38.2.3 The marked discharge capacity of a pressure regulating-relief valve shall be not less than the minimum required discharge capacity as computed from 38.3.1.

38.3 Fusible plugs or rupture members

38.3.1 Calculation of the minimum required discharge capacity and the rated discharge capacity of a rupture member or fusible plug shall be in accordance with the Safety Standard for Refrigeration Systems, ASHRAE 15.

38.3.2 Fusible plugs and rupture members shall comply with the applicable requirements in the Standard for Refrigerant-Containing Components and Accessories, Nonelectrical, UL 207.

38.3.3 Rupture members shall have a nominal rated rupture pressure not exceeding the design pressure of the parts of the system protected.

38A Thermoelectric System

38A.1 A thermoelectric cooling appliance shall comply with requirements in this standard except for those requirements specifically applying to vapor-compression refrigeration systems.

38A.2 In addition to the temperature test in the cooling mode, when a thermoelectric appliance can also be operated in a heating mode, it shall comply with the Temperature Test, Section 44, when operated in the heating mode, except the ambient temperature shall be 77 ±5 ºF (25 ±3ºC).

38A.3 A thermoelectric cooling appliance in which the thermoelectric circuit is powered by a low voltage Class 2 or Limited Power Source supply shall not result in a risk of fire as specified in accordance with 83D.1.1, if no fan is provided or 83D.1.2 if provided with fan(s).

38A.4 A thermoelectric cooling appliance in which the thermoelectric circuit is powered by other than a low voltage Class 2 or Limited Power Source supply shall not result in a risk of fire or electric shock in accordance with 83D.1.1 (if no fan is provided), 83D.1.2 (if provided with fan(s)), and 83D.1.3.

Exception: When the thermoelectric module complies with 83D.5, the tests of 83D.1.1, and 83D.1.3 are not required.

38A.5 In reference to 38A.3 and 38A.4, a thermoelectric cooling appliance that uses a fan motor, other than one that is protected in accordance with Section 18.2, to cool the semiconductor thermoelectric module shall not develop temperatures exceeding 302°F (150°C) on the fan motor winding (open type) or on the fan motor enclosure (enclosed type) when tested in accordance with 83D.3.1. This requirement also applies to fan motors supplied by a low voltage Class 2 or Limited Power Source circuit.

38A.6 In reference to the polymeric material requirements, a semiconductor thermoelectric module powered by other than a low voltage Class 2 or Limited Power Source circuit shall be considered an ignition source.

PERFORMANCE

39 Instrumentation

39.1 Temperature measurements

39.1.1 Temperatures are to be measured by thermocouples, except that the change-in-resistance method may be used to measure the temperature of motor windings or of coils. See 44.4. The

thermocouples are to consist of 24 – 30 AWG (0.21 – 0.05 mm^2) wires. The thermocouples and related instruments are to be accurate and calibrated in accordance with good laboratory practice. The thermocouple wire shall conform to the requirements specified in the Tolerances on Initial Values of EMF versus Temperature tables in the Standard Specification and Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples, ANSI/ASTM E230/E230M.

39.1.2 A thermocouple junction and adjacent thermocouple lead wire are to be securely held in positive thermal contact with the surface of the material whose temperature is being measured. In most cases thermal contact will result from securely taping or cementing the thermocouple in place, but where a metal surface is involved, brazing, or soldering the thermocouple to the metal may be required.

39.1.2.1 Except as specified in 39.1.2.2, during any test in which temperatures are measured, temperatures shall be monitored until maximum temperatures are attained. Thermal equilibrium is to be considered to exist when three successive readings indicate the same or decreasing temperatures. Readings shall be taken at the end of not less than three consecutive periods, the duration of each period being not less than 5 minutes.

39.1.2.2 In reference to 39.1.2.1, if temperatures on the component being monitored cycle between higher and lower temperatures due to the component cycling as part of the test (for example a load cycling on and off due to operation of a protective device), equilibrium is to be considered obtained when three successive peak temperatures indicate the same or decreasing temperatures.

39.1.2.3 In reference to 39.1.2.1 and 39.1.2.2, the recorded temperature shall be the highest of the three readings.

39.1.3 When thermocouples are used in the determination of temperatures in connection with the heating of electrical equipment, it is recommended that thermocouples consisting of 30 AWG (0.05 mm^2) iron and constantan wires and a potentiometer type of indicating instrument are to be used whenever reference temperature measurements by means of thermocouples are required.

39.1.4 When the temperature of a copper motor winding or coil is to be determined by the change-in-resistance method the following formula shall be used:

$$T = \frac{R}{r}(234.5 + t) - 234.5$$

in which:

T = the temperature to be determined in degrees C.

t = the known temperature in degrees C.

R = the resistance in ohms at the temperature to be determined.

r = the resistance in ohms at the known temperature.

39.1.5 When it is required to de-energize the winding before measuring R, the value of R at shutdown is to be determined by taking several resistance measurements at short intervals, beginning as quickly as possible after the instant of shutdown. A curve of the resistance values and the time is to be plotted and extrapolated to give the value of R at shutdown.

39.2 Pressure measurements

39.2.1 Pressure gauges are to be attached in a manner that prevents leakage. Special fittings for direct connection to the system or minimum lengths of 1/8 inch (3.2 mm) outside diameter commercial capillary tubing may be employed for gauge connections. The volume of the pressure-measuring gauge and lines is to be held to a minimum. All joints in the gauge system are to be tested for leakage.

39.2.2 Opening of the gauge line valves are not to cause a significant change in the electrical input of the system. High-side gauges and lines may be heated above the saturation temperature corresponding to the expected pressure or may be precharged with a liquid refrigerant of the same type as used in the system to reduce the effect of opening the gauge line valves.

39.2.3 The instrumentation and test procedures specified in Sections 38, 44, 47, 49, and 50 may be modified for the investigation of a remote refrigerator, as such a unit does not include a complete refrigeration system.

40 Test Voltage

40.1 Unless otherwise specified, a refrigerator is to be tested at 60 hertz voltages maintained at the refrigerator's supply connections in accordance with Table 40.1.

Exception: A refrigerator rated at other than 60 hertz frequency is to be tested at its rated voltage(s) and frequency(s).

Table 40.1
Test voltages

Nameplate voltage rating	Normal test voltage[a]
110 to 120	120
200 to 208	208
220 to 240	240
254 to 277	277
440 to 480	480
550 to 600	600
Other	Rated

[a] These test voltages are nominal for the Condenser or Heat Rejection Fan Motor Failure Test, Section 49, and Condenser or Heat Rejection Water Failure Test, Section 50.

41 Leakage Current Test – Cord Connected Refrigerators

41.1 A cord-connected refrigerator shall comply with the leakage current requirements in the Standard for Leakage Current for Appliances, UL 101 with the leakage current being no more than 0.75 MIU.

Exception No. 1: The following appliances shall have a leakage current not exceeding 3.5 MIU:

a) Refrigerators with a plug rated 30 A or higher.

b) Refrigerators with a special configuration plug, such as an ANSI type L5-15 twist-lock plug.

Exception: The instructions provided with such refrigerators shall include the statement shown in clause 90.5.

Exception No. 2: A cord-connected refrigerator may produce a leakage current greater than 0.75 MIU under the following conditions:

a) The refrigerator shall, upon loss of grounding, reliably disconnect the sources that cause leakage current from the equipment to be greater than 0.75 MIU.

b) The leakage current shall not exceed 3.5 MIU with the equipment grounding conductor open and with any loss of ground disconnect capability disabled.

41.2 For the purpose of this test, commercial refrigerators are to be considered stationary appliances.

41.3 The test is to be conducted at the ambient conditions specified in 41.4.

41.4 The sample is to be conditioned in an ambient temperature of 21 – 27°C (70 – 80°F) and minimum 50 percent relative humidity for not less than 8 hours.

42 Input Test

42.1 The measured ampere input to a cord connected refrigerator shall not exceed the total rating marked on the refrigerator nameplate by more than 10 percent when tested as described in the Temperature and Pressure Test, Section 44, and the Defrost Test, Section 47.

42.2 The measured input to a permanently connected refrigerator shall not exceed the individual rating of each load or group of loads or the total rating as marked on the nameplate by more than 10 percent when tested as described in the Temperature and Pressure Test, Section 44, and the Defrost Test, Section 47.

42.3 With reference to the requirements of 42.1 and 42.2, the measured ampere input is to be the value obtained 1/2 hour after continuous operation under cooling conditions and is to be the maximum value measured during defrost or other heating operation. For a beverage cooler as described in 44.14, the input is to include the dispensing operation if this results in a higher current. The power input of all accessories is to be considered when establishing the minimum marked rating of the refrigerator.

42.4 With reference to 42.3, the measured ampere input is to be increased for accessible 15 and 20 ampere convenience outlets connected to the same circuit as the refrigerator, as follows:

a) By 80 percent of the receptacle rating when a single receptacle is employed.

b) By 100 percent of the receptacle rating when more than one receptacle is employed.

c) By 100 percent of the load(s) marked on or adjacent to the receptacle(s) when the refrigerator is marked as indicated in 87.3.2 and is provided with overcurrent protection as specified in the Exception to 26.2.

42.5 With reference to 42.1 and 42.2, the measured ampere input is not to include a periodic (once or twice an hour) short-time (less than 5 minutes) load that is greater than the load measured on any one branch circuit. However, when such a load exceeds 125 percent of the marked nameplate rating, it shall be included in the marked rating of the refrigerator.

42.6 The load described in 42.5 shall not exceed the rating of the attachment plug on a cord-connected unit or the minimum circuit ampacity marked on a permanently connected unit.

43 Starting Test

43.1 A refrigerator shall start, operate, and defrost as intended without rupturing a line fuse of the size required by the refrigerator.

Exception: For a permanently connected refrigerator protected by a fuse sized in accordance with 66.1.4, no starting test is required.

43.2 The refrigerator, with four fuses connected in series, is to be operated under the conditions described in the Temperature and Pressure Test, Section 44, and when provided with a defrost system, operated under the conditions described in the Defrost Test, Section 47. See 43.7.

43.3 For a cord connected refrigerator, the fuse rating is to be determined by the rating of the attachment plug. For a permanently connected refrigerator protected by a fuse size in accordance with Exception No. 1 to 66.1.4, the fuse rating is to be as marked on the nameplate.

43.4 If no fuse opens, the fuse size is acceptable for starting the refrigerator. If one fuse opens, the test is to be repeated using the three remaining fuses. If none of the three opens, the results are acceptable. If one of the three opens, the results are not acceptable, and the test is to be repeated using four time-delay fuses of the same rating as the original fuse.

43.5 If it is determined that time-delay fuses are required for starting, the refrigerator shall be marked in accordance with 88.14 or 89.2, whichever is appropriate.

43.6 If an automatic-reset thermal protective device interrupts the current flow one or more times during the test, the refrigerator shall restart and run after each interruption and shall comply with the fusing requirements of 43.4 and 43.5.

43.7 A defrost system that employs only electric heaters is not required to be so tested.

43.8 When 15 or 20 ampere general purpose receptacles are provided and intended to be connected to the same circuit as the refrigerator, the starting test is to be conducted with an additional resistive load connected to the refrigerator. The resistive load is to be sized as follows:

a) The load is to be equal to 80 percent of the rating of the receptacle when a single receptacle is employed.

b) The load is to be equal to 100 percent of the rating of the largest receptacle when more than one receptacle is employed on the same circuit.

c) The load is to be equal to 100 percent of the load(s) marked on or adjacent to the receptacle(s) the refrigerator is marked as indicated in 87.3.2 and is provided with overcurrent protection as specified in the Exception to 26.2.

44 Temperature and Pressure Test

44.1 The temperature rises measured on the electric components and surfaces of a refrigerator shall not exceed those specified in Table 44.1.

Table 44.1
Maximum temperature rises

Device or material	°C	(°F)
A. Motors		
1. Class A insulation systems on coil windings of alternating-current motors having a frame diameter of 7 inches (178 mm) or less (not including hermetic motor-compressors)[a]		
a. In open motors –		
Thermocouple or resistance method	75	(135)
b. In totally enclosed motors –		
Thermocouple or resistance method	80	(144)
2. Class A insulation systems on coil windings of alternating-current motors having a frame diameter of more than 7 inches (178 mm) (not including hermetic motor-compressors)[b]		
a. In open motors –		
Thermocouple method	65	(117)
Resistance method	75	(135)
b. In totally enclosed motors –		
Thermocouple method	70	(126)
Resistance method	80	(144)
3. Class B insulation systems on coil windings of alternating-current motors having a frame diameter of 7 inches (178 mm) or less (not including hermetic motor-compressors)		
a. In open motors –		
Thermocouple or resistance method	95	(171)
b. In totally enclosed motors –		
Thermocouple or resistance method	100	(180)
4. Class B insulation systems on coil windings of alternating-current motors having a frame diameter of more than 7 inches (178 mm) (not including hermetic motor-compressors)		
a. In open motors –		
Thermocouple method	85	(153)
Resistance method	95	(171)
b. In totally enclosed motors –		
Thermocouple method	90	(162)
Resistance method	100	(180)
B. Components		
1. Capacitors		
Electrolytic type[c]	40	(72)
Other types[d]	65	(117)
2. Field wiring[e]	35	(63)
3. Fuses		
a. Class CC, G, J, L, and T		
Tube	100	(180)
Ferrule or blade	85	(153)
b. Other classes[g]	65	(117)

Table 44.1 Continued on Next Page

Table 44.1 Continued

Device or material	°C	(°F)
4. Hermetic motor-compressor or Stirling engine enclosure[f]	150	(302)
5. Relay, solenoid, and other coils (except motor coil windings) with:[b]		
a. Class 105 insulated wiring –		
Thermocouple method	65	(117)
Resistance method	85	(153)
b. Class 130 insulation –		
Thermocouple method	85	(153)
Resistance method	105	(189)
6. Solid contacts	65	(117)
7. Transformer enclosures – with		
a. Class 2 transformers	60	(108)
b. Power Transformers	65	(117)
8. Wood or other flammable material	65	(117)
C. Insulated Conductors		
1. Flexible cords and wires with rubber, thermoplastic, or neoprene insulation unless recognized as having special heat-resistant properties as follows:		
°C (°F)		
60 (140)	35	(63)
75 (167)	50	(90)
80 (176)	55	(99)
90 (194)	65	(117)
105 (221)	80	(144)
D. Surfaces:[h]		
1. Surfaces of refrigerators at points of zero clearance to test enclosure	65	(117)
2. Surfaces of refrigerator contacted by persons in operating it (control knobs, pushbuttons, levers, and similar surfaces)		
Metal	35	(63)
Nonmetallic	60	(108)
3. Surfaces of refrigerator subjected to casual contact by persons (enclosure, grille, and similar surfaces)		
Metal	45	(81)
Nonmetallic[h]	65	(117)
4. Surfaces of test enclosure where clearance to flammable material is specified	65	(117)
E. Electric Insulation – General		
1. Fiber used as electrical insulation or cord bushings	65	(117)
2. Phenolic composition used as electric insulation or as parts where deterioration will result in a risk of electric shock or fire	125	(225)
3. Thermoplastic material	Rise based on temperature limits of material	

[a] Thermocouple applied directly to the integral insulation of the coil conductor.

[b] Thermocouple applied as in (a) or applied to conventional coil wrap.

[c] For an electrolytic capacitor which is physically integral with or attached to a motor, the temperature rise on insulating material integral with the capacitor enclosure may not be more than 65°C (117°F).

Table 44.1 Continued on Next Page

Table 44.1 Continued

Device or material	°C	(°F)
[d] A capacitor that operates at a temperature higher than a 65°C (117°F) rise may be judged on the basis of its marked temperature rating.		
[e] A temperature rise of no more than 50°C (90°F) is acceptable in the terminal box or wiring compartment of a refrigerator that requires supply conductors with an ampacity of more than 100 amperes when the refrigerator is clearly marked with the following statement or its equivalent: "For supply connections, use ___ AWG or larger wires acceptable for at least 75°C (167°F)." See 9.2.8.		
[f] Maximum – not rise.		
[g] Includes both casing and ferrule or blade.		
[h] See 5.3.11 and 5.3.12.		

44.2 The maximum pressure developed in a refrigeration system, including equalization pressures after compressor or Stirling engine shutdown, shall be used as a basis for the Strength Test – Pressure Containing Components, Section 68.

44.3 Motor-compressors or Stirling engines shall operate continuously under the conditions of this test with any protective device in the circuit.

Exception: An automatic reset protective device may cycle during the first 8 hours of the test. A manual reset protective device shall not trip during the test.

44.4 The refrigerator is to be fitted with pressure gauges on the high- and low-sides for a compressor system or on the motor enclosure when a Stirling system is used. Thermocouples are to be secured to electrical components, such as the compressor or Stirling motor enclosure, fan-motor windings, starting-relay coil, capacitors, and wiring insulation, and to surfaces as indicated in item D of Table 44.1. The temperature of motor windings or of coils may be measured by the change-in-resistance method, but the primary method of temperature measurement is to be the thermocouple method. The electrical input is to be measured with a voltmeter and an ammeter. The temperature controller is to be short-circuited during this test.

44.5 The refrigerator is to be installed in accordance with the manufacturer's instructions, see 90.1 and 90.2, and operated under the conditions specified in 44.7 – 44.14, as applicable. The test potential is to be as indicated in Table 40.1.

44.6 When the wiring to a general purpose receptacle does not comply with the requirements of 10.1.1, a resistive load is to be connected to the receptacle circuit during the test and the temperature of the wiring insulation measured. The resistive load is to be sized as described 43.8 (a), (b), or (c).

44.7 The refrigerator is to be placed in an enclosure simulating conditions of intended use. The enclosure is to consist of a bottom, back, two sides, and top constructed of 3/8 inch (9.5 mm) thick plywood with the inside surfaces painted flat black and with all joints sealed. The enclosure is to be brought into close contact with the refrigerator unless indicated otherwise in the manufacturer's instructions.

44.8 For cooling operation and simultaneous cooling/heating operation, the air-cooled refrigerator is to be placed within a room maintained at 40°C (104°F) with doors or lids open until the assembly reaches room temperature. For heating operation only, the appliance is to be placed in a room maintained at 25°C (77°F). See 44.12 and 44.13.

Exception No. 1: Equipment that does not incorporate a complete refrigeration system, such as a remote refrigerator, may be tested in an ambient temperature of 25°C (77°F).

Exception No. 2: A refrigerator or freezer for use as a Type I Display Refrigerator or Freezer may be tested in an ambient temperature of 24°C (75°F).

Exception No. 3: A refrigerator or freezer for use as a Type II Display Refrigerator or Freezer may be tested in an ambient temperature of 27°C (80°F).

Exception No. 4: The need for additional testing on a Thermoelectric or Peltier device capable of operating in heating mode shall be determined based on a room ambient maintained at 25° C (77° F). Usually, such testing is not required for a device in a Class 2 or Limited Voltage / Current circuit.

Exception No. 5: Refrigerated buffet units and refrigerated food preparation units may be tested in an ambient temperature of 30°C (86°F).

Exception No. 6: A laboratory refrigerator or freezer may be tested in an ambient temperature of 27 °C (80.6 °F).

44.9 Lights, other electrical loads, or both, that may operate concurrently with the condensing unit are to be energized during the test. The assembly is to be started and operated with doors or lids closed until temperatures and pressures have stabilized. The potential is to be maintained as indicated in Table 40.1. The electrical input, the temperature of electrical components and surfaces, and high- and low-side pressures are to be recorded at intervals during the test.

44.10 The appliance is to be operated in all normal modes of operation, except that insulated resistance-type heater wiring, ballasts, and defrost heaters are to be tested as indicated in Sections 45 – 47.

44.11 For the test of a refrigerator of the water-cooled type, the condenser or heat rejection cooling water flow is to be maintained at 27°C (80°F) inlet and 38°C (100°F) outlet temperatures. When the outlet water cannot attain a temperature of 38° C (100° F) because of product construction considerations, the refrigerator is to be tested at 27°C (80°F) inlet water and 35 psig (241 kPa) nominal pressure.

44.12 For the test of a wet-type beverage cooler, the tank is to be filled to the marked height with water at 40°C (104°F). The refrigerator then is to be tested in accordance with 44.9.

44.13 For the test of a batch-type beverage dispenser, the ingredient charge is to be prepared and the container filled in accordance with the manufacturer's instructions. When water is to be added to the ingredients, the temperature of the water is to be 27° C (80° F). The refrigerator then is to be tested in accordance with 44.9 under “no-draw” conditions.

44.14 For the test of a beverage cooler or beverage cooler-dispenser that employs make-up water, the ingredient charge is to be prepared and the containers filled in accordance with the manufacturer's instructions. The temperature of the make-up water is to be maintained at 27° C (80° F). The refrigerator then is to be tested in accordance with 44.9 under “no-draw” conditions for the period of time recommended by the manufacturer. At the end of this time the test is to be continued at the draw rate recommended by the manufacturer until temperatures and pressures have stabilized.

44.15 For the test of a processing water cooler, the inlet and outlet temperatures or the make-up water shall be as specified by the manufacturer.

44.16 The refrigerator shall comply with the Dielectric-Voltage Withstand Test, Section 48, following this test.

45 Heating Test – Condensation Wiring

45.1 This test is conducted only on cabinets supplied with insulated resistance-type heater wire or similar condensation wiring that does not comply with 10.2.6.

45.2 The temperature measured on the insulation of the heater wire shall not exceed its temperature limit.

45.3 The heater wire, installed in the cabinet or in the section enclosing the wire, is to be connected to a power supply maintained as indicated in 40.1 until constant temperatures are attained, as determined by thermocouples on the insulation. The test is to be conducted at 25°C (77°F) ambient temperature with the refrigerator in the OFF position.

45.4 The condensation wiring system is to comply with the Dielectric-Voltage Withstand test, Section 48, following this test.

46 Heating Test – Ballasts And Wiring

46.1 Ballasts are to be tested in accordance with the 46.2 – 46.7 when they are:

a) Installed so that thermal insulation may cause overheating;

b) Subject to external heat; or

c) Mounted at more than one level within a common compartment.

46.2 The temperature on the coil of an open-type ballast and on the enclosure of an enclosed reactor-type ballast or other control device employed in an electric-discharge lamp system shall be not higher than 90°C (194°F); the temperature on the enclosure of an automatic starter shall be not higher than 80°C (176°F); and the temperature attained on insulated conductors and splices shall not exceed the limits indicated in Table 44.1 under the test conditions described in 46.3 – 46.7.

46.3 The test is to be conducted only on cabinets with electric-discharge lamp systems that are not exempt by the provisions of 46.6.

46.4 The test is to be conducted with the ballasts installed in a complete cabinet with light loads connected or in a simulated cabinet section with the ballasts loaded in accordance with the ballasts rating. The refrigeration system is to be shut off when the test is conducted in the complete cabinet, unless the ballasts are located where they are exposed to heat from components of the refrigeration system.

46.5 The ballast and load are to be connected to a supply circuit maintained at the voltage specified on the control equipment. The test ambient is to be 25°C (77°F). Thermocouples are to be attached to open coils, ballast enclosures, and wiring. The test is to be continued until components reach constant temperatures.

46.6 Except as indicated in 46.1, the heating test may be waived for ballasts on refrigerators that:

a) Employ not more than one lighting control unit;

b) Employ two 2-lamp 20 watt control units mounted side-by-side, provided that the spacing between the sides of the control units is not less than 3/4 inch (19.1 mm);

c) Employ four or more single-lamp 20 watt control units mounted in pairs, provided that the spacing between the sides of the control units in each pair is not less than 2 inches (50.8 mm) and the spacing between the ends of adjacent pairs is not less than 4 inches (102 mm); or

d) Employ control units other than described in (b) and (c), provided that the spacing between any two control units is not less than 1 inch (25.4 mm) when arranged end-to-end and not less than 4 inches when arranged otherwise.

46.7 The ballasts and wiring are to comply with the Dielectric-Voltage Withstand Test, Section 48, following this test.

47 Defrost Test

47.1 While operating in the defrost mode, temperature rises of electrical components, wiring, enclosure surfaces, and the like, of a refrigerator shall not exceed the values specified in Table 44.1. A hot-gas defrost system of a self-contained refrigerator shall not rupture or develop leaks during the test. After defrost operation, the refrigerator shall have an insulation resistance of at least 50,000 ohms. After the test, the refrigerator shall comply with the requirements of the Dielectric Voltage-Withstand Test, Section 48.

Exception: Determination of insulation resistance following the defrost cycle may be omitted when:

a) 47.4 is omitted, or

b) It is evident from visual examination of the refrigerator that moisture or water resulting from the defrost operation cannot contact uninuslated live parts.

47.2 The test voltage is to be as specified in Table 40.1. The maximum high- and low-side pressures are to be recorded as reference values for requirements of the Strength Tests – Pressure Containing Components, Section 68.

47.3 A remote refrigerator is to be connected to a condensing unit of the size recommended by the manufacturer.

Exception: Connection to a condensing unit is not required if frost build-up is not necessary as permitted by the Exception to 47.4(b).

47.4 The defrost test sequence is to be as follows:

a) The refrigerator is to be mounted or positioned in accordance with the manufacturer's instructions (see 90.1).

b) The refrigerator is to be operated in a room maintained at a temperature of 21 – 27° C (70 – 80° F) dry-bulb and 50 percent relative humidity until frost has built up sufficiently to block the evaporator. Blockage of the evaporator is considered to have occurred when (1) the average cabinet temperature starts to increase or (2) the refrigeration system low-side pressure starts to decrease. Other equally reliable methods of detecting evaporator coil blockage may be used. Adjustments may be made to the refrigerator to reduce the length of the frost build-up period. The following are examples of two methods which may be used although other methods may serve the same purpose: (1) a door(s) that provides access to the refrigerated compartment may be opened or (2) the evaporator fan motor(s) may be disconnected from the electrical supply.

Exception: When agreeable to all concerned, (b) may be omitted when there are no uninsulated live parts located beneath (1) any portion of the evaporator including tubing, hairpin turns, return bends, fins, end plates and inlet and outlet tubes, (2) refrigerant suction lines, and (3) an expansion valve.

c) Following (b), the refrigerator is to be returned to its intended defrost mode; that is, any open doors are to be closed, electrical components that normally operate during the defrost cycle are