*English Translation Version for Reference Only*

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# China Civil Aviation Technical Standard Order

This China Civil Aviation Technical Standard Order (CTSO) is issued according to Part 37 of the China Civil Aviation Regulations (CCAR-37). Each CTSO is a criterion which the concerned aeronautical materials, parts or appliances used on civil aircraft must comply with when it is presented for airworthiness certification.

## Airplane Galley Insert Equipment, Electrical/Pressurized

**1. Purpose.**

This China Civil Aviation Technical Standard Order (CTSO) is for manufacturers applying for airplane galley insert equipment CTSO authorization(CTSOA). This CTSO prescribes the minimum performance standards(MPS) that airplane galley insert equipment must first meet for approval and identification with the applicable CTSO marking.

**2. Applicability.**

This CTSO affects new application submitted after its effective date. Major design changes to article approved under this CTSO will require a new authorization in accordance with section 21.353 of CCAR-21-R4.

**3. Requirements**

New models of airplane galley insert equipment identified and manufactured on or after the effective date of this CTSO must meet the

MPS qualification and documentation requirements in Society of Automotive Engineers (SAE) Aerospace Standard (AS) 8057, Minimum Design and Performance of Airplane Galley Insert Equipment, Electrical/Pressurized, issued July, 2008 as modified by Appendix 1 of this document.

a. Functionality. This CTSO's standards apply to equipment intended to be used as airplane galley insert equipment installed in galleys and other areas (e.g., bars). Some examples of Galley Insert Equipment are listed below however, the CAAC does not limit the definition to these items only.

（1）Ovens (e.g., convection, steam, induction, microwave, bun warmer, plate warmer).

（2）Beverage makers (e.g., coffee makers, coffee warmers, water heaters, espresso makers).

（3）Beverage cups and jugs (so-called hot cups and jugs).

（4）Self-contained refrigeration equipment (e.g., refrigerators, freezers, wine chillers, water coolers, air chillers).

（5）Trash compactors.

（6）Rail assemblies.

（7）Associated components, such as oven racks and trays, beverage servers.

b. Failure Condition Classifications. Loss of the function defined in

paragraph 3.a of this CTSO is a minor failure condition. Design the system to at least this failure condition classification.

c. Software Qualification. If the article includes software, develop the software according to RTCA, Inc. document RTCA/DO-178B, Software Considerations in Airborne Systems and Equipment Certification, dated December 1, 1992 to the design assurance level consistent with the failure condition classification defined in paragraph 3.b of this CTSO.

d. Electronic Hardware Qualification. If the article includes a complex custom microcoded component, develop the component according to RTCA, Inc. document RTCA/DO-254, Design Assurance Guidance for Airborne Electronic Hardware to the design assurance level consistent with the failure condition classification defined in paragraph 3.b of this CTSO.

e. Deviations. For using alternate or equivalent means of compliance to the criteria in the MPS of this CTSO, the applicant must show that the equipment maintains an equivalent level of safety. The applicant must apply for a deviation under the provision of section 21.368(a) in CCAR-21-R4.

**4. Marking**

a. Mark at least one major component permanently and legibly with

all the information in 21.423(b) of CCAR-21-R4. The marking must include the serial number.

b. Also, mark the following permanently and legibly, with at least the manufacturer's name, subassembly part number, and the CTSO number:

（1）Each component that is easily removable (without hand tools), and，

（2）Each subassembly of the article that manufacturer determined may be interchangeable.

c. If the article includes a deviation per paragraph 3.e. of this CTSO, the marking should include a means to indicate a deviation was granted.

**5. Application Data Requirements.**

The applicant must furnish the responsible certification personnel with the related data to support design and production approval. The application data include a statement of conformance as specified in section 21.353 in CCAR-21R4 and one copy each of the following technical data:

a. A manual(s) containing the following:

（1）Operating instructions and equipment limitations sufficient to describe the equipment's operational capability.

（2）Describe in detail any deviations. As applicable, identify

equipment by part number, version, revision, and criticality level of software/hardware, classification for use, and environmental categories.

（3）Procedures and limitations sufficient to ensure that the airplane galley insert equipment, when installed according to the installation or operational procedures, still meets this CTSO's requirements. Limitations must identify any unique aspects of the installation. The limitations must include a note with the following statement:

**"This article meets the minimum performance and quality control standards required by a China Civil Aviation Technical Standard Order (CTSO). Installation of this article requires separate approval."**

（4）A summary of the test conditions used for environmental qualifications for each component of the article. For example, a form as described in RTCA/DO-160F, Environmental Conditions and Test Procedures for Airborne Equipment, dated December 6, 2007, Appendix A.

（5）Schematic drawings, wiring diagrams, and any other documentation necessary for installation of the airplane galley insert equipment.

（6）List of line replaceable components, by part number, that makes up the airplane galley insert equipment. Include vendor part number cross-references, when applicable.

b. Instructions covering periodic maintenance, calibration, and repair, for the continued airworthiness of the airplane galley insert equipment. Include recommended inspection intervals and service life, as appropriate.

c. Nameplate drawing with the information required by paragraph 4 of this CTSO.

d. Identify functionality, features or performance contained in the article not evaluated under paragraph 3 of this CTSO (that is, non-CTSO functions). Non-CTSO functions are accepted in parallel with the CTSO authorization. For those non-CTSO functions to be accepted, the applicant must declare these functions and include the following information with CTSO application:

（1）Description of the non-CTSO function(s), such as performance specifications and software, hardware, and environmental qualification levels. Include a statement confirming that the non-CTSO functions don't interfere with the article's compliance with the requirements of paragraph 3.

（2）Procedures and limitations sufficient to ensure that the non-CTSO function(s), when installed according to the installation procedures, still meets this CTSO's requirements. Limitations must identify any unique aspects of the installation.

（3）Instructions for continued performance applicable to the

non-CTSO function(s) described in paragraph 5.d.(1).

（4）Interface requirements and applicable installation test procedures to ensure compliance with the performance data defined in paragraph 5.d.(1).

（5）Results of test/analysis, as appropriate, to verify that performance of the hosting CTSO article is not affected by the non-CTSO function(s).

（6）Results of test/analysis, as appropriate, to verify the function and performance of the non-CTSO function(s) as described in paragraph 5.d.(1).

e. The quality system description required by in section 21.358 in CCAR-21R4, including functional test specifications. The quality system should ensure that it will detect any change to the approved design that could adversely affect compliance with the CTSO MPS, and reject the article accordingly.

f. Material and process specifications list.

g. List of all drawings and processes (including revision level) that define the article's design.

**6. Manufacturer Data Requirements.**

Besides the data given directly to the authorities, have the following technical data available for review by the authorities:

a. Functional qualification specifications for qualifying each production article to ensure compliance with this CTSO.

b. Equipment calibration procedures.

c. Schematic drawings.

d. Wiring diagrams.

e. Material and process specifications.

f. If the article contains non-CTSO function(s), the applicant must also make available items 6.a through 6.e as they pertain to the non-CTSO function(s).

**7. Furnished Data Requirements.**

a. If furnishing one or more articles manufactured under this CTSO to one entity (such as an operator or repair station), provide one copy or on-line access to the data in paragraphs 5.a through 5.c of this CTSO. Add any other data needed for the proper installation, certification, use, or for continued compliance with the CTSO, of the airplane galley insert equipment.

b. If the article contains declared non-CTSO function(s), include one copy of the data in paragraphs 5.d.(1) through 5.d.(6).

**8. Availability of Referenced Documents.**

a. Order copies of SAE documents from:

Society of Automotive Engineers, Inc.

400 Commonwealth Drive, WARRENDALE, PA 15096-001, USA

You can also order copies online at www.sae.org.

b. Order copies of RTCA documents from:

Radio Technical Commission for Aeronautics, Inc.

1150 18th Street NW, Suite 910, Washington D.C. 20036

You can also order copies on the RTCA website at www.rtca.org.

## Appendix 1. Minimum Performance Standard for Airplane Galley Insert Equipment, Electrical/Pressurized

This appendix prescribes the minimum performance standards (MPS) for airplane galley insert equipment. The applicable standard is SAE AS 8057, Minimum Design and Performance of Airplane Galley Insert Equipment, Electrical/Pressurized, issued July, 2008. We modified it as follows：

1. Page 5, replace paragraph 1.3.b. with:

   "The word "should" indicates a criterion for which an alternative, including non-compliance, may be applied."

2. Page 8, disregard paragraph 2.2 Definitions: "ACCEPTANCE TEST", "ASSOCIATED COMPONENTS", "DETRIMENTAL PERMANENT DEFORMATION", and "FAILSAFE".

3. Page 8, replace paragraph 2.2 Definitions: "FAILURE" with: "FAILURE: is a failure to meet the Minimum Performance Standard of the CTSO. The standard ensures a level of safety that is acceptable."

4. Page 9, replace paragraph 2.2 Definitions: INTERCHANGEABILITY with: "INTERCHANGEABILITY: That quality which allows an assembly or part to substitute or be substituted for another and to meet all physical, functional, and structural requirements of the original."

5. Page 9, replace paragraph 2.2 Definitions: MAXIMUM NORMAL OPERATING PRESSURE (MNOP) with: “MAXIMUM NORMAL OPERATING PRESSURE (MNOP): The maximum attainable pressure of the equipment’s pressure system when all the equipment’s components are functioning normally.”
6. Page 9, replace paragraph 2.2 Definitions: OPTION with “OPTION: A function capable of being included as part of equipment. It shall be fully developed and able to be incorporated without adverse effects to meeting the performance requirements of this AS included in this CTSO.”
7. Page 9, disregard paragraph 2.2 Definitions: “PERIODIC TESTING”.
8. Page 10, disregard paragraph 2.2 Definitions: “PROCESS SPECIFICATION”
9. Page 10, replace paragraph 3.1 with:

   “Table 1 identifies applicable requirements for typical galley insert equipment designs. Novel designs may require compliance to additional requirements, or requirements in Table 1 not identified by a bullet. To use the table, find the equipment in question along the top row, and then read down that column; the row in which a bullet appears indicates requirements that shall be addressed. A bullet in brackets indicates that the requirements are applicable for only a part of the equipment in question.”

10. Page 11, disregard paragraphs 3.2.1 and 3.2.1.1.

11. Page 12, disregard paragraph 3.2.1.2.a.

12. Page 12, replace paragraph 3.2.1.2.c with:

    "Aluminum honeycomb core shall be finished for corrosion resistance."

13. Page 12, disregard paragraphs 3.2.1.4. through 3.2.1.6.

14. Page 12, replace paragraph 3.2.1.8 with:

    "Components shall be protected against deterioration or loss of strength in service due to environmental causes. Selection and finishing of material (including fasteners), where dissimilar metals may be placed in contact, shall be per MIL-STD-889 or equivalent. Material not inherently corrosion resistant shall be finished with a protective treatment or coating. Magnesium alloys shall not be used."

15. Page 13, disregard paragraphs 3.2.1.9. through 3.2.2.3.

16. Page 14, replace paragraph 3.2.2.4 with:

    "Bonded joints shall not be loaded primarily in tension"

    Disregard paragraphs 3.2.2.4.a thru d.

17. Page 14, disregard paragraph 3.2.2.5.

18. Page 14, replace paragraph 3.2.3 with:

    "Construction for Trash Compactors"

    Trash compactors shall be constructed of fire resistant materials capable of containing fire (see 3.10) under the conditions expected to

result in service."

19. Page 15, disregard paragraph 3.2.4.

20. Page 15, replace paragraph 3.2.5 with:

"Interface clearances between equipment and the surrounding galley or structure required for ventilation, heat dissipation, installation, loading, etc. shall be clearly defined and included in the Application Data Requirements, paragraph 5. of the CTSO."

21. Page 15, replace paragraph 3.2.6 with:

"Equipment shall comply with the requirements of Appendix 2 of the CTSO."

22. Page 15, replace paragraph 3.2.7 with:

"The manufacturer of a CTSO article shall permanently and legibly mark

(1) Each CTSO article with the CTSOA holder's name, trademark, symbol, or other CAAC approved identification and part number; and

(2) Each CTSO article, unless otherwise specified in the applicable CTSO, with the CTSO number and letter of designation, all markings specifically required by the applicable CTSO, and the serial number or the date of manufacture of the article or both.

23. Page 16, disregard paragraph 3.2.8.

24. Page 16, replace paragraph 3.3.1.a. with:

"Equipment shall be designed to meet the structural loading as

specified in 4.2.1."

25. Page 16, replace paragraph 3.3.2.a. with:

"The structure of equipment shall address the load case in each direction and be verified according to 4.2.1."

26. Page 16, replace paragraph 3.3.2.b with:

"The loading conditions shall be determined by assuming installation of equipment around the z-axis of the airplane (see Figure 1)."

27. Page 16, disregard paragraph 3.3.2.c.

28. Page 16, replace paragraph 3.3.2.d. with:

"Failure shall not occur under ultimate load cases. All permanent deformation that occurs under ultimate or limit load cases shall be reported in the data furnished with each article." Disregard "NOTE" following paragraph 3.3.2.d.

29. Page 16, replace paragraph 3.3.3 with:

"A local attachment factor of 1.33 shall be applied in addition to the design load factors for attachments (such as door hinges, latches and retaining devices)."

30. Page 16, replace paragraph 3.3.4 with:

"Material strength properties shall be based on tests of material meeting industry specifications to establish design values on a statistical basis. Design values shall be chosen to minimize the probability of structural failure due to material variability. The

applicable specifications are Metallic Materials Process Development and Standardization (MMPDS, formerly MIL-Handbook-5) and the Composite Materials Handbook (CMH-17, formerly MIL-Handbook-17).

Analytical substantiation of material strength shall be based on material design values shown to be statistically reliable by repeated structural testing. Strength substantiation shown by full scale testing shall account for the variability of the materials and processes used to fabricate the parts by applying an appropriate overload factor. See chapter 2 in General Aviation Manufacturer's Association (GAMA) document Publication 13 for guidance in determining the appropriate overload factor."

31. Page 18, replace paragraph 3.3.5.i. with:

"Forces generated by the conditions tested in 3.17, 4.2.1., or the weight of the retaining device itself, shall not cause the retaining device to release."

32. Page 18, replace paragraph 3.3.5.m. with:

"Equipment with a stowage compartment (e.g., trash compactors, ovens, refrigerators and freezers, wine chillers) shall be designed such that the stowage compartment completely encloses its contents.

33. Page 18, correct 3.3.6.b.2. to read:

"maximum wet weight, including associated components used for

normal operation of the equipment (with the exception of attached hoses, tubes, pipes and/or electrical conduit), maximum amount of water in the equipment plumbing system and including water in tank, beverage in server, soaked pillow pack (if applicable)."

34. Page 19, disregard paragraph 3.3.8.

35. Page 19, disregard paragraph 3.3.9

36. Page 19, replace paragraph 3.4.1.a. with:

"Equipment shall be designed for the primary power levels typically found in aircraft (e.g., 28VDC, and/or 115 VAC (Constant frequency (CF) or Wide variable frequency (WF), or 230 VAC (CF) or (WF))."

37. Page 20, replace paragraph 3.4.4 with:

"Equipment shall be designed to be capable of withstanding over-voltage events without arcing, sparking, smoke or fire. Equipment shall be designed to pass the following dielectric tests: (Note: Components (filters, protection diodes) normally not capable of withstanding the dielectric withstanding voltage test without damage may be disconnected or individually disabled (e.g., short circuited) for these tests. The dielectric withstanding voltage test shall be run prior to the insulation resistance test.)" Paragraphs 3.4.4.a and b. remain unchanged.

38. Page 21, replace paragraph 3.4.7. with:

"In addition to the requirements of this document, microwave ovens

shall meet GB 4706.21-2008 “Household and similar electrical appliances-Safety-Particular requirements for microwave ovens，including combination microwave ovens”. The microwave emission limit of the microwave oven should also meet the following requirements: at a distance greater than or equal to 5cm from the surface of the microwave oven, the initial microwave leakage should meet 1mW/cm$^2$ or less, and the microwave leakage should meet 5mW/cm$^2$ or less when testing under abnormal conditions. The specific sanitary standards are implemented according to the requirements of Appendix 2.”

39. Page 21, replace paragraph 3.4.8.a. with:

“Equipment shall be designed to minimize the generation of or susceptibility to electromagnetic interference.”

40. Page 21, disregard paragraph 3.4.8.b.

41. Page 22, replace paragraph 3.4.9.b. with:

“Hidden installed equipment (e.g., remote water heater, air chiller) may have a separate control module capable of being installed on the front of the galley for the following functions:” Information in bullets remains unchanged.

42. Page 23, replace paragraph 3.6.2.a. with:

“Show the complete equipment plumbing interface in the Application Data Requirements, paragraph 5. of the CTSO.”

43. Page 23, disregard paragraphs 3.6.2.c and 3.6.2.d.

44. Page 23, replace paragraph 3.6.3 with:

"Equipment, capable of being connected to the potable water system of an airplane, that heats and stores water shall incorporate a feature for sensing a low water condition. Indication of low water shall both illuminate a warning light and interrupt power to the equipment heating elements."

45. Page 23, replace paragraph 3.6.4.a. with:

"Equipment capable of being connected to an airplane potable water system shall incorporate a self-venting device."

46. Page 23, replace paragraph 3.6.4.b. with:

"Equipment capable of being connected to an airplane potable water system shall be self- draining."

47. Page 24, replace paragraph 3.6.6.a. with:

"Demonstrate equipment proof and burst pressure values by test and provide pressure values in CTSO, Application Data Requirements, paragraph 5 as required."

48. Page 25, replace paragraph 3.6.7.b. with:

"Water taps/faucets shall be self-closing unless the Application Data Requirements, paragraph 5. of the CTSO specifies this equipment is intended for installation above a sink in the galley monument."

49. Page 25, revise paragraph 3.8.c. first sentence with:

"External surfaces that have to be heated directly to meet the equipment purpose (e.g., toaster slot, skillet surface, heating plates of a sandwich press, warmer pad for beverage server) are excluded from 3.8.a. and 3.8.b.

50. Page 25, replace paragraph 3.9 with:

"Materials (including finishes or decorative surfaces applied to the materials) shall comply with the appropriate paragraphs of Appendix. F in CCAR-25，as follows:"

51. Page 25, replace paragraph 3.9.1.a. with:

"Equipment shall comply with the appropriate flammability requirements of CCAR-25 when tested per Appendix F, Part I."

52. Page 25, replace paragraph 3.9.1.b. with:

"Thermal and acoustic insulation material and components (batting, cover foil, foam, etc.) shall comply with the flame propagation requirements of CCAR-25, Appendix F, Part VI."

53. Page 26, replace paragraph 3.9.2. with:

"Exposed surfaces of equipment, when stowed, shall meet the heat release and smoke density requirements of CCAR-25, Appendix F, Parts IV and V."

54. Page 26, replace paragraph 3.10.a. with:

"Equipment dedicated to, or that may be used for, waste stowage (e.g., trash compactors) shall meet AC 25-17A Transport Airplane Cabin

Interiors Crashworthiness Handbook Appendix 8 Fire Containment Test Methods, Sections 4.2 CARTS and 5.2 ACCEPTANCE CRITERIA."

55. Page 26, replace paragraph 3.11. with:

"Equipment shall be marked using materials and/or processes that will ensure legibility during its lifespan. Markings shall be conspicuous and worded in mandatory "command" English. Non-English language marking is acceptable, in addition to English. Non-English marking may be used alone when airworthiness requirements are not involved. Marking location, style and wording should be consistent. Weight placards shall include both English and metric units.The location and wording of placards shall be shown in the Application Data Requirements, paragraph 5. of the CTSO."

56. Page 26, replace paragraph 3.11.3.a. with:

""No Cigarette Disposal" shall be placed on or near each waste receptacle disposal door (e.g., the waste disposal flap of a trash compactor)."

57. Page 27, disregard paragraphs 3.14.a, 3.14.b, and 3.14.c.

58. Page 27, disregard paragraph 3.17 Note #1 on Pass/Fail criteria at bottom of Table 2 and replace Note #2 with: "(2) Equipment shall comply with the performance requirements of this CTSO in each instance RTCA/DO-160 reads 'DETERMINE COMPLIANCE WITH

APPLICABLE EQUIPMENT PERFORMANCE STANDARDS'. The equipment shall also comply with the performance standards of this CTSO after DO-160 testing.

59. Page 30, replace paragraph 3.18.1 with:

"The power consumption of the equipment shall be defined in the Application Data Requirements, paragraph 5. of the CTSO."

60. Page 32, replace paragraph 3.19. with:

"A Failure Mode and Effects Analysis (FMEA) shall be performed at the equipment level independent of the aircraft. The analysis shall include typical and hidden failure modes throughout the entire operating range and include the effects of mishandling."

61. Page 33, replace paragraph 4.2.1 Table 3 Note (2) with:

"(2) Load factors may be increased to meet aircraft flight and ground cases. If increased factors are used, they shall be provided in CTSO, Application Data Requirements, paragraph 5.a.(1)"

62. Page 33, replace paragraph 4.2.1 Table 3 Note (5) with:

"(5) For equipment with a stowage compartment, maximum door deflections shall meet 3.3.5.n.

63. Page 34, replace paragraph 4.2.4.a. with:

"Proof Pressure Test: The qualification unit shall have its pressurized components tested to the required proof pressure; this pressure shall be held for five minutes. The equipment shall not be damaged nor

leak as a result of the test."

64. Page 35, replace paragraph 4.2.6.2.b. with:

"The top, sides and front surfaces of equipment shall be tested per CCAR-25, Appendix "F", Parts IV and V."

65. Page 35, correct 4.2.7. to read:

"Trash compactors used to receive combustible material shall comply with the fire containment requirements of 3.10, when substantiated per AS 8056, 4.6."

66. Page 35, disregard section 4.2.9.

67. Page 37, replace paragraph 4.2.15. with:

"Conduct and prepare the FMEA in accordance with ARP 4761 at the equipment level independent from the aircraft."

68. Page 38, disregard section 4.3.

69. Page 39, replace paragraph 5.1.b.12 with:

"Maximum amount of discharge air emitted by equipment, if applicable."

70. Page 40, disregard section 5.2.

71. Page 41, disregard section 6.

## Appendix 2. Guidelines for Sanitary Construction Of Aircraft Galleys and Galley Components

The changes proposed in Article 21 of Appendix 1 to this CTSO require the following:

### 0. Preface

This appendix contains criteria for the sanitary construction of aircraft galleys and components or related equipment. It has been developed as a guideline for the manufacturer's of airframes, manufacturers of aircraft galleys and components or related equipment, the airline industry, and public health personnel to achieve and maintain a higher level of sanitation in aircraft galleys and to provide for uniformity in sanitary construction.

### 1. Definitions

**1.1 Acceptable:** Demonstrated to the Food and Drug Administration to be satisfactory and suitable for its intended use.

**1.2 Accessible:** An area, space, or surface that can be exposed for inspection and proper cleaning with the use of simple devices.

**1.3 Readily Accessible:** An area, space, or surface that is or can be exposed for cleaning and inspection without the use of tools.

**1.4 Internal Angle or Corner:** The intersection of two planes at an angle of 110 degrees or less.

**1.5 Airline Catering Point:** Any catering establishment or airline commissary, from which food, drink or service equipment is provided for use aboard aircraft.

**1.6 Easily Cleanable:** Surfaces which are readily accessible and of such material and finish and so fabricated that residue may be completely removed by normal cleaning methods.

**1.7 Closed**: Fitted together snugly to have surface-to-surface contact leaving no opening greater than 1/32 inch.

**1.8 Galley Component:** That equipment used in conjunction with airline food service which is not an integral part of the galley and which is REMOVABLE. Equipment such as ovens, refrigerators, freezers, carts, tray carriers, liquor kits, and coffee brewers are classified in this category for purposes of this document.

**1.9 Food:** Any raw, cooked, or processed edible substance, beverage (including water and ice) or ingredient used or intended for use in whole or in part for human consumption.

**1.10 Food Service Supplies:** Items of equipment and utensils, including single service, used in food service operations.

**1.11 Potentially Hazardous Food:** Any food which consists in whole or in part of milk or milk products, eggs, meat, poultry, fish, shellfish, or other ingredients capable of supporting rapid and progressive growth of infectious or toxigenic microorganisms.

**1.12 Galley:** That section of the aircraft including bars, service centers, and auxiliary galleys from which food, beverages, and service supplies are stored and served.

**1.13 Joint:** The line of meeting of two or more pieces, parts, or sections of equipment.

**1.14 Corrosion-Resistant Material:** One which maintains its original surface characteristics under use conditions and the prolonged influences of food, cleaning compounds, and sanitizing solutions. For the purpose of this document, aluminum is considered corrosion resistant.

**1.15 Non Absorbent Material:** One with a surface resistant to moisture penetration.

**1.16 Non-Toxic Material:** One which will not introduce poisonous, harmful or injurious substances into the food product, and must meet the following requirements：

For enamel products, the requirements of GB4806.3-2016 “National Food Safety Standard Enamel Products” need to be met, and the lead content requirement for cups and mugs (volume is about 240mL): ≤0.5μg/mL (this requirement is added to Section 4.2).

For ceramic products, the requirements of GB4806.4-2016 “National Food Safety Standard Ceramic Products” need to be met.

For glass products, the requirements of GB4806.5-2016 “National Food Safety Standard Glass Products” need to be met, and the lead content

requirements for cups and mugs (volume is about 240mL): ≤0.5μg/mL (this requirement is added to 4.3 Section).

For paper and paperboard materials and products, the requirements of GB4806.8-2016 "National Food Safety Standard Paper and Paperboard Materials and Products for Food Contact" need to be met.

For metal materials and products, the requirements of GB4806.9-2016 "National Food Safety Standard Metal Materials and Products for Food Contact" need to be met.

For food contact coatings and coatings, the requirements of GB4806.10-2016 "National Food Safety Standard Food Contact Coatings and Coatings" need to be met.

For plastic and resin food contact materials, the requirements of Table 1 must be met.

**1.17 Multi-Temperature Unit:** A container capable of combining two or more of the functions of a refrigerator, freezer, or oven.

**1.18 High Temperature Oven:** An oven capable of rapidly heating food to a temperature of 60℃（140℉）, or above.

**1.19 Holding Oven:** An oven capable of constantly maintaining the temperature of food at 140oF, or above, but not intended to heat, reheat, or reconstitute food.

**1.20 Refrigerator:** A container capable of maintaining food at 7.2℃（45℉）, or below at all times.

**1.21 Removable:** Capable of being taken away from the main unit with the use of simple tools.

**1.22 Readily Removable:** Capable of being taken away from the main unit without the use of tools.

**1.23 Sealed:** Free of cracks or other openings which permit the entry or passage of moisture.

**1.24 Seam:** The line of meeting of two or more pieces, parts, or sections of equipment.

**1.25 Single-Service Article:** Articles which are constructed and intended by the manufacturers, and generally recognized by the public, as for one usage only, then to be discarded.

**1.26 Smooth:** A surface finish which is at least equal to the following:

**1.26.1 Food Contact Surface:** Number 3 (100 grit) stainless steel finish.

**1.26.2 Non-Food Contact Surface:** Commercial grade hot rolled steel free of visible scale.

**1.27 Safe Temperatures:**

Temperatures of 7.2℃（45℉）, or above with respect to potentially hazardous foods.

**1.28 Simple Tools:** Common hand tools such as a screw driver, pliers, or open end wrench.

**1.29 Liquid Waste:** Fluids including water, melted ice and beverages, arising from in- flight food service operations in galleys.

**1.30 Solid Waste:** Materials including garbage and rubbish that accumulate from in- flight food service operations.

**1.31 Potable Water:** Water meeting the requirements of GB 5749-2006 "Standards for Drinking Water Quality".

## 2. Materials

Good sanitary design and construction features are related to the type of materials to be used in fabrication of equipment. Materials shall be able to withstand normal use; not render toxic any food or beverage with which they may come in contact; and be easily cleanable. The following criteria apply to the galleys, galley components, potable water systems:

### 2.1 Food Contact Surfaces:

Food contact surfaces shall be CORROSION RESISTANT, DURABLE, EASILY CLEANABLE, RELATIVELY NON-ABSORBENT, NON-TOXIC, SMOOTH, and free of open SEAMS. SINGLE SERVICE ARTICLES need not be durable. Bolts, nuts, threads, rivets, studs and screw heads shall be minimized in accordance with good manufacturing practices on these surfaces. Equipment which shall comply with this item shall include but not be limited to heating units which come in contact with food, beverage or ice containers, coffee maker and reservoirs, and soup warmers. Materials used as food contact surfaces shall be in

compliance with the following requirements：

For enamel products, the requirements of GB4806.3-2016 "National Food Safety Standard Enamel Products" need to be met, and the lead content requirement for cups and mugs (volume is about 240mL):≤0.5μg/mL (this requirement is added to Section 4.2).

For ceramic products, the requirements of GB4806.4-2016 “National Food Safety Standard Ceramic Products” need to be met.

For glass products, the requirements of GB4806.5-2016 “National Food Safety Standard Glass Products” need to be met, and the lead content requirements for cups and mugs (volume is about 240mL): ≤0.5μg/mL (this requirement is added to 4.3 Section).

For paper and paperboard materials and products, the requirements of GB4806.8-2016 “National Food Safety Standard Paper and Paperboard Materials and Products for Food Contact” need to be met.

For metal materials and products, the requirements of GB4806.9-2016 “National Food Safety Standard Metal Materials and Products for Food Contact” need to be met.

For food contact coatings and coatings, the requirements of GB4806.10-2016 “ National Food Safety Standard Food Contact Coatings and Coatings” need to be met.

For plastic and resin food contact materials, the requirements of Table 1 must be met.

**2.2 Non-Food Contact Surfaces:** Surfaces of equipment not intended for contact with food shall be CORROSION-RESISTANT, DURABLE, EASILY CLEANABLE, NON- ABSORBENT, SMOOTH, and free of open SEAMS. These surfaces which may be exposed to splash, food debris, or otherwise require frequent cleaning, shall be washable, free of unnecessary ledges, projections, or crevices; readily accessible for cleaning; and of such material as to be readily maintained in a clean and sanitary condition.

**2.3 Paint:** Paint shall not be used on food contact surfaces. When paint is used on the interior of compartment or components, it shall be a NON-TOXIC MATERIAL and of a light color, preferably white.

**2.4 Sealing Compounds:** Good fabrication techniques should preclude the use of sealants. When sealants are necessary, they shall be non-shrinking, EASILY CLEANABLE, NON-ABSORBENT, and wiped SMOOTH. Resilient sealants shall be used in those areas where sealants may be subjected to loosening or cracking.

**2.5 Solder:** The deposited material shall be DURABLE, EASILY CLEANABLE, SMOOTH, and finished equal to the surrounding area.

**2.5.1 Soft Solder:** Soft solder when used as a food contact surface shall be limited to joining metal or sealing SEAMS between abutting metal surfaces; shall be of such formulation as to be NON-TOXIC MATERIAL under use conditions; shall contain at least 50 percent tin; the content of

lead and cadmium, antimony, bismuth and other toxic materials shall not exceed the good manufacturing practice.

**2.5.2 Hard Solder**: (Silver Solder): Hard solder when used as a FOOD CONTACT SURFACE shall be of such formulation as to be NON-TOXIC MATERIAL under such conditions; shall be CORROSION RESISTANT, and shall, be consistent with good industrial practice in the refining of its constituent elements, cadmium, antimony, bismuth, and other toxic materials shall not exceed the good manufacturing practice.

**2.6 Welding or Brazing**: Welding or brazing materials shall be NON-TOXIC MATERIAL. The smoothness of the resulting JOINT or SEAM surfaces shall be equal to the parent material. All JOINTS or SEAMS shall be DURABLE and EASILY CLEANABLE.

**2.7 Fastening Devices**: Fastening devices shall be CORROSION-RESISTANT under use conditions, sized, and located to permit ease in cleaning. Hollow stem rivets, if used, must be closed at both ends. Blind-type rivets are ACCEPTABLE, provided the tail is ground SMOOTH with the surface of the head.

**2.8 Gaskets**: Gaskets shall be NON-ABSORBENT, NON-TOXIC, odor free, stable, and shaped to fit snugly when installed. Hollow-type gaskets must be closed at ends to be ACCEPTABLE. Exposed surfaces of gaskets shall be EASILY CLEANABLE and JOINTS shall be SEALED.

**2.9 Filler or Trim Strips**: Filler or trim strips shall be constructed of

SMOOTH, odor free, stable, EASILY CLEANABLE, NON-ABSORBENT, NON-TOXIC MATERIAL with all sharp or rough edges removed.

**2.10 Insulation**: Insulation shall be of a material that will not compact, settle or separate under normal operation and use. Fibrous insulation or like material shall be sheathed or protected in such a manner to prevent particles of insulation falling onto food or on galley surfaces.

**2.11 Sound Deadening Material**: Sound deadening material shall be applied so that it does not flake or peel.

## 3. Galley Components

Good sanitary design and construction features are clearly related to the type, weight, and configuration of materials to be used in fabrication of equipment. Materials shall be suitable for the intended use. Components shall meet all applicable requirements of Sections 2 and the general and applicable specific requirements set forth in Section 3.

### General Requirements

**3.1 Temperature Control**: Unless provided for in the GALLEY, the GALLEY COMPONENTS shall be designed to include an effective means of maintaining hot foods at or above 60℃(140℉), and cold foods at or below 7.2℃(45℉).

### Specific Requirements

**3.2 Refrigerators and Freezers:**

**3.2.1** Provisions shall be made to maintain temperature of stored foods at or below 7.2℃(45℉) at all times. Freezers shall be capable of maintaining stored foods in the frozen state.

**3.2.2** Designer/manufacturer must demonstrate to the relevant department that it complies with the requirements of 3.2.1.

**3.2.3** Refrigerator plate surface within the compartment shall be EASILY CLEANABLE or REMOVABLE. Other interior accessories, except light fixtures and impellers, shall be READILY REMOVABLE.

**3.3 Oven, High Temperature:**

**3.3.1** Where ovens are self cleaning, the gaskets may be kept from the NON-ABSORBENT

requirements.

**3.3.2** Where ovens are not self-cleaning, exposed heating elements and all other interior

accessories, except impellers, shall be EASILY REMOVABLE.

**3.3.3** Designer/manufacturer must demonstrate to the FDA that 1st article unit does meet with provisions of 1.18.

**3.3.4** External exhaust ducts if utilized shall be covered with No. 16 size mesh screen or equivalent.

**3.4.1** Holding ovens shall be capable of maintaining the temperature of the food at 60℃(140℉), or above at all times. Conduction ovens shall

meet an equivalent test.

**3.4.2** Indicators shall be provided to signal when the operating temperature of the unit has reached 60℃(140℉).

**3.4.3** Ovens designed for transportation to the aircraft unless other means of protection are used shall be dust tight.

**3.5 Multi-Temperature Units**: These units shall also meet the requirements

applicable for the various temperature ranges uses involved.

**3.6 Coffee Brewers & Reservoirs & Servers:**

**3.6.1** The holder of the coffee package shall be designed to be EASILY CLEANABLE.

**3.6.2** Sensing probes shall be EASILY CLEANABLE or READILY REMOVABLE.

**3.6.3** Reservoir interiors shall be EASILY CLEANABLE and READILY REMOVABLE.

**3.6.4** Faucets shall be EASILY CLEANABLE or READILY REMOVABLE.

**3.6.5** Coffee reservoirs shall be provided with EASILY CLEANABLE covers and when indicated shall be equipped with suitable means to prevent spillage.

**3.6.6** Coffee reservoirs shall have an opening large enough to permit dish washing machine cleaning of the interior.

**3.7 Cup Dispensers:**

**3.7.1** Dispensers when used for storage of single service beverage containers shall be provided with an end cover to protect content end of the cup and be EASILY CLEANABLE.

**3.8 Can Openers/Bottle Openers:**

**3.8.1** All can openers shall be READILY REMOVABLE for returning to the catering point for cleaning.

**3.8.2** Bottle openers if not EASILY CLEANABLE shall be READILY REMOVABLE.

**3.9 Tray Carrier:**

**3.9.1** Doors shall be close-fitting.

**3.9.2** Handle recesses shall be EASILY CLEANABLE.

**3.9.3** Dry ice pockets shall be of EASILY CLEANABLE open-type construction.

**3.9.4** Tray carriers designed with perforated construction shall be transported to aircraft in an ACCEPTABLE transporter unit or be adequately protected from dust and vermin.

**3.10 Ice Container:**

**3.10.1** Provisions shall be made to protect the ice from contamination during transportation and storage.

**3.10.2** Sliding covers, if provided, shall be EASILY CLEANABLE or READILY REMOVABLE and their tracks shall be EASILY

CLEANABLE.

**3.11 Glass Carrier:**

**3.11.1** Doors shall be close-fitting and handle recesses shall be EASILY CLEANABLE.

**3.11.2** Drawers and racks shall be READILY REMOVABLE and designed to permit handling of the glassware without having to touch the lip of the glass.

**3.11.3** Racks of SINGLE USE material are ACCEPTABLE.

**3.12 Mobile Units:**

**3.12.1** Casters and wheels shall be CLEANABLE.

**3.12.2** Exposed portions of the unit's tie-down and brake system shall be CLEANABLE.

**3.12.3** If used, mixing faucets shall be of an ACCEPTABLE type.

**3.12.4** Units for storage and dispensing of glasses, cups, and SINGLE-SERVICE beverage containers shall be of an ACCEPTABLE type.

**3.12.5** Covers if provided for waste storage units shall be EASILY CLEANABLE.

**3.13 Beverage Containers:**

**3.13.1** The inner shell and the outer shell of a double walled metal container shall both be air tight.

**3.13.2** Covers shall be of double wall construction. Vents for the

container shall be designed and located to prevent contamination of the contents when the cover is in place.

**3.13.3** The container is READILY ACCESSIBLE when the cover is removed.

**3.13.4** Insulation shall be non-settling under normal use and temperature ranges.

**3.13.5** The inside of the container shall be sloped toward the faucet to effect complete

drainage.

**3.13.6** Faucets shall be capable of being taken apart without the use of tools and be EASILY CLEANABLE.

**3.13.7** Refillable beverage syrup storage containers are acceptable if they meet the following requirements. Collapsible type containers shall be SINGLE-SERVICE only.

（1）For enamel products, the requirements of GB4806.3-2016 “National Food Safety Standard Enamel Products” need to be met, and the lead content requirement for cups and mugs (volume is about 240mL): ≤0.5μg/mL (this requirement is added to Section 4.2).

（2）For ceramic products, the requirements of GB4806.4-2016 “National Food Safety Standard Ceramic Products” need to be met.

（3）For glass products, the requirements of GB4806.5-2016 “National Food Safety Standard Glass Products” need to be met, and the lead

content requirements for cups and mugs (volume is about 240mL): ≤0.5μg/mL (this requirement is added to 4.3 Section).

（4）For paper and paperboard materials and products, the requirements of GB4806.8-2016 “ National Food Safety Standard Paper and Paperboard Materials and Products for Food Contact” need to be met.

（ 5 ） For metal materials and products, the requirements of GB4806.9-2016 “National Food Safety Standard Metal Materials and Products for Food Contact” need to be met.

（6）For food contact coatings and coatings, the requirements of GB4806.10-2016 “National Food Safety Standard Food Contact Coatings and Coatings” need to be met.

（7）For plastic and resin food contact materials, the requirements of Table 1 must be met.

## 4. Aircraft and Galley Potable Water Systems

### 4.1 Potable Water Storage Tanks:

Potable water tanks shall be constructed in a manner that will prevent contamination of water. They shall be independent and have no common partition with a tank holding non- potable water or other liquids. Tanks shall be constructed of CORROSION-RESISTANT, NON-ABSORBENT and NON-TOXIC material. Interior welded or soldered SEAMS and JOINTS shall be free of rough surfaces. Tanks shall

be designed to permit complete draining and flushing when the aircraft is in its normal parked position. If a protective coating is used, such coating shall be in compliance with section 1.16 of this appendix.

Aircraft galley potable water tanks may be filled independently or from the main potable storage tanks aboard. If filling is to be from the main tanks, it shall be via a continuous, closed piping system, Shut-off valves may be installed in these lines. If filling is directly to the galley tanks, the water filling connection shall be quick-coupling, of a size or type different from other service connections on the aircraft (no greater than 3/4 inch). The connection shall be clearly labeled "Potable Water Filling" and be provided with properly secured protective dust-tight cover. The fill line shall be completely independent and not cross-connected with any line used for non-potable liquids.

Tank overflows and vents shall terminate in a downward direction, and shall be located and constructed to prevent entrance of contamination into the tank. A combined overflow and vent is permissible.

If a means is provided for determining the amount of water in the potable water tank, it shall be constructed to prevent the entrance of contamination into the tank.

**4.2 Distribution:**

All potable water distribution piping, tubing and fittings shall be of CORROSION-RESISTANT, NON-ABSORBENT AND NON-TOXIC

MATERIAL. It shall not be subject to cracking or breaking under normally encountered temperature ranges and use. The potable water system shall not be cross-connected with any non-potable system. Overflows, vents, and drains from tanks or the distribution system shall not be connected directly to waste water lines or waste retention facilities. The entire distribution system shall be designed to allow for complete drainage. If protective covering for piping in the LOWER GALLEY is necessary, the covering shall be NON-ABSORBENT and EASILY CLEANABLE.

Water pressure may be maintained by gravity, compressed air or other non-toxic gases, or electric pump. When compressed air is used, a filter shall be installed in the air supply line. The potable water pump shall be used for no other purpose. Delivery of potable water to sinks, wash basins, and other facilities shall be through an air gap equivalent to twice the effective diameter of the inlet line but in no case less than one inch above the overflow rim of the fixture. Where an air gap is impractical, a properly installed ACCEPTABLE backflow preventer (vacuum breaker) shall be provided. A direct connection of the potable water system to a coffee making or ice making unit is ACCEPTABLE.

If aerators or strainers are used on water outlets, they shall be constructed or CORROSION- RESISTANT, EASILY CLEANABLE material and be EASILY REMOVABLE. Potable water system shall be

properly cleaned, disinfected and flushed before being placed in service.

**4.3 Filters:**

Filtration of potable water from approved sources is not necessary from a public health standpoint. If used, filters shall comply with the " National Food Safety Standard" and shall be of the replaceable type. They shall not degrade the quality of the water. Filters and any other such device shall comply with relevant standards, such as GB 5749-2006 "Standards for drinking Water", GB/T 17218-1998 Hygienic safety evaluation for chemicals used in drinking water treatment", etc.

**4.4 Water Heaters:**

Hot water heaters shall be supplied directly from a potable water system. The accumulation tank and heating elements shall be constructed of CORROSION- RESISTANT, NON-TOXIC material. The insulated casing for the hot water heating system shall be constructed to preclude the accumulation of soil and debris.

**4.5 Water Coolers:**

Water coolers shall be constructed to prevent contamination of the potable water supply. All surfaces in contact with potable water shall be constructed of CORROSION-RESISTANT, NON-TOXIC MATERIAL. A NON-TOXIC coolant shall be used.

**4.6 Drinking Water Stations:**

Drinking water stations shall be constructed of EASILY

CLEANABLE and CORROSION-RESISTANT MATERIAL. All corners subject to splash shall have a radius of at least 1/8 inch. Fountain orifices shall be of the angle-jet type with a guard designed to prevent mouth contact with the outlet. The outlet shall terminate at least an inch above the highest surrounding flood level rim. The drain strainer shall be READILY REMOVABLE. Aerators on faucet type outlet shall be READILY REMOVABLE. Cup dispensers shall be designed as outlined under Item 3.7.

**Table 1 Requirements for testing indexes of plastic and resin food contact materials**

| NO. | Material | Detecting Item | Index |
|---|---|---|---|
| 1 | Acrylic and modified acrylic plastics, semirigid and rigid | 1 Determination of total nonvolatile extractives<br>2 Absorbance of potassium permanganate oxidizable distilled water and 8 and 50 percent alcohol extractive<br>3 Absorbance of ultraviolet-absorbing distilled water and 8 and 50 percent alcohol extractives<br>4 Absorbance of ultraviolet-absorbing n-heptane extractives<br>Note：Acrylonitrile copolymers identified in this section shall comply with the provisions of 21 of this table. | 1 ≤0.3mg/in².<br>2 ≤0.15<br>3 ≤0.30<br>4 ≤0.10 |
| 2 | Closures with sealing gaskets for food containers | 1 Chloroform fraction of water extractives<br>2 Chloroform fraction of heptane extractives<br>3 Chloroform fraction of 8% alcohol extractives | 1 Plasticized polymers≤50ppm（0.05‰）<br>Preformed overall discs or annular rings of unvulcanized plasticized polymers≤50ppm（0.05‰）<br>Preformed overall discs or annular rings of vulcanized plasticized polymers≤50ppm（0.05‰）<br>Preformed overall discs or annular rings of polymeric or resinous-coated paper, paperboard, plastic, or metal foil substrates≤50ppm（0.05‰）<br>2 Plasticized polymers≤500ppm（0.5‰）<br>Preformed overall discs or annular rings of unvulcanized plasticized polymers≤250ppm（0.25‰） |

| | | | |
|---|---|---|---|
| | | | Preformed overall discs or annular rings of vulcanized plasticized polymers≤50ppm（0.05‰）<br>Preformed overall discs or annular rings of polymeric or resinous-coated paper, paperboard, plastic, or metal foil substrates≤250ppm（0.25‰）<br>3 Plasticized polymers≤50ppm（0.05‰）<br>Preformed overall discs or annular rings of unvulcanized plasticized polymers≤50ppm（0.05‰）<br>Preformed overall discs or annular rings of vulcanized plasticized polymers≤50ppm（0.05‰）<br>Preformed overall discs or annular rings of polymeric or resinous-coated paper, paperboard, plastic, or metal foil substrates≤50ppm（0.05‰） |
| 3 | Ethylene-vinyl acetate copolymers（EVA） | 1 Ethylene-vinyl acetate copolymers：<br>（1） extract with distilled water<br>（2） extract with n-heptane<br>（3） extract with 8 percent ethanol<br>（4） extract with 50 percent ethanol<br>2 Maleic anhydride grafted ethylene-vinyl acetate copolymers：<br>（1）melt flow index<br>（2）The weight of the copolymer when blended with other polymers<br>Note：The provisions of this section are not applicable to ethylene-vinyl acetate copolymers used in food-packaging adhesives. | 1 Ethylene-vinyl acetate copolymers：<br>（1）net chloroform-soluble extractives≤0.5 mg/in²<br>（2）net chloroform-soluble extractives≤0.5 mg/in²<br>（3）net chloroform-soluble extractives≤0.5 mg/in²<br>（4）net chloroform-soluble extractives≤0.5 mg/in²<br>2 Maleic anhydride grafted ethylene-vinyl acetate copolymers：<br>（1）melt flow index≤0.21g/min（2.1 grams per 10 minutes）<br>（2）≤17%×weight of total polymer |
| 4 | Melamine-formaldehyde resins | 1 extract with distilled water | 1 net chloroform-soluble extractives≤0.5 mg/in² |

| | | | |
|---|---|---|---|
| | in molded articles | 2 extract with n-heptane<br>3 extract with 8 percent ethanol | 2 net chloroform-soluble extractives≤0.5 mg/in²<br>3 net chloroform-soluble extractives≤0.5 mg/in² |
| 5 | Perfluorocarbon resins（polytetrafluoroethylene /Teflon/PTFE） | 1 articles<br>（1） extract with distilled water<br>（2） extract with 50 percent ethanol<br>（3） extract with n-heptane<br>（4） extract with ethyl acetate<br>2 coating<br>（1） extract with distilled water<br>（2） extract with 8 percent ethanol<br>（3） extract with n-heptane | The content of the extract obtained by extracting with each extract meets the following requirements：<br>1 total extractives≤0.2 mg/in²<br>2 fluoride extractives calculated as fluorine≤0.03mg/in² |
| 6 | Polycarbonate resins（PC） | 1 extract with distilled water<br>2 extract with 50 percent ethanol<br>3 extract with n-heptane | 1 total extractives≤0.15%×weight of the resins<br>2 total extractives≤0.15%×weight of the resins<br>3 total extractives≤0.15%×weight of the resins |
| 7 | Polyethylene phthalate polymers（PET） | 1 For use in contact with all types of foods except (a) those containing more than 8 percent alcohol, or (b) those at temperatures over49°C（120℉）<br>（1）extract with distilled water<br>（2）extract with n-heptane<br>（3）extract with 8 percent ethanol<br>2 The plastics are used for packaging, transporting, or holding food, excluding alcoholic beverages, at temperatures not to exceed 121°C/250 ℉ | 1<br>（1）net chloroform-soluble extractives≤0.5 mg/in²<br>（2）net chloroform-soluble extractives≤0.5 mg/in²<br>（3）net chloroform-soluble extractives≤0.5 mg/in²<br>2<br>（1）net chloroform-soluble extractives≤0.5 mg/in²<br>（2）net chloroform-soluble extractives≤0.5 mg/in²<br>3<br>（1）net chloroform-soluble extractives≤0.5 mg/in²<br>（2）net chloroform-soluble extractives≤0.5 mg/in²<br>（3）net chloroform-soluble extractives≤0.5 mg/in²<br>4 |

| | | | |
|---|---|---|---|
| | | （1）extract with distilled water<br>（2）extract with n-heptane<br>3 The plastics are used for packaging, transporting, or holding alcoholic beverages that do not exceed 50 percent alcohol by volume.<br>（1）extract with distilled water<br>（2）extract with n-heptane<br>（3）extract with distilled water<br>4 The plastics are used to contain foods during oven baking or oven cooking at temperatures above 121°C/250℉<br>（1）extract with distilled water<br>（2）extract with n-heptane<br>5 The plastics are intended for:(i) Dry food contact. (ii) Bulk food (excluding alcoholic beverages) repeated use applications, including filtration, at temperatures not exceeding 100℃/212℉.(iii) Filtration of bulk alcoholic beverages, not exceeding 50 percent alcohol by volume, at temperatures not exceeding 49℃/120℉..<br>（1）extract with distilled water<br>（2）extract with n-heptane<br>（3）extract with 50 percent ethanol | （1）net chloroform-soluble extractives≤0.02 mg/in²<br>（2）net chloroform-soluble extractives≤0.02 mg/in²<br>5<br>（1）net chloroform-soluble extractives≤0.2 mg/in²<br>（2）net chloroform-soluble extractives≤0.2 mg/in²<br>（3）net chloroform-soluble extractives≤0.2 mg/in²<br>6<br>（1）net chloroform-soluble extractives≤0.005 mg/in²<br>（2）net chloroform-soluble extractives≤0.05 mg/in² |

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|---|---|---|---|
| | | 6 The plastics are used for packaging, transporting, or holding alcoholic foods that do not exceed 95 percent alcohol by volume.<br>（1）Containers with greater than 500 mL capacity，extract with 95 percent ethanol<br>（2）Containers with less than or equal to 500 mL capacity，extract with 95 percent ethanol | |
| 8 | Polysulfone resins（PSF，PSU） | 1 extracted at reflux temperatures for 6 hours with distilled water<br>2 extracted at reflux temperatures for 6 hours with 3 percent acetic acid in distilled water,<br>3 extracted at reflux temperatures for 6 hours with 50 percent (by volume) ethyl alcohol in distilled water<br>4 extracted at reflux temperatures for 6 hours with *n*-heptane | 1 total extractives≤0.0078 mg/in²<br>2 total extractives≤0.0078 mg/in²<br>3 total extractives≤0.0078 mg/in²<br>4 total extractives≤0.0078 mg/in² |
| 9 | Poly (tetramethylene terephthalate)（PBT） | 1 extract with distilled water<br>2 extract with n-heptane<br>3 extract with 3 percent aqueous acetic acid<br>4 extract with 50 percent ethanol | 1 total extractives≤0.08 mg/in²<br>2 total extractives≤0.02 mg/in²<br>3 total extractives≤0.04 mg/in²<br>4 total extractives≤0.02 mg/in² |
| 10 | Styrene-methyl methacrylate | 1 total nonvolatile extractives | 1 ≤0.3 mg/in² |

| | | | |
|---|---|---|---|
| | copolymers | 2 potassium permanganate oxidizable distilled water and 8 and 50 percent alcohol extractives<br>3 ultraviolet-absorbing distilled water and 8 and 50 percent alcohol extractives<br>4 ultraviolet-absorbing n-heptane extractives | 2 ≤0.15<br>3 ≤0.30<br>4 ≤0.40 |
| 11 | Urea-formaldehyde resins in molded articles（UF） | 1extract with distilled water<br>2extract with n-heptane<br>3 extract with 8 percent ethanol | 1 total extractives≤0.5 mg/in²<br>2 total extractives≤0.5 mg/in²<br>3 total extractives≤0.5 mg/in² |
| 12 | Phenolic resins in molded articles | 1 extracted with distilled water at reflux temperature for 2 hours<br>2 tested by a spectrophotometric method sensitive to 0.006 milligram of aniline per-square inch of food-contact surface | 1<br>（1）total extractives≤0.15 mg/in²<br>（2）Extracted phenol≤0.005 mg/in²<br>2 No extracted aniline |
| 13 | Polyester resins, cross-linked（PETG/PCTG） | 1 extract with distilled water<br>2 extract with 8 percent ethanol<br>3 extract with 50 percent ethanol<br>4 extract with n-heptane | 1 net chloroform-soluble extractives≤0.1 mg/in²<br>2 net chloroform-soluble extractives≤0.1 mg/in²<br>3 net chloroform-soluble extractives≤0.1 mg/in²<br>4 total nonvolatile extractives≤0.1 mg/in² |
| 14 | Polyethersulfone resins（PES） | 1extract with distilled water<br>2 extract with 50 percent ethanol<br>3 extract with 3 percent acetic acid in distilled water<br>4 extract with n-heptane | 1 net chloroform-soluble extractives≤0.02 mg/in²<br>2 net chloroform-soluble extractives≤0.02 mg/in²<br>3 net chloroform-soluble extractives≤0.02 mg/in²<br>4 net chloroform-soluble extractives≤0.02 mg/in² |

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|---|---|---|---|
| 15 | Polyoxymethylene copolymer. | 1 extract with distilled water，n-heptane and 8 percent ethanol<br>2 extracted with distilled water at reflux temperature<br>3 extract with n-heptane at reflux temperature | 1 net chloroform-soluble extractives≤0.5 mg/in²<br>2 ≤0.2%×weight of the copolymer<br>3 ≤0.15%×weight of the copolymer |
| 16 | Polyoxymethylene homopolymer | 1 density<br>2 melting point<br>3 extract with distilled water，n-heptane and 8 percent ethanol<br>4 extracted with distilled water at reflux temperature<br>5 extracted with n-heptane at reflux temperature<br>6 Formaldehyde | 1 1.39~1.44<br>2 172℃~184℃<br>3 net chloroform-soluble extractives≤0.5 mg/in²<br>4 ≤0.2%×weight of homopolymer<br>5 ≤0.15%×weight of homopolymer<br>6 ≤0.0050%×weight of homopolymer |
| 17 | Polyvinylidene fluoride resins（PVDF） | 1extract with distilled water<br>2 extract with 50 percent ethanol<br>3 extract with n-heptane | 1 total extractives≤0.01 mg/in²<br>2 total extractives≤0.01 mg/in²<br>3 total extractives≤0.01 mg/in² |
| 18 | Rubber articles intended for repeated use | 1 extract with distilled water<br>2 extracted with *n*-hexane | 1<br>（1）extracted at reflux temperature for 7 hours：total extractives≤20 mg/in²<br>（2）the succeeding 2 hours of extraction： total extractives≤1 mg/in²<br>2<br>（1）extracted at reflux temperature for 7 hours：total extractives≤175 mg/in²<br>（2） the succeeding 2 hours of extraction：total extractives≤4 mg/in² |
| 19 | Polyetherimide resin | 1 intrinsic viscosity in chloroform at 25℃（77℉） | 1 ≥0.35 deciliter per gram<br>2 total nonvolatile extractives≤0.077mg/in² |

| | | | |
|---|---|---|---|
| | | 2 extracted with distilled water at 121℃（250℉）for 2 hours | |
| 20 | Polyphenylene sulfone resins（PPSU） | glass transition temperature | （360±5）℃ |
| 21 | Acrylonitrile copolymers | 1 In the case of single-use articles having a volume to surface ratio of 10 milliliters or more per square inch of food contact surface, extracted with distilled water, 8 percent ethanol, 3 percent acetic acid, n-heptane.<br>2 In the case of single-use articles having a volume to surface ratio of less than 10 milliliters per square inch of food contact surface, extracted with distilled water, 8 percent ethanol, 3 percent acetic acid, n-heptane.<br>3 In the case of repeated-use articles, extracted at a time equivalent to initial batch usage, extracted with distilled water, 8 percent ethanol, 3 percent acetic acid, n-heptane. | 1 acrylonitrile monomer extraction limitation：≤0.003mg/in²<br>2 acrylonitrile monomer extraction limitation：0.3ppm<br>3 acrylonitrile monomer extraction limitation：≤0.003mg/in² |