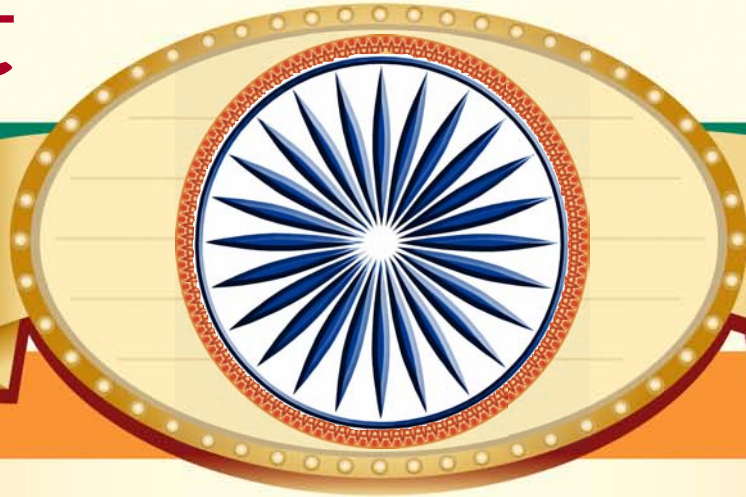


इंटरनेट

मानक



Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

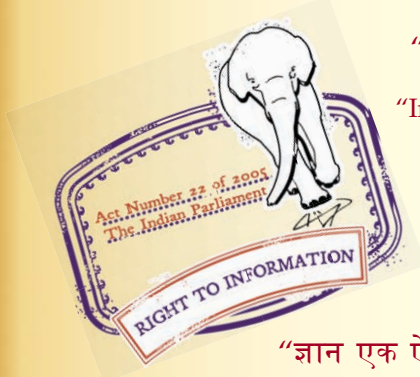
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

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“Step Out From the Old to the New”

IS 3615 (2007): Glossary of terms used in refrigeration and air conditioning [MED 3: Refrigeration and Air Conditioning]



“ज्ञान से एक नये भारत का निर्माण”

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“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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भारतीय मानक
प्रशीतन और वातानुकूलन सम्बन्धी शब्दावली
(पहला पुनरीक्षण)

Indian Standard

GLOSSARY OF TERMS USED IN REFRIGERATION
AND AIR CONDITIONING
(*First Revision*)

ICS 01.020; 23.120; 27.120

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Refrigeration and Air Conditioning Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first issued in 1967. The first revision has been taken up to include the other terms that are generally being used in the field of refrigeration and air conditioning.

This glossary of terms has been prepared for the guidance of manufacturers, users of refrigeration and air conditioning equipment and others concerned to assist them in the correct interpretation of the common terms used in this trade. It is hoped that this standard will help in establishing a generally recognized meaning and eliminate ambiguity and confusion arising out of individual interpretation.

Definitions have been arranged in alphabetical order and cross references have been given wherever necessary.

In the preparation of this standard, assistance has been derived from the following:

ASHRAE Standard 12-75 Refrigeration terms and definitions. The American Society of Heating, Refrigerating and Air Conditioning

BS 5643 : 1984 Glossary of refrigeration, heating, ventilating and air conditioner terms — British Standards Institute

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

Indian Standard

GLOSSARY OF TERMS USED IN REFRIGERATION AND AIR CONDITIONING

(First Revision)

1 SCOPE

This standard is intended to provide definitions of words and terms employed in all phases of activities connected with refrigeration and air conditioning.

2 TERMINOLOGY

For the purpose of this standard the following definitions shall apply.

- 2.1 Absorbent** — A material which, due to an affinity for certain substances, extracts one or more such substances from a liquid or gaseous medium with which it is in contact and which changes physically or chemically, or both, during the process. Calcium chloride is an example of a solid absorbent, while solutions of lithium chloride, lithium bromide, and the ethylene glycols are examples of liquid absorbents.
- 2.2 Absorber** — It is a device containing liquid for absorbing refrigerant vapour or other vapours. In an absorption system, it is that part of the low side used for absorbing refrigerant vapour.
- 2.3 Absorption** — It is a process whereby a material extracts one or more substances present in an atmosphere or mixture of gases or liquids accompanied by physical change or chemical change, or both, of the material.
- 2.4 Access Door** — A door provided in a unit casing, wall, floor, ceiling, duct, etc, to permit inspection, entrance, or availability to concealed parts or devices.
- 2.5 Accumulator** — It is a storage chamber for low-side liquid refrigerant, also known as surge drum or surge header; also, a pressure vessel whose volume is used in a refrigerant circuit to reduce pulsation.
- 2.6 Activated Alumina** — It is a form of aluminium oxide, which absorbs moisture readily and is used as a drying agent.
- 2.7 Activated Carbon** — It is a form of carbon made porous by special treatment by which it is capable of absorbing various odours, anesthetics, and other vapours.
- 2.8 Adiabatic Process** — It is a thermodynamic process during which no heat is extracted from or added to the system.
- 2.9 Adsorbent** — It is a material which has the ability to cause molecules of gases, liquids, or solids to adhere to its internal surfaces without changing the adsorbent physically or chemically. Certain solid materials, such as silica gel and activated alumina, have this property.
- 2.10 Adsorption** — The action, associated with surface adherence, of a material in extracting one or more substances present in an atmosphere or mixture of gases and liquids, unaccompanied by physical or chemical change. Commercial adsorbent materials have enormous internal surfaces.
- 2.11 Aeration** — It is a process of exposing a substance or area, to air circulation.
- 2.12 Aerosol** — It is an assemblage of small particles, solid or liquid, suspended in air. The diameters of the particles may vary from 100 microns to 0.01 micron or less; that is dust, fog, smoke.
- 2.13 Agitator** — It is a device causing turbulent motion in a fluid confined in a tank.
- 2.14 Air Alternator** — It is a device which automatically switches the air from one side of the ice tank to the other.
- 2.15 Air, Ambient** — It is the air surrounding an object.
- 2.16 Air Change** — Introduction of new, cleansed, or recirculated air to conditioned space, measured by the number of complete changes per unit time.
- 2.17 Air Changes** — A method of expressing the amount of air leakage into or out of a building or room in terms of the number of building volumes or room volumes exchanged.
- 2.18 Air Cleaner** — It is a device used to remove airborne impurities.
- 2.19 Air Conditioner, Room** — It is a factory-made, encased assembly designed as a unit primarily to provide free delivery of conditioned air to an enclosed space, room, or zone. It includes a prime source of refrigeration for cooling and dehumidification and means for circulating and cleaning air. It may also include means for ventilating and heating.
- 2.20 Air Conditioning** — It is the process of treating air so as to control simultaneously its temperature,

humidity, cleanliness, and distribution to meet the requirements of the conditioned space.

2.21 Air Conditioning, Comfort — It is the process of treating air so as to control simultaneously its temperature, humidity, cleanliness, and distribution to meet the comfort requirements of the occupants of the conditioned space.

2.22 Air Conditioning, Complete — It is the process of air conditioning in which the temperature and humidity are independently controlled.

2.23 Air Conditioning, Industrial — It is the process of air conditioning for other uses other than comfort.

2.24 Air Conditioning, Summer — It is the comfort air conditioning carried out primarily when outside temperature and humidity are above those to be maintained in the conditioned space.

2.25 Air Conditioning Unit — It is an assembly of equipment for the treatment of air so as to control simultaneously its temperature, humidity, cleanliness, and distribution to meet the requirements of a conditioned space.

2.26 Air Conditioning Unit, Cooling (Heating) — It is a specific air-treating combination, consisting of means for ventilation, air circulation, air cleaning, and heat transfer, with control means for cooling (or heating).

2.27 Air Conditioning, Winter — It is the process of heating, humidification, air distribution, and air cleaning, where outside temperatures are below the inside room temperature.

2.28 Air Conditioning, Year Round System — It is a complete system, which ventilates, heats and humidifies in winter, cools and dehumidifies in summer, the air in the spaces under consideration and provides the deserved degree of air cleanliness and motion.

2.29 Air Cooler — It is a factory-encased assembly of element whereby the temperature of air passing through the device is reduced.

2.30 Air Cooler, Dry — It is an equipment that removes sensible heat from the dehydrated air whenever it leaves the dehydrator at an elevated temperature.

2.31 Air Cooler, Dry-Type — It is a forced circulation air cooler wherein heat transfer is not implemented by a liquid spray during the operating period.

2.32 Air Cooler Unit — It is specific air-treating combination consisting of means of air circulation and cooling.

2.33 Air Lateral — It is a pipe which supplies the air to the ice cans contained in the freezing tank.

2.34 Air Main — It is a pipe which carries air to the air laterals supplying ice cans contained in the freezing tank.

2.35 Air, Outdoor — It is the air taken from outdoors and, therefore, not previously circulated through the system.

2.36 Air, Outside — It is external air; atmosphere exterior to refrigerated or conditioned space and ambient (surrounding) air.

2.37 Air, Recirculated — It is the returned air passed through the conditioner before being again supplied to the conditioned space.

2.38 Air, Reheating of — In an air conditioning system, the final step in treatment in the event the temperature is too low.

2.39 Air, Return — It is the air returned from conditioned or refrigerated space.

2.40 Air, Saturated — It is the moist air in which the partial pressure of the water vapour is equal to the vapour pressure of water at the existing temperature. This occurs when dry air and saturated water vapour coexist at the same dry-bulb temperature.

2.41 Air, Standard — It is the dry air at a pressure 760 mm Hg at 21°C temperature and with a specific volume of 0.833 m³/kg

2.42 Air Treatment — It is a process by which one or more of the following characteristics of air are modified:

- a) Temperature,
- b) Humidity, and
- c) Cleanliness.

2.43 Air Tunnel — It is a refrigerated tunnel with rapid air circulation through which the product to be frozen is passed.

2.44 Air Washer — It is a washer spray system or device for cleaning, humidifying or dehumidifying the air.

2.45 Analyzer — It is a device in the high side of an absorption system for increasing the concentration of refrigerant in the vapour entering the rectifier or condenser.

2.46 Anemometer — It is an instrument for measuring the velocity of a fluid.

2.47 Approach — In an evaporative cooling device, the difference between the average temperature of the circulating water leaving the device and the average

wet-bulb temperature of the entering air. In a conduction heat exchanger device, the difference in temperature between the leaving treated fluid and the entering working fluid.

2.48 Area, Core — It is the total plane area of the portion of a grille, face, or register bounded by a line tangent to the outer edges of the outer openings through which air can pass.

2.49 Area, Free — It is the total minimum area of the openings in an air inlet or outlet through which air can pass.

2.50 Aspect Ratio — It is the ratio of the length of the core of a grille, face, or register to the width in air distribution outlets. In rectangular ducts, it is the ratio of width to depth.

2.51 Aspiration — It is production of movement in a fluid by suction created by fluid velocity.

2.52 Atomization — It is the process of reducing to fine spray.

2.53 Baffle — It is a partition or deflector used for diverting fluid, usually in the form of a plate or wall.

2.54 Baffle, Refrigerator — It is a plate, wall, or partition which is designed to perform one or more of the following functions:

- a) To prevent contact of food with refrigerated surfaces.
- b) To prevent dripping of condense on food.
- c) To regulate and/or direct circulation of refrigerated air.

2.55 Benching Machine — It is a portable device for elevating and stacking ice blocks.

2.56 Bimetallic Element — It is an element formed of two metals having different coefficients of thermal expansion, used as a temperature control device.

2.57 Blanch — This is a process of sterilization. In the case of vegetables to be canned, cooked, or frozen, this is usually by dipping in a hot water bath.

2.58 Boiling Point — It is the temperature at which the vapour pressure of a liquid equals the absolute external pressure at the liquid-vapour interface.

2.59 Breaker — It is a relatively poor conductor of heat used to join the liner and outer shell of an internally refrigerated container such as a refrigerator.

2.60 Breaker Strip — Refrigerator cabinet, a separate insulating element or integral insulating extension of the cabinet interior surfaces around the periphery of the cabinet door or drawer opening(s) which functions as a thermal barrier to minimize heat flow to the interior of the cabinet.

2.61 Breather Plug — It is a removable plug, cap, or other means of venting a space containing insulating material through vapour-tight sheathing to the interior of a refrigerated compartment.

2.62 Brine — Any liquid cooled by the refrigerant and used for the transmission of heat without a change in its state, having no flash point or a flash point above 68°C.

2.63 Brine, Electrolytic — Any brine capable of causing chemical decomposition of one of two dissimilar metals by electrolysis.

2.64 British Thermal Unit (Btu) — It is the quantity of heat required to raise the temperature of one pound of air-free water through one degree Fahrenheit at a constant pressure of one normal atmosphere.

NOTE — This definition is given only for guidance though we use SI units.

1 Btu = 0.251 9 kcal/h.

2.65 Calorie — It is the quantity of heat required to raise the temperature of 1 g of water through 1°C, at a constant pressure of one normal atmosphere.

2.66 Capacity — It is the usable output of a system or system component in which only losses occurring in the system or component are charged against it.

2.67 Capacity, Air Conditioner, Useful Latent (Dehumidifying) — It is the available refrigerating capacity of an air conditioner for removing latent heat from the space to be conditioned.

2.68 Capacity, Air Conditioner, Useful Sensible — It is the available refrigerating capacity of an air conditioner for removing sensible heat from the space to be conditioned.

2.69 Capacity, Air Conditioner, Useful Total — It is the available refrigerating capacity of an air conditioner for removing sensible and latent heat from the space to be conditioned.

2.70 Capacity, Condensing Unit — It is the refrigerating effect in kcal/h produced by the difference in total enthalpy between refrigerant liquid leaving the unit and the total enthalpy of the refrigerant vapour entering the unit.

2.71 Capacity, Cooler Refrigerating, Net — It is the rate of heat removal from a fluid flowing through a cooler (air, water, brine, etc.) at stated conditions; the difference in specific enthalpies of the cooling fluid entering and leaving the cooler. In case frosting occurs within the cooler, the latent heat of fusion and the subcooling heat of the ice (frost) must be added in determining the net cooler refrigerating capacity.

2.72 Capacity, Expansion Valve — It is the

refrigerating effect in kcal/h, produced by the evaporation of refrigerant passed by the valve under specified conditions.

2.73 Capacity, Ice Making — It is the actual productive ability of a system making ice in a given period.

2.74 Capacity, Ice Melting Equivalent — It is the amount of heat absorbed by one kilogram of ice at 0°C in liquefying to water at 0°C.

2.75 Capacity Reducer — In a compressor, it is a device, such as a clearance pocket, movable cylinder head, or suction bypass, by which compressor capacity can be adjusted without otherwise, changing the operating conditions.

2.76 Capacity, Refrigerating — It is the rate of heat removal from a medium or space to be cooled at stated conditions. The term refrigerating effect is used to denote heat transfer to or from the refrigerant itself in a refrigerating system, whereas the term refrigerating capacity is used to denote the rate of heat removal from a medium or space to be cooled.

2.77 Capacity, Refrigerating Compressor — It is the rate of heat removal by the refrigerant assigned to the compressor in a refrigerating system. This is equal to the product of the mass rate of refrigerant flow produced by the compressor and the difference in specific enthalpies of the refrigerant vapour at its thermodynamic state entering the compressor and the refrigerant liquid at saturation temperature corresponding to the pressure of the vapour leaving the compressor.

2.78 Capacity, Refrigerating Gross — It is the total rate of heat removal from all sources by the evaporator of a refrigerating system at stated conditions. It is numerically equivalent to the system refrigerating effect.

2.79 Capacity, Refrigerating, Net — It is the remaining rate of heat removal from all sources by the evaporator of a refrigerating system, at stated conditions, after deducting internal and external heat transfers to the evaporator that occur before distribution of the refrigerating medium and after its return.

2.80 Capacity, Refrigerating System — It is the cooling effect produced by the change in total enthalpy between the refrigerant entering the evaporator and the refrigerant leaving the evaporator.

2.81 Capacity, Refrigerating, Useful — It is the refrigerating capacity available for the specific ultimate cooling function for which the system was designed.

2.82 Capacity, Refrigerating, Volumetric — It is the refrigerating capacity of a system per unit volume of refrigerant circulated at the compressor suction.

2.83 Capillary — It is the action by which the surface of a liquid, where it is in contact with a solid (as in a slender tube), is raised or lowered.

2.84 Capillary Tube — In refrigeration practice, it is a tube of small internal diameter used as a liquid refrigerant flow control or expansion device between high and low sides; also used to transmit pressure from the sensitive bulb of some temperature controls to the operating element.

2.85 Ceiling Outlet — A round, square, rectangular, or linear air diffuser located in the ceiling which provides a horizontal distribution pattern of primary and secondary air over the occupied zone and induces low velocity secondary air motion through the occupied zone.

2.86 Centrifuge — It is a device for separating substances of different densities by centrifugal action.

2.87 Chill — It is a process of refrigeration moderately, as to meats, without freezing.

2.88 Chiller (Drip Tray) — A drawer or receptacle located directly beneath the refrigerated surfaces of a manual or semi-automatic defrosting refrigerator for chilling of food and/or water collecting during defrosting. It may also serve as a baffle to regulate compartment temperature.

2.89 Chiller (Drip Tray) Volume — It is the product of the mean inside width and length of the tray and the mean height between the inside bottom of the tray and the outside bottom of the surface of the refrigerated plate or coil when the tray is in its lowest position.

2.90 Chilling (Cooling) — It is the process of lowering of the temperature of a substance by the removal of heat in the temperature range above freezing.

2.91 Chilling Room — It is a room where products are cooled prior to cold storage.

2.92 Coefficient of Performance, Compressor, Heat Pump — It is the ratio of the compressor heating effect (heat pump) to the rate of energy input to the shaft of the compressor, in consistent units, in a complete heat pump, under designated operating conditions.

2.93 Coefficient of Performance, Compressor, Refrigerating — It is the ratio of the compressor refrigerating effect to the rate of energy input to the shaft of the compressor, in consistent units, in a complete refrigerating plant, under designated operating conditions.

2.94 Coefficient of Performance (Heat Pump) — It is the ratio of the rate of heat delivered to the rate of energy input, in consistent units, for a complete operating heat pump plant or some specific portion of that plant, under designated operating conditions.

2.95 Coefficient of Performance (Refrigerating) —

It is the ratio of the rate of heat removal to the rate of energy input, in consistent units, for a complete refrigerating plant or some specific portion of that plant, under designated operating conditions.

2.96 Coil — A cooling or heating element made of pipe or tubing with or without external fins.

2.97 Coil, Direct Expansion — It is a coil using the direct method of refrigeration.

2.98 Coil, Expansion — An evaporator constructed of pipe or tubing.

2.99 Cold Storage — It is a process of preserving perishables on a large scale by refrigeration.

2.100 Comfort Chart — It is a chart showing effective temperatures with dry-bulb temperatures and humidities (and sometimes air motion) by which the effects of various air conditions on human comfort may be compared.

2.101 Comfort Cooling — Refrigeration used for comfort as opposed to refrigeration used for storage or manufacture.

2.102 Comfort Line — It is a line on the comfort chart showing relation between the effective temperature and the percentage of adult feeling comfortable.

2.103 Comfort Zone — Average of the range of effective temperatures over which the majority (50 percent or more) of adults feel comfortable; extreme of the range of effective temperatures over which one or more adults feel comfortable.

2.104 Comfortable Extreme — It is the range of effective temperatures over which one or more adults feel comfortable.

2.105 Compartment, Freezer — The compartment in a household refrigerator designed for short-term storage of food at temperatures below 0°C. In a household combination refrigerator-freezer, it is that compartment(s) designed for storage of foods at temperatures of -12°C average or lower. In a household freezer, it is that compartment or compartments designed for extended storage of frozen foods at a recommended rating temperature of -18°C, having inherent capability for the freezing of food.

2.106 Compartment, General Refrigerated — The general refrigerated compartment(s) in a household refrigerator, 'all-refrigerator', or combination refrigerator-freezer is that compartment(s) designed for the refrigerated storage of food at an average temperature above 0°C. Special compartments designed for the storage of fresh foods to temperatures near 0°C shall be considered part of the general

refrigerated compartment. Special compartments of household combination refrigerator-freezers operating at average temperatures between -12°C and 0°C shall be considered part of the general refrigerated compartment.

2.107 Compartments, Butter, Margarine, or Cheese — Compartments provided for the storage of butter, margarine, or cheese.

2.108 Compartments, Special — Those compartments designed for maintaining special environmental conditions for a particular type of product or purpose.

2.109 Compression — In a compression refrigeration system, it is a process by which the pressure of the refrigerant is increased.

2.110 Compression, Compound — It is the process of compression by stages in two or more cylinders.

2.111 Compression, Dual — Split suction valving arrangement on compressor for carrying two suction pressures.

2.112 Compression Efficiency — It is the ratio of work required to compress, and reversibility, all the vapour delivered by a compressor (per stage) to the actual work delivered to the vapour by the piston or bladder of the compressor.

2.113 Compression, Multistage — It is the process of compression in two or more steps, where the discharge of one earlier stage compressor is connected with the suction of next higher stage compressor.

2.114 Compressor, Booster — It is a compressor for very low pressures, usually discharging into the suction line of another compressor.

2.115 Compressor, Centrifugal — A nonpositive displacement compressor which depends for pressure rise, at least in part, on centrifugal effect.

2.116 Compressor, Compound — It is a compressor in which compression is accomplished by stages, as in two or more cylinders.

2.117 Compressor, Double Acting — One which has two compression strokes per revolution of the crankshaft per cylinder that is, both faces of the piston are working faces.

2.118 Compressor, Double Suction — It is split suction; valving arrangement on compressors for carrying two suction pressures.

2.119 Compressor, Horizontal — It is a compressor with horizontal cylinder or, in small sizes, with horizontal crankshaft.

2.120 Compressor, Motor, Sealed (Hermetic Type) — A combination consisting of a compressor and motor, both of which are enclosed in the same housing, with no external shaft or shaft seals, the motor operating in the refrigerant.

2.121 Compressor, Open-Type — It is a refrigerant compressor with a shaft or other moving part extending through its casing to be driven by an outside source of power, thus requiring a shaft seal or equivalent rubbing contact between a fixed and moving part.

2.122 Compressor, Positive Displacement — It is a refrigerant compressor in which increase of refrigerant gas or vapour pressure is attained by changing the internal volume of the compression chamber.

2.123 Compressor, Reciprocating — It is a positive displacement compressor in which the change in internal volume of the compression chamber(s) is accomplished by the reciprocating motion of one or more pistons.

2.124 Compressor, Refrigerant — It is a component of a refrigerating system which increases the pressure of a compressible refrigerant fluid and simultaneously reduces its volume, while moving the fluid through the device.

2.125 Compressor, Refrigerant, Accessible Hermetic (Semi-hermetic) — It is a hermetic refrigerant compressor whose housing is sealed by one or more gasketed joints and is provided with means of access for servicing internal parts in the field.

2.126 Compressor, Refrigerant, Mechanical — It is a mechanically operated component of a refrigerating system which draws in refrigerant in a gaseous state and discharges it at a higher pressure.

2.127 Compressor, Refrigerant, Welded Hermetic — A hermetic refrigerant compressor whose housing is permanently sealed by welding or brazing and is not provided with means of access for servicing internal parts in the field.

2.128 Compressor, Rotary — It is a positive displacement compressor in which the change in internal volume of the compression chamber(s) is accomplished by the rotary motion of a positive displacement member(s).

2.129 Compressor, Screw — It is a positive displacement compressor in which pressure is increased by contrarotating intermeshing screw from members.

2.130 Compressor, Sealed Unit — A motor-compressor assembly having the compressor contained within a gas-tight casing through which no shaft

extends. Drive is usually by a motor within the same casing but may be induced by external means.

2.131 Compressor, Single-Acting — It is a compressor in which one compression stroke per revolution of the crank for each cylinder takes place.

2.132 Compressor, Vertical — It is a compressor with a vertical cylinder or, cylinders in small sizes, with a vertical crankshaft.

2.133 Compressor Unit, Refrigerant — A refrigerating component designed to compress a specific refrigerant vapour, consisting of compressor, prime mover, and regularly furnished accessories.

2.134 Concentration — It is a number specifying the composition of a solution with respect to the constituent names, as gram salt per litre of brine.

2.135 Condensate — The liquid formed by condensation of a vapour. In steam heating, water condensed from steam; in air conditioning, water extracted from air, as by condensation on the cooling coil of a refrigeration machine.

2.136 Condensation — It is the process of changing a vapour into liquid by the extraction of heat. Condensation of steam or water vapour is effected in either steam condensers or dehumidifying coils and the resulting water is called condensate.

2.137 Condenser (Refrigerant) — A heat exchanger in which the refrigerant, compressed to a suitable pressure, is condensed by rejection of heat to an appropriate external cooling medium.

2.138 Condenser, Air Cooled Refrigerant — It is a refrigerant condenser in which heat rejection is accomplished entirely by raising the temperature of the air used as a cooling medium.

2.139 Condenser, Atmospheric Refrigerant — It is a condenser cooled with water which is exposed to the atmosphere.

2.140 Condenser, Evaporative Refrigerant — A refrigerant condenser in which part of the heat rejection may be accomplished by raising the temperature of an air stream passing over a heat exchange surface and the remainder by evaporation of water sprayed or otherwise distributed over the heat exchange surface.

2.141 Condenser, Open-Shell-and-Tube — It is a condenser in which the cooling fluid usually water passes through a number of tubes in order to liquefy the refrigerant passing through the shell.

2.142 Condenser, Secondary — It is the condenser of a secondary system, also, a condenser and a secondary system where the condenser is cooled by the evaporator of the secondary system.

2.143 Condenser, Submerged — Condenser piping submerged in a bath of condenser water.

2.144 Condenser, Water-Cooled Refrigerant — It is a refrigerant condenser in which heat rejection is accomplished entirely by raising the temperature of the water used as a cooling medium.

2.145 Condensing Refrigerating Effect — The condensing heat added to the refrigerant vapour in the refrigerant compressor unit.

2.146 Condensing Unit, Hermetically Sealed — A sealed condensing unit in which the housing is permanently sealed by welding or brazing and is not provided with means of access for servicing internal parts in the field.

2.147 Condensing Unit, Mechanical, Performance Factor — It is the ratio of its capacity to its energy input, expressed in kcal/kWh.

2.148 Condensing Unit, Refrigerant — An assembly of refrigerating components designed to compress and liquefy a specific refrigerant, consisting of one or more refrigerant.

2.149 Condensing Unit, Service-Sealed — A sealed condensing unit in which the housing is sealed by one or more gaskets and means of access are provided for servicing internal parts in the field.

2.150 Condition, Steady State, Refrigerator — Steady state condition shall be considered to be established during a stabilization period under either cyclic or continuous conditions when:

- a) the average general refrigerated compartment temperature in household refrigerators, 'all-refrigerators', or combination refrigerator-freezers does not vary more than 0.6°C in two cycles (if cycling occurs) or in 2 h, whichever is longer;
- b) the average freezer compartment temperature, during no-load pull down test only for household refrigerators, combination refrigerator-freezers, or household freezers does not vary more than 0.6°C in two cycles (if cycling occurs) or in 2 h, whichever is longer; and
- c) The average frozen food temperature in household refrigerators, combination refrigerator-freezers, or household freezers is changing at a rate not exceeding 0.6°C in 24 h, based on temperature observations covering a period of not less than 8 h.

2.151 Conditions, Steady — An operating state of a system, including its surroundings, in which the extent of change with the time of all the significant parameters

is so small as to have no important effect on the performance being observed or measured.

2.152 Conductance, Surface Film — It is the time rate of heat flow per unit area under steady conditions between a surface and a fluid for unit temperature difference between the surface and the fluid.

2.153 Conductance, Thermal — It is the time rate of heat flow through a body (frequently per unit area) from one of its bounding surfaces to the other for a unit temperature difference between the two surfaces, under steady conditions.

2.154 Conduction, Thermal — It is the process of heat transfer through a material medium in which kinetic energy is transmitted by the particles of the material from particle to particle without gross displacement of the particles.

2.155 Conductivity, Thermal — It is the time rate of heat flow through unit area and unit thickness of a homogeneous material under steady conditions when a unit temperature gradient is maintained in the direction perpendicular to area. Materials are considered homogeneous when the value of the thermal conductivity is not affected by variation in thickness or in size of the sample within the range normally used in construction.

2.156 Control — It is any manual or automatic device for regulation of a system or component in normal operation. If automatic, the implication is that it is responsive to changes of pressure, temperature, or any other property whose magnitude is to be regulated.

2.157 Controlled Atmosphere Storage (Gas Storage) — It is the artificial addition of carbon dioxide to the atmosphere, particularly in large concentration, with no attempt to regulate the amount of oxygen.

2.158 Control, Dual Effect — It is a control responsive to temperatures of two zones or to two variable conditions.

2.159 Controller, High Pressure — A pressure controller designed to control the pressure at a selected point on the high pressure side of a refrigerating system.

2.160 Controller, Low Pressure — A pressure controller designed to control the pressure at a selected point on the low pressure side of a refrigerating system.

2.161 Controller, Pressure — It is an automatic control device actuated by pressure, designated to be responsive to pressure convection, transfer of heat by the movement of fluid.

2.162 Convection, Forced — Convection resulting from forced circulation of a fluid, as by a fan, jet, or pump.

2.163 Convection, Natural — Circulation or movement of gas or liquid (usually air or water) taking place due to differences in density resulting from temperature changes.

2.164 Convector — An agency of convection. In heat transfer, a surface designed to transfer its heat to a surrounding fluid largely or wholly by convection. The heated fluid may be removed mechanically or by gravity (gravity convector). Such a surface may or may not be enclosed or concealed.

2.165 Cooler, Brine (Water) — Evaporator for cooling brine in an indirect system.

2.166 Cooler, Cold Storage — An insulated room maintained at 0°C or above.

2.167 Cooler, Non-priming — Tubes are omitted from the top segment of the shell leaving a gas space above the tubes about equal to one-fourth of the inside shell diameter.

2.168 Cooler, Oil — It is a heat exchanger for the purpose of cooling oil in a lubrication system.

2.169 Cooler, Sensible Heat — It is a form of cooling surface using water, brine, or direct expansion refrigerant. It is always located on the leaving side of the dehydrator but frequently treats in addition a large volume of room air which is not circulated through the dehydrator for moisture reduction.

2.170 Cooling Coil — It is an arrangement of pipe or tubing which transfers heat from air to a refrigerant or brine.

2.171 Cooling, Direct Method of — It is a system in which the evaporator is in direct contact with the material or space refrigerated or is located in air-circulating passages communicating with such spaces.

2.172 Cooling, Evaporative — It is the process of evaporating part of a liquid by supplying the necessary latent heat from the sensible heat of the main bulb of the liquid which is thus cooled.

2.173 Cooling, Indirect Method of — It is a system in which a liquid, such as brine or water, cooled by the refrigerant, is circulated to the material or space refrigerated or is used to cool air so circulated.

2.174 Cooling, Regenerative — It is the process of utilizing heat which must be rejected or absorbed in one part of the cycle to perform a useful function in another part of the cycle by heat transfer.

2.175 Cooling, Surface — It is a method of cooling air of other gas by passing it over cold surfaces.

2.176 Cooling Effect, Sensible, Air Cooler — It is the difference between the total cooling effect and the dehumidifying effect in kcal/h.

2.177 Cooling Effect, Total, Air Cooler — It is the difference between the total enthalpy of the dry air and water vapour mixture entering the cooler per hour and the total enthalpy of the dry air and water vapour mixture leaving the cooler per hour, expressed in kcal/h.

2.178 Cooling Element — It is the heat transfer surface containing refrigerating fluid in the location where refrigerating effect is desired.

2.179 Cooling Medium — Any substance whose temperature is such, that it is used with or without a change of state, to lower the temperature of other bodies or substances.

2.180 Cooling of Air — Reduction in air temperature due to the abstraction of heat as a result of contact with a medium held at a temperature lower than that of the air. Cooling may be accompanied by moisture addition (evaporation), by moisture extraction (dehumidification), or by no change whatever of moisture content.

2.181 Cooling Power — It is the maximum rate of heat-removal from a cooling plant operating under normal conditions.

2.182 Cooling Range — In a water cooling device, it is the difference between the average temperature of the water entering the device and the average temperature of the water leaving it.

2.183 Core Sucking and Filling System — A combination consisting of a pump, distributing piping, hose, and device by which water containing impurities may be withdrawn from the unfrozen core of an ice block, and by means of connection to the source of water supply; the core may be refilled with pure water.

2.184 Critical Velocity — It is the velocity above which fluid flow is turbulent.

2.185 Cryohydrate — A frozen mixture of water and salt; brine mixed in eutectic proportions to give the lowest freezing point.

2.186 Crystal Formation — It is the zone of maximum, temperature range in freezing in which most of the freezing takes place (about 0.8°C to 1.1°C for water).

2.187 Cutting Room — The cold room in locker plants where animal carcasses are cut up into commercial sizes, such as rib roast, legs, etc.

2.188 Cycle, Binary Vapour — A refrigerating cycle in which two separate refrigerants are used, one superimposed upon augmenting the cycle of the other.

2.189 Cycle, Closed — It is any cycle in which the primary medium is always enclosed and repeats the same sequence of events.

2.190 Cycle, Defrosting — It is a refrigeration cycle which permits the cooling unit to defrost during 'OFF' period.

2.191 Cycle, Refrigerating — A sequence of thermodynamic processes through which a refrigerant passes, in a closed open system, to absorb heat at a relatively low temperature level and reject heat at a higher temperature level.

2.192 Cycle, Refrigerating, Ideal Basic Vapour Compression — A closed refrigerating cycle in which the refrigerant vapour compressed reversibly and is entropically, desuperheated irreversibly and condensed reversibly at constant pressure expanded irreversibly and adiabatically, and evaporated reversibly at constant pressure.

2.193 Cycle, Reversible — Theoretical thermodynamic cycle composed of a series of reversible processes, which can be completely reversed, for example, Carnot cycle.

2.194 Damper — A valve, or plate, used to regulate the flow of air or other fluid.

2.195 Damper, Multiple Louvers — It is a damper having a number of adjustable blades.

2.196 Declination of Sun — It is the angle above or below the equatorial plane. It is plus if north of the plane and minus if below. Celestial objects are located by declination.

2.197 Defrost, Automatic — A defrost system in which the defrost cycle is automatically initiated and automatically terminated with automatic resumption of normal refrigeration at the conclusion of the defrost operation. The defrost water is disposed off automatically.

2.198 Defrost, Manual — Manual defrost is one in which defrosting of refrigerated surface is accomplished by natural or manual means with manual initiation and manual termination of the overall defrost operation.

2.199 Defrost, Semi-automatic — A defrost system in which the defrost cycle is manually initiated and automatically terminated, with automatic resumption of normal refrigeration at the conclusion of the defrost operation. Defrost water is disposed off automatically or collected in a container for subsequent manual removal.

2.200 Defrost, Semi-automatic, Fast — A semi-automatic fast defrost system is the same as a semi-automatic defrost except that a means of accelerating defrosting is provided.

2.201 Defrosting — It is the process of removing unwanted ice or frost from a cooling surface.

2.202 Defrosting, Hot Gas — It is the process of using of high pressure or condenser gas in the evaporator or low side to effect removal of frost.

2.203 Dehumidification — It is the process of condensation of water vapour from air by cooling below the dew point or the removal of water vapour from air by chemical or physical methods.

2.204 Dehumidifier — An air cooler or washer used for lowering the moisture content of the air passing through it; and an absorption or adsorption device for removing moisture from air.

2.205 Dehumidifier, Surface — An air-conditioning unit, designed primarily for cooling and dehumidifying air through the action of passing the air over wet cooling coils.

2.206 Dehydration — The removal of water vapour from air by the use of absorbing or adsorbing materials; and the removal of water from stored goods.

2.207 Desiccant — Any absorbent or adsorbent, liquid or solid, that will remove water or water vapour from a material. In a refrigeration circuit the desiccant should be insoluble in the refrigerant.

2.208 Desiccation — It is any process for evaporating water or removing water vapour from a material.

2.209 Design Working Pressure — It is the maximum allowable working pressure for which a specific part of a system is designed.

2.210 Dew Point, Apparatus — That temperature which would result if the psychrometric process occurring in a dehumidifier, humidifier, or surface cooler were carried to the saturation condition of the leaving air while maintaining the same ratio of sensible to total heat load in the process.

2.211 Dew-Point Rise — The increase in moisture content (specific humidity) of air expressed in terms of rise in dew-point temperature.

2.212 Dew Point, Room — It is the dry-bulb (dew-point, etc) temperature of the conditioned room or space.

2.213 Diagram, Indicator — Pressure-volume diagram tracing condition of gas in a compressor or engine cycle in terms of pressure and volume displaced.

2.214 Diffuser Air — A circular, square, or rectangular air distribution outlet generally located in the ceiling and comprised of deflecting members discharging supply air in various directions and planes and arranged to promote mixing of primary air with secondary room air.

2.215 Diffuser, Air, Adjustable Flow Rate — It is an air diffuser incorporating a device for varying air flow rate without affecting the direction of the air jets.

2.216 Diffusable, Air, Adjustable Pattern — It is an air diffuser that incorporates an integral device by means of which the direction of the air jets can be varied.

2.217 Diffuser, Air Ceiling — It is an air diffuser suitable only for ceiling mounting.

2.218 Diffuser, Air, Fully Adjustable — An air diffuser that incorporates independent devices to achieve the following:

- a) Variation of the direction of air jets without alteration of the air flow rate, and
- b) Variation of the air flow rate without alteration of the direction of the air jets.

2.219 Dimensions, Overall — The projected dimensions of a device, usually on horizontal and vertical planes, that can be used to determine whether the device will fit in an assigned space or can be moved through a designated passageway.

2.220 Distributor — It is a device for dividing flow of liquid fluid between parallel paths in an evaporator or in other types of heat transfer apparatus.

2.221 Door Dike — A door dike is a projection on the door which extends into the refrigerated compartment(s) and which functions primarily as a barrier to minimize heat flow to the interior of the cabinet.

2.222 Door, Refrigerator, Left Hand — It is a door which is hinged on the left-hand side of the door when viewed facing the cabinet.

2.223 Door, Refrigerator, Right Hand — It is a door which is hinged on the right-hand side of the door when viewed facing the cabinet.

2.224 Draft — A current of air, when referring to the pressure difference which causes a current of air or gases to flow through a flue, chimney, heater, or space; or when referring to a localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of air flow, whereby more heat is withdrawn from a person's skin than is normally dissipated.

2.225 Drier — A manufactured device containing a desiccant, placed in the refrigerant circuit, its primary purpose being to collect and hold within the desiccant all water in the system in excess of the amount which can be tolerated in the circulating refrigerant.

2.226 Drift — In a water spray device the entrained unevaporated water carried from the device by air movement through it.

2.227 Drinking Water Cooler — An assembly which either employs or is used in conjunction with a

mechanical condensing unit for the purpose of cooling drinking water.

2.228 Drinking Water Cooler, Bottled — A cooler which employs a bottle for storing the supply of water to be cooled and which utilizes a faucet for filling Glasses or cups.

2.229 Drinking Water Cooler, Bubbler-Type — A cooler which is equipped to use water under pressure from a piped system as a supply to the cooler and which employs a valve in the drinking water line for controlling the flow of water to a bubbler or open flowing stream so that the water may be drunk without utilizing glasses or cups.

2.230 Drinking Water Cooler, Capacity — The quantity of a water cooler will cool in a given ambient temperature with a given incoming water temperature and a given outgoing water temperature, under steady state conditions.

2.231 Drinking Water Cooler, Electric — A completely self-contained unit comprised of an insulated cabinet, evaporator, and electric motor-driven condensing unit.

2.232 Drinking Water Cooler, Faucet Pressure Type — A cooler which is equipped to use water under pressure from a piped system as a supply to the cooler and which utilizes a faucet for filling glasses or cups.

2.233 Drinking Water Cooler, Pressure Type — It is a type of water cooler, which employs a closed cooling chamber having connections for inlet water under pressure and outlet for cold water.

2.234 Drinking Water Cooler, Self-Contained — A factory made assembly, in one structure which includes a complete mechanical refrigerating system and which has the primary function of cooling potable water and also provides for dispensing such water, by either integral or remote means or both.

2.235 Drinking Water Cooler, Storage Type — It is a type of water cooler, which stores and cools the water in the same container or separate containers. Such water coolers may or may not be filled with plumbing connection for water inlet, drain, overflow, etc.

2.236 Drip

- a) A pipe, or a steam trap and a pipe considered as a unit, which conducts condensation from the steam side of a piping system to the water or return side of the system; and
- b) Water which appears on thawing frozen food, water melting from evaporator, or water dropping from a cooling surface.

2.237 Dry Ice — A term used to describe solid carbon

dioxide (CO₂) on account of its sublimation into gas without intermediate liquefaction.

2.238 Duct — A passageway made of sheet metal or other suitable material, not necessarily leak tight, used for conveying air or other gas at low pressures.

2.239 Dunnage — These are strips of wood used in stowing cargo to provide air space between pieces or packages.

2.240 Dust — An air suspension (aerosol) of particles of any solid material usually with particle size less than 100 microns.

2.241 Ebullator — A device inserted in flooded evaporator tubes to prevent the evaporator from becoming oil bound or the refrigerant liquid from becoming quiescent at a pressure lower than its boiling point.

2.242 Effect, Chimney — The tendency of air or gas in a duct or other vertical passage to rise when heated due to its lower density in comparison with that of the surrounding air or gas; in buildings, the tendency toward displacement (caused by the difference in temperature) of internal heated air by unheated outside air due to the difference in density of outside and inside air.

2.243 Effect, Cooling, Total — The difference between the total enthalpy of the dry air and water vapour mixture entering a unit per hour and the total enthalpy of the dry air and water vapour (and water) mixture leaving the unit per hour, expressed in kcal/h.

2.244 Effect, Dehumidifying — The heat removed in reducing the moisture content of air, passing through a dehumidifier from its entering to its leaving condition.

2.245 Effect, Heating, Compressor (Heat Pump) — The rate of heat delivery by the refrigerant assigned to the compressor in a heat pump system. This is equal to the product of the mass rate of refrigerant flow produced by the compressor and the difference in specific enthalpies of the refrigerant vapour at its thermodynamic state leaving the compressor and saturated liquid refrigerant at the pressure of the vapour leaving the compressor.

2.246 Effect, Humidifying — The latent heat of vaporization of water at the average evaporating temperature multiplied by the number of kilograms of water evaporated per hour and expressed in kcal/h.

2.247 Effect, Refrigerating — It is the rate of heat removal by a refrigerant in a refrigerating system. This is equal to the product of the mass rate of refrigerant flow in the system and the difference in specific enthalpies of the refrigerant at two designated points in the system or two designated thermodynamic states

of the refrigerant. The term refrigerating effect is used to denote heat transfer to or from the refrigerant itself in a refrigeration system, whereas the term refrigerating capacity is used to denote the rate of heat removal from a medium or space to be cooled.

2.248 Effect, Refrigerating, Compressor — The rate of heat removal by the refrigerant assigned to the compressor in a refrigerating system. This is equal to the product of the mass rate of refrigerant flow produced by the compressor and the difference in specific enthalpies of the refrigerant vapour at its thermodynamic state entering the compressor and refrigerant liquid at saturation temperature corresponding to the pressure of the vapour leaving the compressor.

2.249 Effect, Refrigerating, Condensing Unit — The rate of heat removal by the refrigerant assigned to the condensing unit in a refrigerating system. This is equal to the product of the mass rate of refrigerant flow produced by the condensing unit and the difference in the specific enthalpies of the refrigerant vapour entering the unit and the refrigerant liquid leaving the unit.

2.250 Effect, Refrigerating, Cooler — The rate of heat absorption by a refrigerating medium flowing through a cooler (air, water, brine, etc) at stated conditions. It is measured as the product of the mass flow rate of the refrigerating medium and the difference in specific enthalpies of the refrigerating medium entering and leaving the cooler.

2.251 Effect, Refrigerating System — It is the rate of heat removal by the refrigerant in the evaporator of a refrigerating system. This is equal to the product of the mass rate of refrigerant flow through the evaporator and the difference in the specific enthalpies of the refrigerant entering and leaving the evaporator.

2.252 Effect, Sun — Solar energy transmitted into space through windows and building materials.

2.253 Effect, Total Cooling — The difference between the total enthalpy of the dry air and water vapour mixture entering a unit per hour and the total enthalpy of the dry air and water vapour (and water) mixture leaving the unit per hour, expressed in kcal/h.

2.254 Efficiency, Compression — Ratio of work required to compress, adiabatically and reversibly, all the vapour delivered by a compressor (per stage) to the actual work delivered to the vapour by the piston or blades of the compressor.

2.255 Efficiency, Mechanical — It is the ratio of the compression energy or work of a compressor to the energy or work input.

2.256 Efficiency, Volumetric, Apparent — It is the ratio of length of suction line, on indicator card, to stroke.

2.257 Efficiency, Volumetric, Due to Cylinder Heating — It is the ratio of the total to the apparent volumetric efficiency. It is also called real or no-clearance volumetric efficiency.

2.258 Efficiency, Volumetric, Total — It is the ratio of the actual volume of gas moved by the compressor or pump to the actual displacement of the compressor or pump.

2.259 Ejector — A device which builds up a high fluid velocity in a restricted area to obtain a lower static pressure at that point so that fluid from another source may be drawn in.

2.260 Element, Electric Heating — It is a unit assembly consisting of a resistor, insulated supports and terminals for connecting the resistor to electric power.

2.261 Element, Pressure Imposing — Any device or portion of the equipment used for the purpose of increasing the pressure upon the refrigerant.

2.262 Emissivity — The capacity of a material to emit radiant energy, emittance is the ratio of the total radiant flux emitted by a body to that emitted by an ideal black body at the same temperature.

2.263 Emulsion — It is a relatively stable suspension of small but not colloidal particles of a substance in a liquid, the suspended particles being undissolved.

2.264 Energy, Internal — The sum of all the kinetic and potential energies contained in a substance due to the states of motion and separation of its several molecules, atoms, and electrons. It includes sensible heat (vibration energy) and that part of the latent heat that is represented by the increase in energy during evaporation.

2.265 Enthalpy — A thermodynamic property of a substance defined as the sum of its internal energy plus the quantity pv/J , where p = pressure of the substance, v = volume, and J = mechanical equivalent of heat.

2.266 Enthalpy, Specific — It is enthalpy per unit weight of a substance.

2.267 Entropy — The ratio of the heat added to a substance to the absolute temperature at which it was added.

2.268 Entropy Specific — It is entropy per unit weight of a substance.

2.269 Enzyme — It is a complex organic substances such as diastase, pepsin, etc, capable of transforming,

by catalytic action, some other compound; a soluble ferment.

2.270 Equalizer — It is a piping arrangement to maintain a common liquid level or pressure between two or more chambers.

2.271 Equalizer, External — In a thermostatic expansion valve, a tube connection from a selected control point in the low-side circuit to the pressure sensing side of the control element such that the control-point pressure is transmitted to the actuating element (diaphragm or bellows). This connection provides a means for compensating for the pressure drop through accessories and the evaporator.

2.272 Equalizer, Internal — In a thermostatic expansion valve, an integral internal port or passage whereby the actuating element (diaphragm or bellows) is exposed to pressure leaving the valve.

2.273 Equivalent Evaporation — The amount of water a boiler would evaporate, in litre per hour, if it received and vapourized feed water at 100°C and atmospheric pressure.

2.274 Evaporation — Change of state from liquid to vapour.

2.275 Evaporative Equilibrium (of a Wet-Bulb Instrument) — The condition attained when the wetted wick has reached a stable and constant temperature. (When the instrument is exposed to air at velocities over 5 m/s, this temperature may be considered to approach the true wet-bulb temperature).

2.276 Evaporator, Dry-Type — An evaporator of the continuous tube type where refrigerant from a pressure reducing device is fed into one end and the suction line connects to the outlet end.

2.277 Evaporator (Refrigerant) — It is a heat exchanger in which the liquid refrigerant, after reduction of its pressure (expansion), is evaporated by absorption of heat from the medium to be cooled.

2.278 Exfiltration — It is air flow outward through a wall, leak membrane, etc.

2.279 Exhaust Opening — It is any opening through which air is removed from a space which is being heated or cooled, or humidified or dehumidified, or ventilated.

2.280 Exhauster — A fan used to withdraw air under suction.

2.281 Expansion, Coefficient of — It is the change in length per unit length or the change in volume per unit volume per degree change in temperature.

2.282 Expansion, Dry — It is a processor heat removal

by a refrigerant in an evaporator fed by a flow control, responsive to temperature or pressure, or both, at some point in the evaporator or to the difference between high- and low-side pressures and not to the liquid level in the evaporator. All entering refrigerant is evaporated before being re-circulated.

2.283 Expansion, Multistage — Passing volatile refrigerant through two or more pressure reducing devices, connected in series, usually with an evaporator between them, operating at one pressure and a second evaporator fed through both devices at a lower pressure.

2.284 Expansion Valve, Capacity — It is the refrigerating effect in kcal/h produced by the evaporation of refrigerant passed by the valve under specified conditions.

2.285 Expansion Valve, Superheat — It is the difference between the temperature of the thermal bulb and the temperature corresponding to the pressure at the outlet or at the equalizer connection, when provided, of a thermostatic expansion valve.

2.286 Expansion Valve, Superheat Change — The change in superheat of a thermostatic expansion valve required to open the valve at a predetermined amount.

2.287 Extended Surface — It is heat transfer surface, one side of which is increased in area by the addition of fins, discs, or other means.

2.288 Fan, Attic — An exhaust fan to discharge air near the top of a building while cooler air is forced (drawn) in at a lower level.

2.289 Fan, Centrifugal — A fan rotor or wheel within a scroll-type housing and including driving mechanism supports for either belt drive or direct connection.

2.290 Fan, Economizer — A device which prevents operation of the fan motor on a cold diffuser during the shutdown period after the coil has been defrosted.

2.291 Fan, Exhaust — A fan used to remove or exhaust air from a space.

2.292 Fan, Propeller — A propeller or disc-type wheel within a mounting ring or plate and including driving mechanism supports for either belt drive or direct connection.

2.293 Fan, Shroud — A protective housing which surrounds the fan and which may also direct the flow of air.

2.294 Fan, Tubeaxial — A propeller or disc-type wheel within a cylinder and including driving mechanism supports for either belt drive or direct connection.

2.295 Fan, Vaneaxial — A disc-type wheel within a cylinder, a set of air guide vanes located either before

or after the wheel, and including driving mechanism supports either for belt drive or direct connection.

2.296 Filter — It is a device to remove solid material from a fluid.

2.297 Filter, Air Cleanable — It is a filter in which the medium can be washed or wiped.

2.298 Filter, Air, Dust Holding Capacity — The mass of duct which a filter can retain at rated air flow during an increase in resistance from that under clean conditions to the resistance at some arbitrary chosen value. It is usually twice the value of the pressure drop at clean conditions.

2.299 Filter, Air, Electrostatic — An air filter that applies an electric charge to the dust particles in the air stream, and collects, precipitates or builds up the particles on plates of opposite charge.

2.300 Filter, Air Replaceable Media — It is a non-cleanable filter in which the filter medium, when dirty is discarded and replaced by a new one.

2.301 Filter Press — It is a device for separating solid and liquid matter under pressure so that the solid residue is compressed into briquettes to facilitate removal.

2.302 Fin — An extended surface to increase the heat transfer area, as metal sheets attached to tubes.

2.303 Flammability — It is the ability of a material to burn.

2.304 Flare Fitting — It is a type of soft-tube connector which requires the flaring of the tube to provide a mechanical seal.

2.305 Flash Chamber — Separating tank placed between the expansion valve and evaporator in a refrigeration system to separate and bypass any flash gas formed in the expansion valve.

2.306 Flash Point — Temperature of combustible material, as oil, at which there is a sufficient vaporization to support combustion of the material.

2.307 Floatation — It is a method of treating materials by floating in a liquid. It is an ice-making method in which ice floats away from the surface on which it has been frozen.

2.308 Flow, Turbulent — It is fluid flow in which the fluid moves transversely as well as in the direction of the tube or pipe axis, as opposed to streamline or viscous flow.

2.309 Fluid, Heat Transfer — Any gas, vapour, or liquid used to absorb heat from a source at a high temperature and reject it to a lower temperature substance.

2.310 Fluid, Primary — It is the refrigerant, to distinguish from secondary fluid or brine.

2.311 Fluid, Refrigerating — Any fluid used to transfer heat between cold refrigerant and the substance or bodies to be cooled, by circulation of the fluid without change of state or by an evaporation-condensation process at essentially equal pressures.

2.312 Fluid, Secondary — Fluid cooled by the refrigerant in an indirect method of refrigeration.

2.313 Foaming — Formation of a foam or froth of oil-refrigerant due to rapid boiling out of the refrigerant dissolved in the oil when the pressure is suddenly reduced. This occurs when the compressor starts operating, and if large quantities of refrigerant have been dissolved, large quantities of oil may boil out and be carried through the refrigerant lines.

2.314 Fog — Suspended liquid droplets generated by condensation from the gaseous to the liquid state or by breaking up a liquid into a dispersed state, such as by splashing, foaming, and atomizing.

2.315 Forced Circulation Air Cooler — It is a cooler which includes a fan or a blower for positive air circulation.

2.316 Forecooler — In an ice plant, a device for cooling the water for ice making before it enters the cans; pre-cooler.

2.317 Free Delivery-Type Air Cooler — It is a cooler taking air from and discharging it directly to the space to be treated without any element external to the cooler to impose air resistance.

2.318 Free Delivery-Type Unit — It is a device which takes in air and discharges it directly to the space to be treated without external elements which impose air resistance.

2.319 Freeze-Up — It is failure of a refrigerating unit to operate normally due to formation of ice at the expansion device. A valve may freeze shut or open, causing improper refrigeration in either case. On a coil, frost formation to the extent that air flow stops or is severely restricted.

2.320 Freezer — A refrigerated chamber maintained substantially colder than the freezing point temperature of the contents.

2.321 Freezer, Carrying — Cold storage freeze room, generally kept between -147°C and -7°C , to receive and hold frozen goods.

2.322 Freezer, Household — A cabinet which is designed for the extended storage of frozen food at a recommended temperature of -18°C at 32°C ambient, with inherent capability for the freezing of food and a

source of refrigeration, and it is intended for household use.

2.323 Freezer, Household, Chest — It is a household freezer which is accessible from the top.

2.324 Freezer, Household, Upright (Vertical) — An upright freezer is a household freezer which is accessible from the front.

2.325 Freezer, Sharp

It is a storage freezer room, generally kept at -34°C to -23°C , to receive unfrozen goods and freeze them.

2.326 Freezing — It is the process of changing a liquid substance or the liquid content of a food or other commodity to a solid state by the removal of heat.

2.327 Freezing Method, Refrigerated Plate — It is heat transfer by means of the direct contact of refrigerated plates with the packaged product.

2.328 Freezing Method, Spray — Refrigerated liquid is sprayed into an insulated enclosure containing the product to be frozen.

2.329 Freezing Method, Tray — It is a method of freezing food by subjecting it to moving refrigerated air. The food is arranged on shallow trays which are placed in portable racks and put in an insulated chamber through which the air is blown.

2.330 Freezing Point — It is the temperature at which a given liquid substance will solidify or freeze upon removal of heat. Freezing point for water is 0°C .

2.331 Freezing, Quick — It is the process of freezing of a food or other commodity at a rapid rate of temperature reduction to produce a desired crystalline structure in the frozen product.

2.332 Freezing Time — It is the time for any complete freezing process to take place.

2.333 Frost Back — It is the flooding of liquid from an evaporator into the suction line, accompanied by frost formation on the suction line in most cases.

2.334 Frozen Food — Any food in which the water contained in it is in the solid form.

2.335 Fumes — Solid particles commonly formed by the condensation of vapors from normally solid materials such as molten metals. Fumes may also be formed by sublimation, distillation, calcination, or chemical reaction wherever such processes create airborne particles predominantly below one micron in size. Such solid particles sometimes serve as condensation nuclei for water vapour to form smog.

2.336 Fusible Plug — It is a device having a predetermined melting temperature member for the relief of pressure (gauge):

- a) an instrument for measuring pressure or liquid level; and
- b) also, an arbitrary scale of measurement for sheet metal thickness, wire, and drill diameters, etc.
- 2.337 Gas** — It is a usually highly superheated vapour which, within acceptable limits of accuracy, satisfies the perfect gas laws.
- 2.338 Gas, Flash** — It is the gas resulting from the instantaneous evaporation of refrigerant in a pressure reducing device to cool the refrigerant to the evaporation temperature at a reduced pressure.
- 2.339 Gas, Foul (Non-condensable Gas)** — It is a gas in a refrigerating system, which does not condense at the temperature and partial pressure at which it exists in the condenser, therefore imposing a higher head pressure on the system.
- 2.340 Gas, Inert** — A gas that neither experiences nor causes chemical reaction nor undergoes a change of state in a system or process; for example, nitrogen or helium mixed with a volatile refrigerant.
- 2.341 Gas Constant** — The coefficient R in the perfect gas equation $pv = Rt$.
- 2.342 Generator** — Basic part of an absorption system. A still provided with means of heating, used to drive refrigerant out of solution.
- 2.343 Glass, Gauge** — It is a device for showing a liquid level.
- 2.344 Glass, Sight** — Glass tube used to indicate the liquid level in tanks, bearings, and similar equipment.
- 2.345 Glazing of Foods** — It is freezing a coat of ice on frozen foods by dipping in water, the latent heat of the coat being absorbed inwards.
- 2.346 Graduated Acting** — Term applied to a control instrument or device which functions to give throttling control; that is, operates between full 'ON' and full 'OFF' position.
- 2.347 Gravity, Specific** — Density compared to density of standard material; reference usually to water or to air.
- 2.348 Grid** — A device for lifting a row of ice cans.
- 2.349 Grill** — It is a louvered or perforated covering for an air passage opening which can be located in the side wall ceiling, or floor.
- 2.350 Head, Dynamic** — In flowing fluid, the sum of the static and velocity pressures at the point of measurement (same as total head).
- 2.351 Head, Static** — The static pressure of a fluid expressed in terms of the height of a column of the fluid, or of some manometric fluid, which it would support.
- 2.352 Head, Total** — In flowing fluid, the sum of the static and velocity pressures at the point of measurement.
- 2.353 Head, Velocity** — In a moving fluid, it is the height of the fluid or of some manometric fluid equivalent to its velocity pressure.
- 2.354 Heat** — It is the form of energy that is transferred by virtue of a temperature difference.
- 2.355 Heat Capacity** — It is the amount of heat necessary to raise the temperature of a given mass one degree. Numerically, the mass multiplied by the specific heat.
- 2.356 Heat Conductor** — It is a material capable of readily conducting heat.
- 2.357 Heat Exchanger** — A device specifically designed to transfer heat between two physically separated fluids.
- 2.358 Heat Exchanger, Double-Pipe** — One in which two pipes are arranged concentrically, one within the other, and in which one fluid flows through the inner pipe and the other through the annulus between them.
- 2.359 Heat, Humid** — It is the ratio of increase of enthalpy per kilogram of dry air, with its associated moisture, to rise of temperature under conditions of constant pressure and constant specific humidity.
- 2.360 Heat Interchanger** — It is a device to transfer heat from the liquid refrigerant to the suction gas; also known as heat exchanger.
- 2.361 Heat, Latent** — Change of enthalpy during a change of state, usually expressed in kcal/kg. With pure substances, latent heat is absorbed or rejected at constant temperature at any pressure.
- 2.362 Heat, Latent of Condensation** — It is the difference in specific enthalpy of a condensable fluid between its dry saturated vapour state and its saturated liquid state at the same pressure.
- 2.363 Heat, Latent of Condensation or Evaporation (Specific)** — Thermodynamically, it is the difference in the specific enthalpies of a pure condensable fluid between its dry saturated vapour state and its saturated (not subcooled) liquid state at the same pressure.
- 2.364 Heat of Fusion** — Latent heat involved in changing between the solid and the liquid states.
- 2.365 Heat of Reaction** — Heat per unit mass or per mole of one of the reagents or products of reaction in a chemical reaction; exothermal if given off, endothermal if absorbed.

2.366 Heat of the Liquid — It is enthalpy of a mass of liquid above an arbitrary zero.

2.367 Heat, Sensible — Heat which is associated with a change in temperature; specific heat exchange of temperature; in contrast to a heat interchange in which a change of state (latent heat) occurs.

2.368 Heat, Specific — The ratio of the quantity of heat required to raise the temperature of a given mass of any substance one degree to the quantity required to raise the temperature of an equal mass of a standard substance (usually water at 15°C) one degree.

2.369 Heat, Vital — Heat generated by fruits and vegetables in storage, due to ripening.

2.370 Heat Pump — A refrigerating system employed to transfer heat into a space or substance. The condenser provides the heat while the evaporator is arranged to pick up heat from air, water, etc. By shifting the flow of air or other fluid, a heat pump system may also be used to cool the space.

2.371 Heat Pump, Cooling and Heating — A refrigerating system designed so that the heat extracted at a low temperature and the heat rejected at a higher temperature may be utilized alternately or simultaneously for cooling and heating functions respectively.

2.372 Heat Pump, Heating — A refrigerating system designed primarily to utilize the heat rejection from the system for a desired heating function.

2.373 Heat Rejection Effect — Condensing, that portion of the total refrigerant heat rejecting effect of a condenser which is used for condensing the entering refrigerant vapour to a saturated liquid at the entering refrigerant pressure.

2.374 Heat Rejection Effect, Subcooling — It is the total refrigerant heat rejection effect less the condensing heat rejection effect.

2.375 Heat Rejection Effect, Total Refrigerant — The total useful capacity of a refrigerant condenser for removing heat from the refrigerant circulated through it.

2.376 Heat Transmission — Any time rate of heat flow; usually refers to conduction, convection, and radiation combined.

2.377 Heating, Regenerative (or Cooling) — It is a process of utilizing heat, which must be rejected or absorbed in one part of the cycle, to perform a useful function in another part of the cycle by heat transfer.

2.378 High Pressure Side (High Side) — It is that portion of a refrigerating system operating at approximately the condenser pressure.

2.379 Hold Over — In an evaporator, the ability to stay cold after heat removal from the evaporator stops. A material used to store heat in latent or sensible form.

2.380 Hot Gas Line — A line used to convey discharge gas from the compressor to the evaporator for the purpose of defrosting.

2.381 Humidifier — It is a device to add moisture to air.

2.382 Humidifier, Central — It is a device which humidifies air to be circulated through ducts in an air-conditioning system.

2.383 Humidifier, Room Spray-Type — It is an air humidifier which sprays water directly into the room.

2.384 Humidify — It is adding water vapour to the atmosphere; adding water vapour or moisture to any material.

2.385 Humidistat — It is a regulatory device, actuated by changes in humidity, used for the automatic control of relative humidity.

2.386 Humidity — It is the water vapour within a given space.

2.387 Humidity, Absolute — It is the weight of water vapour per unit volume.

2.388 Humidity, Percentage — The ratio of the specific humidity of humid air to that of saturated air at the same temperature and pressure, usually expressed as a percentage (degree of saturation: saturation ratio).

2.389 Humidity Ratio (Specific Humidity) — The weight of water vapour (steam) associated with one kilogram weight of dry air.

2.390 Humidity, Relative — The ratio of the mol fraction of water vapour present in the air to the mol fraction of water vapour present in saturated air at the same temperature and barometric pressure. Approximately, it equals the ratio of the partial pressure or density of the water vapour in the air to the saturation pressure or density, respectively, of water vapour at the same temperature.

2.391 Hydrolysis — It is the process of splitting-up of compounds by reaction with water, for example, reaction of dichlorodifluoromethane or methyl chloride with water, in which case acid materials are formed.

2.392 Hydrometer — It is an instrument which, by the extent of its submergence, indicates the specific gravity of the liquid in which it floats.

2.393 Hygrometer — It is an instrument responsive to humidity conditions (usually relative humidity) of the atmosphere.

2.394 Hygroscopic — Absorptive of moisture; readily absorbs and retains moisture.

2.395 Hygrostat — It is an automatic control, responsive to humidity.

2.396 Ice Bank — It is a thermal accumulator in which during off-peak periods of refrigeration demand, ice is formed, and in which, during peak periods of refrigeration demand, compressor capacity is supplemented by melting ice.

2.397 Ice Can — An open content top tank or can of properly formed and reinforced sheet metal which, when submerged in a chilled antifreeze solution in an ice tank, will permit the freezing of its water into a block of ice of a desired form or weight.

2.398 Ice Can Frames — It is a metal frame or support in which a number of ice cans are fixed so as to enable them to be handled as a group rather than as individual cans.

2.399 Ice Can Truck — A wheeled frame with arm and hoist suitably arranged to be moved over the ice tank top for lifting individual cans from the tank.

2.400 Ice Maker Cycle — A cycle type automatic ice maker has separate and sequence water fill, freezing and harvesting phases of the ice making operation.

2.401 Ice Maker, Non-cyclic — A non-cyclic type (continuous) automatic ice maker has simulated water supply freezing and/or harvesting phases in the ice-making operation.

2.402 Ice Making Capacity — It is the amount of ice that a refrigerating plant is able to produce in a given period of time.

2.403 Ice-Melting Equivalent — It is the amount of heat absorbed by one kilogram of ice at 0°C in liquefying to water at 0°C.

2.404 Ice Point — It is the temperature at which water freezes under normal atmospheric pressure 760 mm Hg and 0°C.

2.405 Ice Storage, Bin Rating — The capacity of an automatic ice-maker storage bin is the average weight of ice contained in the bin when the bin-fill device terminates the ice-making operation.

2.406 Ice Tank Grating and Covers — A framework of wood, metal, or combination of both, which positions the ice cans in the ice-making tank and upon which are supported removable covers, usually of wood, above the cans to exclude dirt and the warmer air of the tank room.

2.407 Ice Tray — An ice tray is a container for freezing water into ice.

2.408 Ice Tray, Automatic-Fill — An automatic-fill ice tray provides for automatic filling with water for freezing into ice.

2.409 Ice Tray Capacity Rating — The weight of water with the tray filled to within 3 mm of the top and with the grids in place.

2.410 Induction Unit, High-Pressure — It employs nozzles which produce a high velocity jet. The high velocity jet of primary air induces a flow of secondary air through coils located in the secondary air stream.

2.411 Induction Unit, Low-Pressure — It is essentially an induction-type convector. It uses a jet of conditioned air (or primary air) to induce into the unit a flow of room or secondary air which mixes with the primary air. The mixture is discharged into the room through a grill at the top of the unit. Heating coils are located in the secondary air stream for use in heating.

2.412 Infiltration — It is air flowing inward as through a wall, leak, etc.

2.413 Insulation, Fill — Granulated, shredded, or powdered material prepared from vegetable, animal, or mineral origin. It can come in bulk or batt form.

2.414 Insulation, Sound — It is an acoustical treatment of fan housings, supply ducts, space enclosures, and other parts of system and equipment for isolation of vibration or to reduce transmission of noise.

2.415 Insulation, Thermal — A material having a relatively high resistance to heat flow and used principally to retard the flow of heat.

2.416 Intercooling — It is removal of heat from compressed gas between compression stages.

2.417 Irradiation — It is the process of subjecting foods, etc, to radiations of special wavelengths, such as the 0.253 7 micron wavelength, which kills certain bacteria; the quantity of radiant energy incident on a surface per unit time and unit area.

2.418 Isentropic — An adjective describing a reversible adiabatic process; a change taking place at constant entropy.

2.419 Isobaric — An adjective used to indicate a change taking place at constant pressure.

2.420 Isomer — One of a group of substances having the same ultimate chemical composition but different molecular structures.

2.421 Isothermal — An adjective used to indicate a change taking place at constant temperature.

2.422 Jacketing — It is surrounding by a confined bath or stream of fluid for temperature control or heat absorption.

2.423 Joint Brazed, High-Temperature — A gas-tight joint obtained by the joining of metal parts with alloys which melt at temperatures higher than 816°C but less than the melting temperatures of the joined parts.

2.424 Joint Brazed, Low-Temperature — A gas-tight joint obtained by the joining of metal parts with metallic mixtures or alloys which melt at temperatures below 816°C but above 538°C.

2.425 Joint, Mechanical — A gas-tight joint obtained by the joining of metal parts through a positive holding mechanical construction (such as flanged joint, screwed joint, flared joint).

2.426 Joint, Soldered — A gas-tight joint obtained by the joining of metal parts with metallic mixtures or alloys which melt at temperatures below 538°C.

2.427 Joint, Welded — A gas-tight joint obtained by the joining of metal parts in the plastic or molten state.

2.428 Joule-Thomson Effect

It is the ratio of temperature change to pressure change (dT/dp) of an actual gas in a process of throttling or expansion without doing work or interchanging heat.

2.429 Lag — The delay in action of the sensing element of a control device due to the time required for the sensing element to reach equilibrium with the property being controlled; namely temperature lag, flow lag, etc.

2.430 Law of Partial Pressure, Dalton's — Each constituent of a mixture of gases behaves thermodynamically as if it alone occupied the space. The sum of the individual pressures of the constituents equals the total pressure of the mixture.

2.431 Laws of Thermodynamics, First and Second — The First Law states, in effect, the conservation of energy principle, particularly equating heat and mechanical energy and denying perpetual motion in so far as it implies a creation of energy. The Second Law states that the quality of energy varies as to form, particularly that heat energy is only in part transformable into mechanical energy. It denies the possibility of a machine operating in a cycle and developing mechanical energy from a single source of heat.

2.432 Leak Detector — A device used to detect refrigerant leaks in a refrigerating system, *Halide torch* — a flame tester that generally uses alcohol and burns with a blue flame, but when the sampling tube draws in Freon vapour, the flame color changes to bright green.

2.433 Liner — It is the enclosure forming the interior of the general refrigerated compartment and/or some freezer compartment(s). The complete liner comprises

the compartment liner in the cabinet, the exposed breaker strip surfaces, and the door liner(s).

2.434 Liquefaction — A change of state to liquid; generally used instead of condensation in case of substances ordinarily gaseous.

2.435 Liquid, Volatile — Any liquid, which evaporates readily at atmospheric pressure and room temperatures.

2.436 Liquid Indicator — It is a device, frequently combined with a strainer, located in the liquid line and having a sight port by which liquid flow may be observed for the presence of bubbles.

2.437 Liquid Line — It is the tube or pipe carrying the refrigerant liquid from the condenser or receiver of a refrigerating system to a pressure-reducing device.

2.438 Liquid Refrigerant Receiver — A vessel in a refrigerating system designed to insure the availability of adequate liquid refrigerant for proper functioning of the system and to store the liquid refrigerant when the system is pumped down.

2.439 Liquid Refrigerant Separator — A vessel permanently installed in the low pressure side of a system for the purpose of trapping unvaporized refrigerant.

2.440 Liquor — A solution used in absorption refrigeration.

2.441 Liquor, Strong (Rich) — A solvent with relatively high concentration of solute.

2.442 Liquor, Weak — A solvent with relatively low concentration of solute.

2.443 Load — The amount of heat per unit time imposed on a refrigerating system or the required rate of heat removal.

2.444 Load Factor — It is the ratio of actual mean load to a maximum load or maximum production capacity in a given period.

2.445 Load, Usage — It is the sum of the air change, product, and miscellaneous loads on a refrigerator; the sum of the loads exclusive of wall heat gains.

2.446 Locker Plant — It is a cold storage establishment containing food storage boxes or lockers for individual users.

2.447 Louver — An assembly of sloping vanes intended to permit air to pass through and to inhibit transfer of water droplets.

2.448 Low-Pressure Side (Low Side) — It is that portion of a refrigerating system operating at approximately the evaporator pressure.

2.449 Lyophilization — It is the process of dehydrating a frozen substance under conditions of sublimation for example, vacuum freeze-drying.

2.450 Main — It is the pipe for distributing to or collecting from various branches.

2.451 Manifold — It is that portion of main in which several branches are close together. Also, single piece in which there are several fluid paths.

2.452 Manometer — An instrument for measuring pressures; essentially a U-tube partially filled with a liquid, usually water, mercury, or a light oil, so constructed that the amount of displacement of the liquid indicates the pressure being exerted on the instrument.

2.453 Mass — The quantity of matter in a body as measured by the ratio of the force required to produce a unit acceleration to the acceleration.

2.454 Meat Keeper — A meat keeper is an enclosed compartment or container which is designed for the storage of fresh meat at or near 0°C.

2.455 Melting — Change of state from solid to liquid.

2.456 Melting Point — For a given pressure, the temperature at which the solid and liquid phases of the substance are in equilibrium.

2.457 Mixture, Eutectic — A mixture, which melts or freezes normally at constant temperature and with constant composition. Its melting point is usually the lowest possible for mixtures of the given substances.

2.458 Modulating — It is a control, tending to adjust by increments and decrements; also one modified by variation of a second condition.

2.459 Mole (Mol) — It is a weight of a substance numerically equal to its molecular weight. The unit is a gram mol.

2.460 Molecular Sieve — An adsorbent composed of porous alumino-silicates with pores of uniform molecular dimensions which will selectively adsorb molecules of the substance to be gathered.

2.461 Natural Convection Air Cooler — An air cooler depending upon natural convection for air circulation.

2.462 Oil Separator — A device for separating oil and oil vapour from the refrigerant, usually installed in the compressor discharge line.

2.463 Oil Still — It is a device to separate oil from refrigerant by a distillation process.

2.464 Organic Compound — Originally a chemical compound produced by a life process. Now it is generally understood to include all compounds containing carbon.

2.465 Outlet, Ceiling — A round, square, rectangular, or linear air diffuser located in the ceiling, which provides a horizontal distribution pattern of primary and secondary air over the occupied zone and induces low-velocity secondary air motion through the occupied zone.

2.466 Outlet, Slotted — A long, narrow air distribution outlet, comprised of deflecting members, located in the ceiling, side wall, or sill, with an aspect ratio greater than 10, designed to distribute supply air in varying directions and planes, and arranged to promote mixing of primary air and secondary room air.

2.467 Outlet, Varied — A register, or grill, equipped with vertical and/or horizontal adjustable vanes.

2.468 Output — It is capacity; duty; performance; net, refrigeration produced by a system. It is equal to the load imposed.

2.469 Outside Air Opening — It is any opening used as an entry for air from outdoors.

2.470 Overrun — In ice cream freezing, the ratio of the volume of ice cream to the volume of the mix used.

2.471 Ozone — Triatomic oxygen (O₃) sometimes used in air conditioning or cold storage as an odour eliminator; can be toxic in certain concentrations.

2.472 Packing — It is the stuffing around a shaft or valve stem to prevent fluid leakage.

2.473 Packing Plant — An establishment engaged in the slaughtering, dressing, and processing of animals; also used in connection with the processing of vegetables or fish.

2.474 Pasteurization — It is heat treatment, usually at 55°C to 70°C, for killing bacteria, as in milk, without greatly changing its chemical composition.

2.475 Performance Factor — The ratio of the useful output capacity of a system to the input required to obtain it. Units of capacity and input need not be consistent.

2.476 Phase

- a) In thermodynamics, one of the states of matter, as solid, liquid, or gaseous; and
- b) Electrically, an alternating current whose alternations have a definite time relation to the rotational position of the alternator. In a polyphase machine, the phases are separated by 360 electrical degrees divided by the number of phases.

2.477 Phosphorous Pentoxide — It is a drier material which becomes gummy on reacting with moisture and, hence, is not used as a drying agent in refrigerating systems.

2.478 Plaque and/or Sump — The volume generated by embossed areas on the interior surfaces of the general refrigerated and/or freezer compartments.

2.479 Plenum Chamber — An air compartment connected to one or more distributing ducts.

2.480 Point, Critical — Of a substance, state point at which liquid and vapour have identical properties; critical temperature, critical pressure, and critical volume are the terms given to the temperature, pressure, and volume at the critical point. Above the critical temperature or pressure there is no line of demarcation between liquid and gaseous phases.

2.481 Point, Triple — It is the state point at which three phases of a given substance (that is solid, liquid, and gas) exist in equilibrium.

2.482 Polytropic-Change — Any set of changes in a gas represented by the equation: $PV^n = \text{constant}$.

2.483 Pond, Spray — It is an arrangement for lowering the temperature of water in contact with outside air by evaporative cooling of the water. The water to be cooled is sprayed by nozzles into the space above a body of previously cooled water and allowed to fall by gravity into it.

2.484 Precipitator, Electric — A device for removing dust from the air by means of electric charges induced on the dust particles.

2.485 Pre-cooler

- a) A cooler for the removal of sensible heat before shipping, storing, or processing; and
- b) A device for cooling a fluid before it enters some piece of apparatus.

2.486 Pre-cooling — It refers to the practice of preparing fruits and vegetables for shipment by cooling before or after they enter a car.

2.487 Pre-heating — In air conditioning, to heat the air in advance of other processes.

2.488 Pressure — The normal force exerted by a homogeneous liquid or gas, per unit of area, on the wall of the container.

2.489 Pressure, Absolute — Pressure referred to a perfect vacuum. It is the sum of gauge pressure and atmospheric pressure.

2.490 Pressure, Atmospheric — It is the pressure due to the weight of the atmosphere. It is the pressure indicated by a barometer. Standard atmospheric pressure or standard atmosphere is the pressure of 76 cm of mercury having a density of 13.595 1 g/cm³ under standard gravity of 980.665 cm/sec².

2.491 Pressure, Balance — It is in a system or container equal to that which exists outside.

2.492 Pressure, Critical — Vapour pressure corresponding to the critical state of the substance at which the liquid and vapour have identical properties.

2.493 Pressure, Discharge — An operating pressure in a refrigerating system measured in the discharge line at the compressor outlet.

2.494 Pressure, Gauge — Pressure above atmospheric.

2.495 Pressure, Hydrostatic — The normal force per unit area that would be exerted by a moving fluid on an infinitesimally small body immersed in it if the body were carried along with the fluid.

2.496 Pressure, Operating — It is the pressure occurring at a reference point in a refrigerating system when the system is in operation.

2.497 Pressure, Partial — It is the portion of total gas pressure of a mixture attributable to one component.

2.498 Pressure, Saturation — The saturation pressure for a pure substance for any given temperature is that pressure at which vapour and liquid, or vapour and solid, can co-exist in stable equilibrium.

2.499 Pressure, Static — The normal force per unit area that would be exerted by a moving fluid on a small body immersed in it if the body were carried along with the fluid. Practically, it is the normal force per unit area at a small hole in a wall of the duct through which the fluid flows (piezometer) or on the surface of a stationary tube at a point where the disturbances, created by inserting the tube, cancel. It is supposed that the thermodynamic properties of a moving fluid depend on static pressure in exactly the same manner as those of the same fluid at rest depend upon its uniform hydrostatic pressure.

2.500 Pressure, Suction — An operating pressure in a refrigerating system measured in the suction line at the compressor inlet.

2.501 Pressure, Total — It is the sum of the static pressure and the velocity pressure at the point of measurement.

2.502 Pressure, Vapour — The pressure exerted by vapour. If a vapour is kept in confinement over liquid so that the vapour can accumulate above the liquid, the temperature being held constant, the vapour pressure approaches a fixed limit called the maximum or saturated vapour pressure dependent only on the temperature and the liquid. The term vapour is sometimes used synonymous with saturated vapour pressure.

2.503 Pressure, Velocity — In a moving fluid, remove cable of causing an equivalent velocity, if applied to move the same fluid through an orifice, such that all pressure energy expended is converted into kinetic energy.

2.504 Pressure Change of an Expansion Valve — The change in outlet pressure of a constant pressure expansion valve required to open the valve at a predetermined amount.

2.505 Pressure Drop — It is the static pressure loss in fluid pressure, as from one end of duct to the other, due to friction, etc.

2.506 Pressure Equalizing — Allowing high- and low-side pressures to equalize or nearly equalize during idle periods as by use of an unloading valve or by a vapour lock liquid control, or nearly equalizing inlet and discharge pressures on the compressors. In either case, it is to reduce starting torque load.

2.507 Pressure Imposing Element — Any device or portion of the equipment used for the purpose of increasing the pressure upon the refrigerant.

2.508 Pressure Limiting Device — A pressure actuated mechanism designed to automatically stop the operation of a compressor or other pressure-producing component at a predetermined maximum or minimum pressure.

2.509 Pressure Regulator, Evaporator (Back Pressure Valve) — An automatic valve located between the evaporator outlet and compressor inlet that is responsive to its own inlet pressure or to the evaporator or refrigerator temperature and functions to throttle the vapour flow when necessary to prevent the evaporator pressure from falling below a selected value.

2.510 Pressure Relief Device — A valve or rupture member designed to relieve excessive pressure automatically.

2.511 Pressure-Type Air Cooler — It is a cooler for use with one or more external elements which impose air resistance.

2.512 Properties, Thermodynamic — Basic qualities used in defining the condition of a substance, such as temperature, pressure, volume, enthalpy, entropy.

2.513 Psychrometer — It is an instrument for measuring relative humidities by means of wet- and dry-bulb temperatures.

2.514 Psychrometry — The branch of physics relating to the measurement or determination of atmospheric conditions, particularly regarding the moisture mixed with the air.

2.515 Pump Down — It is the operation by which the refrigerant in a charged system is pumped into the liquid receiver.

2.516 Purger — It is a device for removing non-condensable gas from refrigerant condensers or for removing low-concentration liquor from absorption system evaporators.

2.517 Purging — It is the act of blowing out gas from a refrigerant containing vessel, usually for the purpose of removing non-condensables.

2.518 Pyrometer — It is an instrument for measuring high temperature.

2.519 Quality of Wet Vapour — It is the fraction by weight of vapour in a mixture of liquid and vapour.

2.520 Radiation, Thermal — It is the process of transmission of heat through space by wave motion; the passage of heat from one object to another without warming the space between.

2.521 Rectifier — In refrigeration, an externally cooled heat exchanger in the high side of an absorption system for condensing absorbent and separating it from refrigerant before passing it to the condenser.

2.522 Reducer, Pressure, Liquid Refrigerant — It is a device or devices, in a refrigerating system, in which the pressure of the fluid is reduced from that of condensed liquid to that of the evaporator.

2.523 Re-expansion Line — The curve on an indicator card, representing the pressure; the total volume relationship of clearance fluid during the initial portion of the return stroke of the piston prior to the opening of the suction valve.

2.524 Refrigerant — The fluid used for heat transfer in a refrigerating system, which absorbs heat at a low temperature and a low pressure of the fluid and rejects heat at a higher temperature and a higher pressure of the fluid, usually involving changes of state of the fluid.

2.525 Refrigerant Charge — The designated amount of refrigerant required for proper functioning of a closed refrigerating system.

2.526 Refrigerant, Flammable — Any refrigerant which will burn when mixed with air, such as ethyl chloride, methyl chloride, and the hydrocarbons.

2.527 Refrigerant Rectifier

- a) In an absorption system that part between the analyzer and the condenser. A heat exchanger for condensing the absorbent.
- b) In a vapour compression system, a heat exchanger in which refrigerant is boiled off from oil refrigerant bled from the evaporator.

2.528 Refrigerant, Secondary — Any volatile or non-volatile substance in an indirect refrigerating system that absorbs heat from a substance or space to be refrigerated and rejects this heat to the evaporator of the refrigerating system.

2.529 Refrigerating Effect, Condensing — The condensing heat rejection effect less the heat added to the refrigerant vapour in the refrigerant compressor unit.

2.530 Refrigerating Effect, Net Water (Brine) Cooler — The product of the weight rate of water or brine flow and the difference in enthalpy of the entering and leaving water or brine expressed in heat units per unit of time. It is expressed also by the total refrigeration effect less the heat leakage losses.

2.531 Refrigerating Effect, Sub-cooling — The additional refrigeration effect made available by subcooling the refrigerant liquid in the condenser.

2.532 Refrigerating Effect, Total, Water (Brine) Cooler — It is the product of the weight rate of refrigerant flow and the difference in enthalpy of the entering and leaving refrigerant fluid, expressed in heat units per unit of time.

2.533 Refrigerating Medium — Any substance whose temperature is such that it is used, with or without a change of state, to lower the temperature of other bodies or substances below the ambient temperature.

2.534 Refrigerating Plant — A complete refrigerating system with all accessories, controls, and other apparatus required for its utilization and its enclosing structure.

2.535 Refrigerating System Performance Factor — The ratio of the useful refrigerating effect of the system to the power input.

2.536 Refrigeration (Cooling), Direct Method of — A system in which the evaporator is in direct control with the material or space refrigerated or is located in air circulating passages communicating with such spaces.

2.537 Refrigeration (Cooling), Indirect Method of — It is a system in which a liquid, such as brine or water, cooled by the refrigerant, is circulated to the material or space refrigerated or is used to cool air so circulated.

2.538 Refrigeration, Pipe Line — It is a service to a group of buildings with a refrigerant supply from a central refrigerating plant.

2.539 Refrigerator — It is a container and means of cooling it, such as a domestic refrigerator, or a large container, such as a storage refrigerator, service refrigerator, etc.

2.540 Refrigerator, Commercial — It is a general category referring to any of the many types of refrigerators used commercially. Includes reach-ins, walk-ins, and refrigerated display cases (all types being either service or self-service, which are used by business establishments).

2.541 Refrigerator, Domestic — It is a refrigerator for the home, cooled by a mechanical or other type of condensing unit or by other means, having one or more compartments for preserving food either above or below freezing.

2.542 Refrigerator, Electric — It is a completely self-contained unit comprising an insulated cabinet, evaporator, and electric-motor-driven condensing unit.

2.543 Refrigerator-Freezer, Household, Combination — A household combination refrigerator-freezer is a cabinet which consists of two or more compartments, with at least one of the compartments designed for the storage of foods at temperatures above 0°C and with at least one of the compartments designed for the storage of foods at temperatures of -12°C average or below. It has a source of refrigeration and is intended for household use.

2.544 Refrigerator-Freezer, Household, Limited-Freezer Combination — A limited-freezer combination refrigerator-freezer is a household combination refrigerator-freezer which has at least 90 percent of its total net refrigerated volume at a temperature above 0°C.

2.545 Refrigerator, Gas — A refrigerator motivated by thermal energy of burning gas.

2.546 Refrigerator, Household, 'All-Refrigerator' — An all-refrigerator is a household refrigerator which does not include a compartment designed for the storage of food at temperatures below 0°C. It may include means designed for freezing and storage of ice.

2.547 Refrigerator, Household, Frost Free — Insulated cabinet of suitable volume and equipment for household use, cooled by one or more energy consuming means having one or more compartments intended for the preservation of food, one at least of which is suitable for the storage of fresh food, in which all compartments are automatically defrosted with automatic disposal of the defrost water, and at least one compartment is cooled by a frost-free system.

2.548 Refrigerator, Reach-in — It is a service refrigerator.

2.549 Refrigerator, Self-Service — Any of a number of refrigerators generally found in food stores and other stores of the self-service type, wherein the customer helps himself or herself. This may be of the open type or with doors which the customer opens.

2.550 Refrigerator, Service — Generally, any of the various types of commercial refrigerators of the reach-in type or refrigerated display cases from which an attendant serves a customer, as differentiated from self-service refrigerators.

2.551 Refrigerator, Walk-in — It is a refrigerated cooler or freezer with large entry doors suitable for foot traffic.

2.552 Regain of Moisture — The amount absorbed by any material in percent of weight of that material.

2.553 Regelation — Refreezing of water that has resulted from the melting of ice under pressure. (Does not require refrigeration.)

2.554 Register — It is a combination grill and damper assembly covering an air opening.

2.555 Resistance, Thermal — It is the reciprocal of thermal conductance.

2.556 Resistively, Thermal — It is the reciprocal of thermal conductivity.

2.557 Respiration — It is the release of carbon dioxide and heat by the ripening of perishables in storage; also the breathing process of animals.

2.558 Return Air — Air returned from conditioned or refrigerated space.

2.559 Room Dry Bulb (Dew Point) — It is the dry-bulb (dew-point) temperature of the conditioned room or space.

2.560 Room, Quick Freezer — Room kept at very low temperature for the purpose of freezing foodstuffs rapidly.

2.561 Safety Head — In a compressor, a cylinder head held in place by a spring of such strength that it will not be compressed during normal operation but will be moved by solid or liquid matter or abnormal gas pressure between it and the piston, thereby protecting the compressor.

2.562 Salinometer — Hydrometer calibrated in salt concentration.

2.563 Saponify — It is turning to soap, as oil in contact with an alkali or alkaline refrigerant. Chemically, to cause an ester to react with an inorganic base, the products being an alcohol and an acid (either free or in the form of a salt). By extension, to hydrolyze compounds other than esters.

2.564 Saturation — It is the condition for co-existence in stable equilibrium of a vapour and liquid or a vapour and solid phase of the same substance. As an example, steam over the water from which it is being generated.

2.565 Saturation, Degree of (Saturation Ratio) — The ratio of the specific humidity of humid air to that of saturated air at the same temperature and pressure, usually expressed as a percentage.

2.566 Seal, Bellows — Metal bellows used in a shaft seal or in place of a packing for valves; also used in long pipe lines instead of gaskets to compensate for expansion of the line with temperature.

2.567 Seal, Shaft — A rubbing seal or stuffing box used to prevent fluid leakage between the shaft and bearing of a compressor or other fluid-moving device.

2.568 Self-Contained Air Conditioning (Cooling) Unit — An air conditioning unit having the means for ventilation, air circulation, air cleaning, and air cooling, and the controls thereof, in the same cabinet with the condensing unit. Self-contained air-conditioning units are classified according to the method of rejecting condenser heat (water cooled, air cooled, and evaporatively cooled); the method of introducing ventilation air (no ventilation, ventilation by drawing air from outside, ventilation by a combination of the two methods); and the method of discharging air to the room (free delivery or pressure type).

2.569 Sensible Heat Ratio, Air Cooler — It is the ratio of sensible cooling effect to total cooling effect of an air cooler.

2.570 Shelf — A shelf is any surface generally horizontal, within the cabinet which is provided for the storage of food.

2.571 Shelf, Adjustable — An adjustable shelf is one which can have its position changed without the use of tools.

2.572 Shelf, Average Height — The average shelf height is the average clear height, weighted by area, above all shelves included in the net shelf area.

2.573 Shelf, Door — It is any surface on the door, which can be used for the storage of food.

2.574 Shelf, Fractional — It is a shelf which is less than either the width or the depth, or both, of the full shelf.

2.575 Shelf, Full — It is a shelf, which essentially fills the interior cross-section of the cabinet.

2.576 Shelf, Net Area, for Household Freezers — A calculated value based on the net areas of main shelves, door shelves, bottoms of suspended containers or dispensers, and the bottom of the liner(s).

2.577 Shelf, Net Area, for Household Refrigerators, All-Refrigerators and Combination Refrigerator-Freezers — A calculated value based on the net areas of the main shelves, door shelves, bottoms of

suspended containers or dispensers, and the bottom of the liner(s) of the general refrigerated and freezer compartments.

2.578 Shelf, Revolving — It is a shelf, which can be either partially or fully rotated.

2.579 Shelf, Roll Out, Sliding, or Swing Out — It is a shelf, which can roll, slide, or pivot forward on its support(s).

2.580 Shell and Tube — Pertaining to heat exchangers in which a nest of tubes or pipes, or a coil of tube or pipe, is contained in a shell or container. The pipe (or pipes) carries a fluid through it, while the shell is also provided with an inlet and outlet for a fluid flow.

2.581 Silica Gel — A form of silicon dioxide which absorbs moisture readily and is used as a drying agent.

2.582 Sludge — It is a product of decomposition of oil resulting from impurities, moisture, or chemical reactions and favoured by excessive temperature. Sludge may be mushy, gummy, or hard.

2.583 Solution, Eutectic — It is a mixture which melts or freezes, normally at constant temperature and with constant composition. Its melting point is usually the lowest possible for mixtures of the given substances.

2.584 Solution, Strong (Rich) — It is a solvent with relatively high concentration of solute.

2.585 Solution, Weak — It is a solvent with relatively low concentration of solute.

2.586 Sorbent — It is a material which extracts one or more substances present in an atmosphere or mixture of gases or liquids with which it is in contact, due to an affinity for such-substances.

2.587 Spray Deck — It is an overhead bunker where air is cooled and circulated by brine sprays.

2.588 Spray Pond — It is an arrangement for lowering the temperature of water by evaporative cooling of the water in contact with outside air. The water to be cooled is sprayed by nozzles into the space above a body of previously cooled water and allowed to fall by gravity into it.

2.589 Spray-Type Air Cooler — It is a forced-circulation air cooler, wherein the coil surface capacity is augmented by a liquid spray during period of operation.

2.590 Standard Atmosphere for Reference — Air at a temperature of 15°C, a relative humidity of 65 percent, and a pressure of 101.3 mbar.

2.591 Standard Rating — A rating based on tests performed at standard rating conditions.

2.592 Standard Rating Conditions — Rating

conditions used as the basis for comparison of performance characteristics.

2.593 Steam, Dry Saturated — Steam at the saturation temperature corresponding to the pressure and containing no water in suspension.

2.594 Steam, Superheated — Steam at a temperature higher than the saturation temperature corresponding to the pressure.

2.595 Steam, Wet Saturated — Steam at the saturation temperature corresponding to the pressure and containing water particles in suspension.

2.596 Strainer — It is a device for withholding foreign matter from a flowing liquid or gas.

2.597 Sub-cooling — Process of cooling refrigerant below condensing temperature for a given pressure; also, cooling a liquid below its freezing point where it can exist only in a state of unstable equilibrium.

2.598 Sub-cooling, Heat of (Specific) — The difference in specific enthalpies of a pure condensable fluid between the saturated (not sub-cooled) liquid state and the cooled liquid at a given temperature below its condensation temperature at the same pressure.

2.599 Sublimation — It is a change of state directly from solid to gas without appearance of liquid.

2.600 Suction Inlet — It is the port through which gas enters.

2.601 Suction Line — It is the tube or pipe which carries the refrigerant vapour from the evaporator to the compressor inlet.

2.602 Sun Effect — Solar energy transmitted into space through windows and building materials.

2.603 Superheat (Specific) — It is the difference in specific enthalpies of a pure condensable fluid between vapour at a given temperature above saturation and vapour at the dry saturated state at the same pressure.

2.604 Superheater — A heat exchanger used on flooded evaporators, wherein hot liquid on its way to enter the evaporator is cooled by supplying heat to dry and superheat the wet vapour leaving the evaporator.

2.605 Surface Cooling — It is a method of cooling air or other gas by passing over cold surfaces.

2.606 Surge Drum — *See* Accumulator.

2.607 Sweating — It is the condensation of moisture from air on a surface which is below the dew-point temperature.

2.608 System — A heating or refrigerating scheme or machine usually confined to those parts in contact with the heating or refrigerating medium.

2.609 System, Absorption — A refrigeration system in which the refrigerant gas evolved in the evaporator is taken up in an absorber and released in a generator upon the application of heat.

2.610 System, Air Agitation — A combination consisting of a power-driven blower, distributing piping, and flexibly connected fittings for delivering air to the water in ice cans for the purpose of agitating the water and promoting the production of clear ice.

2.611 System, Brine Spray — It is a refrigerating scheme for cooling by a mist or spray of brine.

2.612 System, Cascade — It is that system having two or more refrigerant circuits, each with a pressure imposing element, condenser, and evaporator, where the evaporator of one circuit cools the condenser of another (lower temperature) circuit.

2.613 System, Central Fan — A mechanical indirect system of heating, ventilating, or air conditioning, in which the air is treated or handled by equipment located outside the rooms served, usually at a central location, and conveyed to and from the rooms by means of a fan and a system of distributing ducts.

2.614 System, Central Plant — A system with two or more low sides connected to a single, central high side; a multiple system.

2.615 System, Closed Brine — A refrigerating system in which the circulating brine is completely enclosed and shut off from the atmosphere throughout the cycle except for a vented expansion tank at the high point of the system.

2.616 System, Commercial — A refrigeration system used in a commercial and/or a business place, such as a meat market, store, florist shop, hotel, office building, restaurant, candy shop, bakery, or other place of similar commercial enterprise, assembled and installed in the manufacturing and/or business portion of any building.

2.617 System, Compression — It is a refrigerating system in which the pressure imposing element is mechanically operated.

2.618 System, Cycle Defrost — In household refrigerators and combination refrigerator-freezers only, a system in which the refrigerated surfaces of the general refrigerated compartment are defrosted by an automatic defrost system. Defrost water is disposed off automatically or collected in a container for subsequent manual removal. A characteristic of a cycle defrost system is that nominal refrigerated food temperatures are maintained during operation of the automatic defrost system.

2.619 System, Dense Air — A cold air system maintained under pressure greater than atmospheric

in which air is compressed, heat of compression dissipated, and the air, chilled by expansion and performance of work, can create useful refrigeration.

2.620 System, Direct Expansion — A refrigerating system in which the evaporator is in direct contact with the refrigerated material or space or the evaporator is located in air circulating passages communicating with such spaces.

2.621 System, Duct — It is a series of ducts, elbows, and connectors to convey air from one location to another.

2.622 System, Dual Temperature Brine — In chilling beef, the use of an initial brine temperature, followed by a lower brine temperature.

2.623 System, Flooded — A system in which only part of the refrigerant passing over the heat transfer surface is evaporated, and the portion not evaporated is separated from the vapour and recirculated.

2.624 System, Indirect — It is a refrigerating system in which a liquid, such as brine or water, cooled by the refrigerant, is circulated to the material or space refrigerated or is used to cool air so circulated.

2.625 System, Industrial — A system used in the manufacture or processing of materials, such as ice-making plants, cold storage warehouses, ice cream plants, dairy plants, packing houses, chemical plants, and other places of similar industrial enterprise.

2.626 System, Low Pressure — In air conditioning, a distributing system delivering air to ordinary ventilating grills at low velocities with low static losses through the supply grills.

2.627 System, Mechanical Refrigerating — A refrigerating system employing a mechanical compression device to remove the low pressure refrigerant enclosed in the low pressure side and to deliver it to the high pressure side of the system.

2.628 System, Multiple — A system using the direct method in which refrigerant is delivered to two or more evaporators in separate rooms or refrigerators.

2.629 System, No-frost — A system in which all the refrigerated surfaces in the cabinet are defrosted by an automatic defrost system. Characteristics of a no-frost system are:

- a) system is automatically operated to prevent formation of frost on all refrigerated surfaces,
- b) no accumulation of ice or frost forms on the stored food,
- c) nominal refrigerated food temperatures are maintained during operation of the automatic defrost system(s), and

- d) water from defrosting is disposed off automatically.

2.630 System, Off-Peak — It is a system with control which normally avoids use of power during peak load periods, usually having eutectic or water-ice hold-over means.

2.631 System, Open Brine — A refrigerating system in which the circulating brine returns to an open tank which serves as a reservoir for the pump suction and as an inspection tank for the condition and flow of brine.

2.632 System, Refrigerating — Any system which, in operation between a heat source and a heat sink (in the thermodynamic sense) at two different temperatures, is able to absorb heat from the heat source at the lower temperature and reject heat to the heat sink at the higher temperature.

2.633 System, Refrigerating, Absorption-Type — A refrigerating system in which refrigeration is effected by evaporation of a refrigerant in a heat exchanger (evaporator), the resulting vapour being then absorbed by an absorbent medium from which it is subsequently expelled by heating at a higher partial vapour pressure and condensed by cooling in another heat exchanger (condenser).

2.634 System, Refrigerating, Compression-Type — It is a refrigerating system in which the temperature and pressure of gaseous refrigerant are increased by a mechanically operated component. In most cases, the refrigerant undergoes changes of state in the system.

2.635 System, Refrigerating, Hermetically Sealed Compression — It is a refrigerating system utilizing a hermetic refrigerant compressor.

2.636 System, Removable Unit — A refrigerating system which is readily removable as one unit from the cabinet or space which it cools and from the building in which it is used without disconnecting any refrigerant-containing part of the system.

2.637 System, Run-Around — A regenerative-type closed secondary system in which a continuously circulated fluid abstracts heat from the primary system fluid at one place, returning this heat to the primary system fluid at another place.

2.638 System, Self-Contained (Single Packaged) Refrigerating — It is a completely factory-assembled and factory-tested refrigerating system in a suitable frame or enclosure, in which all of the refrigerant-containing parts are permanently connected at the factory.

2.639 System, Steam Jet — A refrigerating system in which high pressure steam, supplied through a nozzle

and acting to eject vapour from the evaporator, maintains the requisite low pressure on one side and produces a higher pressure on the other by virtue of compression in a following diffusion passage.

2.640 System, Unitary Refrigerating — A complete factory-assembled and factory-tested refrigerating system comprising one or more assemblies which may be shipped as one unit or separately but which are designed to be used together.

2.641 System, Vapour — It is a refrigerating system employing a condensable vapour as the refrigerant.

2.642 System, Water Vacuum — In refrigeration, one which employs a vacuum to bail water at the temperature desired; one which employs evaporating water vapour as the refrigerant.

2.643 System, Welded — One in which all refrigerant joints are brazed or welded.

2.644 System, Year-Round Air Conditioning — It is an air-conditioning system which ventilates, heats, and humidifies in winter, cools and dehumidifies in summer the spaces under consideration, and provides the desired degree of air motion and cleanliness. The system includes the following equipment, whether it is located within the structure served or external to it: the refrigerating system and the heat generating system; any piping systems used to convey the heating and cooling media to suitable heat transfer surfaces; pumps, accessories, automatic controls, and interrelated electrical work. The heat transfer portions of the system generally include, as required, preheaters, fans, systems of distributing ducts, piping, and necessary means of manual or automatic control.

2.645 Tank, Brine

- a) In an ice plant, the main freezing tank, in which the cans are immersed while ice is being produced.
- b) In a brine-circulating system, a storage tank or balance tank for brine.
- c) In domestic and commercial fields, a container surrounding the evaporator and filled with brine for storing refrigerant or for equalizing temperature at various points of the evaporator, especially in ice cream cabinets.

2.646 Tank, Brine Expansion — It is a vented reservoir in a closed circulating brine system for the accommodation of volume expansion of brine due to temperature change.

2.647 Tank, Brine Return — It is a reservoir in an open circulating brine system for the storage of brine at the pump suction and for inspection of the condition and flow of brine.

2.648 Tank, Dip — A tank located conveniently to the can dump and supplied with water, in which the ice can be immersed to thaw the ice block loose from the can.

2.649 Tank, Freezing — A container kept at low temperatures for storing foodstuffs or for freezing foodstuffs.

2.650 Tank, Tee-Making — A tank arranged with proper accessories to hold an evaporator and antifreeze solution and ice cans, the cans being immersed in the solution which usually is in circulation around the evaporator and the cans.

2.651 Tank, Water Forecooling — It is a tank where inlet water is cooled prior to freezing.

2.652 Temperature — It is the thermal state of matter with reference to its tendency to communicate heat to matter in contact with it. If no heat flows upon contact, there is no difference in temperature.

2.653 Temperature, Absolute — Temperature expressed in degrees above absolute zero.

2.654 Temperature, Absolute Zero — The zero point on the absolute temperature scale, 273.16° below zero of the Centigrade scale.

2.655 Temperature, Critical — The saturation temperature corresponding to the critical state of the substance at which the properties of the liquid and vapour are identical.

2.656 Temperature, Dew-Point — The temperature at which the condensation of water vapour in a space begins for a given state of humidity and pressure as the temperature of the, vapour is reduced; the temperature corresponding to saturation (100 percent relative humidity) for a given absolute humidity at constant pressure.

2.657 Temperature, Dry-Bulb — It is the temperature of a gas or mixture of gases indicated by an accurate thermometer after correction for radiation.

2.658 Temperature, Effective — An arbitrary index which combines into a single value the effect of temperature, humidity, and air movement on the sensation of warmth or cold felt by the human body. The numerical value is that of the temperature of still, saturated air which would induce an identical sensation.

2.659 Temperature, Mean Radiant (MRT) — The temperature of a uniform black enclosure in which a solid body or occupant would exchange the same amount of radiant heat as in the existing non-uniform environment.

2.660 Temperature, Room — The temperature of any room, for example:

- a) A room in which a refrigerator is being operated or tested; and
- b) A room being conditioned for the comfort of occupants. Room temperature used colloquially to mean the ordinary temperature one is accustomed to find in dwellings.

2.661 Temperature, Saturation — Of a fluid, the boiling point corresponding to a given pressure; evaporation temperature; condensation temperature.

2.662 Temperature, Wet-Bulb — Thermodynamic wet-bulb temperature is the temperature at which liquid or solid water, by evaporating into air, can bring the air to saturation adiabatically at the same temperature. Wet-bulb temperature (without qualification) is the temperature indicated by a wet-bulb psychrometer constructed and used according to specifications.

2.663 Temperature, Wet-Bulb Depression — It is the difference between dry-bulb and wet-bulb temperatures.

2.664 Temperature Difference, Diffusion — It is the temperature difference between the air temperature at supply opening and design indoor temperature.

2.665 Temperature Difference, Effective — It is the difference between the room air temperature and the supply air temperature at the outlet to the room.

2.666 Temperature Difference, Mean — Mean of difference between temperatures of a fluid-receiving and a fluid-yielding heat.

2.667 Temperature, Low — Temperature below ordinary refrigerating plant requirements, for example, from -1°C down; also any pan of a system below another parallel refrigerating level of temperature.

2.668 Thaw Needle — A small tube with valved head, connected by hose to a source of warm water or steam, which may be inserted in the air agitation tube in an ice can for the purpose of thawing the air agitation tube loose from the ice block.

2.669 Thawing — Changing free water, or contained water as in foods, from the solid phase to the liquid phase by the addition of heat.

2.670 Thermocouple — It is a device for measuring temperature, utilizing the fact that an electromotive force is generated whenever two junctions of two dissimilar metals in an electric circuit are at different temperature levels.

2.671 Thermodynamics — It is the science of heat energy and its transformations to and from other forms of energy.

2.672 Thermometer — It is an instrument for measuring temperature.

- 2.673 Thermostat** — An automatic control device actuated by temperature and designed to be responsive to temperature.
- 2.674 Thermostat, Direct-Acting** — It is an instrument for activating a control circuit upon sensing a predetermined low temperature.
- 2.675 Thermostat, Reverse-Acting** — It is an instrument for activating a control circuit upon sensing a predetermined high temperature.
- 2.676 Thermostat, Room** — It is a thermostat properly located in a room so as to respond to representative room temperature and thereby control heating or cooling devices.
- 2.677 Throttling, of a Fluid** — It is an irreversible adiabatic process which consists of lowering pressure by an expansion without work.
- 2.678 Throw** — The horizontal or vertical axial distance an air stream travels after leaving an air outlet before the maximum stream velocity is reduced to a specified terminal level.
- 2.679 Ton of Refrigeration** — The quantity of heat absorbed in the melting of 1 tone (2 000 lb) of water ice per 24 h, that is, 72 575 kcal/day, or 3 024 kcal/hour.
- 2.680 Total Heat (See Enthalpy)** — A thermodynamic property of a substance defined as the sum of its internal energy plus the quantity Pv/J , where P = pressure of the substance, v = volume, and J = mechanical equivalent of heat.
- 2.681 Tower, Water-Cooling** — It is an enclosed device for evaporatively cooling water by contact with air.
- 2.682 Tower, Water-Cooling, Atmospheric** — One in which the air movement through the tower is dependent only upon atmospheric conditions; also known as natural draft cooling tower.
- 2.683 Tower, Water-Cooling, Forced-Draft** — It is a mechanical draft water-cooling tower having one or more fans located in the air entering the tower.
- 2.684 Tower, Water-Cooling, Induced-Draft** — It is a mechanical draft water-cooling tower having one or more fans located in the air leaving the tower.
- 2.685 Tower, Water-Cooling, Mechanical-Draft** — It is a water-cooling tower utilizing one or more fans to move the air through the tower, the fans being an integral part of the tower.
- 2.686 Transmission** — In thermodynamics, a general term for heat travel; properly, heat transferred per unit of time.
- 2.687 Transmittance, Thermal (U Factor)** — It is the time rate of heat flow per unit area under steady conditions from the fluid on the warm side of a barrier to the fluid on the cold side, per unit temperature difference between the two fluids.
- 2.688 Trough, Drip (Drain)** — It is a device for channeling water.
- 2.689 Tube, Capillary** — In refrigeration practice, a tube of small internal diameter used as a liquid refrigerant flow control or expansion device between high and low sides; also used to transmit pressure from the sensitive bulb of some temperature controls to the operating element.
- 2.690 Unloader** — A device on or in a compressor for equalizing the high- and low-side pressures for a brief period during starting in order to decrease the starting load on the motor; also a device for controlling compressor capacity by rendering one or more cylinders ineffective.
- 2.691 Valve, Back Pressure (Evaporator Pressure Regulator)** — An automatic valve located between the evaporator outlet and compressor inlet that is responsive to its own inlet pressure or to the vapour flow when necessary to prevent the evaporator pressure from falling below a selected value.
- 2.692 Valve, Charging** — A valve used to charge or add refrigerant to the system or add oil to the compressor crankcase
- 2.693 Valve, Check** — It is a valve allowing fluid flow in one direction only.
- 2.694 Valve, Constant Pressure Expansion** — It is a controlling device for regulating the flow of volatile refrigerant into a cooling unit, actuated by changes in pressure of the low side.
- 2.695 Valve, Diaphragm** — A form or packless valve, manually or mechanically actuated; also a valve actuated by pressure of a motivating fluid on one side of the diaphragm which seals the motivating fluid from the flowing fluid controlled by the valve. Flowing and motivating fluids may, but need not, be the same.
- 2.696 Valve, Direct-Acting Diaphragm** — It is one which closes with the admission of fluid pressure to a diaphragm and opens when pressure is released.
- 2.697 Valve, Discharge** — On a compressor, the valve which allows compressed refrigerant to flow from the cylinder to the discharge main.
- 2.698 Valve, Emergency Relief** — It is a manually operated valve for the discharge of refrigerant in case of fire or other emergency.

2.699 Valve, Expansion — It is a valve for controlling the flow of refrigerant to the cooling element.

2.700 Valve, Expansion, Automatic — It is a device which regulates the flow of refrigerant from the liquid line into the evaporator to maintain a constant evaporator pressure.

2.701 Valve, Expansion, Hand — It is a manually operated needle-type valve for controlling the flow of liquid refrigerant to an evaporator.

2.702 Valve, Expansion, Thermostatic — It is a controlling device for regulating the flow of volatile refrigerant into a cooling unit, actuated by changes in evaporator pressure and superheat of the refrigerant leaving the cooling unit. The basic response is to superheat.

2.703 Valve, Float Refrigerating valve controlled by liquid level and valve actuated by float in a liquid container.

2.704 Valve, Low-Side Float — A float valve, operating by changes in level of low-pressure liquid, that opens at low level and closes at high level.

2.705 Valve, Packless — It is a valve which does not use packing to prevent leaks around the valve stem. Flexible material is generally used to seal against leaks and still permit valve movement.

2.706 Valve, Pressure Relief — A valve held closed by a spring or other means and designed to relieve automatically pressure in excess of its setting; also called a safety valve.

2.707 Valve, Purge — A device to allow fluid to flow out of a system, particularly non-condensable gases; also called a drain valve.

2.708 Valve, Reducing — It is a valve, which maintains a uniform pressure on its outlet side irrespective of how the pressure on its inlet side may vary above the pressure to be maintained.

2.709 Valve, Reverse-Acting Diaphragm — It is a valve, which opens with the admission of fluid pressure to a diaphragm and closes when pressure is released.

2.710 Valve Seat — The stationary portion of the valve which, when in contact with the movable portion, stops flow completely.

2.711 Valve, Service — A valve intended to help isolate an apparatus from the rest of the system; may be a stop valve.

2.712 Valve, Solenoid — A valve which is closed by gravity, pressure, or spring action and opened by the movement of a plunger due to the magnetic action of an electrically energized coil, or *vice versa*.

2.713 Valve, Stop — It is a shut-off valve, other than a valve for controlling the flow of refrigerant.

2.714 Valve, Suction — In a compressor, the valve which allows refrigerant to enter the cylinder from the suction line and prevents return flow.

2.715 Valve, Suction Pressure Regulating — An automatic valve located between the evaporator outlet and the compressor inlet that is responsive to its own outlet pressure and functions to throttle the vapour flow so as to prevent; the suction pressure at the compressor inlet from exceeding a selected value. It is used primarily to prevent overload on compressor motors.

2.716 Valve, Thermal — A valve controlled by a thermally responsive element, for example, a thermostatic expansion valve which is usually responsive to suction or evaporator temperature.

2.717 Valve, Water Regulator — It is an automatic valve to control the flow of cooling water through a condenser.

2.718 Vane, Ratio — In air distributing devices, it is the ratio of depth of vane to shortest opening width between two adjacent grill bars.

2.719 Vapour — It is a gas, particularly one near to equilibrium with the liquid phase of the substance and which does not follow the gas laws. It is usually used instead of gas for a refrigerant and, in general, for any gas below the critical temperature.

2.720 Vapour, Saturated — Vapour in equilibrium with its liquid that is, when the numbers per unit time of molecules passing in two directions through the surface dividing the two phases are equal.

2.721 Vapour, Superheated — Vapour at a temperature which is higher than the saturation temperature (that is, boiling point) at the existing pressure.

2.722 Vapour, Water — It is used commonly in air conditioning parlance to refer to steam in the atmosphere.

2.723 Vapour Wet, Quality of — It is the fraction by weight of vapour in a mixture of liquid and vapour.

2.724 Vapour Barrier — A moisture impervious layer applied to the surfaces enclosing a humid space to prevent moisture travel to a point where it may condense due to lower temperature.

2.725 Vapour Lock — The formation of some vapour or all vapour in a liquid line reducing weight flow as compared to weight flow in liquid phase with the same pressure differential.

2.726 Vapour Lock Device — An orifice, capillary tube, or other device having a restricted passage of fixed size for liquid refrigerant. It restricts flow of vapour of that same liquid to a lower rate of flow with the same pressure difference.

2.727 Ventilation — It is the process of supplying or removing air by natural or mechanical means to or from any space. Such air may or may not have been conditioned.

2.728 Viscosity — It is that property of semi-fluids, fluids, and gases by virtue of which they resist an instantaneous change of shape or arrangement of parts. It is the cause of fluid friction whenever adjacent layers of fluid move with relation to each other.

2.729 Viscosity, Absolute — The force per unit area required to produce unit relative velocity between two parallel areas of fluid unit distance apart; also called coefficient of viscosity.

2.730 Viscosity, Kinematic — It is the ratio of absolute viscosity to density of a fluid.

2.731 Volume, Refrigerated, Net — The net refrigerated volume of household refrigerators and combination refrigerator-freezers is the sum of the net general refrigerated volume and the net freezer refrigerated volume. The net refrigerated volume of a household 'all-refrigerator' is the net general refrigerated volume. The net refrigerated volume of a household freezer is the net freezer refrigerated volume.

2.732 Volume, Refrigerated, Net Freezer — It is that portion of the net refrigerated volume below 0°C average for household refrigerators (exception, *see volume, refrigerated, net general*) and -13.3°C average or below for household combination refrigerator-freezers and household freezers.

2.733 Volume, Refrigerated, Net General — That portion of the net refrigerated volume above 0°C average for household refrigerators and 'all-refrigerators' or above -12°C average for household

combination refrigerator-freezers. Regardless of its temperature, the volume of the refrigerated chiller tray and other special compartment(s) for storage of fresh food near 0°C is to be included in the net general refrigerated volume.

2.734 Volume, Specific — It is the volume of a substance per unit mass; the reciprocal of density.

2.735 Wall Section — A cross section of wall arranged chiefly to reveal conductivity characteristics.

2.736 Water, Circulating — In a water-cooled or water-cooling device, it is the quantity of water entering the device per unit of time.

2.737 Water, Cooling — Water used for condensation of refrigerant; condenser water.

2.738 Water, Make-Up — Water supplied to replenish, as water replacing that lost by evaporation.

2.739 Water, Raw — In ice making, any water used for ice making except distilled water.

2.740 Wax — It is a solid material which may separate on cooling of oil-refrigerant mixtures.

2.741 Weep — Drip from frozen foods.

2.742 Weight Factor, Frozen Food — The conversion factor for a net freezer space weight rating is 516 kg/m³. It is recognized that many commercially available packaged frozen foods weigh less than 516 kg/m³.

2.743 Wiredrawing — It is restriction of area for a flowing fluid, causing a loss in pressure by (internal and external) friction without loss of heat or performance of work; throttling.

2.744 Work, Effective — The net mechanical energy required by, or load imparted to, the piston of a compressor.

2.745 Work, Indicated — Work equivalent of indicator card area for a reciprocating compressor or engine.

2.746 Wort — The unfermented infusion of malt that, when fermented, produces beer.

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

Refrigeration and Air Conditioning Sectional Committee, MED 03

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