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Appraisal of various types of manually activated and/or coin activated vending machines is discussed in this standard. The following are included--(1) introduction and definitions and discussion of various types of food and beverage vending machines, (2) general provisions including minimum requirements, alternate materials, and a classification of vending machines, (3) materials--surfaces, paints, solder, welding, (4) construction including general design and construction specifications, and (5) special features--louvers and overhangs, legs and feet, and safety requirements. (RH)

FOOD VENDING MACHINES

BASIC AND SPECIAL CRITERIA FOR THE EVALUATION OF MANUALLY ACTIVATED AND/OR COIN ACTIVATED VENDING MACHINES FOR FOODS AND/OR BEVERAGES

Reprinted with Revisions February, 1963

NATIONAL SANITATION FOUNDATION

NUMBER C-1

PREPARED BY THE JOINT COMMITTEE ON FOOD EQUIPMENT STANDARDS

NATIONAL SANITATION FOUNDATION

BASIC AND SPECIAL CRITERIA

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C-1

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FOR THE EVALUATION OF

MANUALLY ACTIVATED AND/OR COIN ACTIVATED

VENDING MACHINES

FOR FOODS AND/OR BEVERAGES

Adopted by the

JOINT COMMITTEE ON FOOD EQUIPMENT STANDARDS

in cooperation with

REPRESENTATIVES OF INDUSTRY INCLUDING USERS OF EQUIPMENT

approved by the

COUNCIL OF PUBLIC HEALTH CONSULTANTS

and published by the

NATIONAL SANITATION FOUNDATION

ANN ARBOR, MICHIGAN

August 1958

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Price 50 cents

The National Sanitation Foundation

Purpose and Organization

IN 1944, A SMALL GROUP of industrial and public health leaders were discussing mutual problems involving sanitation. They realized that more solutions to modern sanitation problems affecting industry and the public health could be developed through mutual understanding and cooperative action than through ordinances, inspections and law enforcement alone.

It occurred to them that great strides could result from the creation of an independent but authoritative liaison organization which would be a clearing house through which business and industry and health authorities could work together for the solution of their common problems and for the common good.

They foresaw that, through such an organization, they could jointly seek new facts in sanitary science to bring it up to date with technological advances of industry and with modern problems of the health officer in the field.

They could sponsor educational programs and sanitation services which would win everyone's cooperation in a nation-wide program designed to promote superior sanitation in modern products and services, and in the daily lives of the people.

Thus was born the National Sanitation Foundation. The Foundation is a non-profit, non-commercial organization seeking solutions to all problems involving cleanliness. It is dedicated to the prevention of illness, the promotion of health and the enrichment of the quality of American living through the improvement of the physical, biological and social environment in which we live today.

Distinguished representatives of the public health profession, of business and industry, and of the public serve on its Board of Trustees, Council of Public Health Consultants, Industrial Advisory Board and various committees.

The National Sanitation Foundation is endorsed by health agencies, both official and voluntary. More than 350 industrial and business firms have contributed nearly three quarters of a million dollars to its support. The Foundation is now in its fourteenth year of operation.

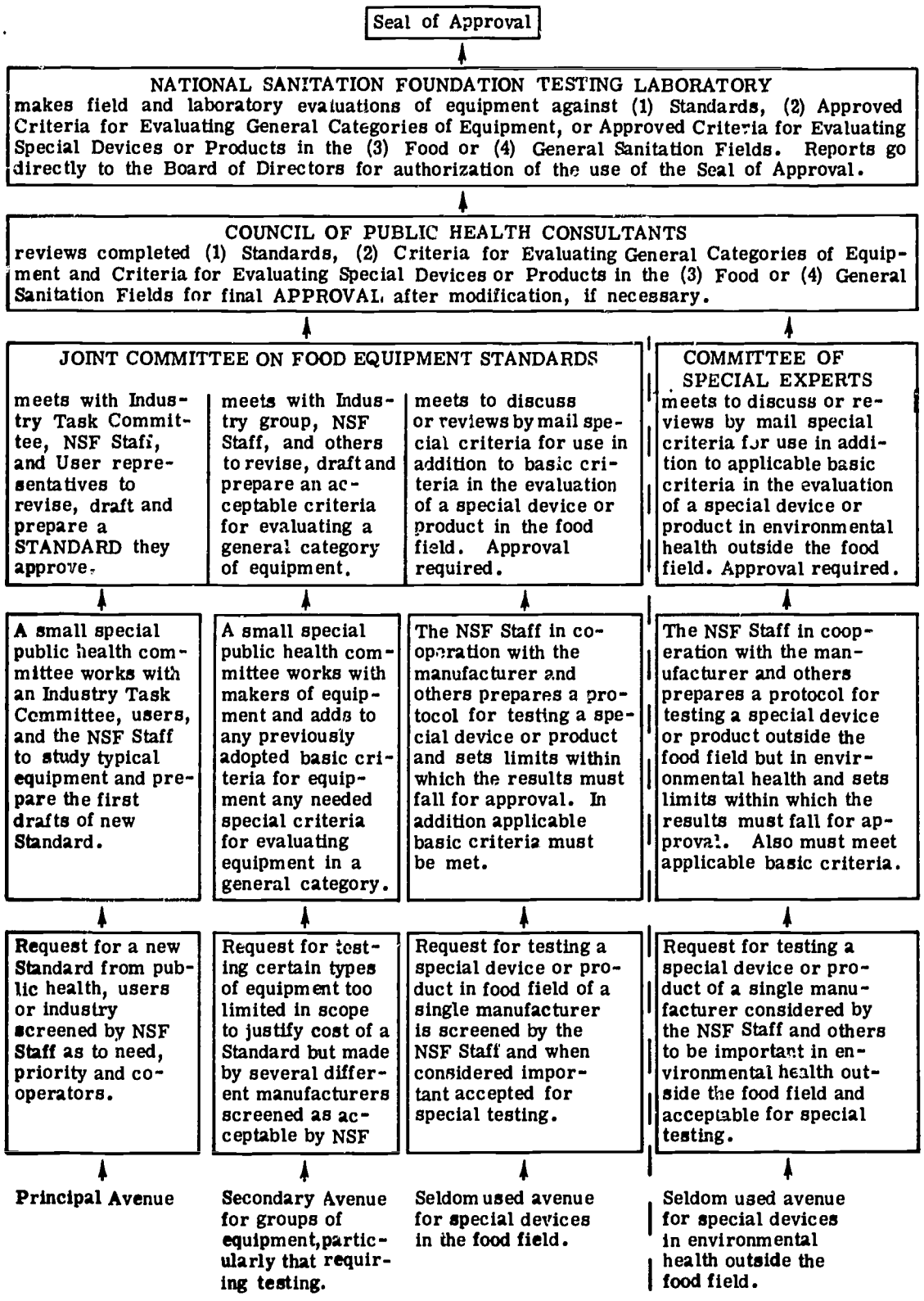
PREFACE

This is the first of a series of documents establishing Basic Criteria for evaluation of special classes of equipment. Items of equipment within the special class found to conform to these Basic Criteria may, upon authorization of the Directors of the National Sanitation Foundation Testing Laboratory, display the nSf Seal of Approval. In accordance with established procedure, shown as the "secondary avenue" on the accompanying flow chart, these requirements were established by the Joint Committee on Food Equipment Standards and approved by the Council of Public Health Consultants.

It should be noted that compliance with the Sanitation Ordinance and Code recommended by the Public Health Service of the United States Department of Health, Education, and Welfare is incorporated in these criteria. The National Sanitation Foundation through the services of the National Sanitation Foundation Testing Laboratory issues a copyrighted Seal of Approval to be used on equipment which has been approved by The Laboratory. Such authorized manufacturers have permission to use the Seal of Approval in commercial advertising and publicity. The Laboratory reserves the right to limit the use of the Seal of Approval and therefore makes additional requirements regarding research and inspection whenever and wherever necessary, whether in the manufacturing plant, at the point of operation, or in the National Sanitation Foundation Testing Laboratory.

The authorization of the use of the Seal of Approval on such equipment provides an easy means for health officials and the consuming public to identify equipment which provides all reasonable safeguards to the health of the consumer, as well as assurance that the equipment can be readily cleaned.

Approval Flow Chart Prepared by Joint Committee on Food Equipment Standards



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BASIC AND SPECIAL CRITERIA FOR THE EVALUATION OF MANUALLY ACTIVATED AND/OR COIN ACTIVATED VENDING MACHINES FOR FOODS AND/OR BEVERAGES

INTRODUCTION AND DEFINITIONS

Appraisal of various types of manually activated and/or coin activated vending machines submitted to the National Sanitation Foundation Testing Laboratory, Inc. for testing with a view to obtaining the National Sanitation Foundation "Seal of Approval" shall be conducted along the following lines:

Vending Machine Defined: The term "vending machine" within the scope of these criteria shall include any self-service, manual or coin-activated machine, which, upon insertion of a coin, coins or tokens, or by other means, dispenses unit servings of food or beverages, either in bulk or in packages, without the necessity of replenishing the machine between each vending operation.

Readily Perishable Foods: The term "readily perishable foods" shall mean any food or beverage or ingredients consisting in whole or in part of milk, milk products, eggs, meat, fish, poultry, or other food capable of supporting rapid and progressive growth of microorganisms which can cause food infections or food intoxication. However, products in hermetically sealed containers processed by heat to prevent spoilage, and dehydrated, dry or powdered products so low in moisture content as to preclude development of microorganisms, are excluded from the terms of this definition.

Hot Liquid Food or Beverage: The term "hot liquid food or beverage" shall mean liquid food or beverage, the temperature of which at the time of service to the consumer is at least 150° F.

Single Service Article: The term "single service article" shall mean any utensil, container, implement, or wrapper intended for use only

once in the preparation, storage, display, service, or consumption of food or beverage.

Product Contact Surface: The term "product contact surface" shall mean any surface of the vending machine, appurtenances, or containers which comes into direct contact with any food, beverage, or ingredient.

GENERAL APPRAISAL

1. Vending machines submitted to the National Sanitation Foundation Testing Laboratory, Inc. for consideration under the Program for Testing and Approval of Special Devices and Products will be evaluated and tested against this basic criteria. Plans, specifications or sample models may be submitted for consideration prior to the development of production models.

2. Applicable items of Section V, "Sanitation Requirements for Vending Machine Operations," covered by the United States Public Health Service ordinance and code, entitled "The Vending of Foods and Beverages," will be utilized in the evaluation of vending machines.

3. Whenever indicated, field and laboratory observations and tests will be conducted to determine specific aspects of design, construction, operation and maintenance.

4. Whenever indicated, bacteriological, chemical, physical and toxicological studies will be conducted to determine possible health hazards associated with the vending of the products under consideration.

5. A manual covering recommended operation and sanitation practices to be followed in the use of the equipment shall be submitted by the manufacturer and shall be a basic consideration in the evaluation of the vending device. Significant changes in subsequent editions of the manual shall be submitted.

GENERAL PROVISIONS

Minimum Requirements: These are minimum requirements and variations are permissible when they tend to make units more resistant to wear, corrosion or more easily cleanable.

Alternate Materials: Whenever specific materials are mentioned it is understood that the use of materials proven to be equally satisfactory from the standpoint of sanitation and wholesomeness of product will be approved.

Classification of Vending Machines: Vending machines shall be evaluated and approved for use in connection with the dispensing of one or more of the following categories of food and beverage:

Class No. 1 - Hot bulk food or beverage
Class No. 2 - Cold bulk food or beverage
Class No. 3 - Hot packaged food or beverage
Class No. 4 - Cold packaged food or beverage
Class No. 5 - Hot readily perishable bulk food or beverage
Class No. 6 - Cold readily perishable bulk food or beverage
Class No. 7 - Hot readily perishable packaged food or beverage
Class No. 8 - Cold readily perishable packaged food or beverage
Class No. 9 - Bulk food or beverage
Class No. 10 - Packaged food or beverage

Note: The manufacturer shall affix to the interior of the vending machine a permanent type plate showing the class, or classes, of food and/or beverage which can be dispensed in accordance with the National Sanitation Foundation Seal of Approval Listing.

MATERIALS

General: Only such materials shall be used in the construction of vending machines as will withstand wear, penetration of vermin, the corrosive action of foods or beverages to be dispensed, cleaning compounds and such other elements as may be found in the use environments. Surfaces in contact with food or beverage shall be of a non-toxic material and shall not contribute to the adulteration of the product for the specific application under consideration. Materials normally used in fabricating National Sanitation Foundation approved food service equipment may be accepted without further testing or evaluation for similar applications.

Products Contact Surfaces: All materials which are in contact with unpackaged foods or beverages shall be stainless steel, nickel alloy, vitreous china, thermal and shock resistant glass or approved plastic.

Surfaces Contacting Packaged Foods: Surfaces in contact with foods or beverages that are packaged shall be galvanized steel or equally resistant material. Painted surfaces are not satisfactory for this use. However, plastic coatings which comply with other requirements for above surfaces shall be acceptable.

Paint: Paint is an acceptable finish for normally dry, non-wearing surfaces that are not in contact with the product. However, paint shall not be used on surfaces which are so located that paint is likely to fall into the product if chipping or flaking occurs.

Solder: Solder in contact with food, drinking water and beverages or ingredients shall contain as small an amount of antimony, cadmium, lead, zinc or other toxic materials as can practicably be used and still accomplish its purpose. For surfaces not likely to come in contact with food, beverages, or ingredients the use of any commercial solders is satisfactory.

Welding: When welded seams are used, the weld area and deposited weld metal shall be equally as cleanable and resistant to corrosion as the parent material.

CONSTRUCTION

General Design and Construction: Vending machines shall be designed and constructed in such a manner as to be easily cleaned. All parts having product contact surfaces shall be easily accessible, visible, and readily cleanable, either in an assembled position or when removed. Demountable parts shall be removable without the use of tools. Products contact surfaces shall be accessible to sanitizing agents after assembly for operation, if cleaning in place is required.

Corners or Angles - Internal: An internal angle or corner, for sanitation considerations, shall be defined as the intersection of surfaces at 135 degrees or less. In general, rounded corners and rounded angles are recommended wherever it will make cleaning easier. All internal corners of product contact surfaces shall conform with the following:

1. Metal: All product contact surfaces shall be smooth. An internal angle formed by the intersection of surfaces shall have a minimum continuous and smooth radius of 1/8 inch.

2. Other Than Metal: For materials other than metal the radii specified for metal are to be effected by use of parent material.

Corners or Angles - External: All exposed external angles and corners are to be made closed and smooth.

Fillers for Product Contact Surfaces: Whenever filler material is used to make or fill seams, or to round out angles or corners, it shall be securely bonded to the adjoining material so that it will not crack or chip off and the surface shall be smooth.

Welding: Welded area included in product contact surfaces in sections that require routine cleaning and all the surfaces in contact with food shall be smooth.

Joints, Seams, and Edges: Shall be closed by use of welding, soldering, or properly designed draw fastening. Tight trim strips may be used in non-product zones, provided such trim strips are set in an approved mastic.

1. Fastening Methods: Exposed screws, projecting screws, projecting studs or rivet heads shall be eliminated from product contact surfaces, and, wherever other means of fastening are practical and feasible, from surfaces which are exposed to spilled foods or beverages.

   a. Interior Fastenings: In areas subject to cleaning, interior fastenings shall be accomplished in such a manner as to minimize projections and ledges.

   b. Exposed Joints and Seams: Where exposed to seepage and condensation, all joints and seams of integral parts shall be closed and made smooth by means of welding or soldering. If soldered, such joints shall be suitably braced and riveted or tack welded to insure against breaking open from strain or vibration.

2. Exposed Edges and Nosings: All exposed edges and nosings on horizontal surfaces shall be made integral with tops, regardless of profiles and where exposed to fingers and cleaning, they shall be made smooth. Where the edges of tops or shelves are flanged down and turned back, the return under flange shall be angled down and the space between the top and the flange shall not be less than 3/4 of an inch, and the space between the sheared edge and the frame angle or cabinet body shall not be less than 3/4 of an inch to provide access for cleaning.

3. Openings and Rims: To prevent seepage, all top openings over storage spaces and containers shall be protected by a raised rim at least 3/16 inch above the surface and above the level to which liquids may accumulate.

Reinforcing and Framing: Reinforcing and framing members not totally enclosed or within walls are to be placed in such manner as to be easily cleanable. All framing members shall be so placed as to eliminate harborage for vermin. The ends of all hollow sections not otherwise protected against the entrance of vermin, splash, or spillage, shall be sealed. Horizontal angle reinforcing and gussets shall not be used where spillage may accumulate thereon. Where angles are used horizontally they shall have one leg turned down wherever the nature of the equipment permits, or shall be formed integral with the sides, as for use with removable shelves or for drawer slides.

Finishing: Painted finishes may be used where they improve sanitation by preventing oxidation or condensation but not on friction sur-

faces such as on shelf runners. Non-wearing surfaces subject to corrosion that require cleaning shall be rendered corrosion resistant by approved plating or painting. Metal surfaces to be painted shall meet the materials specifications.

Body Construction:

1. Sheet Metal - No Frame: This type of construction shall mean a body fabricated of sheet metal without general interior framing, structural strength being achieved by the gauge of the material and by integrally formed single angle or channel edges and corners. All vertical channel sections shall be closed unless otherwise protected against the entrance of vermin.

2. Angle Framed: The designation "angle framed" applies to units built of sheet metal applied over a structural framework of pipe, tubing, angles or channels. Such units shall comply with the requirements for reinforcing and framing.

3. Fixed Panels: Where fixed panels are applied to the outside or inside or set into angle or other reinforced body or counter frames, the method of fastening shall be such as to minimize projections and openings.

4. Removable Panels: Where necessary for inspection and maintenance easily removable panels shall be provided, and shall be so mounted to prevent drainage to the interior. They shall be of adequate size to serve the purpose intended, but otherwise confined in size and so constructed that one person can handle them.

5. Wood Framed: The designation "wood framed" applies to units built of sheet metal applied over a structural framework of wood. Such units shall have no exposed wooden members and all enclosed spaces shall be sealed against vermin and condensation. When wood construction is used, sheet metal shall be applied in such a manner as to insure bonding between wood and metal.

Kick Plates: If kick plates are provided, they shall be built so that they can be readily removed or opened to permit access to space beneath the unit for inspection, servicing and cleaning.

Doors: Door and panel access openings to the product and container storage spaces of the machine shall be tight fitting and, if necessary gasketed, so as to preclude the entrance of dust, moisture, insects and vermin. Metal doors to enclose openings and provide access to interior compartments, either hinged or side sliding, shall be fabricated in two basic types of construction; that is, by means of (1) a

single panel, or (2) a double panel wall, with or without intermediate insulation. All side sliding doors are to be easily removable. Doors other than metal are to be in accordance with "MATERIALS" specifications, and to be flush panel type. Piano type hinges are not permissible where food or beverage spillage, condensation or other soil accumulation may occur.

1. Doors - Without Insulation: Single panel doors shall be built in such a manner as to minimize the collection of food particles, spillage, and other foreign matter and preferably without sections at the bottom, but if channel sections are so used they shall be shallow and wide enough to be easily cleanable.

2. Doors - Insulated: When gaskets are used in insulated doors, they shall be tightly joined together around four sides and corners. Gaskets, if used, shall be made of resilient rubber or rubber-like material that is non-toxic, relatively stable, relatively non-absorbent and has a smooth surface. All gasket retaining grooves shall be readily cleanable and shall have minimum radius of 1/16".

3. Door Tracks and Guides: All tracks and guides for doors shall be built in such a manner as to minimize the collection of food particles, spillage and other foreign matter; and to be shallow and wide enough to be easily cleanable, and shall have minimum radius of 1/16".

Shelving: All shelving, whether fixed or removable, solid or open type, shall be constructed and installed so as to make cleaning easy and so as not to harbor vermin.

1. Removable shelves: Where shelves are used as removable false bottoms in wet places, the flanged corners are to be either closed or sufficiently open to permit cleaning.

2. Diverting Shelves: Where shelves are intended to prevent seepage, as when set into interiors, back and ends of shelves are to be turned up a minimum of 2 inches and made with closed angles and corners.

SPECIAL FEATURES

Louvers and Openings: All necessary ventilation louvers or openings into the machine shall be effectively screened, with openings not larger than 16 mesh or equal, against insects and rodents. Such screens shall be installed so as to facilitate cleaning and replacement. Space in between louver flaps shall be such as to permit easy cleaning when

the screening is removed. Louvers and openings to compressor compartments of machines designed for use in eating and drinking establishments may be exempt from this screening requirement; provided the manufacturer shall have affixed to the machine a permanent-type plate which includes the following statement, or its equivalent: "This machine is intended for use only in eating and drinking establishments."

Legs and Feet: Unless the vending machine is designed to be sealed to the floor so as to prevent seepage underneath, one or more of the following provisions shall be made for cleaning this area:

1. The machine shall be mounted on legs six or more inches in height; or

2. The machine shall be mounted on casters, rollers, or gliders to allow its being easily moved; or

3. The machine shall be light enough to permit its being manually moved with ease, or

4. Units designed to be mounted on counters or tables shall conform to the provisions of 1 through 3 above, or be sealed to the counter or table, or be mounted on 4-inch or higher legs.

Legs and feet shall be of metal of sufficient rigidity to provide support with a minimum of cross-bracing; and so fastened to the body of the equipment and so shaped at floor contact as to prevent the accumulation of dirt and the harborage of vermin. All hollow sections shall be sealed. Where such legs and feet are made adjustable, they shall be of simple design, free from embellishments and exposed threads.

Service Connections and Openings: All service connections through an exterior wall of the machine including water, gas, electrical, and refrigeration, shall be grommeted or sealed to prevent the entrance of dust, insects, and rodents. All connections, such as gas, water or electric, to machines dispensing readily perishable products shall be demonstrated to be such as to discourage their unauthorized or unintentional disconnection.

Containers, Valves, Piping, Fittings, Faucets: All containers, valves fittings, chutes, and faucets which are in contact with food or beverage shall be easily and readily removable, and so fabricated as to be easily disassembled. When disassembled, all surfaces shall be visible for inspection and cleaning. In machines of such design that product contact surfaces are not readily removable, and in-place cleaning is intended, tubing, pipe fittings, and valves shall be so arranged that

cleaning and bactericidal solutions can be circulated throughout the fixed system, such solutions will contact all interior surfaces, and the system is self-draining or otherwise completely evacuated. Whenever in-place cleaning is intended, a readily accessible and easily removable section shall be provided in each such line for inspection purposes.

Product Storage Compartments and Containers:

1. The product storage compartments within vending machines dispensing packaged liquid products shall be so constructed as to be self-draining, or shall be provided with a drain outlet which permits complete draining of the compartment. Drains from the storage compartment shall be not less than one inch nominal standard pipe size.

2. The openings into all non-pressurized containers used for the bulk storage of vendable products and ingredients, including water, shall be provided with covers which prevent any contamination from reaching the interior of the containers. Such covers shall be designed to provide a flange which overlaps the opening, and where necessary, shall be sloped to provide drainage from the cover surface. Any port opening through the cover shall be flanged upward at least 3/8" and shall be provided with a cover which overlaps the flange.

   Such covers shall be designed with sufficient clearance so as not to extend into the foods or beverages which they cover. All covers shall be removable as a unit or in sections. If built in sections, flanges shall overlap at joints. Hinges or pivots shall be designed to be readily cleaned and sanitized.

   Where sliding, hinged or lift covers are used over food or beverage compartments, they shall be constructed in such a manner as to prevent seepage of liquids, condensation, dust, or other foreign materials into food or beverage compartments and liquid or solid accumulations on covers from falling into the food or beverage compartments when the covers are opened.

3. Product storage compartments and/or canisters for milk, milk products and similar readily perishable products or ingredients shall be so designed as to be easily removed. Dispensing controls whose surfaces come in contact with such ingredients or product shall likewise be easily removed.

4. Condensate or drip deflecting aprons which prevent drainage into the product shall be provided on all piping, thermometers, equipment, rotary shafts and other functional parts extending into the container, unless a water-tight joint is provided. Such

aprons shall be considered as satisfactory covers for those openings which are in continuous use.

5. Storage compartments for readily perishable foods or beverages, or of their ingredients within the vending machines shall be maintained at a temperature of not more than 50° F. or such products shall be maintained at a temperature of not less than 150° F. Automatic controls shall be provided to insure the maintenance of these temperatures at all times; provided, however, that an exception may be made for the actual time required to fill and otherwise service the machine and for a maximum recovery period of 30 minutes following completion of the filling or servicing operations. Vending machines dispensing readily perishable food shall be provided with a thermometer which, to an accuracy of ± 2°F., indicates the air temperature of the food storage compartment.

6. The vending machine shall be equipped so that readily-perishable foods and beverages which are to be dispensed hot shall be dispensed at a temperature of not less than 150° F.

Service Stage: The delivery tube or chute and orifice shall be protected from manual contact, dust, insects, rodents, and other contamination. The design shall be such as to divert condensation or other moisture away from the normal filling position of the container receiving the food or beverage. The vending stage shall be provided with a tight fitting, self-closing door or cover.

1. Protection against manual contamination of the dispensing chutes, or orifices, for bulk products shall be accomplished by:

   a. Inter-locking the service stage door with the coin mechanism so access to the service stage is limited to use periods, or

   b. Recessing such dispensing area sufficiently to normally protect against such contamination, or

   c. By such other means as is demonstrated to be satisfactory.

Cooling Equipment:

1. Tubing used for refrigerant coils shall be mounted in such a manner that food and insulation are protected against condensate.

2. Refrigeration coils, if exposed, shall be finless type located

where they can be easily and thoroughly cleaned by brushing. If a blower or fin type evaporator is used, it shall be enclosed in a housing to protect against spillage of food or beverage, and provide for drainage of any accumulation of condensate. There shall be no exposed refrigeration lines or horizontal ledges in product storage compartments. Refrigeration coils shall be protected against spillage of foods or beverages.

3. Water cooling units: The exterior of both refrigerant and water coils shall be accessible for cleaning by means of a brush. There shall be a readily accessible cock, plug, and drain to facilitate flushing and draining of the water bath compartment, the bottom of which shall be sloped to facilitate drainage.

4. Instantaneous cooler in storage compartments: If the unit is not built with integral insulation, a condensate drip pan with drain connection is to be placed under the cooler, allowing ample space for cleaning.

5. A condenser unit which is an integral part of the vending machine shall be sealed from the product and container storage spaces.

6. Ice-making equipment shall be designed and constructed to be accessible for cleaning and service. Ice contact surfaces shall be considered product contact surfaces. Water contact surfaces need not comply with the requirements for Corners and Angles-Internal.

Opening Devices: Opening devices which may come into contact with the product or the product contact surface of the containers, shall be of sanitary design and construction and of smooth, non-toxic corrosion resistant, and non-absorbent materials. Multi-use opening devices if provided as an integral part of the vending machine, shall be readily removable for cleaning, and shall be protected from manual contact, dust, insects, rodents, and other contamination.

Single Service Containers and Utensil Storage: All machines shall be so designed that cups, containers, utensils, and all other single service items can be added directly from the original wrapping or package without handling the product contact surfaces of such items. Single service items within the machine shall be protected from manual contact, dust, insects, rodents, and other contamination. Whenever utensils are required in connection with the food or beverage being dispensed the utensil shall be considered as a part of the product and provision shall be made for the utensil to be stored and dispensed in a sanitary manner. Storage compartments for single service utensils

shall be provided with a sight glass, or so designed as to permit determination as to the quantity of such items remaining without exposure to contamination.

Water Inlets and Storage: Water, if required, shall be supplied the machine under pressure.

1. Protection against back siphonage or back flow shall be provided by an air gap of not less than 1 inch; an approved type vacuum breaker, or such other method as may be proved effective by test.

2. All water connections and fittings within the machine shall be in accordance with the National Plumbing Code.

3. All water contact surfaces shall be considered as product contact surfaces.

4. The float valve in the water reservoirs shall be installed, handled and serviced in a sanitary manner. The float valve shall be constructed of non-toxic and corrosion resistant metal.

5. Effective means shall be provided to prevent carbon dioxide or carbonic acid or carbonated water from coming in contact with copper or copper alloy water tubing and devices in the machine or service lines.

6. Where check valves are used for the protection of the water supply system, a screen of not less than 100 mesh to the inch shall be installed in the water supply line immediately upstream from the check valves.

7. In all vending machines which dispense carbonated beverages and which are connected to a water supply system the ingredients water contact surfaces from the check valves or other protective device downstream, including the device itself, shall be of such material as to preclude the production of toxic substances which might result from interaction with carbon dioxide or carbonated water.

Water Filters: If used, water filters or other water conditioning devices shall be of a type which is readily accessible to permit periodic cleaning or replacement of the active element.

Drip Containers and Drains: Unless provided with external drains, containers shall be provided within the machine which will collect all of the drip, spillage, overflow, or other liquid wastes. Containers or surfaces on which such wastes may accumulate shall be of a ma-

terial which will resist corrosion. If liquid wastes from drip, spillage or overflow, which originates within the machine are discharged into a sewerage system, the connection to the sewer shall be through an air gap or safe waste. Drains shall be protected against the entrance of rodents or vermin, and shall be of sufficient size to provide for adequate drainage, and to be easily cleanable, but in no instance:

1. Shall drains for refrigerated units and ice bins be less than 1/2 inch standard pipe size.

2. Shall drains from storage compartments be less than 1-1/2 inch standard pipe size.

3. Shall drains from service stages be less than 3/8 inch standard pipe size.

Refuse Containers: Refuse storage containers except for crown closures shall not be located within the machine.

Drip Cans or Containers: When drip cans or containers become filled to within 3/4 of the liquid capacity, the vending mechanism shall be automatically locked to prevent further vending, until reset. The reset control shall be located inside the vending machine so that only authorized service personnel can reactivate the machine.

Cut-out Requirements: *Each machine dispensing readily perishable products shall be provided with a device whereby the vending mechanism of the machine will be automatically locked until reset, when the following conditions exist. The reset button shall be located inside the machine so that only the service personnel can reactivate the machine.

1. When the supply of single service cups or containers is exhausted.

2. When the temperature in a storage compartment for readily perishable foods or ingredients rises above or drops below required levels.

3. Provision shall be made for cut-out when vending machines through malfunction or otherwise develop excessive temperatures in products to be dispensed.

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*(Note: The temperature regulating mechanism shall remain in service during locked periods.)

Safety Requirements:

1. Hot water heating devices shall be equipped with an approved safety valve set at 125 pounds maximum pressure, a high temperature cut-off at 220° F. and a fusible plug having a melting point of 225° F. Temperature and pressure limit devices may be either separate or combined.

2. If gas burning devices are used, they shall be properly vented. Safety shut-off devices shall be installed to close the gas supply in the event the pilot light becomes extinguished.

3. Safeguards against the entrance of broken glass, metal, etc. from fixtures and devices within the vending machine shall be provided.

4. Each vending machine shall be designed to prevent the machine from toppling or overturning in normal usage.

APPENDIX A

Requirements for Double Check Valve Assemblies

A. GENERAL

1. Each check valve shall be designed to effectively and completely close when there is no flow. The closing shall be sufficiently positive that the valve shall not leak when the inlet pressure is one (1) p.s.i. and the outlet pressure is zero.

2. Each check valve shall permit no leakage in a direction reverse to normal flow over the full range of anticipated working pressure.

3. The loading of the check valves, if required to comply with Items 1 or 2, shall be done internally.

4. When the pressure loss through the check valves does not exceed 10 p.s.i., they may be approved for general use for protection of drink or food dispensing machines not equipped with carbonators.

5. Check valve units designed with a greater pressure loss for special use, shall be restricted to the proposed use.

6. Check valve units for hot water over 140° F., shall be of an approved type designed to operate at temperatures of 140° F. or more without rendering any portion of the device inoperative.

B. MATERIAL

1. The check valve and all moving parts and appurtenances shall be constructed of corrosion-resistant material.

2. The check valve barrier shall have a rubber face or the check valve shall have a raised rubber seat. The rubber shall have a shore hardness not to exceed 50. Rubber shall be of neo-

prene or equal, and shall be resistant to carbon dioxide. Check valves designed for hot water shall be constructed as designated in Paragraph A-6.

C. VALVES, STRAINERS AND UNIONS

1. An approved control valve shall be accessibly located on the supply to the check valve assembly.

2. At least one union joint shall be provided on one end of the double check valve assembly to permit repair or removal of the unit.

3. For test a 60 mesh strainer shall be located between the control valve and the check valve assembly. Screens of 100 mesh shall be required for use applications. Such strainer shall be accessible for cleaning, without the removal of strainer body or disconnecting the supply piping.

D. MARKINGS

Each double check valve assembly shall have the following permanent markings plainly visible on the body:

1. Manufacturer's name or trade mark.

2. Model Number.

3. Check valve designed for hot water, shall include the letter "H" in the model designation.

4. Direction of flow.

E. TESTS

1. Each check valve system shall be tested for compliance with all the provisions of this specification.

2. Adequate clearance of movable parts to be determined by use of sand or earth screened through a 60-mesh screen.

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