DEPARTMENT OF HEALTH AND HUMAN SERVICES Food and Drug Administration

Food Process Filing for Low-Acid Retorted Method (Form FDA 2541d)

Note: There are separate process filing forms for each of the following: Food Process Filing for Low-Acid Retorted Method (Form FDA 2541d); Food Process Filing for Acidified Method (Form FDA 2541e); Food Process Filing for Water Activity/Formulation Control Method (Form FDA 2541f); and Food Process Filing for Low-Acid Aseptic Systems (Form FDA 2541g).

USE FDA INSTRUCTIONS ENTITLED "Instructions for Paper Submission of Form FDA 2541d (Food Process Filing for Low-Acid Retorted Method)" FDA USE ONLY Date Received by FDA: / (MM/DD/YYYY) Food Canning Establishment (FCE) Number (Enter number assigned by FDA) Submission Identifier (SID) (YYYY-MM-DD/SSS) 20 - - / A. Product Information A.1 (Food Product Group) (Continued) Fungi (e.g., mushrooms, pleurotus, truffles, etc.) Note: Section A.1 (Food Product Group) requests optional information. Gelatin, Pudding Filling for Pies, Pie Filling (liquid form ready-to-eat such as apple pie 1. (Optional) Select one Food Product Group. If there is no single best Food Product filling, etc.) Group that applies, select Other. Gravies/Sauces (spaghetti sauce, mushroom gravy) Aquaculture Seafood (e.g., farming of aquatic organisms including fish, mollusks, Imitation Dairy (includes soy-based products) crustaceans, etc.) Baby Food (infant/junior foods including infant formula) Imitation/Pit/Mixed/Subtropical Fruit ☐ Bakery Products (canned brown bread, bakery glazes) ☐ Imitation/Pit/Mixed/Subtropical Fruit Beans, Corn, or Peas ☐ Imitation/Pit/Mixed/Subtropical Fruit as a Jam, Jelly, Preserve, Drink, Syrup, Topping ☐ Beans or Peas - Dry or Mature Soaked ☐ Beans, Corn, Peas - Fresh Succulent Leafy/Stem Vegetables Berry/Citrus/Core Fruit Leafy/Stem Vegetable ☐ Berry/Citrus/Core Fruit Leafy/Stem Vegetable as a Juice or Drink (e.g., spinach juice, etc.) Berry/Citrus/Core Fruit as a Jam, Jelly, Preserve, Drink, Syrup, Topping Meal Replacement/Medical Foods (e.g., supplemental liquid nutrition, etc.) ☐ Beverage Base ☐ Breakfast Foods (liquid form – ready-to-eat, such as porridge, gruel) ☐ Meat Products (Exotic Meat (emu, elk, etc.)) ☐ Mixed Fishery (e.g., seafood salad, etc.) Cheese (does not include soy cheese or imitation dairy) Mixed Vegetables ☐ Cocoa Coffee/Teas (excluding herbal and botanical teas) Mixed Vegetables (e.g., carrots and peas, etc.) ☐ Dairy (milk-based) Crustacean (e.g., crab, shrimp, lobster, etc.) Mixed Vegetables as a Juice or Drink (e.g., carrot and green bean juice, etc.) Dietary Supplement and/or herbal and botanical teas Dressings/Condiments (e.g., salad dressing, chutney, salsa, pepper sauce, etc.) Multiple Food (one container with a separate compartment for each product item (e.g., lasagna dinner, chop suey dinner, etc.) Engineered Seafood (e.g., shelf-stable imitation crab, surimi, etc.) Fishery (finfish) □ Noodle/Pasta ☐ Other Vegetables □ Nut Spread and Nut Topping Fishery (other aquatic (e.g., alligator, cuttlefish, frog legs, squid, etc.) Pet Food (e.g., dog/cat food, etc.) Fruit as a Vegetable ☐ Rice, Wheat, Oat or Grain (liquid form – ready-to-eat such as grits) Fruit as a Vegetable (e.g., eggplant, pumpkin, etc.) Fruit as a Vegetable Juice or Drink (e.g., eggplant juice, pumpkin juice, etc.)

Food Process Filing for Low-Acid Retorted Method (Form FDA 2541d) A.1 (Food Product Group) (Continued) C. Container Type (Select one) **Root and Tuber Vegetables** Note: If the product is not packaged in one of the container types identified below, select Other. Root/Tuber Vegetables (e.g., carrots, leeks, potatoes, etc.) Root/Tuber Vegetables as a Juice or Drink (e.g., carrot juice, etc.) 1. Aluminum/Tinplate/Steel Can a) What is the shape of the container? (Select one) ☐ Shelled Egg Shellfish (e.g., clams, mussels, oysters, etc.) ☐ Soup ☐ Oval Cylindrical Rectangular Sweet Goods/Dessert (liquid form – ready-to-eat, such as pudding) Irregular (Attach a picture or schematic. Provide name or a brief description of ☐ Vegetable Protein Products (e.g., imitation meat analog) attachment below.) Vine/Other Fruit Other (Attach a picture or schematic. Provide name or a brief description of attachment below.) ☐ Vine/Other Fruit as a Jam, Jelly, Preserve, Drink, Syrup, Topping b) How many pieces are used to construct the container? (Select one or more choices, Other (Specify below) as applicable) i. 2-pieces – Do you use perforated divider plates? Yes ☐ No 2. Enter Product Name (e.g., beans, green; mushrooms (button); tuna (light); sardines (sild)) ii. 3-pieces – Do you use perforated divider plates? Yes ☐ No How is the side seam sealed? (Select one) ☐ Cemented Welded c) Is the container a low-profile container? 3. What is the form of the product? (Select all that are applicable) Yes (If yes, answer either question c.i or c.ii.) \quad No (If no, continue to Section D.) Chunks (e.g., chunks, nuggets, etc.) i. Heat penetration test was conducted with nested containers. (Attach study and ☐ Liguid (i.e., all liguid no solids) ☐ On the Cob ☐ Paste/Puree ☐ Pieces picture or diagram. Provide name or a brief description of attachment below.) Round/Spheres Shredded/Julienne Sliced (e.g., slices, guarters, strips, etc.) Spears/Stalks Whole ii. Nesting of containers prevented by: (Select one) Other (Enter product form) ☐ Brick Stacked ☐ Lid to Lid/Bottom to Bottom ☐ Perforated Divider Plates ☐ Racks ☐ Spiral 4. What is the packing medium? (Select all that are applicable) 2. Ceramic/Glass ☐ Cream/Sauce/Gravy ☐ Oil ☐ Solid (no packing medium) a) What is the shape of the container? (Select one) Syrup None Cylindrical Rectangular Other (Enter packing medium) Irregular (Attach a picture or schematic. Provide name or a brief description of attachment below.) Continue to Section B.

B. Governing Regulation (Refer to the precursor questions in the instructions)

| X | Low-acid (21 CFR 108.35 and 21 CFR Part 113)

Continue to Section C.

☐ No

Other (Attach a picture or schematic. Provide name or a brief description of

☐ Yes

attachment below.)

b) Do you use perforated divider plates?

Food Process Filing for Low-Acid Retorted Method (Form FDA 2541d) C. Container Type: 4. Retortable Paperboard Carton (Continued) C. Container Type: 2. Ceramic/Glass (Continued) c) Is overpressure used during the processing of the product to maintain container integrity? b) Is the container physically restricted during the processing of the product to control container thickness? ☐ Yes (Continue to c.i) □ No (Continue to c.ii-c.iv) Yes (Continue to b.i) ☐ No (Continue to c) i. What is the total overpressure used during processing? __:_ (enter in pounds per square inch gauge (psig)) (Continue to Section D) Racks ii. What is the percent (%) headspace? Other (Attach a picture. Provide name or a brief description of attachment iii. What is the minimum initial temperature? ____ (enter in Fahrenheit) below.) iv. What is the vacuum? ____ (enter in inches of mercury (Hg)) 3. Telexible Pouch c) Is overpressure used during the processing of the product to control container thickness? a) What is the shape of the container? (Select one) ☐ Yes (Continue to c.i) ☐ No (Continue to d) ☐ Flat pouch ☐ Gable top Gable top/side gusseted Gusseted i. What is the total overpressure used during processing? ___ (enter in pounds ☐ Irregular (Attach a picture or schematic. Provide name or a brief description of per square inch gauge (psig)) attachment below.) d) What is the maximum thickness during retort processing? _ _ _ (enter in inches) e) What is the maximum residual air? _ _ _ (enter in cubic centimeters) \(\subseteq \text{Not Applicable} \) Other (Attach a picture or schematic. Provide name or a brief description of attachment below.) 5. Semi-Rigid a) What is the shape of the container? (Select one) b) Is the container physically restricted during the processing of the product to control Bowl Cylindrical Oval Rectangular container thickness? ☐ Yes (Continue to b.i) ☐ No (Continue to c) Irregular (Attach a picture or schematic. Provide name or a brief description of attachment below.) i. Racks Other (Attach a picture. Provide name or a brief description of attachment below.) Other (Attach a picture or schematic. Provide name or a brief description of attachment below.) c) Is overpressure used during the processing of the product to control container thickness? Yes (Continue to c.i) ☐ No (Continue to d) b) Is this a compartmentalized container? (Select one) i. What is the total overpressure used during processing? ____ (enter in pounds Yes How many compartments? ___ No per square inch gauge (psig)) c) What is the predominant material used to make the body of the container? (Select one) d) What is the maximum thickness during retort processing? _ _ _ _ (enter in inches) HDPE (high-density polyethylene) HDPP (high-density polypropylene) Paperboard ☐ PET (polyethylene teraphthalate)

(Continue next page – Semi Rigid)

4. Retortable Paperboard Carton

attachment below.)

a) What is the shape of the container? (Select one)

Other (Attach a picture or schematic. Provide name or a brief description of

Rectangular

Other (Enter material)

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d) What is the predominant material used to make the lid of the container? (Select one) Aluminum/Steel	C. Container Type: 6. Other (Continued) b) Specify the material that, based on weight, is the predominant material used to make the container stock. This is the material that constitutes the highest weight value of the container stock. c) Specify the material that, based on weight, is the predominant material used to make the lid stock. This is the material that constitutes the highest weight value of the lid stock. If the container does not have a lid, specify Not Applicable. d) Specify the method used to seal the lid to the body of the container. If the container does not have a lid, specify Not Applicable. Continue to Section D. D. Container Size Note: Section D.1 (dimensions) is required information. However, section D.2
f) Is the container physically restricted during the processing of the product to control container thickness? Yes (Continue to f.i) No (Continue to g) Racks Other (Attach a picture. Provide name or a brief description of attachment below.)	 (net weight) is optional information. 1. Dimensions: a) Diameter Height (Use for cylindrical shapes) (see accompanying instructions for proper coding) b) Length Width Height/Thickness (Use for container shapes other than cylindrical) (see accompanying instructions for proper coding) 2. Net Weight (Optional): (enter in ounces)
g) Is overpressure used during the processing of the product to control container thickness? Yes (Continue to g.i) No (Continue to h) i. What is the total overpressure used during processing? (enter in pounds per square inch gauge (psig)) h) What is the maximum thickness during retort processing? (enter in inches) i) What is the maximum residual air? (enter in cubic centimeters) Not Applicable 6. Other (Enter container type) a) Attach schematic or picture of container. (Provide name or a brief description of attachment below.)	E. Processing Method: Thermally Processed Non-Aseptic System 1. What is the finished equilibrium pH of the product after processing? 2. Heating Medium (Select one) a)
	Continue to Section F.

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F. Process Mode	G. Process System Critical Factors (Continued)					
1. Mode (Select One). Only 1 Process Mode, either Agitating or Still, should be selected.	3. Is the product vacuum packed? ☐ Yes ☐ No					
a) Agitating <i>(Select one)</i> i. Axial <i>(Select one)</i>	4. What is the container position in retort? (Select one) (Under Section F.1 when Agitating is selected, skip this question.)					
☐ Batch ☐ Continuous	☐ Brick Stacked ☐ Horizontal ☐ Jumbled/Random					
ii.	☐ Lid Down ☐ Lid Up ☐ Vertical					
iii. Oscillation (Only batch) <i>(Select one)</i> High frequency Low frequency	When heating medium of high pressure assisted, microwave, ohmic, or steam is selected in Section E, skip G.5 and G.6.					
b) Still <i>(Select one)</i> i. Horizontal	5. Minimum Come-Up-Time: (enter in minutes) (Attach a temperature distribution study. Provide name or a brief description of attachment below.)					
ii.	When heating medium of steam-air is selected in Section E, skip G.6					
2. Cooker: What type of cooker do you use? (Select one)a) Crateless: Bottom Surface (Select one)	6. Minimum Water Flow Rate: (enter using gallons per minute (gpm))					
☐ Solid ☐ Perforated b) ☐ Hydrolock	□ Not Applicable (Attach an explanation. Provide name or a brief description of attachment below.) □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □					
c) Hydrostatic d) Retort	Continue to Section H.					
e)	H. Product Critical Factors: (Complete all product critical factor questions as delineated by process authority to assure commercial sterility.)					
g) Other (Enter cooker type)	1. Does the product contain particulates?					
(For Other cooker type choice, attach documentation. Provide name or a brief description of attachment below.)	a) Is controlling the particulate size a critical factor? — Yes (Continue to b-d) — No (Continue to H.2)					
	b) What is the shape and dimension of the particulate size to be controlled? If more than one, list all that apply.					
Continue to Section G.						
G. Process System Critical Factors	c) Does your product contain fines?					
1. What is the filling method(s) used to fill the product into the container? (Select all that apply)	i. What is the maximum percent? ·					
☐ Hand filling☐ Pocket filler☐ Vibrating/Tumble filling☐ Volumetric filling	d) Is full rehydration of the particulate a critical factor?					
How many phases are used to fill the container with the product? (Select one)	2. Does the product contain any dry ingredients?					
	☐ Yes (Continue to a) ☐ No (Continue to H.3)					
☐ Single Phase ☐ Two Phase ☐ Three Phase (Continue to a)	 a) What is the minimum % moisture of the hydrated dry ingredients before processing? 					
a) Enter the number of ounces added in each Phase. Phase 1: Phase 2: Phase 3:	□ Not Applicable					

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H. Product Critical Factors (Continued)	H. Product Critical Factors (Continued)					
3. How are pieces arranged in the container? (Select one) Head to Tail Heads/Tips Down Heads/Tips Up Horizontal Layered Vertical Not Applicable Other (Enter arrangement of pieces)	8. Are other binders added? Yes (Continue to a-b) No (Continue to H.9, a) What is the maximum % binder added? b) What is the type of binder added? 9. Does syrup strength affect the heat penetration during processing of the product?					
For Other arrangement of pieces choice, attach documentation. Provide name or a brief description of attachment below.)	☐ Yes (Continue to a) ☐ No (Continue to Section I) a) What is the brix measurement?					
	Continue to Section I.					
4. Does the % total solids affect the heating of the product during processing?	I. Process Source (Complete the questions below) *Note: If you selected "Still" as the mode in Section F.1, and "Steam" as the heating medium in Section E.1, you may select "Unknown" or "Locally Made" for sterilizer if applicable.					
5. Is the finished equilibrium pH of the product after processing (identified in Section E) critical to the process?Yes No	sterilizer if applicable. 1. Process Source a) What is the Process Source?					
6. Does consistency/viscosity affect the heating of the product? Yes (Continue to a-c) No (Continue to H.7) a) What instrument is used to measure the consistency/viscosity?	(Attach support documentation. Provide name or a brief description of attachment below.)					
b) What is the temperature when you measure the consistency/viscosity? (enter in Fahrenheit) c) What is the consistency/viscosity?	b) What is the date of the Process Source Document (mm/dd/yyyy)? / / / 2. What is the Manufacturer's Name and the Sterilizer Model?					
What is the unit of measure? <i>(Select one)</i> Centipoise Other <i>(Enter units of measure)</i>	*Unknown/Locally Made (Attach pictures and documentation. Provide name or a brief description of attachment below.)					
7. Is starch added to maintain consistency/viscosity of the product? Yes (Continue to a-b) No (Continue to H.8) a) What is the maximum % starch added? b) What type of starch is added?	Continue to Section J.					

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J. Scheduled Process: (Do not write in shaded areas -- Check appropriate box under column heading, when applicable, and enter numerical values on dashed lines.)

In the section below, please do NOT enter decimal points. They are already on the form. No blank spaces are allowed, therefore, enter leading zeros, where necessary.

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9					Col 10	Col 11	Col. 12	Col. 13	
Process No	Col. 2 Step	Col. 3 Minimum Initial Temp.	Col. 4 Process Time	Process Temp.	Fo (F18/250)	Col. 7 Thruput (Containers per Minute)	Col. 8 Headspace	a. Reel Speed	b. Reel Diameter	c. Steps per Turn of Reel	d. Chain/ Conveyer Speed	e. Cooker Capacity	f. Frequency Strokes per Minute	Col. 10 Maximum Fill Weight	Col. 11 Minimum Free Liq. at Closing	Col. 12 Minimum Container Closing Machine Gauge Vacuum	Col. 13 Other
							Gross NA				Carriers Flights (per minute)					(+/- 3° F)	
Number	Number	°Fahrenheit	Minutes	°Fahrenheit	Minutes	Number	Inches	RPM	Inches	Number	Number	Number	Number	Ounces	Ounces	In. Hg.	
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F000	d Process Filing for I	Low-Acid Retorte	d Method (Form F	DA 2541d)								
K. /	Additional Informat	on (Optional)										
	Heat Penetration Data (c	ptional) :										
ı	Enter applicable values:	1. j value	2. fh value	_ 3. f2 value	4. jc valu	e·	5. fc value	6	x (X _{bh}) value			
I	Heat Penetration Study (Attach document.	Provide name or a b	rief description of attachi	nent below.)							
	Temperature Distribution	Study (Attach doc	ument. Provide nam	e or a brief description of	attachment	below.)						
	Other (Attach documen	t. Provide name or	a brief description o	of attachment below.)								
Comi	ments:											
Note: Under the terms and provisions of Title 18, Section 1001, United States Code, in any matter within the jurisdiction of the executive branch of the Government of the United States it is a criminal offense to falsify, conceal, or cover up a material fact; make any materially false, fictitious, or fraudulent statement or representation; or make or use any false writing or document knowing the same to contain any materially false, fictitious, or fraudulent statement or entry.						when it contains parameters that cannot be reconciled with one another, such that the filing does not describe a process that could actually be carried out. If we determine that your process filing appears fabricated, we will delete the filing from our system and notify you. We will not consider you to have complied with 21 CFR 108.35(c)(2) until you submit a completed process filing that does not appear to be fabricated.						
	your process filing ap in compliance with 2	•	•									
Full	Name (Please Type or F	Print)			Signature							
		,										
Esta	State or Province				Country (other than U.S.)				Date	Telephone No.		

LACF Contact Information

For more information, contact the LACF Registration Coordinator by e-mail at LACF@FDA.HHS.GOV or phone: 240-402-2411.

For paper submissions, send completed forms to:

Food and Drug Administration LACF Registration Coordinator (HFS-303) Center for Food Safety and Applied Nutrition 5001 Campus Drive College Park, MD 20740-3835

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