

MICROBIAL CONTROL

INTRODUCTION

This TECHnote discusses the requirements for microbial control in buildings and how these are addressed in NATSPEC. Microbial control aims to minimise health risks. These include Legionnaires' disease, Pontiac fever, Hypersensitivity pneumonitis and Humidifier fever, posed by viruses, fungi and bacteria. Control may be achieved through proper design, installation, commissioning and maintenance of cooling towers, warm and hot water services and air handling systems.

LEGIONELLA

Legionnaires' disease is a bacterial infection which presents as a severe form of pneumonia and can be fatal if not treated with antibiotics. Those particularly at risk include older people and those with compromised immune systems.

Legionella infections are contracted by inhaling airborne water particles contaminated by *Legionella* bacteria. Cooling water systems, heating water systems and air handling systems which are not properly designed, built or maintained can provide conditions in which the bacteria thrive and disperse.

The *Legionella* bacteria is found widely in the environment and is also associated with spa pools, potting mixes and shallow ornamental fountains exposed to heat and light.

MANDATORY REQUIREMENTS

The National Construction Code (NCC) Volume 1 has the following requirements for microbial control of water and air handling systems in some classes of building:

BCA F4D10: Requires compliance with AS/NZS 3666.1 for the design, installation and commissioning of hot water, warm water and cooling water systems.

BCA F6D6: Requires compliance with AS 1668.2 for design, installation and commissioning of mechanical ventilation and air conditioning systems.

CONSIDERATIONS

The following is a list of issues for consideration when designing and specifying for microbial control:

Legislation, guidelines and

responsible authorities: Each state and territory have legislation addressing *Legionella*. The relevant acts being known by names such as the Public Health Act, the Health Act, the Public Health and Wellbeing Act, Workplace Health and Safety Act, and Public and Environment Health Act.

Regulated systems: In some states and territories, regulated systems may be limited to cooling towers and warm water systems. Other states also regulate air handling systems.

Registration, approvals and licensing: May be required for certain types of system, e.g. cooling towers.

Maintenance and testing requirements: Regulatory requirements vary by state and territory and may require audits.

Design issues: Design to prevent the multiplication of the bacteria, the production of an aerosol and contact with contaminated droplets. This includes avoiding dead-legs and providing for draining down systems for cleaning and storage of chemicals. The design must consider any health and safety requirements including provisions for safe storage and transport of chemicals, spillage control and management.

NATSPEC APPROACH

The following text is included in the **STANDARDS** clause of the Mechanical and Hydraulic worksections:

Microbial control: To AS/NZS 3666., AS/NZS 3666.2 and the recommendations of SA/SNZ HB 32.

Individual worksections listed in the sidebar also cite the AS/NZS 3666 series.

In addition, NATSPEC also allows for specifying the commissioning and maintenance requirements for the contract duration.

Relevant documents

AS/NZS 3666 series *Air-handling and water systems of buildings - Microbial control*

Part 1 *Design, installation and commissioning*

Part 2 *Operation and maintenance*

AS 1668 series *The use of ventilation and air conditioning in buildings*

Part 2 *Mechanical ventilation in buildings*

SA/SNZ HB 32 *Control of microbial growth in air-handling and water systems in buildings*

NCC Volumes 1, 2 and 3

Relevant worksections

0171 *General requirements*

0701 *Mechanical systems*

0702 *Mechanical design and install*

0713 *Cooling towers*

0714 *Mechanical pumps*

0715 *Chillers – combined*

0716 *Chillers – centrifugal*

0717 *Chillers – water cooled screw*

0718 *Chillers – air cooled screw and scroll*

0719 *Chillers – absorption*

0721 *Packaged air conditioning*

0722 *Room air conditioners*

0723 *Evaporative air coolers*

0724 *Air handling plant – combined*

0725 *Air handling plant – built-up*

0726 *Air handling plant – minor*

0727 *Air handling plant – packaged*

0731 *Fans*

0732 *Air filters*

0734 *Humidifiers*

0741 *Ductwork*

0753 *Water treatment*

0761 *Refrigeration*

0762 *Cool rooms*

0791 *Mechanical commissioning*

0792 *Mechanical maintenance*

0801 *Hydraulic systems*

0802 *Hydraulic design and install*

0813 *Water heaters*

0816 *Hydraulic services tanks*

0822 *Wastewater*

0823 *Cold and heated water*

0891 *Hydraulic maintenance*