Special requirements for heating, ventilation, and air-conditioning (HVAC) systems in health care facilities
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Contents

Technical Committee on Health Care Facilities 6
Subcommittee on Special Requirements for HVAC Systems in Health Care Facilities 9
Preface 11

0 Introduction 13

1 Scope 13

2 Reference publications 14

3 Definitions and abbreviations 17
3.1 Definitions 17
3.2 Abbreviations 22

4 General 23

5 General design requirements 25
5.1 General 25
5.2 Ventilation 26
5.3 Infection control 26
5.4 Fire protection and smoke management 26
5.5 Continuity of systems 27
5.6 Monitoring 27
5.7 Energy management and sustainability 27
5.8 Existing systems and equipment 28

6 Detailed design requirements 29
6.1 General 29
6.1.1 Temperature, relative humidity, relative pressurization, and air flow 29
6.1.2 Class of health care facility 29
6.1.3 Heating and cooling design requirements by Class 29
6.1.4 Space 29
6.1.5 Access 30
6.1.6 Replacement 30
6.1.7 Isolation valves and connections 30
6.1.8 Maintenance 30
6.1.9 Identification of piping and ductwork 30
6.1.10 Surface materials 30
6.1.11 Waterproofing 31
6.1.12 Recirculation flexibility in 100% outside air systems 31
6.2 Heating source 31
6.2.1 General 31
6.2.2 Design load - heating 31
6.2.3 Boilers and other heating units 31
6.2.4 External heating supply 32
6.2.5 Temporary supply 32
6.2.6 Secondary fuel requirements 32
6.2.7 Standby fuel 32
6.2.8 Ancillary equipment for heating units 32
6.2.9 Essential electrical system 33
6.2.10 Chemicals 33
6.2.11 Water supply 33
6.2.12 Parallel steam traps 33
6.3 Cooling source 34
6.3.1 General 34
6.3.2 Design load - cooling 34
6.3.3 Cooling system 34
6.3.4 Maintenance of essential cooling functions 34
6.3.5 Design considerations 35
6.3.6 Ancillary equipment for cooling systems 35
6.3.7 Sizing of cooling sources 36
6.3.8 Cooling towers and cooling condensers 36
6.3.9 Temporary connection 37
6.3.10 Cooling sources 37
6.4 Piped HVAC distribution 38
6.4.1 Piping locations 38
6.4.2 Piping shafts 38
6.4.3 Shut-off valves 38
6.4.4 Supply and return connections 38
6.5 Air handling systems 38
6.5.1 General 38
6.5.2 Requirements for areas of different use 38
6.5.3 Return air systems 39
6.5.4 Minimum operation 39
6.5.5 Variable air volume (VAV) systems 41
6.5.6 Air handling unit redundancy 41
6.5.7 Outdoor air intakes 44
6.6 Air handling units 45
6.6.1 Construction 45
6.6.2 Water removal 46
6.6.3 Ultraviolet disinfection systems 47
6.6.4 Access 47
6.7 Air filtration 48
6.8 Humidification 49
6.8.1 General 49
6.8.2 Chemical treatment 50
6.8.3 Central air handling 50
6.8.4 Humidification controls 50
6.8.5 Duct-mounted humidifiers 51
6.9 Air distribution 51
6.9.1 General 51
6.9.2 Ceiling space 51
6.9.3 Circulation, transfer, and recirculation 52
6.9.4 Duct surfaces 52
6.9.5 Lining of HVAC elements 53
6.9.6 Duct access 53
6.9.7 Duct cleaning 54
6.10 Air separation, air flow, and relative space pressurization 54
6.10.1 General 54
6.10.2 Low-level air separation by means of air flow 55
6.10.3 Medium level air separation 55
6.10.4 Airborne isolation rooms (AIRs), protective environment rooms (PERs), and other special precaution rooms requiring high-level air separation 55
6.10.5 Portable or fixed HEPA filtration units 60
6.11 Room and space requirements 61
6.11.1 General 61
6.11.2 Directional airflow 61
6.11.3 Type I areas 62
6.11.4 Scavenging systems 63
6.11.5 Specialized rooms 63
6.11.6 Mental health facilities 64
6.11.7 Hemodialysis 64
6.11.8 Normally unoccupied service areas 65
6.12 HVAC heating/cooling terminals and local heating/cooling units 65
6.12.1 Access 65
6.12.2 Finned elements 65
6.12.3 Local heating or cooling units 65
6.12.4 Noncentral air handling units 66
6.12.5 Water removal for local cooling and non-central air handling units 66
6.13 Exhaust systems 67
6.13.1 General 67
6.13.2 Alarms 67
6.13.3 Dedicated exhaust 67
6.13.4 Discharge locations 68
6.13.5 Filtration and treatment 68
6.13.6 Nitrous oxide cylinder storage 68
6.13.7 Ethylene oxide exhaust 68
6.13.8 Fans 68
6.14 Controls 68
6.14.1 Individual temperature controls 68
6.14.2 Area humidity controls 69
6.14.3 Essential electrical system 69
6.14.4 Indicators 69
6.15 Smoke management 69
6.15.1 General 69
6.15.2 Special considerations 69
6.15.3 Sleeping rooms 69
6.15.4 Smoke dampers 70
6.15.5 Coordination 70
6.15.6 Smoke management zoning 70
6.15.7 Functionality 70
6.15.8 Testing 70
6.15.9 Priority 70
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.15.10</td>
<td>Sequence</td>
<td>70</td>
</tr>
<tr>
<td>6.15.11</td>
<td>Response time</td>
<td>70</td>
</tr>
<tr>
<td>6.15.12</td>
<td>Sealing</td>
<td>70</td>
</tr>
<tr>
<td>6.16</td>
<td>Catastrophic event management</td>
<td>71</td>
</tr>
<tr>
<td>6.16.1</td>
<td>General</td>
<td>71</td>
</tr>
<tr>
<td>6.16.2</td>
<td>Air exchange rates</td>
<td>73</td>
</tr>
<tr>
<td>6.16.3</td>
<td>Design conditions for heating and cooling</td>
<td>74</td>
</tr>
<tr>
<td>6.17</td>
<td>Acoustics and vibration control</td>
<td>77</td>
</tr>
<tr>
<td>6.17.1</td>
<td>Acoustics</td>
<td>77</td>
</tr>
<tr>
<td>6.17.2</td>
<td>Vibration control</td>
<td>77</td>
</tr>
<tr>
<td>6.18</td>
<td>System balancing and adjustments</td>
<td>77</td>
</tr>
<tr>
<td>6.18.1</td>
<td>General</td>
<td>77</td>
</tr>
<tr>
<td>6.18.2</td>
<td>Airflow</td>
<td>77</td>
</tr>
<tr>
<td>6.19</td>
<td>Energy efficiency and sustainability</td>
<td>78</td>
</tr>
<tr>
<td>6.19.1</td>
<td>System design</td>
<td>78</td>
</tr>
<tr>
<td>6.19.2</td>
<td>Unoccupied periods</td>
<td>78</td>
</tr>
<tr>
<td>6.19.3</td>
<td>Energy recovery</td>
<td>78</td>
</tr>
<tr>
<td>6.19.4</td>
<td>Free cooling</td>
<td>79</td>
</tr>
<tr>
<td>6.19.5</td>
<td>Direct digital controls</td>
<td>79</td>
</tr>
<tr>
<td>6.19.6</td>
<td>Environmental aspects</td>
<td>79</td>
</tr>
<tr>
<td>6.19.7</td>
<td>Rainwater collection</td>
<td>79</td>
</tr>
<tr>
<td>6.19.8</td>
<td>Demand-controlled ventilation</td>
<td>79</td>
</tr>
<tr>
<td>6.19.9</td>
<td>Alternative energy</td>
<td>79</td>
</tr>
<tr>
<td>6.19.10</td>
<td>Glazing</td>
<td>80</td>
</tr>
<tr>
<td>6.19.11</td>
<td>Chillers</td>
<td>80</td>
</tr>
<tr>
<td>6.19.12</td>
<td>Kitchens</td>
<td>81</td>
</tr>
<tr>
<td>7</td>
<td>Commission</td>
<td>81</td>
</tr>
<tr>
<td>8</td>
<td>Operation, maintenance, and monitoring</td>
<td>81</td>
</tr>
<tr>
<td>8.1</td>
<td>General</td>
<td>81</td>
</tr>
<tr>
<td>8.2</td>
<td>Operation and monitoring of HVAC systems and components</td>
<td>82</td>
</tr>
<tr>
<td>8.2.1</td>
<td>General</td>
<td>82</td>
</tr>
<tr>
<td>8.2.2</td>
<td>Calibration</td>
<td>82</td>
</tr>
<tr>
<td>8.2.3</td>
<td>Records</td>
<td>82</td>
</tr>
<tr>
<td>8.2.4</td>
<td>HVAC performance</td>
<td>83</td>
</tr>
<tr>
<td>8.2.5</td>
<td>Operational monitoring and replacement of filters and seals</td>
<td>83</td>
</tr>
<tr>
<td>8.2.6</td>
<td>Fan coils, drain pans, and induction units</td>
<td>85</td>
</tr>
<tr>
<td>8.2.7</td>
<td>Fire and smoke dampers</td>
<td>85</td>
</tr>
<tr>
<td>8.3</td>
<td>Maintenance of HVAC systems and components</td>
<td>85</td>
</tr>
<tr>
<td>8.3.1</td>
<td>General</td>
<td>85</td>
</tr>
<tr>
<td>8.3.2</td>
<td>Maintenance and monitoring</td>
<td>86</td>
</tr>
<tr>
<td>8.3.3</td>
<td>Consultation</td>
<td>86</td>
</tr>
<tr>
<td>8.3.4</td>
<td>Chemical treatment</td>
<td>86</td>
</tr>
<tr>
<td>8.3.5</td>
<td>Dust generated during construction, renovations, and maintenance</td>
<td>86</td>
</tr>
<tr>
<td>8.3.6</td>
<td>Sustainability</td>
<td>86</td>
</tr>
<tr>
<td>8.3.7</td>
<td>Other monitoring activities</td>
<td>86</td>
</tr>
<tr>
<td>8.3.8</td>
<td>Duct cleaning</td>
<td>86</td>
</tr>
<tr>
<td>8.3.9</td>
<td>Cooling towers</td>
<td>87</td>
</tr>
</tbody>
</table>
8.3.10 Existing systems and equipment 88
8.4 Energy management 88
8.4.1 General 88
8.4.2 Adverse environmental impact analysis 88
8.4.3 Sustainability 88
8.5 Construction, renovation, or maintenance provisions to prevent the spread of infection 88
8.5.1 General 88
8.5.2 Construction air handling units 88
8.6 Continuity of service 88
8.7 Catastrophic events 89

Annex A (informative) — Guidelines for HVAC design 121
Annex B (informative) — Health care facility examples according to class 124
Annex C (normative) — Condensate trap depth chart 129
Annex D (informative) — Examples of configurations designed to meet redundancy requirements in Clause 6.5.6.1.3 130
Preface

This is the fifth edition of CSA Z317.2, Special requirements for heating, ventilation, and air-conditioning (HVAC) systems in health care facilities, one of a series of Standards on the design, construction, and maintenance of health care facilities and systems. It supersedes the previous editions, published in 2015, 2010, 2001, and 1991.

This Standard is intended for use by architects, engineers, planners, consultants, and health care facility staff to ensure the efficient planning, design, construction, and maintenance of HVAC systems. In addition to design and construction requirements, this Standard includes commissioning, operational, maintenance, and monitoring requirements for HVAC systems that will reduce the risk of transmission of infection among building occupants, including patients, staff, and visitors. Significant changes in this edition include the following:

a) clarification of HVAC requirements for rooms and areas used for similar or different functions, including more stringent requirements for areas in a facility used for more than one function;
b) additional guidance on HCFs providing services when outdoor conditions are extreme and when indoor conditions are outside of the HVAC design ranges;
c) information on areas with increased activity level potentially requiring a higher air exchange rate to maintain air quality;
d) enhanced electrical system requirements for control systems during loss of power to ensure continuity of systems;
e) revisions for HVAC system upgrades associated with renovations or additions;
f) expansion of requirements for chemical treatment of steam and condensate piping systems;
g) expansion of requirements for heating and cooling source redundancy;
h) additional considerations for the placement of outdoor intakes;
i) clarification for the location of duct-mounted humidifiers;
j) new provisions for flex ducting;
k) expanded requirements for audible and visual alarms for AIRs;
l) clarification on the use of non-aspirating diffusers in Type I areas;
m) alignment of inhaled anaesthetic and analgesic gas scavenging requirements with CSA Z7396.1;
n) a new clause on ventilation of normally unoccupied service areas;
o) clarification on placement of local heating or cooling units and water removal requirements;
p) guidance on catastrophic HVAC equipment failure in alignment with catastrophic event management in CSA Z8000;
q) new requirements for HEPA filter testing and performance verification;
r) clarification that HVAC system operation may be modified or operated in certain situations beyond the ranges specified in Table 1, in consultation with the MDT;
s) new HVAC design criteria for Whole body storage and Morgue viewing in Table 1;
t) expansion of HVAC design criteria for Scope reprocessing areas in Table 1;
u) expansion of HVAC design criteria for Treatment and procedure rooms for patients requiring airborne precautions in Table 1;
v) updated airflow direction requirements for the Operating room and Sterile core in Table 1;
w) updated examples of health care facilities according to class in Annex B; and
x) revised formulas and calculations in Annex C.

CSA Group acknowledges that the development of this Standard was made possible, in part, by the financial support of the governments of Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Northwest Territories, Nova Scotia, Nunavut, Ontario, Prince Edward
Island, Québec, Saskatchewan, and Yukon, as administered by the Canadian Association for Drugs and Technology in Health (CADTH).

This Standard was prepared by the Subcommittee on Special Requirements for HVAC Systems in Health Care Facilities, under the jurisdiction of the Technical Committee on Health Care Facilities and the Strategic Steering Committee on Health and Well-being, and has been formally approved by the Technical Committee.

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Introduction

Indoor air quality is an important health and wellness consideration, and is especially critical to the health of patients, visitors, staff, and occupants of health care facilities (HCFs). Inadequate indoor air quality can complicate patient care and recovery and negatively affect health and wellness. The proper design, installation, commissioning, operation, and maintenance of HVAC systems can decrease the risk of airborne transmission of organisms inside buildings and therefore the risk of healthcare acquired infections. Optimization of indoor air quality protects the health and safety of patients, staff, and visitors and supports positive clinical outcomes.

In addition, a well-designed HVAC system can help HCFs to meet their conservation objectives and promote the judicious use of renewable and non-renewable resources while delivering required comfort and safety for all building occupants.

Scope

1.1 This Standard provides requirements for the planning, design, construction, commissioning, operation, and maintenance of HVAC systems in HCFs. In general, these requirements are more stringent than those applied to non-health care facilities.

Note: See Annex A for general guidelines on HVAC system design. Table 1 provides specific design parameters for HVAC systems.

1.2 This Standard
a) specifies minimum values for certain parameters;
b) establishes the suitability of different design options;
c) establishes recommendations for zoning, controls, and monitoring; and

d) outlines best practice for energy conservation.

1.3 This Standard is not intended to preclude the use of design concepts and the adoption of installation, operations, and maintenance procedures more stringent than those specified in this Standard. In cases where clinical evidence supports additional measures to improve the safety and efficacy of HCFs, such additional measures should be considered in the design, installation commissioning, operation, and maintenance of the HVAC system.