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Water quality – Risk assessments for *Legionella* control – Code of practice

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Contents

Summary of pages
This document comprises a front cover, and inside front cover, pages i to ii, pages 1 to 48, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 January 2019. It was prepared by Subcommittee EH/3/4, *Microbiological methods*, under the authority of Technical Committee EH/3, *Water quality*. A list of organizations represented on these committees can be obtained on request to their secretary.

Supersession

This British Standard supersedes BS 8580:2010, which is withdrawn.

Use of this document

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. "organization" rather than "organisation").

The word "should" is used to express recommendations of this standard. The word "may" is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the clause. The word "can" is used to express possibility, e.g. a consequence of an action or an event.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Introduction

Legionellosis refers to illness caused by bacteria of the genus *Legionella* including Legionnaires' disease and Pontiac fever. The most serious form of disease caused by *Legionella* is Legionnaires' disease, a severe pneumonia with a relatively high fatality rate, which was first recognized in 1976. Outbreaks and sporadic infections occur throughout the world. At least 61 species of *Legionella* have been described and over 28 have been associated with disease in humans, but the predominant cause of Legionnaires' disease is *L. pneumophila. Legionella* are opportunistic pathogens of humans and normally inhabit warm, moist or aquatic environments where they grow in association with other organisms. In particular, they are known to grow in a range of protozoa. Their predilection for warm water means that they are capable of colonizing artificial water systems and equipment containing water. Legionnaires' disease is not contagious from person to person but is of environmental origin and usually contracted by inhaling the organism in an aerosol produced from water contaminated with the organism. Aspiration of water (water going down the wrong way) containing *Legionella* can also cause infection, particularly in hospitalized individuals.

There is a chain of events leading to an individual contracting Legionnaires' disease:

- the water system needs to become contaminated (inoculated) with the bacteria;
- hazardous conditions have to exist within the system for the amplification of the bacteria to sufficient concentrations to cause infection;
- the contaminated water usually needs to be dispersed into droplets fine enough to form an aerosol for transmission to the individual;
- inhalation of contaminated aerosols or, in rare cases, aspiration of contaminated drinking water; and
- the exposed individual has to be susceptible to succumb to infection.

The ubiquitous occurrence of *Legionella*, combined with their association with protozoa, means that all building water systems are susceptible to contamination with *Legionella* via the water supply or dust entering the system. It is therefore normal practice to assume that a system can become contaminated. Whether the amplification of *Legionella* is likely within the equipment or system can be inferred from the conditions of the water; the design, construction and operating conditions of the equipment or system at the time of assessment; and records of treatment and monitoring of the equipment or system in the past. It is not recommended to test for the presence of *Legionella* prior to the implementation of a water management programme.

The generation of aerosols can be observed in the operation of systems such as cooling towers, evaporative condensers, industrial processes, spa pools/hot tubs, showers and taps. Many of these can produce substantial aerosols. Some systems, such as cooling towers, evaporative condensers and some industrial processes, can transmit the aerosol widely, exposing a large population over an area up to several kilometres. Spa pools and hot tubs can expose many users and anyone in the immediate vicinity, while showers and taps are most likely to lead only to the exposure of individual users.

Finally, for an individual to become infected following exposure they have to be susceptible, usually having predisposing conditions. Only a very small proportion of those exposed develop disease, but increasing age, particularly 50 years and over, smoking, being male and being immunosuppressed through disease or treatment can increase susceptibility. Host susceptibility is therefore an important factor influencing risk and needs to be considered in the assessment.

A site-specific analysis of hazardous conditions allows appropriate control measures to be identified and put in place to protect the health and safety of employees and members of the public who could be affected by work activities. *Legionella* risk assessment is no different and is a legal requirement

