

Basic Compliance Of The B-52 Mechanical Refrigeration Code

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Introduction

Ontario's ice rink operators must read and comply with a variety of legislation. The B-52 Mechanical Refrigeration Code (MRC) is one such document. *The purpose of the B-52 MRC is to minimize the risk of personal injury by providing minimum requirements for the design, construction, installation, inspection, and maintenance of the mechanical refrigeration systems.* The ORFA document is meant to assist its members in understanding some key requirements of the B-52 MRC but it should not be considered an interpretation of any obligation of the B-52 MRC. The review of the full B-52 MRC should be undertaken by the refrigeration plants Chief and/or Responsible Person. As the reader will note there are a variety of operational and testing of equipment requirements to take place. A caution is given to the fact that these inspections are an owner's responsibility to ensure that they take place and are recorded. There should be no expectation that the refrigeration contractor or their designate will ensure compliance to the B-52 MRC or any other regulatory obligation by the owner is being met. Expected maintenance, inspection or testing requirements should be clearly identified in the refrigeration equipment annual or ongoing work plan. The full B-52 MRC document may be purchased at:

<http://shop.csa.ca/en/canada/pressure-vessels/b52-package/inv/27022582005>

Section	Section Overview	Compliance Review Date
1.2.2.	The B-52 MRC applies to all refrigeration systems installed in a new or existing premise	
5.11.1 Signs (All Systems)	Each refrigeration system will have a permanent sign which is secured, readily accessible, legible containing the following information: <ul style="list-style-type: none"> ✓ name and address of installer ✓ refrigerant type ✓ lubricant type and amount ✓ total weight of refrigerant required for normal operation ✓ field test pressures applied ✓ refrigerant capacity at design or nominal conditions ✓ and for prime mover(s) the rating in kilowatts (hp) or full-load current and voltage 	
5.11.3 Signs for Systems with more than 45kg 100lb of Refrigerant	In addition systems containing more than 45 kg (100lb) of refrigerant shall be provided with durable signs with letters not less than 13 mm (1/2 in) in height designating the following: <ul style="list-style-type: none"> ✓ the main electrical disconnect switch(es) ✓ any remote control switch(es) ✓ any pressure-limiting device(s) ✓ each pressure vessel ✓ the main shut-off to each vessel; and the refrigerant piping (indicating whether it is at the high-side or low-side pressure and whether it is normally in the liquid or vapour state). 	
5.11.5 Posting of instructions	It shall be the duty of the owner of a refrigeration system or systems with a prime mover or movers having a capacity exceeding 125 kW (175 hp) to place in a conspicuous location and as near as practicable to the refrigerant compressor(s) a card giving directions for operating the system, including precautions to be observed in case of breakdown or leakage, as follows: <ul style="list-style-type: none"> ✓ the telephone number of the appropriate first-response organization for an emergency situation ✓ instructions for shutting down the system in case of emergency; ✓ the name, address, and day and night telephone numbers for obtaining service; and the name, address, 	

	<p>and telephone number of the nearest regulatory authority, and instructions to notify the authority immediately in case of emergency</p> <p><i>Consideration should be given to preparing an emergency evacuation plan for those installations for which a plan is deemed appropriate.</i></p>	
6.2.2 Doors	<ul style="list-style-type: none"> ✓ Each machinery room shall have a door or doors that open outward, are self-closing (and tight fitting if they open into the building), and are of a number large enough to ensure that persons can escape in an emergency ✓ The door(s) shall not open to a public corridor or any room used for assembly ✓ There shall be no openings that will permit passage of escaping refrigerant to other parts of the building. 	
6.2.3 Refrigerant Vapour Detector for Refrigerants Other Than Ammonia	<ul style="list-style-type: none"> ✓ A refrigerant vapour detector shall be located in an area where refrigerant from a leak is most likely to concentrate and shall be actuated at a value not greater than the corresponding TLV®/TWA (or a consistent toxicity measure) ✓ The sensors, when activated, shall sound a sufficiently audible alarm; and initiate mechanical ventilation – Ammonia Vapour Detection requirements is covered in Section 6.3 	
6.2.4.1 Explosion Protection	<ul style="list-style-type: none"> ✓ Except as permitted by Clause 6.2.4.3, no open flames or apparatus to produce an open flame shall be installed in a machinery room 	
6.2.5 Ventilation	<ul style="list-style-type: none"> ✓ Machinery rooms shall be ventilated to the outdoors by a mechanical ventilation system 	
6.2.5.4 Fan Switches	<ul style="list-style-type: none"> ✓ Readily accessible independent fan switches shall be installed inside and outside the machinery room ✓ Fan switches located outside the machinery room shall be capable of starting but not stopping the ventilation. 	
6.2.5.5.2 Minimum Ventilation	<ul style="list-style-type: none"> ✓ Whenever the refrigeration system is operating or whenever the room is occupied, a sufficient part of the mechanical ventilation shall be operated to provide normal volumes equal to the greater of the following: 2.54 L/s/m² (0.5 cfm/ft²) of machinery room area; or the volume required to prevent a maximum temperature rise above ambient greater than 10 °C (18°F), based on all of the heat-producing machinery in the room. 	
6.2.5.7 Minimum Temperature	<ul style="list-style-type: none"> ✓ Supplementary heating shall be provided to maintain a minimum machinery room temperature of 5 °C (40°F) where damage could result at temperatures below freezing. 	
6.3 Class T Machinery Rooms	<ul style="list-style-type: none"> ✓ There shall be no flame-producing device or hot surface over 427 °C (800°F) permanently installed in the room ✓ the room shall have at least one exit door that opens directly to the outer air. Other exits communicating with the building shall be permitted, but shall be through a vestibule equipped with approved self-closing, tight-fitting fire doors ✓ the machinery room envelope, including any vestibule, shall be of tight construction; the machinery room envelope, including any vestibule, shall have not less than one-hour fire-resistive construction ✓ all pipes piercing the interior walls, ceiling, or floor of a shall be tightly sealed to the walls, ceiling, or floor through which they pass ✓ air ducts shall be of tight construction and shall have no openings in such rooms; remote pilot control of the mechanical equipment in the machinery room shall be located immediately outside the machinery room and shall be provided solely for shutting down the equipment in an emergency ✓ ventilation fans shall have a control switch on a separate circuit located immediately outside of the 	

	<p>machinery room, and shall be permitted to run as long as power is available; all locations shall be equipped with a vapour detector that shall automatically start the ventilation system and actuate an alarm at the lowest practical detection levels not exceeding 300 ppm for ammonia; the vapour detector shall also initiate a supervised alarm so that corrective action can be initiated.</p>	
8.1 Charging and Withdrawal of Refrigerants	<ul style="list-style-type: none"> ✓ No service containers shall be left connected to a system, except while refrigerant is being charged or withdrawn. 	
8.3 Refrigerant Storage	<ul style="list-style-type: none"> ✓ Refrigerant, in addition to that in the system, shall be stored only in a machinery room. Such refrigerant shall not exceed a maximum limit of 136 kg (300lb) and shall be stored in acceptable storage containers. Storage of the refrigerant in any other room shall first be approved by the regulatory authority having jurisdiction. 	
8.4.1. Maintenance	<p>The following minimum maintenance requirements shall be met:</p> <ul style="list-style-type: none"> ✓ pressure-relief valves shall be replaced or recertified at intervals no longer than five years. Recertification of relief valves shall be conducted in accordance with the requirements of the regulatory authority having jurisdiction ✓ pressure-limiting devices shall be tested at least once every 12 months for set point accuracy and for their ability to properly stop the affected equipment ✓ other safety devices shall be tested at least once every 12 months for set point accuracy and for their ability to properly stop the affected equipment ✓ leak detectors shall be tested for function at the specified refrigerant concentration in accordance with the manufacturer's instructions. The maximum interval between tests shall not exceed one year; the leak detector, in the simulated leak test, shall initiate an audible and visible alarm and begin ventilation ✓ all safety-related maintenance recommendations by the equipment manufacturer(s) shall be followed ✓ all power and control electrical terminations shall be checked at least once every 12 months and tightened if necessary ✓ at the end of each test, a tag noting the test date and the tester's name shall be affixed to the tested components 	
9.11 Maintenance	<ul style="list-style-type: none"> ✓ The owner of a refrigeration system shall supply and maintain for its employees the personal protective equipment required by the jurisdiction where the system is located. 	
9.1.2 Service Personnel	<ul style="list-style-type: none"> ✓ Installation and service personnel working on a refrigeration system shall be equipped, on arrival at the premises, with the personal protective equipment required by the jurisdiction where the system is located. 	

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