

Waterworks (Amendment) Regulations 2017
Joint Submissions and Proposed Amendments

by
Progressive Lawyers Group
&
Frontline Tech Workers Group

A. BACKGROUND

1. On 28th March 2017, the Executive Council advised and the Chief Executive ordered that the Waterworks Regulations (Cap. 102A) (“**WWR**”) be amended and the Waterworks (Amendment) Regulation 2017 (the “**Amendment**”) be made.
2. Pursuant to the Amendment, the Development Bureau proposed to update the applicable standards such that the latest technical requirements and standards for plumbing materials are set out in the WWR by:-
 - (a) providing the Water Authority with the power to demand compliance of the requirements and prescribed specifications set down under Schedule 2 in accordance with r20(1), including the power to approve:-
 - (i) any departure from the prescribed specification for a pipe or fitting under r20(2); and
 - (ii) any installation of a pipe or fitting that does not comply with the specification under Schedule 2 in accordance with r25(2);
 - (b) amending the definition of the standards applicable to pipes and fittings for plumbing works;
 - (c) updating Schedule 2 of the WWR to specify the applicable technical requirements and standards for plumbing materials.

B. OUR OBSERVATIONS

3. The Progressive Lawyers Group (“**PLG**”) and the Frontline Tech Workers Group (“**FTWG**”) make the following observations in relation to the Amendments:-
 - (a) In respect of the Water Authority’s power to approve pipes, fitting and installation which are not compliant with the requisite standards, we submit that the Water Authority is given too wide a discretionary power without sufficient restrictions which could easily be abused. Under r20(2)(b), there are no international standards to which the Water Authority should make reference,

whilst in sub-regulation r25(2) there are neither guidelines nor restrictions to limit the exercise of such power at all. We are therefore concerned that such a wide discretionary power may not serve the purpose of ensuring compliance of the plumbing materials up to the required standards or prescribed specifications under Schedule 2;

- (b) The Amendment does not stipulate the procedures as to how the Water Authority should conduct checking to ensure compliance of the variable standards and the specifications;
- (c) Under Schedule 2 of the Amendment, some internationally recognised standards are absent. Furthermore, the standards proposed to be adopted do not include all the materials that could be found in the plumbing materials:-
 - (i) Under Clause 3 of the Amendment, not all applicable standards and specifications commonly used to test the safety of plumbing materials are included;
 - (ii) There are no requirements or standards in relation to microbiology or chemical tests under Schedule 2. The requirements listed under the British Standard issued by the British Standard Institution (“**BS**”), the European Standard issued by the British Standard Institution (“**BS EN**”), a specification forming part of the International Standard issued by the British Standards Institution (“**BS EN ISO**”) or a specification forming part of the Australian Standard issued by the Standards Australia (“**AS**”) are only requirements of performing mechanical test as proposed under r2(2). For example, the chemical and hygiene requirements only briefly referred to clauses 5.1 and 5.2 of BS EN 200:2008. The copper alloy compositions and stainless steel compositions are not listed in the standard of BS EN 200:2008 either; and
 - (iii) There are no details of testing requirements under BS, BS EN, BS EN ISO and AS. The manufacturers or testing laboratories would not be able to find out any requirements of the compositions of the metallic plumbing materials, for example, the water mixer standard, BS EN 817:2008;
- (d) Schedule 2 of the Amendment does not include all of the materials used in the plumbing materials:-
 - (i) Under paragraph 3 of Part 1, Pipes and Fittings, “*Pipes for a fresh water inside service must be made of cast iron, ductile iron, unplasticized polyvinyl chloride, polybutylene, steel, stainless steel, copper, polyethylene, crosslinked polyethylene or chlorinated polyvinyl chloride...*” are required. However, other materials could be used in pipes

for a fresh water inside service, for example, *lubricants, silicone sealing rings, elastomers sealing rings* etc. Yet these materials are not regulated to comply with any standards or specifications in the Amendments;

- (ii) Lead is commonly used in plastic materials as a stabilizer, especially in PVC. Polycyclic aromatic hydrocarbons, cadmium and organotin are commonly found in hard plastics that may be used in a pipe and fitting. However, testing standards and requirements on the above materials are not included under Schedule 2;
 - (iii) Under paragraph 20 of Part 1, Pipes and Fittings, in Schedule 2, “*Stainless steel pipes must be of grade 304 or better...*” are required. However, chlorine ions might create localized areas of corrosion and such corrosion could spread underneath to the protective chromium barriers and compromise the internal structures. We thus submit that the required grade for stainless steel is too low;
 - (iv) Under paragraph 1 of Part 1, Pipes and Fittings, in Schedule 2, the standard test or requirement for bitumen is not available which is commonly found in the coating of the pipes and fittings made of steel and cast iron;
 - (v) No copper alloy and stainless steel composition requirements listed in Tapes BS and BS EN standards under Part 2;
 - (vi) Non-metallic material, for example lubricants, silicone sealing rings, elastomers sealing rings, are not regulated under Part 2, Tapes and Valves, of the Schedule; and
 - (vii) The water heater made for the purpose of human consumption of drinking water is not regulated under Part 4, Hot Water Inside Services, of the Schedule 2;
- (e) The Amendment fails to provide a list of materials that must not be used in any plumbing materials. Nickel-chromium plating is commonly found in copper alloy components, such as mixer taps and valves, to prevent corrosion and improve resistance and appearance by plating it on the surface of tapes and valves. The inside of these brass components might also be affected by the nickel-chromium plating near the apertures and the nickel-chromium might be released and could contaminate the water during the service life of these components. Unfortunately, such is not regulated to comply with any standards under Schedule 2;
- (f) After excessive lead was found in drinking water, the Water Authority issued the materials approval standard which is supposed to be valid for 5 years from

the issue date. However, if the validity of the standards under Schedule 2 expire or are being updated during any time in this 5-year period, the Water Authority failed to mention any measures to remedy such loophole in the Amendment; and

- (g) The Amendment fails to address the problems of aging or oxygenised plumbing materials.

C. OUR RECOMMENDATIONS

4. In light of our observations in paragraph 3 of these Joint Submissions, the PLG and the FTWG recommend the following revisions to the Amendments:-

- (a) In furtherance of paragraph 3(a) of these Joint Submissions, we propose that the Water Authority may only exercise such power to approve non-compliance of the prescribed specification only when both requirements under r20(2) are satisfied. We also recommend that the standards and requirements of AS 4030, NSF 60 & 61 of United States or the Guidelines and Evaluation Criteria issued by Umweltbundesamt of Germany should be referred to when the Water Authority is to determine whether the safety of the pipe or fitting might be adversely affected. Therefore, we recommend that r20(2) under Clause 7 of the Amendment be deleted in its entirety and be replaced by the following proposed revision:-

“(2) A departure from a prescribed specification for a pipe or fitting does not amount to non-compliance with the specification for the pipe or fitting may be permitted by the Water Authority only if the departure does not adversely affect--

- (a) the efficiency of the fire service or inside service in which the pipe or fitting is installed in providing reliable and adequate supply of water;
- (b) the quality of the water; and
- (c) the standards and/or requirements of the pipe or fitting with reference to the standards and requirements of AS 4030, NSF 60 & 61 of United States or the Guidelines and Evaluation Criteria issued by Umweltbundesamt of Germany.”;

- (b) In furtherance of paragraph 3(a) of these Joint Submissions, we propose to require the Water Authority to consider the same factors under r20(2) in exercising its power to approve installation of pipes and fittings that does not comply with the prescribed specifications and Clause 5 of the Amendment to be deleted in its entirety and replaced by the following proposed revision:-

“Regulation 25 amended (power to relax regulations)

Regulation 25 --

Repeal subregulation (2)

Substitute

“(2) Despite the requirement in Schedule 2 for a pipe or fitting to comply with a prescribed specification the Water Authority may approve the installation of a pipe or fitting that does not comply with the specification only if such installation does not adversely affect --

(a) the efficiency of the fire service or inside service in which the pipe or fitting is installed in providing reliable and adequate supply of water;

(b) the quality of the water; and

(c) the standards and/or requirements of the pipe or fitting with reference to the standards and requirements of AS 4030, NSF 60 & 61 issued by American National Standards Institute of the United States or the Guidelines and Evaluation Criteria issued by Umweltbundesamt of Germany.”;

- (c) In furtherance of our observation under paragraphs 3(b) and (c) of these Joint Submission, we propose that the Water Authority be equipped with the power to demand and inspect test reports, such that r20(3) be amended as follows:-

“, inspect, examine, test, or request and inspect any test reports of a pipe or fitting to ascertain whether it complies with a prescribed specification.”;

- (d) To specify some commonly used non-metallic materials and products we have addressed under paragraph 3(d)(i) of these Joint Submissions, we recommend to amend paragraph 23 of Part 1 as follows:-

“Non-metallic materials and products, including but not limited to lubricants, silicone sealing rings, elastomers sealing rings etc., for use in contact with water intended for human consumption must comply with the relevant requirements in BS6920/1:2014...”

- (e) To address the concern under paragraph 3(d)(ii) above, a new paragraph is proposed be added under Part I:-

“24. Polycyclic aromatic hydrocarbons, cadmium and organotin must comply with the REACH Restricted Substance List of 2017 (annex XVII)”

- (f) For the grade under paragraph 3(d)(iii) above, we propose that a higher grade of 316 or better should be adopted;

- (g) In response to paragraph 3(d)(iv) of these Joint Submissions, we suggest to add the following testing standard to Part 1 with reference to BS EN 10300 (in

particularly clause 4.2.4 of BS EN 10300) when bitumen is mixed with enamel. Specific migration of lead and cadmium for enamel should be tested according to the EU Directive 84/500/EEC;

- (h) We also recommend to copy the whole paragraph 23 of Part 1 to Part 2 and to add a new paragraph 22 in Part 2 to regulate non-metallic materials and products used in Tapes and Valves as we have mentioned in paragraph 3(d)(vi):-

“Non-metallic materials and products, including but not limited to lubricants, silicone sealing rings, elastomers sealing rings etc. for use in contact with water intended for human consumption must comply with the relevant requirements in BS6920/1:2014... ..”;

- (i) We also propose that a new paragraph 12 be added immediately after paragraph 11 of Part 4, Hot Water Inside Services to address the issue under paragraph 3(d)(vii),

“A water heater sold, installed or manufactured for the purpose of human consumption of the drinking water must not be made of metallic, non-metallic or solder materials that may adversely affect the water quality.”

- (j) As pointed out in paragraph 3(d) of these Joint Submission, there are many other materials not mentioned under the Schedule of the Amendment. Therefore, we propose that a comprehensive metallic list for all materials in the process of water supplies should be adopted. The European Union provided a good reference, which is the Acceptance of Metallic Materials Used for products in contact with drinking water by 4MS Common Approach¹. This has been adopted and implemented in the Netherlands and Germany;

- (k) In order to handle the materials which should never be used in any plumbing materials as commented on under paragraph 3(e) of these Joint Submissions, we recommend that a list of banned materials should be included under Schedule 2. The Water Authority should retain the power to update the list from time to time unless proof of satisfaction of certain tests to be used in any pipes and fittings. For example, in Germany, nickel-chromium plate for any parts of plumbing materials is banned unless such nickel-chromium plate component passes the testing requirements of DIN EN 15664-1². The Water Authority should not be

1

https://www.umweltbundesamt.de/sites/default/files/medien/374/dokumente/7th_revision_4ms_scheme_for_metallic_materials_part_b.pdf

² DIN EN 15664-1 specifies the procedure to determine the release of metals from metallic materials used in construction products intended to come into contact with drinking water. The test can be used for following three purposes: a) assessment of a material as a reference material for a category of materials using the results of several investigations in different waters covering a broad range of water compositions; b) assessment of a material for approval by way of comparative testing; c) obtain data on the interaction of local water with a material.

allowed to retain any discretion to approve non-compliance or permit the installation or use of any plumbing materials that contains such materials under the list;

- (1) In addressing the problem raised in paragraph 3(f) of these Joint Submissions, the Water Authority is advised to make reference to the practice in Germany on how Germany handles its Geprüfte Sicherheit (“**GS**”) standard. In general, the validity of a GS certificate or mark is valid for 5 years if the standards (EN or DIN EN) remained valid. However, in case any standard is updated or changed during the 5-year period, the GS certificate or mark holder must submit updated test results on the materials based on the new standard with the accredited certification bodies.

D. CONCLUSION

5. To conclude, the PLG and the FTWG believe that amending the WWR is only a small step to ensure our water quality. In particular, we note that the proposed testing standards and prescribed specifications appear to be aimed at conducting mechanical and physical tests of the plumbing materials, and yet microbiological and hygiene tests for water quality are absent throughout the whole Amendment. Therefore, we submit that an independent water safety bill should be enacted to tackle the real issue of water quality for the long-term benefit of our society.

Dated: 27th of June 2017

Jointly Submitted by
Progressive Lawyers Group
&
Frontline Tech Workers Group