Department of Primary Industry

AUSTRALIAN CODE OF PRACTICE FOR DAIRY FACTORIES

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Appendix VII

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Appendix vii— 3-A: Sanitary standards for multiple-use rubber and rubberlike materials used as product contact surfaces in dairy equipment

Number 18-00

Formulated by International Association of Milk and Food Sanitarians, United States Public Health Service, The Dairy Industry Committee

It is the purpose of the IAMFS, USPHS, and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius on new developments. Multiple-Use Rubber and Rubber-Like Materials to be used as product contact surfaces in dairy equipment heretofore or hereafter developed which so differ in specifications or otherwise as not to conform with the following standards, but which in the opinion of the manufacturer or fabricator are equivalent or better, may be submitted at any time for the consideration of IAMFS, USPHS, and DIC.

A. Scope

These sanitary standards cover the requirements of rubber and rubber-like materials for multiple use as product contact surfaces in equipment for production, processing, and handling of milk or milk products. Test criteria are provided for rubber and rubber-like materials as a means of determining their acceptance as to their ability to be cleaned and to receive effective bactericidal treatment and to maintain their essential properties under repeated use conditions.

In order to conform with these 3-A Sanitary Standards, multiple-use rubber and rubber-like materials shall comply with the following material, physical properties and fabrication criteria.

B. Definitions

For the purpose of these sanitary standards, the following definitions and classifications shall apply:

(1) Rubber and rubber-like materials:

Shall mean resilient (See Appendix A) compounds having natural and/or synthetic origins deriving their physical and chemical properties from chemical vulcanization.

(2) Temperature of exposure:

Temperatures to which material is subjected in contact with the product and/or cleaning and bactericidal treatment.

(3) Classifications:

Class I—Temperature of exposure to product up to 300°F., and temperature of exposure to chemical solution used in cleaning and bactericidal treatment up to 180°F. This classification applies when 50% or more of the entire surface area is in contact with the product.

Class II—Temperature of exposure to product up to 300°F., and temperature of exposure to chemical solution used in cleaning and bactericidal treatment up to 180°F. This classification applies when less than 50% of the entire surface area is in contact with the product.

Class III—Temperature of exposure to product up to 120°F., and temperature of exposure to chemical solution used in cleaning and bactericidal treatment up to 180°F. This classification applies when less than 50% of the entire surface area is in contact with the product.

Class IV—Temperature of exposure to product up to 100°F., and temperature of exposure to chemical solution used in cleaning and bactericidal treatment up to 180°F.

Note: See Appendix B for examples.

C. Material

Rubber and rubber-like material having any surface in contact with the product shall be non-toxic, relatively non-absorbent, relatively resistant to fat, resistant to normal cleaning and bactericidal solutions, readily cleanable,k relatively insoluble, relatively stable in the environment of its intended use, and shall not adversely affect the product.

The minimum physical properties of the finished rubber and rubber-like materials, as determined by the testing procedures specified, are the following:

	Class I	*Class II*	*Class III*	*Class IV*
I. *Absorption*				
1. Butteroil[1]: 22 ± ¼ hour @ 158°F. (ASTM #D471) Maximum hardness change, type Shore A points	6	15	20	20
Maximum loss or gain—				
% by Wt.	5	25	25	60
% by Vol.	5	25	25	75
2. Distilled water: 22 ± ¼ hour @ 158°F. (ASTM #D471) Maximum hardness change, type Shore A points	6	10	10	10
Maximum loss or gain—				
% by Wt.	5	15	15	20
% by Vol.	5	15	15	25
II. Stability				
1. Air Aging (ASTM #D573) Maximum hardness change, type Shore A points				
166 ± ½ hour Air Oven @ 212°F.[2]	20	20	–	–
166 ± ½ hour Air Oven @ 158°F.[3]	–	–	15	15
2. Original Tensile Strength, psi minimum (Sample prepared according to ASTM #D412)	500	500	500	500

3. Original Elongation, % minimum (Sample prepared according to ASTM #D412)	75	75	75	75
4. Original Hardness Range, Durometer Type Shore A points (ASTM #D676)	50-90	40-90	35-90	30-90

[1] Butteroil may be prepared by melting butter at 150°F., placing in a graduate and pouring off the oil portion on top. It will be approximately 97% milk fat.

[2] For Class I and II only.

[3] For Class III and IV only.

D. Fabrication

The surface of finished rubber or rubber-like fabricated parts shall be at least as cleanable as stainless steel having a 120 grit finish properly applied. Conformance with this item shall be judged by comparing the removal of standard soil from finished rubber or rubber-like fabricated parts with the removal of such soil from stainless steel having a 120 grit finish.

These standards shall become effective April 14, 1963.

Appendix A

Hard rubber

Hard rubber is a vulcanized rubber having a ratio of combined sulfur to rubber hydrocarbon in excess of 15% and a Shore A Durometer value in excess of 90. It is not considered a part of this standard due to its special characteristics foreign to rubber as normally used in the dairy industry.

Appendix B

Example:

Rubber classes, as provided for in B. (3):

Class I—Some heat exchanger gaskets, "O" rings, C.I.P. gaskets, flange gaskets, rotating seals.

Class II—Plate heat exchanger gaskets, homogenizer seals, static seals.

Class III—Cold applications such as milk and air tubing, manhole and door gaskets, seals.

Class IV—Inflations.