current and therefore require no amendment.

The conclusions of the review of the Regulators' Specifications are as follows if the recommendations of this report are implemented.

Total Number of Published Regulators' Specifications	216
Number of Regulators Specifications Deleted	47
Number of Regulators Specifications Deleted/compiled	70
Number of Regulators Specifications Amended	7 (12)
Number of Regulators Specifications Current	92
Number of Regulators Specifications Compiled <sup>1</sup>	18 (compiled from EN's)
<b>Total Number of Regulators' Specifications</b>	<b>117</b>

**7.10 Table 4 Index to actions required to Regulators' Specifications including replacing with up to date references, compiling into generic groups and deleting inappropriate Specifications**

<u>Test Procedure Number</u>	<u>Issue No:</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
1111.1	1	Taps (all) and valves (various)	Closure	Current Current Current Current Current Current Replace  Current Compile Current Current	BS 750 clause 7.2.1 BS 1010 pt2 clause 1.7 BS 2580 clause 18 BS 2767 clause 5.4.2.2 BS 2879 clause 18 BS 5155 clause 12  BS 5163 clause 18.2,19.1/2 BS 5412 clause 8.2.2 BS 5433 clause 8 BS 6675 clause 12 WRAS Generic test	None None None None None None Replace with BS EN593 clause 6.2 but maintain requirement no leakage None Delete reference & compile within procedure 0200.2 None None None
1111.2	1	Valves-float operated (all)	Closure	Current Current Current Add	WRAS Generic test BS 1212 pt 1 clause 15b BS 1212 pt 2 clause 5.2 BS 1212 pt 3 clause 24.2	None None None None Add reference to BS 1212 pt4
1111.3	1	Valves-thermal and pressure relief	Closure - Pressure Conditions	Compile	WRAS Generic Test	Compile with reference to: BS EN 1487 clause 9.4.2.1/2/4/5 & 9.4.1 BS EN 1488 clause 9.4.2.1/2/4/5 & 9.4.1 BS EN 1489 clause 6.2.2/3/5/6 & 5.2 BS EN 1490 clause 6.3.1/2/4/5 & 5.2 BS EN 1491 clause 6.2.2/3/5/6 & 5.2
1111.4	1	Valves-thermal and pressure	Closure - Temperature	Compile	WRAS Generic Test	Compile with ref to BS EN 1490 clause 6.2
1111.5	1	Type 'HC' backflow device	Closure - Diverter	Compile	BS EN 1111 clause 9.6	Compile with ref to prEN 14506 clause 10.4 include within prEN 200 for no backflow protection clause 7.7 & 7.8
1111.6	1	Valves-pressure limiting and reducing	Closure at set outlet pressure	Current	WRAS Generic Test BS 6283 pt4 Appendix D	None
1111.7	1	CTA with manual diverter	Closure - Diverter	Compile	WRAS Generic Test	Compile with prEN200 clause 7.6
1111.8	1	Valves, non-return	Closure - HP Downstream	Current	WRAS Generic Test	None
1111.9	1	Type 'E' backflow device	Closure - (LP)	Compile	PrEN 164167 clause 7.6	Compile with current prEN 13959 Clause 11.5

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
1111.10	1	Type 'E' backflow device	Closure - (HP)	Compile	PrEN 164167 clause 7.7	Compile with current prEN 13959 Clause 11.6
1111.11	1	Valves, non-return	Closure - LP Downstream	Current	WRAS Generic Test	None
1111.12	1	Bidet Diverter	Closure	Delete	WRAS Generic Test	Delete as tests 1111.5 & 1111.7 cover this specification
1111.13	1	Type 'BA' backflow device	Closure - (LP)	Compile	PrEN 12729 clause 9.5.2	Compile with current BS EN 12729 Clause 9.6.2
1111.14	1	Type 'BA' backflow device	Closure - (HP)	Compile	PrEN 12729 clause 9.5.1	Compile with current BS EN 12729 Clause 9.6.1
1111.15	1	Type 'BA' backflow device	Closure - (LP)	Compile	PrEN 12729 clause 9.5.3	Compile with current BS EN 12729 Clause 9.6.3
1111.16	1	Type 'BA' backflow device	Pressure Differential	Compile	PrEN 12729 clause 9.6.4/5	Compile with current BS EN 12729 Clause 9.7.4 & 9.7.5
1111.17	1	Type 'BA' backflow device	Closure - Relief Valve	Compile	PrEN 12729 clause 9.6.6	Compile with current BS EN 12729 Clause 9.7.6
1111.18	1	Type 'CA' backflow device	Closure - Leaktight	Compile	PrEN W1097 clause 9.5.1	Compile with current prEN 14367 Clause 9.5.1
1111.19	1	Type 'CA' backflow device	Closure	Compile	PrEN W1097 clause 9.5.2	Compile with current prEN 14367 Clause 9.5.2
1111.20	1	Type 'HA' backflow device	Closure - (LP)	Compile	PrEN W1 108 clause 7.6 & AS/NZ 2845 pt1 clause Q	Compile with current prEN 14454 Clause 10.4
1111.21	1	Type 'DA' backflow device	Closure - Leaktight	Compile	PrEN W1 111 clause 11.2	Compile with current prEN 14451 Clause 10.4
1111.22	1	Type 'LA' backflow device	Closure - Leaktight	Compile	PrEN W1 D58 clause 11.3	Compile with current prEN 14455 Clause 10.5
1111.23	1	Type 'HA' backflow device	Closure- (HP)	Compile	PrEN W1 108 clause 6.5	Compile with current prEN 14454 Clause 10.6
1111.24	1	Type 'DUK1' backflow device	Performance Tests	Current	BS 6282 pt4	None
1112.1	1	Various	Body Leakage	Current Current Current Current Replace Replace Replace Current Compile Current Current Current Current ADD	BS 750 clause 7.2.2 BS 1010 pt2 clause 1.7.1 BS 2580 clause 18 BS 2767 clause 5.4.2.1 BS 2879 clause 18 BS 3456 pt3 sec 3.9 clause 22.28 BS 5071 clause 4.6.5 BS 5155 clause 12.3, 12.4.1 BS 5163 clause 8, 18.2, 19.1 BS 5412/3 pt 2 clause 9.11 BS 5433 clause 8 BS 5728 pt3 clause 10.1.3.2 BS 6675 clause 12 WRAS Generic test	None None None None None Replace with BS EN 60335.2.35, clause 22.102 Replace with BS EN 60335-2-75. Clause 22.7 Replace with BS EN 593 clause 6.2 & BS EN 12266-3 None Compile in procedure 0200.0 None None None None None Add reference to cover all products and delete

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
					BS EN 1254 PT 1,2,3,4	procedure1113.1
1112.2	1	Various	Body Leakage	Current Current Replace Current Delete Amend  Current Current Current Current Replace Replace Replace Delete	WRAS Generic test BS417 pt2 clause 4.11 BS 699 clause 11.1 BS 843 clause 14.1 BS 853 clause 12.2 BS 1565 clause 15.1 BS 1566 pt1 clause 12.1/2  BS 1566 pt2 clause 12.1/2 BS 3377 clause 4 BS 4433 pt1 clause 1.13 BS 4433 pt2 clause 1.12 BS 5258 pt1 clause 7.3 BS 5258 pt7 clause 8.2 BS 5258 pt8 clause 8.2 BS 5918 appendix E clause E.2.2	None None Replace with BS EN 60335-2.21 clause 22.101 None Standard withdrawn and not replaced Amend text, refer to clause 16.1 and 16.2  None None None None Replace with BS EN 483 clause 7.2.3 Replace with BS EN 89 clause 7.2.3 Replace with BS 7977-2 clause 7.1.3 Standard withdrawn and not replaced
1112.3	1	Type 'BA' backflow device	Body Leakage	Compile	PrEN 12729 clause 9.4.1	Compile with current BS EN 12729 Clause 9.5.1
1112.4	1	Tube-copper	Body Leakage	Replace	WRAS Generic test BS 2871 pt1 clause 9.	Replace with BS EN 1057 clause C.2
1112.5	1	Tube-stainless steel	Body Leakage	Current	WRAS Generic test BS 2871 pt 2 clause 10	None
1112.6	1	Tube-plastics and rubber	Body Leakage	Outdate d Current/ sus Current/ sus Current/ sus Add  Current/ sus	WRAS Generic test BS 1972 clause 8.1.1 BS 3505 clause 6.4 BS 4991 clause 6.3 & app D BS 6572 clause 5.2.1  BS 6730 clause 5.2.1	Out of date but still required by industry for repair Suspended but still required by industry Suspended but still required by industry Suspended and replaced by BS EN 12201-1/2&5, amend TCS by adding reference to these standards, clauses. BS EN 12201 exceeds the existing requirements, nearest test referred to in EN 12201-5, table 3, leaktightness under internal pressure, mechanical joints.  Suspended and replaced by BS EN 12201-1/2&5, Amend TCS by adding reference to these standards, clauses. BS EN 12201 exceeds the existing requirements, nearest test referred to in EN 12201-5, table 3, leaktightness under internal pressure,

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
				Add		mechanical joints. New plastic Pipe materials and joints see 7.3 and appendix B
1112.7	1	Valves, float operated (all)	Body Leakage	Current Current Current Add	WRAS Generic test BS 1212 pt1 clause 15a BS 1212 pt2 clause 5.1 BS 1212 pt 3 clause 24.1 BS 1212 pt4 clause 16.1	None None None Will ensure all valve types are tested
1112.8	1	Heaters, electric instantaneous, open outlet	Body Leakage	Replace	WRAS Generic test BS 3456 pt3 section 3.9 clause 22.28	Replace with BS EN 60335-2-35 clause 22.102
1112.9	1	Type 'CA' backflow device	Body Leakage	Compile	prEN W1097 clause 9.4.1	Compile with current prEN 14367 Clause 9.4.1
1112.11	1	Combination HW storage units	Body Leakage	Current	WRAS Generic test BS 3198 clause 13.1	None
1112.12	1	DA Vacuum breakers	Porosity	Delete	WRAS Generic test BS 6282 pt2 clause 9 BS 6282 pt3 clause 9 BS 6282 pt4 clause 8	Delete Superseded by Regulators Specification on Backflow 1111.21/23/24.
1112.14	1	Expansion vessels	Body Leakage	Current	WRAS Generic test, loosely based upon BS 6144	None
1112.15	1	Type 'E' backflow device	Body Leakage	Compile	PrEN 164167 clause 7.4	Compile with current prEN 13959 Clause 11.3
1112.17	1	Type 'LA' backflow device	Body Leakage	Compile	PrEN W1 D58 clause 11.2	Compile with current prEN 14455 Clause 10.4
1113.1	1	Valves	Joint Effectiveness	Delete Delete Delete Delete Delete Delete	BS 864 pt2 clause 13.1 BS 1010 pt2 clause 1.7.2 BS 5071 clause 4.6.5 BS 5412 BS 5433 clause 8 WRAS Generic test	Delete, updated ref to BS EN 1254 added to TCS 1112.1  ALL TESTS INCLUDED IN TCS 1112.1
1113.2	1	Fittings with connections for plastic pipes	Joint Effectiveness	Outdate d Replace Replace Outdate d	WRAS Generic test BS 864 pt3 clause 19 BS 864 pt5 BS 4346 pt2 clause 5.11 BS 5114 clause 4.1	Out of date but still required by industry for repair Replace with BS EN 1254-3 clause 5.1 & 5.3 Replace with BS EN 1452-5 clause 4.3 Out of date but still required by industry for repair New plastic Pipe materials and joints see 7.3 and appendix B.
1113.4	1	DA Vacuum Breakers	Water Tightness	Delete Delete Delete	WRAS Generic test BS 6282 pt3 clause 13 BS 6282 pt4 clause 8	Delete Superseded by Regulators' Specification procedure 111.21

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
1113.5	1	Floats, copper for HW use	Joint Effectiveness	Current	BS 1968 Section 9	None
1211.1	1	Valves, stop, solenoid operated	Endurance - Solenoid	Current	WRAS Generic test	None
1211.2	1	Taps (all) and valves (in draw-off situations)	Endurance - Tapware	Compile	WRAS Generic test believed to be derived from BS 5412, 2 options available.	Compile with prEN 200 (rev) clause 11.1
1211.3	1	CTA with swivel outlet	Endurance - Swivel	Compile	WRAS Generic test believed to be derived from BS 5412, 2 options, single or divided outlet.	Compile with prEN 200 (rev) clause 11.3 (single outlet) Compilation document 0200.1 accounts for double outlets.
1211.4	1	Valves, float operated (except continuous HW use)	Endurance - Float Valves	Current Add	WRAS Generic test BS 1212 part 1/2/3 BS 1212 pt 4	None Add reference to ensure all valve types have test criteria
1211.5	1	Type 'HC' backflow device	Endurance - Auto Diverter	Compile	AHG1 Feb 1999	Compile with current prEN 14506 clause 10.5 include within prEN 200 (rev). For no backflow protection clause 11.2
1211.6	1	Heaters, electric thermal storage etc	Temperature Rise	Current	Generic WRAS test derived from BS 843	BS EN 603352-21 now applies but the temp rise test is not incorporated into the standard therefore maintain.
1211.7	1	Taps, self-closing	Endurance	Current	EN 816	None
1211.8	1	Type 'BA' backflow device	Endurance - 5000 RPZ	Compile	PrEN 12729 clause 9.4.2	Compile with current BS EN Clause 9.5.2 Test 3
1211.10	1	DA Vacuum Breakers	Endurance	Delete	IGN 5-11-03 Clause 12 IGN 5-11-04 Clause 8 BS 6282 Clause 12	Delete superseded by Regulators' Specification 1211.24
1211.11	1	DA Vacuum Breakers	Sealing	Delete	BS 6282 pt 3 clause 14 IGN 5-11-03/04 clause 14 & 8.6	Delete superseded by Regulators' Specification 1211.25
1211.12	1	Type 'E' backflow device	Endurance - Check Valve	Compile	PrEN 164167 clause 7.10	Compile with current prEN 13959 Clause 11.9
1211.14	1	Valves intended for shower control	Endurance - Shower Control	Current	WRAS Generic test	None
1211.15	1	Valves, drop for toilets	Endurance	Current	Water Regulations 1999	Refer to BS EN 997 Clause 6.7
1211.16	1	Valves, water supply for instantaneous water heaters	Endurance	Current	WRAS Generic test	None

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
1211.17	1	Unvented Hot Water Systems	Performance (bubble)	Current	WRAS Generic Test	None
1211.18	1	Type 'CA' backflow device	Endurance - CA Devices	Compile	PrEN W1097 clause 9.4.3	Compile with current prEN 14367 Clause 9.4.3
1211.19	1	Type 'CA' backflow device	Endurance - CA Devices	Compile	PrEN W1097 clause 9.4.4	Compile with current prEN 14367 Clause 9.4.4
1211.20	1	Type 'DB' backflow device	Endurance	Compile	Pr EN W1 112 Clause 11.6	Compile with current prEN 14452 Clause 10.8
1211.21	1	Remote/non-touch actuators	Endurance	Current	WRAS Generic test	None
1211.22	1	Type 'BA' backflow device	Endurance	Compile	PrEN 12729 clause 9.4.2	Compile with current BS EN 12729 clause 9.5.2 Test 1 & 2
1211.23	1	Type 'HA' backflow device	Endurance	Compile	Pr EN W1 108 Clause 6.7	Compile with current prEN 14454 Clause 10.9
1211.24	1	Type 'DA' backflow device	Endurance	Compile	Pr EN W1 111 Clause 11.6	Compile with current prEN 14451 Clause 10.8.1
1211.25	1	Type 'DA' backflow device	Endurance	Compile	Pr EN W1 111 Clause 11.6.3	Compile with current prEN 14451 Clause 10.8.2 & 10.8.3
1211.26	1	Type 'LA' backflow device	Endurance	Compile	Pr EN W1 DS8 Clause 11.8	Compile with current prEN 14455 Clause 10.10
1212. 1	6	Cisterns Plastics	Accelerated Ageing	Replace Replace Current	BS 7491 Pt 1 BS 7491 Pt2 BS 4213	Replace with current BS EN 13280 Appendix H Replace with current BS EN 13280 Appendix H None
1212.3	1	Fittings and pipes etc for domestic appliances	Accelerated Ageing	Current Add	BS 7291 Pt 1 Appendix C BS EN 61770 clause 9.1.6	None This addition will ensure all these type of products are tested
1212.4	1	Floats, all materials, not for continuous HW use	Accelerated Ageing	Current	BS 2456 Clause 4.1 Appendix C	None
1212.5	1	Pipes, plastics	Fatigue Test	Delete	WIS 4-32-06 Appendix C	Delete, this test is over and above that considered acceptable to show compliance with the Water Regulations
1212.6	1	Fittings and pipes etc not for continuous HW use	Accelerated Ageing	Current	WRAS Generic test	None
1212.7	1	Float operated switches including HW use	Accelerated Ageing	Current	WRAS Generic test	None
1212.10	1	Fittings and pipe etc for continuous HW use	Accelerated Ageing	Current	BS 7291 Pts 1/2/3/4	None
1212.11	1	BA Valves-reduced pressure zone	Elevated Temperature	Delete	Pr EN 164108	Superseded by Regulators' Specification 1211.22
1212.12	1	BA Valves-reduced pressure zone	Thermal Shock	Delete	Pr EN 164108	Superseded by Regulators' Specification 1211.22
1311.1	1	Cistern lids, all materials	Deflection	Compile	WRAS Generic test	Compile with BS EN 13280 Annex J

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
1311.2	1	Plastic Floats	Deflection	Delete	BS 2456 Section 4 Appendix D	Delete, test has no relevance to the Water Regulations
1311.3	1	Backing Plate	Deflection	Delete	BS 4213 Appendix R	Delete, test has no relevance to the Water Regulations
1311.4	1	Valves, float operated, all uses	Deflection	Current	WRAS Generic test BS 1212 Pt 1 Clause 15C BS 1212 Pt 3 Clause 20.4	None None None
1311.5	1	Cisterns, plastics	Deflection	Replace	WRAS Generic test BS 4213 Section 8.2	None Replace text, refer to clause 7.3 and Annex E
1312.1	1	Cisterns, plastics	Deformation	Replace	WRAS Generic test BS 4213 Clause 8.1.1/2	None Replace text, refer to clause 7.2 and Annex D
1312.2	1	Compression fittings (metal) for imperial plastics tubes	Deformation	Current/ Ob	WRAS Generic test BS 864 Part 3 Clause 21	Current obsolescent New plastic Pipe material and joints see 7.3 and appendix B.
1312.3	1	Type 'E' backflow device	Deformation	Compile	BS 6282 Pt 1 Clause A.8	Compile with current prEN 13959 Clause 11.4
1312.5	1	Floats, all materials - all applications	Deformation - Boss	Current	BS 2456 Clause 4.5	None
1312.6	1	WC Flushing Cisterns	Deformation	Delete	BS 7357 Sec 2 Clause 5 BS 1125 Sec 2 Clause 5	Superseded by Regulators' Specifications for WC suites
1312.7	1	Cisterns, GRP (one piece)	Impact	Compile	BS 7491 Pt 1/2	Compile with BS EN 13280 Annex C.1 & f & clause 7.2.2
1312.8	1	Automatic Flushing Urinal	Deformation	Delete	WRAS Generic test	Delete, test has no relevance to the Water Regulations
1312.9	1	Compression fittings, metal or plastics, for metric plastics tubes	Deformation	Current/ Ob Current/ Ob	WRAS Generic test BS 864 Pt 4 Clause 11.3 BS 5114 Appendix B	None, Add reference to BS EN 1254-3 clause 5.5 New plastic Pipe material and joints see 7.3 and appendix B. New plastic pipe materials and joints see 7.3 and appendix B
1312.10	1	Cisterns, GRP (sectional)	Impact	Compile	BS 7491 Pt 3	Compile with BS EN 13280 Annex C.2 clause 7.2.2
1312.11	1	Type 'CA' backflow device	Bending Strength	Compile	Pr EN W1097 Clause 9.4.2	Compile with current prEN 14367 Clause 9.4.2
1312.12	1	Type 'DC' backflow device	Bending Strength	Compile	Pr EN W1114 Clause 11.2	Compile with current prEN 14453 Clause 10.4
1312.13	1	Type 'DB' backflow device	Bending Strength	Compile	Pr EN W1112 Clause 11.4	Compile with current prEN 14452 Clause 10.6

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
1312.14	1	Type 'BA' backflow device	Bending Strength	Compile	Pr EN 12729 Clause 9.4.3	Compile with current BS EN 12729 Clause 9.5.3
1312.15	1	Type 'DA' backflow device	Bending Strength	Compile	Pr EN W1111 Clause 11.4	Compile with current prEN 14451 Clause 10.6
1312.16	1	Type 'LA' backflow device	Bending Strength	Compile	Pr En WI D58	Compile with current prEN 14455 Clause 10.8
1312.17	1	Type 'HA' backflow device	Bending Strength	Compile	Pr EN W1108 Clause 6.4	Compile with current prEN 14454 Clause 10.7
1313.1	1	Floats, all materials - all applications	Impact	Compile	BS 2456 Section 4.3	None
1313.2	1	Flushing Cisterns	Impact	Delete	BS 1125 Section 2 Clause 5	Superseded by Regulators' Specifications for WC suites
1313.4	1	Type 'E' backflow device	Valve Opening	Delete	Pr EN 164176 Clause 7.7	Incorporated in clause 11.6 see TCS 1111.10
1313.7	1	Type 'E' backflow device	High Flow Rate	Compile	Pr EN 164167 Clause 7.1	Compile with current prEN 13959 Clause 11.1
1314.1	1	Compression fittings (metal/plastics) for imperial plastics tubes	Tension	Current/Ob	BS 864 Pt 3 BS 5114	Maintain, BS EN 1254-3 does not include imperial sizes New plastic Pipe material and joints see 7.3 and appendix B.
1314.4	1	Floats - all materials - all applications	Tension	Current	BS 2456 Section 4.4	None
1314.5	1	WC Flushing Cisterns	Compression	Delete	BS 7357 Clause 5 BS 1125 Clause 5	Superseded by Regulators' Specifications for WC suites
1314.6	1	DA Vacuum Breakers	Tension	Delete	WRAS Generic test BS 6282 Pt 3 Appendix B	Delete Superseded by Regulators' Specifications for Backflow prevention TCS 1312.15
1314.7	1	Compression fittings (metal/plastics) for metric plastics tubes	Tension - Single	Current/Ob	BS 864 Pt 4 Clause 11.8	None, add ref to BS EN 1254-3 clause 5.4 New plastic Pipe materials and joints see 7.3 and appendix B.
1314.8	1	Compression fittings (metal/plastics) for metric plastics tubes	Tension - Multiple	Delete	BS 864 Pt 5 Clause 11.7	Delete, no multiple tension test in BS EN 1254, spec 1314.7 covers this requirement.
1314.9	1	Compression fittings (metal/plastics) for metric copper tubes	Tension	Current/Ob	Derived from BS 7291 Pt 4 Table 3 BS 864 Pt 5 Table 5	The standards have been superseded by BS EN 1254-2; however the test is more demanding, therefore retain the existing criteria. New plastic Pipe materials and joints see 7.3 and appendix B.
1314.10	1	Compression fittings (metal/plastics) for metric lead tubes	Tension	Current	Derived from BS 7291 Pt 4 Table 3 BS 864 Pt 5 Table 5	None, no standard for lead pipe None, no standard for lead pipe

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
1314.11	1	Fittings (metal/plastics) for use with polybutylene pipe	Tension	Current	BS 7291 Pt 2 Clause 3.10.1	None
1314.12	1	Fittings (metal/plastics) for use with cross - linked polyethylene (PEX) pipe	Tension	Current	BS 7291 Pt 3 Clause 3.10.1	None
1314.13	1	Fittings (metal/plastics) for use with polyvinyl chloride (PVC-C) pipe	Tension	Current	BS 7291 Pt 4 Clause 3.10.2	None
1314.14	1	Compression fittings (metal/plastics) for use with galvanised steel pipe	Tension	Current	WRAS Generic test Above and below ground	None
1314.15	1	Push-fit fittings metric	Tension	Current	WRAS Generic test	None
1315.1	1	Taps, draw-off, metal/plastics	Torque	Compile	BS 5412 clause 11.1	Compile with current prEN 200 clause 10.1
1315.2	1	Compression Pipe Fittings	Torque	Delete	WRAS Generic test	Delete, test has no relevance to the Water Regulations
1315.4	1	Backnuts	Torque	Delete	WRAS Generic test	Delete, test has no relevance to the Water Regulations
1315.5	1	Taps, draw off, metal/plastics	Torque	Delete	WRAS Generic test	Delete, test has no relevance to the Water Regulations
1315.6	1	Float Operated Valves	Torque	Delete	BS 1212 Pt 3 Appendix A	Delete, test has no relevance to the Water Regulations
1321.1	1	Tubes – copper	Deletious Film	Replace	BS 2871 Pt 1`	Replace with BS EN 1057 clause 6.5, 8.5 and Appendix B
1411.1	1	All applicable fittings	Dezincification Resistance	Current	BS EN ISO 6509 AS 2345 Table 1	None
1411.2	1	Safety valves	Corrosion Protection	Delete	WRAS Generic test	Covered by 1411.1
1411.3	1	WC drop & flap valves	Corrosion Protection	Current	Regulators' Specification	Regulators' Specification for WC suites, Refer to BS EN 997 Clause 6.8
1412.1	1	All applicable fittings	Corrosion Protection	Current	PD 6484	Remove reference to PD 6484; maintain procedure, as this is still valid.
1430.1	1	Combination HW storage units	Temperature Rise	Current	BS 3198 3 types of heater	None
1511.1	1	Type 'CA' backflow device	Visual Inspection	Compile	Pr EN W1097 Clause 9.6.3	Compile with current prEN 14367 Clause 9.6.3
1511.2	1	Cisterns, WC flushing - all materials	Flush Rate	Current	Regulators' Specification	None
1511.4	1	Taps - spray mixing. If no plug	Flowrate	Current	BS EN 5779 clause 10, 12 Appendix D, E & F.	None

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
1511.5	1	Taps – spray	Flowrate	Current	BS 5388 Clause 12 with 1511.4	None
1511.6	1	Type 'DC' backflow device	Flowrate/Splashing	Current	Pr EN W1114 Clause 11.2	Replace title with current prEN 14453 Clause 10.6 but maintain the existing criteria.
1512.1	1	Washing machines, clothes, with or without driers	Consumption	Current	WRAS Generic test	Specification outdated, BS EN 60456 has a consumption test, but has no criteria for max consumption
1512.2	1	Reverse Osmosis units	Consumption	Current	WRAS Generic test	PrEN 14652 does not set a value for the consumption/waste value. Maintain current procedure
1512.3	1	Tumble Driers	Consumption	Current	WRAS Generic test	None
1512.5	1	Washing machines, dish	Consumption	Replace	Refers to BS 3999 pt 11 for place settings	Replace with the Regulation requirement for domestic dishwashing machines as G29.3
1512.7	4	WC pans, washdown type	Consumption	Delete	BS 5503 pt 3 section 3 Appendix A BS 5504 pt 3 section 4 Appendix A BS 7358 section 3 Appendix A	Superseded by Regulators' Specifications for WC suites
1512.8	1	Ice making machines	Consumption	Current	WRAS Generic Test	None
1512.9	1	Water softeners, salt regenerated ion exchange	Consumption	Current	WRAS Generic Test	PrEN 14743 does not set a value for the consumption/waster value. Maintain current procedure
1512.10	1	WC Suites	Flush Test	Current	Regulators' Specification	Regulators' Specification for WC suites, Refer to BS EN 997 Clause 6.10
1512.11	1	WC Suites	Flush Test	Current	Regulators' Specification	Regulators' Specification for WC suites, Refer to BS EN 997 Clause 6.9
1512.12	1	WC Suites	Flush Test	Current	Regulators' Specification	Regulators' Specification for WC suites, Refer to BS EN 997 Clause 6.12
1611.1	1	Cylinders, indirect, coil primary	Contamination	Delete	BS 1566 pt 1 clause 8.4, table 2	Delete, test has no relevance to the Water regulations
1611.2	1	Heaters, electric, thermal storage/ instantaneous	Design	Current	BS 6700 clause 10.6	Document current but requires reference to BS EN 60335-2-21
1611.3	1	Heaters, electric, thermal storage	Design	Current	BS 843 clause 10	Very Generic test requirement for all heaters
1611.4	1	Cisterns, deep and narrow or for poor access situations	Accessibility	Current	BS 3198 clause 18	None
1611.5	1	Pipes, Valves & Fittings	Design	Delete	BS 864 pt 2 clause 11.4, 11.5 BS 864 pt 3 clause 14, 17 WRAS Generic test BS 1010 pt 2 clause 4.12 BS 5433 clause 26 BS 5412/3 pt 1 clause 9	Test has no relevance to the Water Regulations

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
1611.6	1	Haemodialysis	Backflow	Delete	WRAS Generic Test (air gap)	Superseded by TCS 2213.1 & 2213.12 (AA & AB Air gap)
1611.7	4	WC cisterns	Flushing	Delete	BS 7357 section 2 clause 8 BS 1125 section 2 clause 8	Superseded by Regulators' Specifications for WC suites
1611.8	1	Drain valves and stop valves	Renewal of seat washer	Current	WRAS Generic Test	Ensures compliance with G2.7
1611.9	1	Valves, stop	Washer Plate	Current	WRAS Generic Test	Ensures compliance with G2.7
1611.10	1	Servicing Valve	Operation	Delete	BS 6675 section 2 clause 6.2	Test has no relevance to the Water Regulations
1611.11	1	Taps, draw-off and valves, float operated	Renewal of seat washer	Current	WRAS Generic Test	Ensures compliance with G2.7
1611.13	1	BA Valves-reduced pressure zone	Accessible - Refitting	Compile	Doc N706E clause 8.2.1	Compile with current BS EN 12729 Clause 8
1611.14	1	Pressure/temperature, expansion, pressure relief valves	Easing Gear Operation	Current	BS 6283 pt 1-3 section 3.8	Not specified by Building valve standards BS EN 1487-1491
1611.15	1	WC Flushing cisterns	Operation	Current	Regulators' Specifications	Regulators' Specification for WC suites
1611.16	1	WC Suites	Flush Dye Retention	Current	Regulators' Specifications	Regulators' Specification for WC suites, Refer to BS EN 997 Clause 6.11
1612.1	1	WC Flushing Cistern	Water Tightness	Delete	BS 7357 section 2 clause 8 BS 1125 section 2 clause 8	Superseded by Regulators' Specifications for WC suites
1711.2	1	Switching Devices	Efficiency	Delete	WRAS Generic Test	Requirement covered by other Regulators' Specifications
2111.1	1	All fittings as applicable	Non-metallic Contamination	Current	BS 6920 pt 2 & IGN 9-01-02	Refer to WRAS Mat procedure documents 1 to 4.
2111.2	1	Valves, check, double, for CO <sub>2</sub> injected vending machines	Effect upon Water Quality	Current	WRAS Generic Test	Not specified in EN 13959, therefore maintain specification
2111.3	1	All soldered fittings	Effect upon water quality (solder)	Current	WRAS Generic Test	None
2114.2	1	All non-metallic water fittings as applicable	Light Exclusion	Current	BS EN 578	None
2211.1	1	Fire sprinkler tanks type A air gap	Practical test A air gap	Delete	WRAS Generic Test	Superseded by TCS 2213.1 & 2213.12 (AA & AB Air gaps)
2211.2	1	Fittings for tube and compatible assemblies	Contamination	Current	WRAS Generic Test	Generic test that applies to all pipes & fittings
2211.3	1	CTA - Double outlet	Contamination	Compile	WRAS Generic test believed to be derived from BS 5412, 2 options, single or divided outlet.	Compile with prEN 200 (rev) clause 11.3 (double outlet)

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
2211.4	1	Combination HW storage units	Contamination	Current	BS 3198 Appendix C and D	None
2211.5	1	Cylinders, indirect, single feed. Cross mixing	Contamination	Current	BS 1566 pt 2	None
2211.11	1	Cisterns, cold water storage	Contamination	Current	BS 7181 clause 6.1 & Appendix B	None
2212.1	1	Type 'B' air gap washing machine	Contamination	Delete	WRAS Generic Test, references appropriate Regulators' Specifications.	Refer to appropriate Air Gap AA, AB, AC, and AG. BS EN ISO 61770 is available however the standard is very poor. Criteria available under air gaps
2212.3	1	Type 'AG' air gap	Contamination - AG	Compile	Pr EN 13077	Replace with current pr EN 14623
2212.4	1	Valves, float operated, diaphragm	Contamination	Current Current	BS 1212 pt 2 clause 4.10.1 & 5.3 BS 1212 pt 3 clause 22.1 & 25	None None
2212.6	1	Type 'HC' backflow device	Contamination	Compile	BS 5412 clause 13	Compile with prEN 14506 clause 10.6
2212.7	1	Vacuum test type 'B' air gap	Contamination	Delete	IGN 5-11-03 BS 6282 pt 3 clause 10 appendix A BS 6282 pt4 clause 8	Superseded by TCS 2213.3 (AG Air gap)
2212.8	1	Backflow test washing machines	Contamination	Delete	BS 6614 GENELEC HD 274	Superseded by TCS 2212.3 (AG Air gap), ISO 61770 is available, however the standard is very poor
2212.9	1	Type 'BA' backflow device	Vacuum	Delete	AS 2845.1 appendix AN	Test is not required in BS EN
2212.10	1	Tundish. Air gap to drain	Dimensional	Current	BS EN 1717 clause 9	None
2212.11	1	Type 'CA' backflow device	Vacuum	Compile	Pr EN W1097 C25 clause 9.5.4	Compile with current prEN 14367 Clause 9.5.4
2212.12	1	Type 'CA' backflow device	Contamination	Delete	KIWA BRL K648/01/1990 clause 4.4	Not in 14367 & covered by 2212.11
2212.13	1	Type 'DB' backflow device	Vacuum	Compile	CEN TC 164 W1 112 clause 11.8	Compile with current prEN 14452 Clause 10.0
2212.14	1	Type 'DB' backflow device	Vacuum	Compile	CEN TC W1 112 clause 11.2	Compile with current prEN 14452 Clause 10.4
2212.15	1	Type 'DC' backflow device	Contamination	Compile	PR TC W1 114 clause 11.3	Compile with current prEN 14453 Clause 10.5
2212.16	1	Type 'HA' backflow device	Vacuum	Compile	Pr EN W1 108 clause 6.8	Compile with current prEN 14454 Clause 10.10
2212.17	1	Type 'DA' backflow device	Contamination	Compile	Pr TC W1 111 clause 11.7	Compile with current prEN 14451 Clause 10.9

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
2212.18	1	Type 'LA' backflow device	Contamination	Compile	TC 164 WG4 W1 D58 clause 11.5	Compile with current prEN 14455 Clause 10.7
2212.19	1	Type 'LA' backflow device	Opening Pressure	Compile	TC 164 WG4 W1 D58 clause 11.7	Compile with current prEN 14455 Clause 10.9
2212.20	1	Cisterns, WC flushing	Backflow Prevention	Current	Regulators' Specifications	Regulators' Specification for WC suites, Refer to BS EN 997 Clause 6.2
2213.1	1	Type 'AA' air gap	Air gap 'AA'	Compile	Pr EN 13076	Compile with current BS EN 13076
2213.3	1	Heaters, gas. Gas/water space	Contamination	Current	WRAS Generic Test	None
2213.4	1	Urinal Flushing Cisterns	Air gap	Delete	WRAS Generic Test, air gap type B	Superseded by TCS 2213.18
2213.5	1	Valves, check, cartridges in separate body housings	Visual Inspection	Current	WRAS Generic Test	Not specified in prEN 13959, therefore maintain specification
2213.7	1	Type 'E' backflow device	Visual Inspection	Compile	ASSE 1024 & 1015 clause 3.7 & 3.6	Compile with current prEN 13959 Clause 8.4.1
2213.8	1	Type 'BA' backflow device	Pressure Differential	Compile	Pr EN 12729 clause 9.6.3	Replace with current BS EN 12729 Clause 9.7.3
2213.9	1	Type 'BA' backflow device	Pressure Differential	Delete	Doc N 706E clause 9.6.4	Superseded by TCS 1111.16
2213.10	1	Type 'CA' backflow device	Visual Inspection	Current	ASSE 1013 clause 3.5	None
2213.11	1	Type 'BA' backflow device	Visual Inspection	Current	ASSE 1013 clause 3.5	None
2213.12	1	Type 'AB' air gap	Air gap 'AB'	Compile	Pr EN 13077	Compile with current BS EN 13077
2213.13	1	Type 'E' backflow device	Pressure Differential	Compile	Pr EN 164167 clause 7.5	Compile with current prEN 13959 Clause 11.7
2213.14	1	Type 'AUK1' air gap	Air gap 'AUK1'	Current	Regulators' Specification	Regulators' Specification for Air Gap
2213.15	1	Type 'AC' air gap	Air gap 'AC'	Compile	Pr EN 164105	Compile with current BS EN 13078
2213.16	1	Type 'AD' air gap	Air gap 'AD'	Compile	Pr EN 164106	Compile with current BS EN 13079
2213.17	1	Type 'AF' air gap	Air gap 'AF'	Compile	Pr EN 13077	Compile with current pr EN 14622
2213.18	1	Type 'AUK2' air gap	Air gap 'AUK2'	Current	Regulators' Specifications	None
2213.19	1	Type 'AUK3' air gap	Air gap 'AUK3'	Current	Regulators' Specifications	None

<u>Test Procedure Number</u>	<u>Issue No.</u>	<u>TYPE OF FITTINGS</u>	<u>PROCEDURE</u>	<u>Status</u>	<u>STANDARDS REFERRED</u>	<u>ACTION REQUIRED</u>
3212.1	7	WC Suites	Flush volume and water seal depth	Current	Regulators' Specification	Regulators' Specification for WC suites, Refer to BS EN 997 Clause 6.5
3212.2	1	Cisterns, urinal flushing	Flush Volume	Replace	Byelaws Specification	Replace with the Regulation requirement for urinals as G25.12 and G25.13
5011.1	1	All Fittings	Dimensional	Delete	WRAS Generic Test	Test has no relevance to the Water Regulations
5011.2	1	WC	Flushing	Delete	WRAS Generic Test air gap type B BS 7357 section 2	Superseded by Regulators' Specifications for WC suites
5011.3	1	Cisterns, urinal flushing	Dimensional	Delete	WRAS Generic Test	Superseded by Regulators' Specification for Backflow (AG Air Gap)
5011.5	1	WC Flushing Cisterns	Dimensional	Delete	WRAS Generic Test	Superseded by Regulators' Specification for WC's
5011.6	1	WC Suites	Water Seal Depth	Current	Regulators' Specification	Regulators' Specification for WC suites, Refer to BS EN 997 Clause 6.13
5011.7	1	WC Suites	Dimension	Current	Regulators' Specification	Regulators' Specification for WC suites, Refer to BS EN 997 Clause 6.4
5021.1	1	All Fittings	Dimensional Area	Delete	WRAS Generic Test	Test has no relevance to the Water Regulations
5021.2	1	Support Plate Washers	Dimensional	Delete	BS 4213	Test has no relevance to the Water Regulations
5021.3	1	Type 'DA, DB & DC' backflow devices	Dimension	Compile	Pr TC W1 111 clause 8.3 DA  DB DC	Compile with current prEN 14451 Clause 10.3.2  Compile with current prEN 14452 Clause 10.3 Compile with current prEN 14453 Clause 10.3
5031.1	1	Cisterns, tanks	Capacity	Delete	WRAS Generic Test And BS as appropriate	Capacity has no relevance for Water Regulations
5031.2	1	Cylinders	Capacity	Delete	WRAS Generic Test And BS as appropriate	Capacity has no relevance for Water Regulations
5031.3	1	Floats, all materials	Dimensional	Current	BS 2456 section 3.1 Appendix B BS 1968 section 2	None
6001.1	1	All fittings	Identification	Current	WRAS Generic Test BS 2871 pt1	None Generic test OK but makes reference to BS 2871 pt1 this has been superseded by BS EN 1057. Refer to BS EN 997 Clause 6.3

## **7.11 European Standards that include the majority of the regulators' specifications**

Whilst producing Table 4 comparing the existing Regulators Specifications against European Standards it became apparent that European Standards do not incorporate all the existing Regulators' Specifications. However a number of EN's accommodate the vast majority of the Regulators' Specifications and are listed in 7.12. However in all cases the following specifications are not incorporated within the European standards and are still considered to be a valid requirement for installation within the UK.

- Specification 2111.1 Non-metallic materials in contact with the water must comply with BS 6920.
- Specification 2114.2 Opacity test, no more than 0.2% of visible light shall be transmitted to the water.
- Specification 1412.1 Corrosion protection.
- Specification 6001.1 Identification, the EN's require more onerous identification requirements.

It was envisaged that with the publication of European Standards that the Specifications could be deleted and reference made wholly to the appropriate European Standard in its entirety as a means of ensuring compliance with the essential requirements of the Water Supply (Water Fittings) Regulations 1999. However if a reference to the complete European Standard is made then additional test requirements will be imposed over and above those imposed by the existing Regulators' Specifications as European Standards generally require flowrate, pressure drop, dimensional, material requirements and acoustic testing. European Standards always exceed the number of requirements than those required by the existing Regulators' Specifications (but do not necessarily ensure the essential requirements of the Water Regulations are satisfied). European Standards ensure fitness for purpose, whereas the Regulators' Specifications are restricted to preventing contamination and to conserving water. If the Regulators' Specification requires a product to comply with the complete European Standard then this will impose additional expense and bureaucracy upon manufacturers with no additional benefit for water conservation or backflow prevention for the Water Industry or the consumer.

As an example the cost of WRAS approval for a pillar tap would be approximately £950, the cost of testing against EN200 including the acoustic requirement would be approximately £2500.

As part of this review the contractor after discussions with the DWI project manager agreed that only the exact clauses within the European Standards should be referenced within the Regulators' Specifications.

## **7.12 European Standards that are considered to accommodate the majority of the Regulators' Specifications**

The following European Standards are considered to accommodate the majority of the Regulators' Specifications and will be compiled into additional Regulators' Specifications using the European Standard number as the proposed Specification number.

- EN 13076 Type AA Air Gap
- EN 13077 Type AB Air Gap
- EN 13078 Type AC Air Gap
- EN 13079 Type AD Air Gap
- prEN 14622 Type AF Air Gap
- prEN 14623 Type AG Air Gap
- EN 200 (rev) Sanitary Tapware

- EN1487 Building Valves\*
  - EN 1488 Building Valves expansion group\*
  - EN1489 Building Valves pressure safety valves\*
  - EN 1490 Building Valves combined temperature and pressure relief valves\*
  - EN 1491 Building Valves expansion valves\*
  - EN 12729 Type BA Backflow Preventer
  - prEN 14367 Type CA Backflow Preventer
  - prEN 14451 Type DA Backflow Preventer
  - prEN 14452 Type DB Backflow Preventer
  - prEN 14453 Type DC Backflow Preventer
  - prEN 13959 Type E Backflow Preventer
  - prEN 14454 Type HA Backflow Preventer
  - EN 14506 Type HC Backflow Preventer
  - prEN 14455 Type LA Backflow Preventer
  - BS EN13280 one piece glass fibre reinforced cisterns
- \*Compile into one Regulators' Specification

### **7.13 DWI - Compiled Specifications**

The existing Regulators' Specifications generally list a single test procedure along with the acceptance criteria for a generic type of water related product, the full list of Specifications to be applied to the water related product are then specified by WRAS in their product test report documents. This method of specifying test criteria i.e. individually and not listing all the test criteria to be applied to that generic product is not satisfactory. With the advent of European Standards that now contain the majority of the Regulators' Specifications within the standard the contractor believes that a number of the existing Regulators' Specifications can now be compiled or collated to produce a single Specification for a generic product type. This will not only benefit the manufacturer of the water product but also the Regulator, as the number of Specifications will be greatly reduced.

These compiled Specifications will make reference to the applicable European Standard and the applicable clauses within that standard that the product must comply with in order to verify compliance with the Water Supply (Water Fittings) Regulations 1999, Regulation 4.(1)(a)&(b). This approach will enable the manufacturer of the water related product to more easily ascertain the Regulatory requirements that their product must comply with.

The compiled Specifications will still refer to individual existing Regulators' Specifications, as the European Standards do not encompass all the existing Regulators' Specifications. Examples of existing Specifications that require referencing: -

- Specification 2111.1 Non-metallic materials in contact with the water must comply with BS 6920.
- Specification 2114.2 Opacity test, no more than 0.2% of visible light shall be transmitted to the water.
- Specification 1412.1 Corrosion protection.
- Specification 6001.1 Identification, the EN's require more onerous identification requirements.

The compiled Specifications are presented in Appendix A.

The date reference of the European Standard has not been recorded within the compiled Specifications however if the European Standard is significantly amended then the clause

numbers will change and the references within the compiled Regulators' Specifications will then refer to inappropriate clauses.

The products/generic groups listed below have been chosen for compilation because the European Standards have been published or the pr EN Standard is at the final enquiry stage and that the standards include the majority of the existing Regulators' Specifications.

Generic products compiled 22, however the building valves standards (5) can be incorporated into one specification, therefore 18 new compiled Specifications will be presented. Existing Regulators' Specifications compiled and therefore considered to be deleted 70

Regulators' Specifications reduced by 52.

### **EN 13076 Type AA Air Gap**

The Regulators' Specification for Air Gaps AA 2213.1 can be deleted and the Regulators' Specification 1307.6 introduced that requires Air Gaps AA comply with the requirements of BS EN 13076 and the Regulators' Specifications 2111.1, 2114.3, 1412.2 and 6001.1.

### **EN 13077 Type AB Air Gap**

The Regulators' Specification for Air Gaps AB 2213.12 can be deleted and the Regulators' Specification 1307.7 introduced that requires Air Gaps AB comply with the requirements of BS EN 13077 and the Regulators' Specifications 2111.1, 2114.3, 1412.2 and 6001.1.

### **EN 13078 Type AC Air Gap**

The Regulators' Specification for Air Gaps AC 2213.15 can be deleted and the Regulators' Specification 1307.8 introduced that requires Air Gaps AC comply with the requirements of BS EN 13078 and the Regulators' Specifications 2111.1, 2114.3, 1412.2 and 6001.1.

### **EN 13079 Type AD Air Gap**

The Regulators' Specification for Air Gaps AD 2213.16 can be deleted and the Regulators' Specification 1307.9 introduced that requires Air Gaps AD comply with the requirements of BS EN 13079 and Regulators' Specifications 2111.1, 2114.3, 1412.2 and 6001.1.

### **prEN 14622 Type AF Air Gap**

The Regulators' Specification for Air Gaps AF 2213.17 can be deleted and the Regulators' Specification 1462.2 introduced that requires Air Gaps AF comply with the requirements of prEN 14622 and the Regulators' Specifications 2111.1, 2114.3, 1412.2 and 6001.1.

### **prEN 14623 Type AG Air Gap**

The Regulators' Specification for Air Gaps AG 2212.3 can be deleted and the Regulators' Specification 1462.3 introduced that requires Air Gaps AG comply with the requirements of prEN 14623 and the Regulators' Specifications 2111.1, 2114.3, 1412.2 and 6001.1.

### **Reduced pressure zone valves (BA) BS EN 12729.**

The fifteen Regulators' Specifications for reduced pressure zone valves (BA) incorporate performance and endurance tests. From the existing Regulators' Specifications 1212.11 and 1212.12 can be deleted as these tests are incorporated in clause 9.5.2, tests 1 and 2 in specification 1211.22. 2212.9 can be deleted, as this test is not incorporated with EN 12729.

2213.9 can be deleted as this test is incorporated in clause 9.6.4/5 in Specification 1111.16.

Therefore the remaining eleven Specifications can be compiled into one Specification that refers to BS EN 12729 and compliance with the following clauses: -

9.6.1, 9.6.2, 9.6.3, 9.7.4, 9.7.5, 9.7.6, 9.5.1

9.5.2 Test 3 only with option for cold water test only at  $20 \pm 5^\circ\text{C}$

9.5.2 Test 1 & 2 for hot water use only.

9.5.3, 9.7.3, clause 8

Note TCS 2213.9 incorporates 2 clauses 9.6.4 and 9.6.5

The existing Specifications link the procedure with the next procedure to verify compliance. To ensure that this sequence of verification (test) is maintained clause 10 of BS EN 12729 must be included.

To ensure that the tolerances used are acceptable clause 9.2 of BS EN 12729 must be included.

Clause 9.1 must be included General.

Specification 2213.11 must be maintained, as this aspect of contact between the 2 check elements is not covered by the Standard.

Specification 1411.1 (DZR) is not covered by the Standard; a reference to 1411.1 should be included within the compiled Regulators' Specification.

**TCS 1272.9 includes reference to BS EN 12729 clauses: -**

8.0, 9.1, 9.2, 9.6.1, 9.6.2, 9.6.3, 9.7.4, 9.7.5, 9.7.6, 9.5.1, 9.5.2, 9.5.3, 9.7.3, 10, and the Regulators' Specifications 2111.1, 2114.2, 2213.11, 1411.1, 1412.1 and 6001.1.

**NON-VERIFIABLE DISCONNECTOR CA prEN 14367.**

The ten Regulators' Specifications for non-verifiable disconnectors (CA) incorporate performance and endurance tests. From the existing Regulators' Specifications 2212.12 can be deleted as this test is considered to be verified by Specification 2212.11.

Therefore the remaining nine Specifications can be compiled into one Specification that references prEN 14367 and compliance with the following clauses: -

9.4.1, 9.4.2, 9.4.3, 9.4.4, 9.5.1, 9.5.2, 9.5.4 and 9.6.3.

The existing Specifications link the procedure with the next procedure to verify compliance. To ensure that this sequence of verification (test) is maintained clause 10 must be included.

The following clauses of Pr EN 14367 must also be included.

- 1.0 Scope
- 8.1 General
- 9.1 General
- 9.2 Tolerance

Specification 1411.1 (DZR) and 2213.10 (no contact between check valves) are not covered by the standard. I suggest that a reference to 1411.1 and 2213.10 be included within the compiled Regulators' Specification.

Note: Clause 9.5.3 of prEN 14367 is missing from the Regulators' Specification.

**TCS 1436.7 includes reference to prEN 1436.7 clauses: -**

1.0, 8.1, 9.1, 9.2, 9.4.1, 9.4.2, 9.4.3, 9.4.4, 9.5.1, 9.5.2, 9.5.4, 9.6.3, 10, and the Regulators' Specifications 1411.1, 1412.1, 2111.1, 2114.2, 2213.10 and 6001.1.

**IN-LINE ANTI VACCUM VALVE (DA) prEN 14451**

The eleven Regulators' Specifications for in-line anti-vacuum valves (DA) incorporate performance and endurance tests. From the existing Regulators' specifications the following Specifications can be deleted as they have been superseded by the newer Regulators' Specifications based upon prEN W1114 which have now been superseded by prEN 14451: -

1112.12, 1113.4, 1211.10, 1211.11 and 1314.6.

The remaining six Specifications can be compiled into one Specification that references prEN 14451 and compliance with the following clauses: -

10.3.2, 10.4, 10.6, 10.8.1, 10.8.2, 10.8.3 and 10.9.

The existing Specifications link the procedure with the next procedure to verify compliance. To ensure that this sequence of verification (test) is maintained clause 10.1 must be included.

The following clauses of prEN 14451 must also be included.

General, Tolerance

Annex A - Test samples

Specification 1411.1 (DZR) is not covered by the standard; I suggest that a reference to 1411.1 be included within the compiled Regulators' Specification.

**TCS 1445.1 includes reference to prEN 14451 clauses: -**

10.1, 10.2, 10.3.2, 10.4, 10.6, 10.8.1, 10.8.2, 10.8.3, 10.9, Annex A and the Regulators' Specifications 1411.1, 1412.1, 2111.1, 2114.2 and 6001.1.

**PIPE INTERRUPTER WITH MOVING ELEMENT DB prEN 14452**

The five Regulators' Specifications for pipe interrupter with moving elements (DB) incorporate performance and endurance tests.

The five Specifications can be compiled into one Specification that references prEN 14452 and compliance with the following clauses: -

10.3, 10.4, 10.6, 10.8, 10.10.

The existing Specifications link the procedure with the next procedure to verify compliance. To ensure that this sequence of verification (test) is maintained clause 10.2 must be included.

The following clauses of prEN 14452 must also be included.

General, Tolerances

Annex A - Test Samples

Specification 1411.1 (DZR) is not covered by the Standard a reference to 1411.1 should be included within the compiled Regulators' Specification.

**TCS 1445.2 includes reference to prEN 14452 clauses: -**

10.1.1, 10.2, 10.3, 10.4, 10.6, 10.8, 10.10, Annex A and the Regulators' Specifications 1411.1, 1412.1, 2111.1, 2114.2 and 6001.1

**PIPE INTERRUPTER WITH PERMANENT ATMOSPHERIC VENT DC - prEN 14453**

The four Regulators' Specifications for pipe interrupters with permanent atmospheric vent (DC) incorporate performance tests only (no endurance).

The four Specifications can be compiled into one Specification that references prEN 14453 and compliance with the following clauses: -

10.4, 10.5 and 10.3.

Specification 1511.6 is derived from prEN 14453 clause 10.6 amend 1511.6 to reflect the new prEN reference. This existing Specification identifies that at a fixed flowrate, splashing to the outside of the valve does not occur. Clause 10.6 in prEN 14453 requires the flowrate to be a set to give a pressure drop of 0.1 bar, this exceeds the remit of the Water Supply (Water Fittings) Regulation 1999. Therefore Specification 1511.6 will be maintained as it is.

The existing Specifications link the procedure with the next procedure to verify compliance. To ensure that this sequence of verification (test) is maintained clause 10.2 must be included.

The following clauses of prEN 14453 must also be included: -

10.1 General, Tolerances

Annex A Test Samples

Specification 1411.1 (DZR) is not covered by the Standard; a reference to 1411.1 should be included within the completed Regulators' Specification.

**TCS 1445.3 includes reference to prEN 14453 clauses: -**

10.1, 10.2, 10.3, 10.4, 10.5, Annex A and the Regulators' Specifications 1411.1, 1412.1, 1511.6, 2111.1, 2114.2 and 6001.1.

**Check valves EA/B/C/D prEN 13959**

The eleven Regulators' Specifications for check valves (EA/B/C/D) incorporate performance and endurance tests. From the existing Regulators' Specifications 1313.4 can be deleted as this test is incorporated in clause 11.6 contained in Specification 1111.10. Therefore the remaining ten Specifications can be compiled into one Specification that references EN 13959 and compliance with the following clauses: -

8.4.1, 11.1, 11.3, 11.4, 11.5, 11.6, 11.7, 11.9.

The existing Specifications link the procedure with the next procedure to verify compliance. To ensure that this sequence of verification (test) is maintained clause 10.1 of EN 13959 must be included.

To ensure that the apparatus and tolerances used are acceptable clause 10.2 of EN 13959 must be included.

Details of the test samples Annex A must also be included - Specifications 2111.2, 2213.5 and 1411.1 must be maintained and included with the compiled Regulators' Specification.

**TCS 1395.9 includes reference to EN13959 Clauses: -**

8.4.1, 10.1, 10.2, 11.1, 11.3, 11.4, 11.5, 11.6, 11.7, 11.9 and Annex A and the Regulators' Specifications 2111.1 2111.2, 2114.2, 1411.1 (DZR), 1412.1, 2213.5 and 6001.1.

**HOSE UNION BACKFLOW PREVENTER HA prEN 14454**

The five Regulators' Specifications for hose union backflow preventers (HA) incorporate performance and endurance tests. The five Regulators' specification can be compiled into one Specification that references prEN 14454 and compliance with the following clauses: -

10.4, 10.6, 10.7, 10.9 and 10.10.

TCS 1111.20 has no exact corresponding test, however clause 10.4 of prEN 14454 can be considered to be essentially undertaking the same verification.

The existing Specifications link the procedure with the next procedure to verify compliance. To ensure that this sequence of verification (test) is maintained clause 10.2 must be included.

The following clauses of prEN 14454 must also be included: -

10.1.1 General, Tolerances

8.3 Air Inlets

Annex A Test Samples

Specification 1411.1 (DZR) is not covered by the Standard; a reference to 1411.1 should be included within the compiled Regulators' Specification.

**TCS 1445.4 includes reference to prEN 14454 clauses: -**

8.3, 10.1.1, 10.2, 10.4, 10.6, 10.7, 10.9, 10.10, Annex A and the Regulators' Specifications 1411.1, 1412.1, 2111.1, 2114.2 and 6001.1.

**AUTOMATIC DIVERTER HC prEN 14506 (AFFORDING BACKFLOW PREVENTION)**

The three Regulators' Specifications for automatic diverters (HC) incorporate performance and endurance tests. The Specification 1450.6 must be referred to within the procedure for sanitary tapware 0200.0 to ensure that procedures are available if the automatic diverter is required to afford backflow protection.

The three Specifications can be compiled into one Specification that references prEN 14506 and compliance with the following clauses: - 10.4, 10.5, 10.6.

The existing Regulators' Specifications link the procedure with the next procedure to verify compliance. To ensure that this sequence of verification (test) is maintained clause 10.2 and Annex A of prEN 14506 must be included. To ensure that the tolerances used are acceptable clause 10.1 must be included. The scope of prEN 14506 clause 1.0 must be included.

**TCS 1450.6 includes reference to prEN 14506 clauses: -**

1.0, 10.1, 10.2 & Annex A, 10.4, 10.5 & 10.6 and the Regulators' Specifications 2111.1, 2114.2, 1412.1 and 6001.1.

**PRESSURISED AIR INLET VALVE LA prEN 14455**

The six Regulators' Specifications for pressurised air inlet valves (LA/B) incorporate performance and endurance tests. The six Regulators' Specifications can be compiled into one Specification that references prEN 14455 and compliance with the following clauses: -

10.4, 10.5, 10.7, 10.8, 10.9 and 10.10.

The existing Specifications link the procedure with the next procedure to verify compliance. To ensure that this sequence of verification (test) is maintained clause 10.2 must be included.

The following clauses of prEN 14455 must also be included: -

3.1 - Definition LA

3.2 - Definition LB - will include the LB valve

8.3 - Air Inlets

Annex A - Test Samples

Specification 1411.1 (DZR) is not covered by the standard; a reference to 1411.1 should be included within the compiled Regulators' specification.

**TCS 1445.5 includes reference to prEN 14455 clauses: -**

3.1, 3.2, 8.3, 10.2, 10.4, 10.5, 10.7, 10.8, 10.9, 10.10, Annex A and the Regulators' Specifications 1411.1, 1412.1, 2111.1, 2114.2 and 6001.1.

**TAPWARE**

The document EN 200 is being revised and will incorporate BS 5412 (low pressure tapware) and is now at the final enquiry stage, the UK has a number of issues with this document including the incorrect requirement for the domestic air gap AUK2 and the omission of the AUK3 air gap. A prEN document for automatic diverters (HC backflow preventer) is also being prepared this document details the test criteria for backflow

devices, after comparing the criteria the major difference being the number of endurance cycles required for the endurance of the diverter. prEN 200 (rev) requires 30000 cycles and prEN14506 (HC) requires 80000 cycles, prEN 200 (rev) then only requires that the diverter valve is leaktight and no test is included that verifies the backflow capability of the diverter valve is maintained.

If a combination tap assembly has an automatic diverter valve fitted that meets the requirements of prEN 14506 then the backflow capability is verified. If the diverter meets the requirements of prEN 200 (rev) then the backflow capability is not verified and will need additional backflow prevention devices attached if the shower hose falls below the spillover level of the appliance. Because of this it is proposed that a caveat be attached to the compilation of the sanitary tapware Specification that specifies: -

If the automatic diverter is required to fulfil a backflow protection function then the automatic diverter must comply with the Regulators' Specification 1450.6.

The Regulators' Specifications for sanitary (excluding HC) has sixteen Specifications of these: -

1111.12 can be deleted as the requirement is covered in 1111.5 and 1111.7.

1211.7 is an endurance test for self-closing test and refers to EN816 and must therefore be retained.

1211.21 is an endurance test for non-touch actuators and is not covered by any EN Standard and must be maintained.

1315.4 can be deleted, as this torque test has no relevance to the regulations.

1315.5 can be deleted, as this torque test has no relevance to the regulations.

1511.4 is a flowrate test for spray taps and refers to BS EN 5779 and must be maintained.

1511.5 is a flowrate test for spray taps and refers to BS 5388 and must be maintained.

1611.11 ensures that the seal can be readily replaced and compliance with guidance clause G2.7, and must therefore be maintained.

2213.18 type AUK2 tap gaps this is not adequately covered by prEN 200 and must therefore be maintained.

2213.19 type AUK3 tap gap this is not covered by prEN 200 and must therefore be maintained.

1111.1 refer to a test derived from BS 5412 - remove this reference from procedure and compile.

1112.1 refer to a test derived from BS 5412 - remove this reference from procedure and compile.

Therefore the remaining six Specifications can be compiled into one Specification that references prEN 200 and compliance with the following clauses: - 7.3, 7.4, 7.5, 7.6, 8.4, 10.1, 11.1, 11.3.

The requirements for automatic diverter not affording backflow prevention must also be included clauses: - 7.7, 7.8, 11.2.

The prEN 200 does not specify the sequence of verification therefore the clauses above must be applied in numerical order.

Clause 1.0 of prEN 200 must be included to define the type of tapware to be tested.

### **TCS 0200.0 includes reference to prEN 200 (rev).**

Clauses 1.0, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 8.4, 10.1, 11.1, 11.2, 11.3. and the Regulators' Specifications 2111.1, 2114.2, 1412.1, 2213.18, 2213.19, 1611.11, 1211.7 as required, 1211.21 as required, 1511.4 and 1511.5 as required and 6001.1.

With two caveats attached to read: -

If the automatic diverter is required to fulfil a backflow protection function then the automatic diverter must comply with the Regulators' Specification 1450.6.

The tapware criteria will cover all types of sanitary tapware including products manufactured to BS EN 817, 1111 & 1287. All tests might not be applicable to all sanitary tapware.

Consideration must be given to the torque requirements for ceramic disc products and single lever products.

## **BUILDING VALVES-EXPANSION- TEMPERATURE AND PRESSURE BS EN 1487-91**

The three Regulators' Specifications for Building valves incorporate performance and endurance tests. The three Regulators' Specifications can be compiled into one Specification that references BS EN 1487, 1488, 1489, 1490, and 1491 and compliance with the following clauses: -

BS EN 1487 clause 9.4.2.1/24/5 & 9.4.1, BS EN 1488 clause 9.4.2.1/2/4/5 & 9.4.1  
BS EN 1489 clause 6.2.2/3/5/6 & 5.2, BS EN 1490 clause 6.3.1/2/4/5, 5.2 and 6.2  
BS EN 1491 clause 6.2.2/3/5/6 & 5.2

The following clause of the Building valve set of standards must also be included: -  
3. Definitions

Specification 1411.1 (DZR) is not covered by the Standard; a reference to 1411.1 should be included within the compiled Regulators' Specification.

### **TCS 1487-91 includes reference to: -**

BS EN 1487 clauses 9.4.2. & 9.4, BS EN 1488 clauses 9.4.2 & 9.4, BS EN 1489 clauses 6.2.2 & 5.2  
BS EN 1490 clauses 6.3. 5.2 and 6.2, BS EN 1491 clauses 6.2. & 5.2

And the Regulators' Specifications 1411.1, 1412.1, 1611.14, 2111.1, and 6001.1.

## **GRP CISTERNS, ONE PIECE AND SECTIONAL PROTECTION BS EN 13280**

The four Regulators' Specifications for GRP Cisterns incorporate performance tests. The four Regulators' Specifications can be compiled into one Specification that references BS EN 13280 and compliance with the following clauses: -  
7.2.2, 7.3.3, 7.4.1, 9.4, Annex C, Annex F, Annex G (if applicable), Annex J.

The following clauses of BS EN 13280 must also be included: -

Scope  
3. Definitions

Specifications 5031.1 (capacity) and 1611.4 (accessibility) are not covered by the Standard; a reference should be included within the compiled Regulators' specification.

### **TCS 1328.0 includes reference to BS EN 13280 clauses: -**

7.2.2, 7.3.3, 7.4.1, 9.4, Annex C, Annex F, Annex G (if applicable), Annex J.  
and the Regulators' Specifications 1412.1, 2111.1, 2114.2 and 6001.1

## **8. CONCLUSION**

Whilst reviewing the Regulators' Specifications against European Standards it became apparent that in some generic product groups particularly Backflow protection, that the number of published or soon to be published standards is considerable. Unfortunately in other generic product groups the publication of European Standards is disappointingly low.

A number of the published EN valve standards allow for a leakage rate, whereas the existing Regulators' Specifications require products to be leaktight. In these cases the procedure from the European Standard has been suggested as a replacement with a caveat attached but that the requirement or criteria from the existing Regulators' Specifications is maintained i.e. leaktight.

When reviewing the European Standard that encompasses the majority of the Regulators' Specifications it became apparent that European Standards exceed the number of requirements than those required by the current Regulators' Specifications. European Standards generally require flowrate, pressure drop, dimensional, material requirements and acoustic testing, whereas the Regulators' Specifications address only prevention of contamination and water conservation. It is considered that if the Regulators' Specifications require that a product must comply with the requirements of the full European Standard then this would impose additional testing and cost upon a product that has no relevance to the essential requirements of the Water Supply (Water Fittings) Regulations 1999. As an example the cost of WRAS approval for a pillar tap would be approximately £900, the cost of testing against EN200 including the acoustic requirement would be approximately £2500.

As part of this review the contractor after discussions with the DWI project manager agreed that only the exact clauses within the European Standards should be referenced within the proposed Regulators' Specifications.

Maintaining the Regulators' Specifications will also facilitate that innovative devices can be accommodated if a system of producing new Regulators' Specifications is introduced.

Table 4 identifies that there are a total 216 test procedures of these there are 104 test procedures relating to backflow prevention and WC suites of which 25 have been deleted as they refer to criteria that have been superseded by the Regulators' Specifications for WC suites or the appropriate European Standards for backflow. From the 216 procedures, 47 test procedures have been deleted, 70 have been compiled, 7 require fully amending (12 amendments total) or replacing references to reflect the up to date reference to the appropriate standard. The remaining 92 test procedures are considered to be current and therefore require no amendment.

The conclusions of this review of the Regulators' Specifications are as follows.

Total Number of Published Regulators' Specifications	216
Number of Regulators Specifications Deleted	47
Number of Regulators Specifications Deleted/compiled	70
Number of Regulators Specifications Amended	7 (12)
Number of Regulators Specifications Current	92
Number of Regulators Specifications Compiled	18 (compiled from EN's)
<b>Total Number of Regulators' Specifications</b>	<b>117</b>

# APPENDIX A

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	3	0	7	6
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Issue No: 1

Sheet 59 of 91

## 1. **SCOPE**

**This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied**

This Regulators Specification applies to: -  
Air Gaps AA

## 2. **REQUIREMENT**

Air Gaps AA must be tested as and comply with the requirements/criteria stipulated in BS EN 13076.

And the Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 2213.11.

## 3. **Regulatory Requirements**

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

### **S15.2**

INTERPRETATIONS OF BACKFLOW PREVENTION ARRANGEMENTS AS LISTED IN TABLE S6.1

**'Type AA – Air gap with unrestricted discharge'** means a non-mechanical backflow prevention arrangement of water fittings where water is discharged through an air gap into a receptacle which has at all times an unrestricted spillover to the atmosphere.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	3	0	7	7
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Issue No: 1

Sheet 60 of 91

## 1. **SCOPE**

**This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied**

This Regulators Specification applies to: -  
Air Gaps AB

## 2. **REQUIREMENT**

Air Gaps AB must be tested as and comply with the requirements/criteria stipulated in BS EN 13077.

And the Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 2213.11.

## 3. **Regulatory Requirements**

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

### **S15.2**

INTERPRETATIONS OF BACKFLOW PREVENTION ARRANGEMENTS AS LISTED IN TABLE S6.1

'Type AB – Air gap with weir overflow' means a non-mechanical backflow prevention arrangement of water fittings complying with Type AA, except that the air gap is the vertical distance from the lowest point of the discharge orifice which discharges into the receptacle, to the critical water level of the rectangular weir overflow.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	3	0	7	8
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Issue No: 1

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## 1. **SCOPE**

**This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied**

This Regulators Specification applies to: -  
Air Gaps AC

## 2. **REQUIREMENT**

Air Gaps AC must be tested as and comply with the requirements/criteria stipulated in BS EN 13078.

And the Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 2213.11.

## 3. **Regulatory Requirements**

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

### **S15.2**

INTERPRETATIONS OF BACKFLOW PREVENTION ARRANGEMENTS AS LISTED IN TABLE S6.1

**""Type AC – Air gap with vented submerged inlet and circular overflow"** means a non-mechanical backflow prevention arrangement of water fittings with a vented, but submerged, inlet; the air gap being measured vertically downwards from the lowest point of the air inlet to the critical level.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	3	0	7	9
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Issue No: 1

Sheet 62 of 91

## 1. **SCOPE**

**This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied**

This Regulators Specification applies to: -  
Air Gaps AD

## 2. **REQUIREMENT**

Air Gaps AD must be tested as and comply with the requirements/criteria stipulated in BS EN 13079.

And the Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 2213.11.

## 3. **Regulatory Requirements**

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

### **S15.2**

INTERPRETATIONS OF BACKFLOW PREVENTION ARRANGEMENTS AS LISTED IN TABLE S6.1

**"Type AD – Air gap with injector"** means a non-mechanical backflow prevention arrangement of water fittings with a horizontal injector and a physical air gap of 20 millimetres or twice the inlet diameter, whichever is the greater.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	6	2	2
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Issue No: 1

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## 1. **SCOPE**

This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied

This Regulators Specification applies to: -  
Air Gaps AF

## 2. **REQUIREMENT**

Air Gaps AF must be tested as and comply with the requirements/criteria stipulated in pr EN 14622.

And the Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 2213.11.

## 3. **Regulatory Requirements**

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

### ***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

#### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

#### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

#### **S15.2**

INTERPRETATIONS OF BACKFLOW PREVENTION ARRANGEMENTS AS LISTED IN TABLE S6.1

'Type AF – Air gap with circular overflow' means a non-mechanical backflow prevention arrangement of water fittings with an air gap measured downwards from the lowest point of the discharge orifice, which discharges into the receptacle, to the critical level.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

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## 1. **SCOPE**

**This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied**

This Regulators Specification applies to: -  
Air Gaps AG

## 2. **REQUIREMENT**

Air Gaps AG must be tested as and comply with the requirements/criteria stipulated in pr EN 14623.

And the Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 2213.11.

## 3. **Regulatory Requirements**

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

### **S15.2**

INTERPRETATIONS OF BACKFLOW PREVENTION ARRANGEMENTS AS LISTED IN TABLE S6.1

**'Type AG – Air gap arrangement with minimum size circular overflow'** means a non-mechanical backflow prevention arrangement of water fittings with an air gap; together with an overflow, the size of which is determined by measure or a vacuum test.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

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## 1. SCOPE

**This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied**

This Regulators Specification applies to: -  
Sanitary Tapware 15mm (1/2') and 22mm (3/4').

## 2. REQUIREMENT

The Sanitary Tapware 15mm (1/2') and 22mm (3/4') must be tested as and comply with the requirements/criteria stipulated in pr EN 200 (2005 rev) clauses: -  
**Clauses 1.0, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 8.4, 10.1, 11.1, 11.2, 11.3.**

**And the Regulators Specifications 2111.1, 2114.2, 6001.1, 1412.1, 2213.18 (AUK2) as required, 2213.19 (AUK3) as required, 1611.11, 1211.7 as required, 1211.21 as required, 1511.4 and 1511.5 as required.**

If the automatic diverter is required to fulfil a backflow protection function then the automatic diverter must comply with the Regulators Specification 1450.6.

**All tests might not be applicable to all sanitary tapware.**

## 3. Regulatory Requirements

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

**Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -**

### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability.

### **G2.9**

Taps and combination assemblies used in water supply installations should be appropriate for the residual pressure available and the flow required at a particular appliance.

### **G2.10**

Low resistance taps and combination tap assemblies suitable for minimum inlet pressures of 0.1 bar (0.01 MPa) should comply with BS 5412, or BS 1010 where appropriate, and high resistance taps and combination fittings suitable for minimum inlet pressures of 0.5 bar (0.05 MPa) with BS EN 200 and BS 6920.

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

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## **G15.3**

The type of backflow protection for a given situation is related to the fluid risk categories downstream of the backflow prevention device.

## **G15.4**

Schedules of backflow prevention arrangements and backflow prevention devices, and the maximum permissible fluid risk category for which they are acceptable, are shown in Tables S15.2 and S15.3. Details of the arrangements and devices are shown in Diagrams G15.31.1 to G15.31.24.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

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## 1. SCOPE

**This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied**

This Regulators Specification applies to: -  
Building valves-Safety group-Temperature-Pressure

## 2. REQUIREMENT

Building valves must be tested as and comply with the requirements/criteria stipulated in:-

BS EN 1487 clauses 9.4.2. & 9.4  
BS EN 1488 clauses 9.4.2 & 9.4  
BS EN 1489 clauses 6.2.2 & 5.2  
BS EN 1490 clauses 6.3., 5.2 and 6.2  
BS EN 1491 clauses 6.2. & 5.2  
And the Regulators Specifications 1411.1, 1412.1, 1611.14, 2111.1, and 6001.1.

## 3. Regulatory Requirements

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

### ***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

#### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability.

#### **G4.1**

Water fittings are to be watertight, suitable for the default pressures and temperatures likely to be encountered within the installation.

## 17.

- (1) Every unvented water heater, not being an instantaneous water heater with a capacity not greater than 15 litres, and every secondary coil contained in a primary system shall –
  - (a) be fitted with a temperature control device and either a temperature relief valve or a combined temperature and pressure relief valve; or
  - (b) be capable of accommodating expansion within the secondary hot water system.
- (2) An expansion valve shall be fitted with provision to ensure that water is discharged in a correct manner in the event of a malfunction of the expansion vessel or system.

# Water supply (Water Fittings) Regulations 1999

## Regulators Specifications

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### 19.

Discharges from temperature relief valves, combined temperature pressure and relief valves and expansion valves shall be made in a safe and conspicuous manner.

### 22.

(1) Every expansion valve, temperature relief valve or combined temperature and pressure relief valve connected to any fitting or appliance shall close automatically after a discharge of water.

(2) Every expansion valve shall –

- (a) be fitted on the supply pipe close to the hot water vessel and without any intervening valves; and
- (b) only discharge water when subjected to a water pressure of not less than 0.5 bar (50 kPa) above the pressure to which the hot water vessel is, or is likely to be, subjected in normal operation.

### 23.

(1) A temperature relief valve or combined temperature and pressure relief valve shall be provided on every unvented hot water storage vessel with a capacity greater than 15 litres.

(2) the valve shall –

(a) be located directly on the vessel in an appropriate location, and have a sufficient discharge capacity, to ensure that the temperature of the stored water does not exceed 100 °C; and

(b) only discharge water at below its operating temperature when subjected to a pressure of not less than 0.5 bar (50kPa) in excess of the greater of the following –

(i) the maximum working pressure in the vessel in which it is fitted, or

(ii) the operating pressure of the expansion valve.

(3) In this paragraph 'unvented hot water storage vessel' means a hot water storage vessel that does not have a vent pipe to the atmosphere.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

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## 1. **SCOPE**

This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied

This Regulators Specification applies to: -  
Reduced Pressure Zone (RPZ) valve BA

## 2. **REQUIREMENT**

The Reduced Pressure Zone (RPZ) valve BA must be tested as and comply with the requirements/criteria stipulated in BS EN 12729 clauses: -  
8.0, 9.1, 9.2, 9.6.1, 9.6.2, 9.6.3, 9.7.4, 9.7.5, 9.7.6, 9.5.1, 9.5.2, 9.5.3, 9.7.3, 10.

And the Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 2213.11 and 1411.1 (DZR).

## 3. **Regulatory Requirements**

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (GEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

### ***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

#### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

#### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

#### **G15.7**

Mechanical backflow protection devices which, depending on the type of device, may be suitable for protection against backpressure or backsiphonage, or both, should be installed so that:

- a. they are readily accessible for inspection, operational maintenance and renewal; and
- b. except for Types HA and HUK1, backflow prevention devices for protection against fluid categories 2 and 3, they should not be located outside premises; and
- c. they are not buried in the ground; and
- d. vented or verifiable devices, or devices with relief outlets, are not installed in chambers below ground level or where liable to flooding; and

# Water supply (Water Fittings) Regulations 1999

## Regulators Specifications

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- e. line strainers are provided immediately upstream of all backflow prevention devices required for fluid category 4. Where strainers are provided, servicing valves are to be fitted upstream of the line strainer and immediately downstream of the backflow prevention device; and
- f. the lowest point of the relief outlet from any reduced pressure zone valve assembly or similar device should terminate with a Type AA air gap located not less than 300mm above the ground or floor level.
- Note: For information on the installation and maintenance of reduced pressure zone devices (RPZ valve assemblies) see Installation and Guidance Note No. 9-03-02 published by the Water Regulations Advisory Scheme.

### S15.3

#### GENERAL INTERPRETATIONS OF BACKFLOW PREVENTION DEVICES AS LISTED IN TABLE S6.2

'Type BA – Verifiable backflow preventer with reduced pressure zone' means a verifiable mechanical backflow prevention device consisting of an arrangement of water fittings with three pressure zones with differential obturators and that will operate when potential backflow conditions obtain or there is a malfunction of the valve.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

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## 1. **SCOPE**

This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied

This Regulators Specification applies to: -  
Non-Verifiable Disconnecter CA.

## 2. **REQUIREMENT**

The Non-Verifiable Disconnecter CA. must be tested as and comply with the requirements/criteria stipulated in pr EN 14367 clauses: -  
1.0, 8.1, 9.1, 9.2, 9.4.1, 9.4.2, 9.4.3, 9.4.4, 9.5.1, 9.5.2, 9.5.4, 9.6.3, 10.

And The Regulators specifications 1412.1, 2111.1, 2114.2, 6001.1, 1411.1 (DZR) and 2213.10.

## 3. **Regulatory Requirements**

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (GEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

### ***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

#### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

#### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

#### **G15.7**

Mechanical backflow protection devices which, depending on the type of device, may be suitable for protection against backpressure or backsiphonage, or both, should be installed so that:

- a. they are readily accessible for inspection, operational maintenance and renewal; and
- b. except for Types HA and HUK1, backflow prevention devices for protection against fluid categories 2 and 3, they should not be located outside premises; and
- c. they are not buried in the ground; and
- d. vented or verifiable devices, or devices with relief outlets, are not installed in chambers below ground level or where liable to flooding.

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

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## **S15.3**

GENERAL INTERPRETATIONS OF BACKFLOW PREVENTION DEVICES AS LISTED IN TABLE S6.2

**'Type CA – Non-verifiable disconnecter with different pressure zones'** means a non-verifiable mechanical backflow prevention device which provides disconnection by venting the intermediate pressure zone of the device to the atmosphere when the difference of pressure between the intermediate zone and the upstream zone is not greater than 10% of the upstream pressure.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	4	5	1
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## 1. SCOPE

**This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied**

This Regulators Specification applies to: -  
In-Line Anti Vacuum valve DA.

## 2. REQUIREMENT

The In-Line Anti Vacuum valve DA must be tested as and comply with the requirements/criteria stipulated in pr EN 14451 clauses: -  
**10.1, 10.2, 10.3.2, 10.4, 10.6, 10.8.1, 10.8.2, 10.8.3, 10.9, Annex A.**

And the Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 1411.1 (DZR).

## 3. Regulatory Requirements

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

### **G15.7**

Mechanical backflow protection devices which, depending on the type of device, may be suitable for protection against backpressure or backsiphonage, or both, should be installed so that:

- a. they are readily accessible for inspection, operational maintenance and renewal; and
- b. except for Types HA and HUK1, backflow prevention devices for protection against fluid categories 2 and 3, they should not be located outside premises; and
- c. they are not buried in the ground; and
- d. vented or verifiable devices, or devices with relief outlets, are not installed in chambers below ground level or where liable to flooding.

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	4	5	1
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## **S15.3**

GENERAL INTERPRETATIONS OF BACKFLOW PREVENTION DEVICES AS LISTED IN TABLE S6.2

**'Type DA – Anti-vacuum valve (or vacuum breaker)'** means a mechanical backflow prevention device with an air inlet which is closed when water within the device is at or above atmospheric pressure but which opens to admit air if a vacuum occurs at the inlet to the device.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	4	5	2
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## 1. **SCOPE**

This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied

This Regulators Specification applies to: -  
Pipe Interrupter with Moving Element DB.

## 2. **REQUIREMENT**

The Pipe Interrupter with Moving Element DB must be tested as and comply with the requirements/criteria stipulated in pr EN 14452 clauses: -  
10.1.1, 10.2, 10.3, 10.4, 10.6, 10.8, 10.10, Annex A.

And Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 1411.1 (DZR).

## 3. **Regulatory Requirements**

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (GEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

### ***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

#### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

#### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

#### **G15.7**

Mechanical backflow protection devices which, depending on the type of device, may be suitable for protection against backpressure or backsiphonage, or both, should be installed so that:

- a. they are readily accessible for inspection, operational maintenance and renewal; and
- b. except for Types HA and HUK1, backflow prevention devices for protection against fluid categories 2 and 3, they should not be located outside premises; and
- c. they are not buried in the ground; and
- d. vented or verifiable devices, or devices with relief outlets, are not installed in chambers below ground level or where liable to flooding.

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	4	5	2
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## S15.3

GENERAL INTERPRETATIONS OF BACKFLOW PREVENTION DEVICES AS LISTED IN TABLE S6.2

**'Type DB – Pipe interrupter with atmospheric vent and moving element'** means a mechanical backflow prevention device with an air inlet closed by a moving element when the device is in normal use but which opens and admits air if the water pressure upstream of the device falls to atmospheric pressure, the device being installed so that the flow of water is in a vertical, downward direction.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	4	5	3
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Issue No: 1

Sheet 77 of 91

## 1. **SCOPE**

This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied

This Regulators Specification applies to: -  
Pipe Interrupter with Permanent Atmospheric vent DC.

## 2. **REQUIREMENT**

The Pipe Interrupter with Permanent Atmospheric vent DC must be tested as and comply with the requirements/criteria stipulated in pr EN 14453 clauses: -  
10.1, 10.2, 10.3, 10.4, 10.5, Annex A.

And The Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 1511.6 and 1411.1 (DZR).

## 3. **Regulatory Requirements**

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (GEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

### ***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

#### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

#### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

#### **S15.2**

INTERPRETATIONS OF BACKFLOW PREVENTION ARRANGEMENTS AS LISTED IN TABLE S6.1

'**Type DC – Pipe interrupter with permanent atmospheric vent**' means a non-mechanical backflow prevention device with a permanent unrestricted air inlet, the device being installed so that the flow of water is in a vertical downward direction.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	3	9	5	9
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Issue No: 1

Sheet 78 of 91

## 1. **SCOPE**

This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied

This Regulators Specification applies to: -  
Check valves EA, EB, EC, ED including check valve cartridges.

## 2. **REQUIREMENT**

The Check valves EA, EB, EC, ED including check valve cartridges must be tested as and comply with the requirements/criteria stipulated in BS EN 13959 clauses: -  
8.4.1, 10.1, 10.2, 11.1, 11.3, 11.4, 11.5, 11.6, 11.7, 11.9 and Annex A.

And the Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 2111.2 (if applicable) and 1411.1 (DZR) and 2213.5 (if applicable).

## 3. **Regulatory Requirements**

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

### ***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

#### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

#### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

#### **G15.7**

Mechanical backflow protection devices which, depending on the type of device, may be suitable for protection against backpressure or backsiphonage, or both, should be installed so that:

- a. they are readily accessible for inspection, operational maintenance and renewal; and
- b. except for Types HA and HUK1, backflow prevention devices for protection against fluid categories 2 and 3, they should not be located outside premises; and
- c. they are not buried in the ground.

#### **S15.3**

GENERAL INTERPRETATIONS OF BACKFLOW PREVENTION DEVICES AS LISTED IN TABLE S6.2

# Water supply (Water Fittings) Regulations 1999

## Regulators Specifications

Specification	1	3	9	5	9
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**'Type EA – Verifiable single check valve'** means a verifiable mechanical backflow prevention device which will permit water to flow from upstream to downstream but not in the reverse direction.

**'Type EB – Non-verifiable single check valve'** means a non-verifiable mechanical backflow prevention device which will permit water to flow from upstream to downstream but not in the reverse direction.

**'Type EC – Verifiable double check valve'** means a verifiable mechanical backflow prevention device consisting of two verifiable single check valves in series, which will permit water to flow from upstream to downstream but not in the reverse direction.

**'Type ED – Non-verifiable double check valve'** means a non-verifiable mechanical backflow prevention device consisting of two single check valves in series, which will permit water to flow from upstream to downstream but not in the reverse direction.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	4	5	4
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Issue No: 1

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## 1. SCOPE

This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied

This Regulators Specification applies to: -  
Hose Union Backflow preventer HA.

## 2. REQUIREMENT

The Hose Union Backflow preventer HA must be tested as and comply with the requirements/criteria stipulated in pr EN 14454 clauses: -  
8.3, 10.1.1, 10.2, 10.4, 10.6, 10.7, 10.9, 10.10, Annex A.

And Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 1411.1 (DZR).

## 3. Regulatory Requirements

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

### ***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

#### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

#### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

#### **G15.7**

Mechanical backflow protection devices which, depending on the type of device, may be suitable for protection against backpressure or backsiphonage, or both, should be installed so that:

- a. they are readily accessible for inspection, operational maintenance and renewal; and
- b. except for Types HA and HUK1, backflow prevention devices for protection against fluid categories 2 and 3, they should not be located outside premises; and
- c. they are not buried in the ground.

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	4	5	4
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## S15.3

GENERAL INTERPRETATIONS OF BACKFLOW PREVENTION DEVICES AS LISTED IN TABLE S6.2

**'Type HA – Hose union backflow preventer'** means a mechanical backflow prevention device for fitting to the outlet of a hose union tap and consisting of a single check valve with air inlets that open if the flow of water ceases.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	5	0	6
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Issue No: 1

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## 1. SCOPE

This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied

This Regulators Specification applies to: -  
Automatic Diverter HC (affording Backflow prevention fluid 3).

## 2. REQUIREMENT

The Automatic Diverter HC (affording Backflow prevention fluid 3) must be tested and comply with the requirements/criteria stipulated in pr EN 14506 clauses: -  
1.0, 10.1, 10.2 & Annex A, 10.4, 10.5 & 10.6.

And the Regulators Specifications 2111.1, 2114.2, 1412.1, 6001.1 and 0200.0 as applicable.

## 3. Regulatory Requirements

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

### ***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

#### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

#### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

#### **G15.7**

Mechanical backflow protection devices which, depending on the type of device, may be suitable for protection against backpressure or backsiphonage, or both, should be installed so that:

- a. they are readily accessible for inspection, operational maintenance and renewal; and
- b. except for Types HA and HUK1, backflow prevention devices for protection against fluid categories 2 and 3, they should not be located outside premises; and
- c. they are not buried in the ground; and
- d. vented or verifiable devices, or devices with relief outlets, are not installed in chambers below ground level or where liable to flooding.

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	5	0	6
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## S15.3

GENERAL INTERPRETATIONS OF BACKFLOW PREVENTION DEVICES AS LISTED IN TABLE S6.2

**'Type HC – Diverter with automatic return'** means a mechanical backflow prevention device used in bath/shower combination tap assemblies which automatically returns the bath outlet open to atmosphere if a vacuum occurs at the inlet to the device.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	4	5	5
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Issue No: 1

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## 1. SCOPE

This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied

This Regulators Specification applies to: -  
Pressurised Air Inlet valves LA.

## 2. REQUIREMENT

The Pressurised Air Inlet valves LA must be tested as and comply with the requirements/criteria stipulated in pr EN 14455 clauses: -  
3.1, 3.2, 8.3, 10.2, 10.4, 10.5, 10.7, 10.8, 10.9, 10.10, Annex A.

And Regulators Specifications 1412.1, 2111.1, 2114.2, 6001.1, 1411.1 (DZR).

## 3. Regulatory Requirements

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

### ***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

#### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability

#### **G15.2**

Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Schedule 1: Tables G6.1a to G6.1e.

#### **G15.7**

Mechanical backflow protection devices which, depending on the type of device, may be suitable for protection against backpressure or backsiphonage, or both, should be installed so that:

- a. they are readily accessible for inspection, operational maintenance and renewal; and
- b. except for Types HA and HUK1, backflow prevention devices for protection against fluid categories 2 and 3, they should not be located outside premises; and
- c. they are not buried in the ground; and
- d. vented or verifiable devices, or devices with relief outlets, are not installed in chambers below ground level or where liable to flooding.

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	4	4	5	5
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## S15.3

GENERAL INTERPRETATIONS OF BACKFLOW PREVENTION DEVICES AS LISTED IN TABLE S6.2

**'Type LA – Pressurised air inlet valve'** means an anti-vacuum valve or vacuum breaker, similar to Type DA but suitable for conditions where the water pressure at the outlet of the device under normal conditions of use is greater than atmospheric.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# Water supply (Water Fittings) Regulations 1999 Regulators Specifications

Specification	1	3	2	8	0
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Issue No: 1

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## 1. SCOPE

**This Regulators Specification identifies the performance requirements that must be complied with to ensure that the requirements of Regulation 4.(1)(a)&(b) are satisfied**

This Regulators Specification applies to: -  
GRP cisterns of one piece and sectional

## 2. REQUIREMENT

GRP cisterns must be tested as and comply with the requirements/criteria stipulated in:-  
TCS 1328.0 includes reference to BS EN 13280 clauses: -  
7.2.2, 7.3.3, 7.4.1, 9.4, Annex C, Annex F, Annex G (if applicable), Annex J. For hot water applications only Annex H.  
and Regulators Specifications 1412.1, 2111.1, 2114.2 and 6001.1.

## 3. Regulatory Requirements

The Water Supply (Water Fittings) Regulations 1999 are to prevent the: Waste; Misuse; Undue Consumption or Contamination of the water supplied by the undertaker.

Regulation 4, Requirements for water fittings, requires:

- (1) that every water fitting shall be of an approved quality and standard and be suitable for the circumstances in which it is used;
- (2) has four options for determination of whether a water fitting is of an appropriate quality or standard – ie.
  - (a) it bears a CE mark; or,
  - (b) it conforms to an appropriate (CEN) EN or European Technical Approval; or,
  - (c) it conforms to an appropriate BS, or some other national specification of an EEA State which provide an equivalent level of protection and performance; or,
  - (d) it conforms to a specification approved by the regulator.

Many fittings (and product) are thereby specified under 4 (d), Regulators' Specifications, to ensure that are of an appropriate quality and are suitable for the circumstances and function for which they are used.

***Water Supply (Water Fittings) Regulations 1999 – Schedule 2 Paragraph(s): -***

### **G2.5**

The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

- a. internal and external temperatures to which they will be subjected;
- b. the effect of internal and external corrosion;
- c. compatibility of different materials;
- d. the effect of ageing, fatigue, durability and other mechanical factors; and
- e. permeability.

### **16.**

- (1) Every pipe supplying water connected to a storage cistern shall be fitted with an effective adjustable valve capable of shutting off the inflow of water at a suitable level below the overflowing level of the cistern.
- (2) Every inlet to a storage cistern, combined feed and expansion cistern, WC flushing cistern or urinal flushing cistern shall be fitted with a servicing valve on the inlet pipe adjacent to the cistern.
- (3) Every storage cistern, except one supplying water to the primary circuit of a heating system, shall be fitted with a servicing valve on the outlet pipe.
- (4) Every storage cistern shall be fitted with –
  - (a) an overflow pipe, with a suitable means of warning of an impending overflow, which excludes insects;
  - (b) a cover positioned so as to exclude light and insects; and
  - (c) thermal insulation to minimise freezing or undue warming.
- (5) Every storage cistern shall be so installed as to minimise the risk of contamination of stored water. The cistern shall be of an appropriate size, and the pipe connections to the cistern shall be so positioned, as to allow free circulation and to prevent areas of stagnant water from developing.

**A product or installation which satisfies the requirements of this specification will be deemed to meet the requirements of the Water Supply (Water Fitting) Regulations 1999.**

# APPENDIX B

<input type="checkbox"/>	<input type="checkbox"/>		<b>BS EN ISO 12543-4:1998</b>	Glass in building. Laminated glass and laminated safety glass. Test methods for durability	Current	£24.00	£41
<input type="checkbox"/>	<input type="checkbox"/>		<b>BS EN ISO 12543-5:1998</b>	Glass in building. Laminated glass and laminated safety glass. Dimensions and edge finishing	Current	£30.00	£61
<input type="checkbox"/>	<input type="checkbox"/>		<b>BS EN ISO 12543-6:1998</b>	Glass in building. Laminated glass and laminated safety glass. Appearance	Current	£24.00	£41
<input type="checkbox"/>	<input type="checkbox"/>	 	<b>BS EN 1254-1:1998</b>	Copper and copper alloys. Plumbing fittings. Fittings with ends for capillary soldering or capillary brazing to copper tubes	Current, Under Review	£30.00	£61
<input type="checkbox"/>	<input type="checkbox"/>	 	<b>BS EN 1254-2:1998</b>	Copper and copper alloys. Plumbing fittings. Fittings with compression ends for use with copper tubes	Current, Under Review	£30.00	£61
<input type="checkbox"/>	<input type="checkbox"/>	 	<b>BS EN 1254-3:1998</b>	Copper and copper alloys. Plumbing fittings. Fittings with compression ends for use with plastics pipes	Current, Under Review	£24.00	£41
<input type="checkbox"/>	<input type="checkbox"/>	 	<b>BS EN 1254-4:1998</b>	Copper and copper alloys. Plumbing fittings. Fittings combining other end connections with capillary or compression ends	Current, Under Review	£24.00	£41

<input type="checkbox"/>	<input type="checkbox"/>	 	<b>BS EN 1254-5:1998</b>	Copper and copper alloys. Plumbing fittings. Fittings with short ends for capillary brazing to copper tubes	Current, Under Review	£30.00	£61
<input type="checkbox"/>	<input type="checkbox"/>		<b>BS EN 12540:2000</b>	Corrosion protection of metals. Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and copper plus nickel plus chromium	Current	£43.00	£81
<input type="checkbox"/>	<input type="checkbox"/>	 	<b>BS EN 12541:2002</b>	Sanitary tapware. Pressure flushing valves and automatic closing urinal valves PN 10	Current	£50.00	£10
<input type="checkbox"/>	<input type="checkbox"/>	 	<b>BS EN 12542:2002</b>	Static welded cylindrical tanks, serially produced for the storage of Liquefied petroleum gas (LPG) having a volume not greater than 13 m <sup>3</sup> and for installation above ground. Design and manufacture	Current	£61.00	£12
<input type="checkbox"/>	<input type="checkbox"/>		<b>BS EN 12543-1:1999</b>	Non-destructive testing. Characteristics of focal spots in industrial X-ray systems for use in non-destructive testing. Scanning method	Current	£24.00	£41
<input type="checkbox"/>	<input type="checkbox"/>		<b>BS EN 12543-2:1999</b>	Non-destructive testing. Characteristics of focal spots in industrial X-ray systems for use in non-destructive	Current	£24.00	£41



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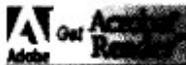
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<input type="checkbox"/>	<input type="checkbox"/>		<b>BS EN 12201-2:2003</b>	Plastic piping systems for water supply. Polyethylene (PE). Pipes	Current	£43.00	£86.00
<input type="checkbox"/>	<input type="checkbox"/>		<b>BS EN 12201-3:2003</b>	Plastic piping systems for water supply. Polyethylene (PE). Fittings	Current	£43.00	£86.00
<input type="checkbox"/>	<input type="checkbox"/>		<b>BS EN 12201-4:2001</b>	Plastic piping systems for water supply. Polyethylene (PE). Valves	Current	£30.00	£60.00
<input type="checkbox"/>	<input type="checkbox"/>		<b>BS EN 12201-5:2003</b>	Plastic piping systems for water supply. Polyethylene (PE). Fitness for purpose of the system	Current	£30.00	£60.00
<input type="checkbox"/>	<input type="checkbox"/>		<b>DD CEN/TS 12201-7:2003</b>	Plastic piping systems for water supply. Polyethylene (PE). Guidance for the assessment of conformity	Current	£24.00	£48.00

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