tor or refrigerator temperature and functions to throttle the vapor flow when necessary to prevent the evaporator pressure from falling below a selected value.

pressure-relief device: a valve or rupture member designed to relieve excessive pressure automatically.

pressure vessel: any refrigerant-containing receptacle of a refrigerating system, other than *evaporators* (each separate section of which does not exceed ½ cu ft of refrigerant-containing volume) *expansion coils, compressors, controls, headers, pipe, and pipe fittings.*

properties, thermodynamic: basic qualities used in defining the condition of a substance, such as temperature, pressure, volume-enthalpy, entropy.

psychrometer: an instrument for ascertaining the humidity or hygrometric state of the atmosphere.

psychrometric: pertaining to psychrometry or the state of the atmosphere with reference to moisture.

psychrometric chart: a graphical representation of the thermodynamic properties of moist air.

psychrometry: the branch of physics relating to the measurement or determination of atmospheric conditions, particularly regarding the moisture mixed with the air.

pump down (refrigeration system): the operation by which the refrigerant in a charged system is pumped into the liquid receiver.

purger: device for removing noncondensable gas from refrigerant condensers or for removing low concentration liquor from absorption system evaporators.

purging: the act of blowing out gas from a refrigerant-containing vessel, usually for the purpose of removing noncondensables.

pyrometer: an instrument for measuring high temperatures.

quick-freezer room: room kept at very low temperature for the purpose of freezing foodstuffs rapidly.

radiation: the transmission of energy by means of electromagnetic waves.

radiation, thermal (heat): the transmission of energy by means of electromagnetic waves of very long wavelength. Radiant energy of any wavelength may, when absorbed, become thermal energy and result in an increase in the temperature of the absorbing body.

radiator: a heating unit exposed to view within the room or space to be heated. A radiator transfers heat by radiation to objects within visible range, and by conduction to the surrounding air which in turn is circulated by natural convection; a so-called radiator is also a convector, but the term radiator has been established by long usage.

radius diffusion: the horizontal axial distance an air stream travels after leaving an air outlet before the maximum stream velocity is reduced to a specified terminal level, e.g., 200, 150, or 100 fpm.

range (cooling range): in a water cooling device, the difference between the average temperature of the water entering the device and the average temperature of the water leaving it.

raw water: in ice making, any water used for ice making except distilled water.

rectifier: in refrigeration, externally cooled heat exchanger in high side of absorption system for condensing absorbent and separating it from refrigerant before passing to condenser. In electricity, a device for converting from AC to DC.

re-expansion line: curve on indicator diagram, representing the pressure-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.

refrigerant: a substance which produces a refrigerating effect by its absorption of heat while expanding or vaporizing.

refrigerant, secondary: the volatile refrigerant used in a secondary system, or a nonvolatile liquid refrigerant such as brine. It might be air. Should be further defined as volatile, nonvolatile, or gaseous.

refrigerated cargo: cargo maintained at an assigned temperature by means of mechanical refrigeration.

refrigerating effect, net: the product of the weight rate of fluid circulated and the difference in enthalpy of the entering and leaving brine expressed in heat units per unit of time. It is expressed also by the total refrigerating effect less the heat leakage losses.

refrigerating effect, subcooling: the additional refrigerating effect made available by subcooling the refrigerant liquid in the condenser.

refrigerating effect, total: 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.

refrigerating engineering: the technique of design, manufacture, application and operation of refrigerating machinery and its primary equipment. Refrigeration (except as exact measure in heat units) refers here to a general science, more concerned with the use of coldness for commerical and other useful purposes.

refrigerating system, absorption: a refrigerating 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.

refrigerating system, brine: an indirect refrigerating system employing brine as the circulating liquid.

refrigerating system; brine spray: a refrigerating scheme for cooling by a mist or spray of brine.

refrigerating system, cascade: one 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.

refrigerating system, central plant: a system with two or more low sides connected to a single, central high side; a multiple system.

refrigerating system, chilled water: an indirect refrigerating system employing water as the circulating liquid.

refrigerating system, compression: a refrigerating system in which the pressure-imposing element is mechanically operated.

refrigerating system, dense-air: 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.

refrigerating system, direct-expansion: a refrigerating system in which the evaporator is in direct contact with the refrigerated material or space or is located in air circulating passages communicating with such spaces.

refrigerating system, dual temperature brine: in chilling beef, the use of an initial brine temperature followed by a lower brine temperature.

refrigerating system, flooded: a refrigerating 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 vapor and recirculated.

refrigerating system, indirect: 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.

refrigerating system, mechanical: a refrigerating system employing a mechanical compression device to remove the low pressure refrigerant enclosed in the low pressure side and deliver it to the high pressure side of the system.

refrigerating system, multiple: a refrigerating system using the direct method in which refrigerant is delivered to two or more evaporators in separate rooms or refrigerators.

refrigerating system, single-package: a complete factory-made and factory-tested refrigerating system in a suitable frame or enclosure which is fabricated and shipped in one or more sections and in which no refrigerant-containing parts are connected in the field.

refrigerating system, steam-jet vacuum: a water vacuum refrigerating system in which high pressure steam, supplied through a nozzle and acting to eject water vapor from the evaporator, maintains the requisite low pressure in the evaporator, and produces the requisite pressure on the high side by virtue of compression in a following diffusion passage.

refrigerating system, vapor: a refrigerating system employing a condensable vapor as the refrigerant.

refrigerating system, water vacuum: a refrigerating system which employs a vacuum to boil water at the temperature desired; one which employs evaporating water as the refrigerant.

refrigeration, direct method of: 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.

refrigeration, indirect method of: 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.

refrigeration, pipe line: service to group of buildings with a refrigerant supply from a central refrigerating plant.

refrigerator: a container and means for cooling it, such as a *domestic refrigerator*, or a large container such as a *storage refrigerator, service refrigerator*, etc.

refrigerator, commercial: a general category referring to any of the many types of refrigerators used commercially. Includes *reach-ins, walk-ins*, refrigerated display cases both service and self-service, of all types which are used by business establishments.

refrigerator, domestic: 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 and usually having a total volume of 16 cu ft or less.

refrigerator, electric: a completely self-contained unit comprising an insulated cabinet, evaporator, and electric motor driven condensing unit.

refrigerator, gas: a refrigerator motivated by thermal energy of burning gas.

refrigerator, ice: a refrigerator using ice as the primary cooling medium; also *icebox*, an obsolescent term.

refrigerator, reach-in: a *service refrigerator*.

refrigerator, self-service: any of a number of refrigerators; generally found in food stores and other stores of the self-service type, from which the customer helps himself. They may be of the open type or with doors which the customer opens.

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.

refrigerator box, walk-in: a refrigerated cooler or freezer with large entry doors suitable for foot traffic.

regain of moisture: the amount absorbed by any material in percent of weight of that material.

regelation: refreezing of water that has resulted from the melting of ice under pressure; does not require refrigeration.

regenerative heating (or cooling): process of utilising 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.

register: a combination grille and damper assembly covering an air opening.

resistance, thermal: the reciprocal of thermal conductance of of thermal transmittance.

resistivity, thermal: the reciprocal of thermal conductivity.

resistor, electric: a material used to produce heat by passing an electric current through it.

return, dry: a return pipe in a steam heating system which carries both water of condensation and air. The dry return is above the level of the water line in the boiler in a gravity system. (See *return, wet.*)

return, wet: that part of a return main of a steam heating system which is filled with water of condensation. The wet return usually is below the level of the water line in the boiler, although not necessarily so. (See *return, dry.*)

return mains: pipes or conduits which return a heating or cooling medium from the heat transfer unit to the source of heat or refrigeration.

rupture member: a safety device which will automatically rupture at a predetermined pressure.

sabin: a unit of equivalent sound absorption equal to the equivalent absorption of one square foot of a surface of unit absorptivity (i.e., of one square foot of surface which absorbs all incident sound energy).

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.

salinometer: hydrometer calibrated in salt concentration.

saponify: to turn 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 salt). By extension, to hydrolyze compounds other than esters.

saturation: the condition for coexistence in stable equilibrium of a vapor and liquid or a vapor and solid phase of the same substance. Example: Steam over the water from which it is being generated.

saturation, degree of: the ratio of the weight of water vapor associated with a pound of dry air to the weight of water vapor associated with a pound of dry air saturated at the same temperature.

saturation ratio: see *saturation, degree of.*

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.

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.

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.

seamless tube: tube produced with an initially continuous periphery.

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.

shell-type apparatus: a refrigerant-containing pressure vessel having tubes for the passage of a refrigerating fluid or one to be cooled.

sight glass: glass tube used to indicate the liquid level in pipes, tanks, bearings and similar equipment.

silica gel: a form of silicon dioxide which adsorbs moisture readily and is used as a drying agent.

sludge: a product of decomposition of oil resulting from impurities, moisture or chemical reactions, and favored by excessive temperature. Sludge may be mushy, gummy, or hard.

smoke: an air suspension (aerosol) of particles, usually but not necessarily solid, often originating in a solid nucleus, formed from combustion or sublimation. Also defined as carbon or soot particles less than 0.1 micron in size which result from the incomplete combustion of carbonaceous materials such as coal, oil, tar, and tobacco.

smokeless arch: an inverted baffle placed in an up-draft furnace toward the rear to aid in mixing the gases of combustion, and thereby to reduce the smoke produced.

solar constant: the solar intensity incident on a normal surface located outside the earth's atmosphere at a distance from the sun equal to the mean distance between the earth and the sun. Its value is 415, 445, or 430 Btu per (hr) (sq ft) as the July, January, or mean value, respectively. At sea level in July the solar intensity value is about 300 Btu per (sq ft) (hr) since about 28 percent is absorbed in the earth's atmosphere.

solubility: the quantity of dissolved substance (solute) which is contained in a unit quantity of saturated solution at a given temperature and pressure.

solute: a component (originally solid, liquid, or gas) of a solution, usually present in lesser amount than the solvent.

solution, strong (rich): a solvent with relatively high concentration of solute.

solution, weak: a solvent with relatively low concentration of solute.

solvent: a liquid component of a solution usually present in greater amount than the solute.

sorbent: 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.

sorption: adsorption or absorption.

spray freezing, method of: refrigerated liquid is sprayed into an insulated enclosure containing the product to be frozen.

spray pond: 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.

stack height: the height of a gravity convector between the bottom of the heating unit and top of the outlet opening.

standard rating: a standard rating is a rating based on tests performed at Standard Rating Conditions.

Standard Rating Conditions: Standard Rating Conditions are rating conditions used as the basis for comparison of performance characteristics.

state, gaseous: one of three states or phases of matter characterized by greatest freedom of molecules and lack of any inherent fixed shape or volume.