## DEPARTMENT OF HEALTH AND HUMAN SERVICES FOOD AND DRUG ADMINISTRATION

## PROCESSING IN STEAM IN CONTINUOUS AGITATING RETORTS (Retort Survey)

## INSTRUCTIONS

Complete the question blocks below. Narrative responses to each item can be entered in the item's "comments" area or where otherwise prompted. Draw a diagram of the retort or obtain one from the firm and attach it to the EIR as an exhibit. Report all pipe sizes as inside diameter (ID). Refer to 21 CFR Part 113.40(c) and pp 28-30 of LACF Guide Part 2.

If problems are found with the firm's retort equipment or processing system, refer the reader to the narrative Turbo EIR under "Objectionable Conditions and Management's Response," and include a narrative explanation of specific problems and evidence under the subheading "Supporting Evidence and Relevance." Submit the completed form as an EIR attachment.

	RETO	RT DESCRIPTION		
RETORT NO.	*CAN SIZE	COOKER CAPACITY	STEPS/REEL	
	NO. OF FRECOORERS	NO. OF FRE33 COOLERS	NO. OF AMOS. COULLAS	
*List the Can Size covered durin	g the inspection.	·		
	COMP	UTER CONTROLS		
DOES A COMPUTER CON EXPLAIN:	TROL ANY OF THE RETORT F	UNCTIONS?	Yes 🗌 No 🗌	
DOES THE FIRM HAVE DOO	CUMENTATION ON HAND THAT	INDICATES THAT THE COMPUTER	SYSTEM HAS BEEN VALIDATED?	
EXPLAIN:			Yes 🗌 No 🗌	
IS RECORD KEEPING PAR	T OF THE COMPUTER FUNCT	[ION?	Yes 🗌 No 🗌	
IF YES, DOES THE RECOR	D KEEPING COMPLY WITH 21	CFR PART 11?	Yes 🗌 No 🗌	
COMMENTS:				
	NDICATING MERCURY IN-0	GLASS THERMOMETERS (113.4	0(c)(1))	
IS THE RETORT EQUIPPED COMMENTS:	WITH AT LEAST ONE MERCI	URY IN-GLASS (MIG) THERMOMET	ER? Yes 🗌 No 🗌	
IS THE RETORT EQUIPPED IF YES, DESCRIBE THE IND	D WITH ANOTHER TYPE OF TH DICATOR:	EMPERATURE INDICATING DEVICE	?Yes 🗌 No 🗌	
ARE SCALE DIVISIONS EAS	SILY READABLE TO 1°F (.5°C)?	,	Yes 🗌 No 🗌	

NO. OF DEGREES F OR C/IN. OF GRADUATED SCALE: PER INCH (4°C/CM) OF GRADUATED SCALE, SEE LACF GUIDE, P. 14.	(TEMP. RANGE MUST NOT EXCEED 17°F(8°C)
DATE LAST TESTED FOR ACCURACY:	
(THERMOMETERS <b>SHALL</b> BE TESTED FOR ACCURACY AGAINST A UPON INSTALLATION AND AT LEAST ONCE A YEAR THEREAFTER; RI DATE, STANDARD USED, METHOD USED, AND PERSON PERFORMIN THERMOMETER <b>SHOULD</b> HAVE A TAG, SEAL, OR OTHER MEANS OF TESTED FOR ACCURACY.)	KNOWN ACCURATE STANDARD THERMOMETER ECORDS OF ACCURACY CHECKS THAT SPECIFY G THE TEST <u>SHOULD</u> BE MAINTAINED. EACH IDENTITY THAT INCLUDES THE DATE IT WAS LAST
STANDARD USED FOR THE TEST:	
NAME AND TITLE OF PERSON WHO PERFORMED TEST:	
IS THE LAST TEST DATE IDENTIFIED ON THE THERMOMETER?	Yes 🗌 No 🗌
WERE CALIBRATING TEST RECORDS PREPARED/MAINTAINED? (SHOULD REQUIREMENT) COMMENTS:	Yes 🗌 No 🗌
DESCRIBE THE FIRM'S ACTIONS REGARDING MIG THERMOMETERS	THAT WERE OUT OF CALIBRATION:
IS THE MERCURY UNDIVIDED? (A THERMOMETER THAT HAS A DIVIDED MERCURY COLUMN OR TH <u>SHALL</u> BE REPAIRED OR REPLACED.) COMMENTS:	AT CANNOT BE ADJUSTED TO THE STANDARD
WHEN MIG THERMOMETERS ARE FOUND TO BE PROVIDING READIN FIRM EVALUATE PRODUCTS PRODUCED USING THOSE THERMOME DESCRIBE THE FIRM'S PROCEDURES:	IGS ABOVE THE ACTUAL TEMPERATURES, DOES THE TERS?Yes No 🗌
IS THE THERMOMETER LOCATED WHERE IT IS EASY TO READ ACCU ( <i>SHALL REQUIREMENT</i> ) COMMENTS:	JRATELY?Yes 🗌 No 🗌
THE SENSOR BULB IS LOCATED IN THE ( <i>SHALL REQUIREMENT</i> ) COMMENTS:	Retort Shell 🗌 , or External Well 🗌
DIAMETER OF OPENING FROM RETORT TO EXTERNAL WELL: (OPENING <u>SHALL</u> BE AT LEAST 3/4-IN. DIA.)	BLEEDER SIZE: (BLEEDER <b>SHALL</b> BE AT LEAST 1/16-IN. DIA.)
IS THE THERMOMETER LOCATED WHERE IT IS EASY TO READ ACCU (SHALL REQUIREMENT) COMMENTS: THE SENSOR BULB IS LOCATED IN THE	JRATELY?

(SHALL REQUIREMENT) IF NO, EXPLAIN (OR ANY OTHER COMMENT):

IF A MUFFLER IS USED ON BLEEDER(S), WHAT EVIDENCE DOES THE FIRM HAVE THAT IT DOES NOT RESTRICT FREE FLOW OF STEAM?

(**SHALL** REQUIREMENT – 113.87(g)) COMMENTS:

IS THE MERCURY THERMOMETER USED AS THE REFERENCED INSTRUMENT DURING PROCESSING? ... Yes No (SHALL REQUIREMENT) (SHALL REQUIREMENT) COMMENTS:

TEMERATURE RECORDING DEVICE (113.40(c)(2))	
IS THE RETORT EQUIPPED WITH A TEMPERATURE RECORDING DEVICE?	
TYPE OF TEMPERATURE RECORDER Round Circular Chart 🗌 Strip Chart 🗌 Other 🗌	
IF OTHER, EXPLAIN:	

IS THE RECORDER COMBINED WITH A STEAM CONTROLLER?
THE TEMPERATURE SENSING BULB IS INSTALLED IN THE Retort Shel [], or External Well [] (THE TEMPERATURE-RECORDER BULB <b>SHALL</b> BE INSTALLED EITHER WITHIN THE RETORT SHELL OR IN A WELL ATTACHED TO THE SHELL.) COMMENTS:
DOES THE TEMPERATURE RECORDER BULB WELL HAVE A 1/16-IN. DIA. OR LARGER BLEEDER THAT EMITS STEAM CONTINUOUSLY DURING THE PROCESSING PERIOD?Yes No NA N/A ( (SHALL REQUIREMENT) COMMENTS:
IF A MUFFLER IS USED ON THE BLEEDER, DOES THE FIRM HAVE DOCUMENTED EVIDENCE THAT IT DOES NOT BLOCK THE FLOW OF STEAM?Yes No N/A ( <i>SHALL REQUIREMENT – 113.87(g)</i> ) COMMENTS:
PRESSURE GAGE (113.40(c)(3))
IF A PRESSURE GAGE IS PRESENT ON THE RETORT COOKER SHELL, IS IT GRADUATED IN DIVISIONS OF 2 LBS. OR LESS?
( <u>SHOULD</u> REQUIREMENT)
IS THE PRESSURE COOLING SHELL EQUIPPED WITH A PRESSURE GAGE?
IF THE COOKER SHELL IS CONNECTED BY TRANSFER VALVES TO A PRESSURE COOLING SHELL, IS THE PRESSURE IN THE COOLER LESS THAN THE PRESSURE IN THE COOKER?
STEAM CONTROLLER (113.40(c)(4))
(EACH RETORT <b>SHALL</b> BE EQUIPPED WITH AN AUTOMATIC STEAM CONTROLLER TO MAINTAIN THE RETORT TEMPERATURE.) COMMENTS:
IS THE STEAM CONTROLLER TEMPERATURE OR PRESSURE ACTUATED?Temp Press
(THE STEAM CONTROLLER MAY BE ACTUATED BY A TEMPERATURE SENSOR POSITIONED NEAR THE MERCURY-IN- GLASS THERMOMETER; A STEAM CONTROLLER ACTIVATED BY THE STEAM PRESSURE OF THE RETORT IS ACCEPTABLE IF IT IS CAREFULLY MAINTAINED SO IT OPERATES SATISFACTORILY.)

COMMENTS:

REPORT THE MANUFACTURER, MODEL, TYPE AND SIZE OF THE AUTOMATIC STEAM CONTROL VALVE:

IF THE TEMPERATURE (STEAM) CONTROLLER IS AIR OPERATED, DOES THE SYSTEM HAVE AN ADEQUATE FILTER TO ASSURE A SUPPLY OF CLEAN, DRY AIR?
(AIR OPERATED TEMPERATURE CONTROLLERS <u>SHOULD</u> HAVE ADEQUATE FILTER SYSTEMS TO ASSURE A SUPPLY OF CLEAN, DRY AIR 113.40(C)(2).) COMMENTS:
BLEEDERS (113.40(c)(5))
ARE BLEEDERS (EXCEPT THOSE FOR THERMOMETER WELLS) 1/8-INCH OR LARGER IN DIAMETER? Yes No () ( <i>SHALL REQUIREMENT)</i> COMMENTS:
ARE THESE BLEEDERS LOCATED ALONG THE TOP OF THE RETORT NO MORE THAN 8 FT. APART AND WITHIN APPROXIMATELY 1 FT. OF THE OUTERMOST LOCATION OF CONTAINERS AT EACH END?
ARE THE BLEEDERS ARRANGED SO THE OPERATOR CAN OBSERVE THAT THEY ARE OPERATING PROPERLY? Yes No (SHALL REQUIREMENT) COMMENTS:
ARE THE BLEEDERS WIDE OPEN DURING THE ENTIRE PROCESS INCLUDING THE COME-UP TIME?
IF A MUFFLER IS USED ON BLEEDERS, DOES THE FIRM HAVE DOCUMENTED EVIDENCE THAT IT DOES NOT RESTRICT FREE FLOW OF STEAM?
VENTING & CONDENSATE REMOVAL (113.40(c)(5&6))
IS THE RETORT VENTED TO REMOVE AIR PRIOR TO PROCESSING?Yes No ()
NUMBER OF VENTS: DIAMETER: LENGTH: LOCATION:

WHAT IS THE TYPE OF VENT VALVE? Other Discrete Gate Discrete Content
ARE VENTS FULLY OPEN DURING VENTING?Yes No I
DOES THE FIRM HAVE ON FILE DOCUMENTARY PROOF DEMONSTRATING THAT ADEQUATE VENTING IS ACHIEVED? Yes No (SHALL REQUIREMENT – 113.40(c)(6); HEAT DISTRIBUTION DATA AND/OR A LETTER FROM A COMPETENT PROCESS AUTHORITY DOCUMENTING THE LAST HEAT DISTRIBUTION TEST PERFORMED ON THE RETORT (DATE OF TEST, WHO PERFORMED THE TEST, THE RESULTING VENT SCHEDULE, ETC) WOULD BE ACCEPTABLE DOCUMENTATION.) COMMENTS:
IS A STEAM BY-PASS VALVE USED DURING VENTING?
(NOTE: VENTING PROCEDURES AND ARRANGEMENTS MUST BE THE SAME AS USED DURING THE TEMPERATURE DISTRIBUTION STUDY THAT WAS CONDUCTED ON THE RETORT TO ESTABLISH THE VENT SCHEDULE.)
IF VENTS ARE EQUIPPED WITH MUFFLERS, SPECIFY TYPE AND PERFORMANCE CHARACTERISTICS. DOES THE FIRM HAVE DOCUMENTED EVIDENCE THAT THE MUFFLER ALLOWS ADEQUATE VENTING?
WHEN THE STEAM IS TURNED ON, IS THE DRAIN OPENED FOR A TIME SUFFICIENT TO REMOVE STEAM CONDENSATE FROM THE RETORT?
HAS PROVISION BEEN MADE FOR CONTINUAL OR AUTOMATIC DRAINAGE OF CONDENSATE DURING RETORT OPERATION?
Yes No ( ( <u>SHALL</u> REQUIREMENT; A CONDENSATE TRAP OR BLEEDER LOCATED AT THE BOTTOM OF THE RETORT WOULD BE SUFFICIENT TO ASSURE CONTINUAL CONDENSATE REMOVAL.) DESCRIBE THE PROCEDURES USED FOR CONDENSATE REMOVAL:
IS THE RETORT EQUIPPED WITH A CONDENSATE TRAP?
IS THERE A CONDENSATE BLEEDER IN THE BOTTOM OF THE RETORT SHELL THAT SERVES AS AN INDICATOR OF CONTINUOUS CONDENSATE REMOVAL?

IF SO, IS THIS BLEEDER VISIBLE TO THE RETORT OPERATOR?Yes □ No □ (SHALL REQUIREMENT) COMMENTS:
DOES THIS CONDENSATE BLEEDER CONTINUOUSLY EMIT STEAM DURING THE THERMAL PROCESS? Yes No ( ( <i>SHALL REQUIREMENT</i> ) COMMENTS:
IS THE CONDENSATE BLEEDER CHECKED WITH SUFFICIENT FREQUENCY DURING RETORT OPERATION TO ASSURE ADEQUATE REMOVAL OF CONDENSATE?
ARE THESE OBSERVATIONS RECORDED AT THE TIME THEY ARE MADE?Yes □ No □ (SHALL REQUIREMENT – 113.100(a)) COMMENTS:
IF THE CONDENSATE BLEEDER IS NOT VISIBLY MONITORED, IS IT EQUIPPED WITH AN AUTOMATIC ALARM SYSTEM THAT SERVES AS A CONTINUOUS MONITOR OF CONDENSATE FUNCTIONING?Yes No ( (SHALL REQUIREMENT) COMMENTS:
IF AN AUTOMATIC ALARM IS USED TO MONITOR CONDENSATE FUNCTIONING, DOES IT WORK ADEQUATELY? Yes No COMMENTS:
RETORT SPEED TIMING (113.40(c)(7))
IS THE ROTATIONAL SPEED OF THE RETORT ADJUSTED AND RECORDED WHEN THE RETORT IS STARTED, AT ANY TIME A SPEED CHANGE IS MADE, AND AT INTERVALS OF SUFFICIENT FREQUENCY TO ENSURE THAT THE RETORT SPEED IS MAINTAINED AS SPECIFIED IN THE SCHEDULED PROCESS?
ARE THESE ADJUSTMENTS AND RECORDINGS MADE AT LEAST ONCE EVERY 4 HOURS?
IF ROTATIONAL SPEED ADJUSTMENTS AND RECORDINGS ARE NOT MADE AT INTERVALS OF SUFFICIENT FREQUENCY, DOES THE FIRM HAVE A RECORDING TACHOMETER TO PROVIDE A CONTINUOUS RECORD OF THE RETORT SPEED? Yes $\Box$ No $\Box$
COMMENTS:

DOES THE FIRM HAVE A MEANS OF PREVENTING UNAUTHORIZED SPEED CHANGES ON THE RETORT? ...... Yes 🗌 No 🗌

(SHALL REQUIREMENT; A LOCK OR NOTICE FROM MANAGEMENT POSTED AT OR NEAR THE SPEED ADJUSTMENT DEVICE THAT PROVIDES A WARNING THAT ONLY AUTHORIZED PERSONS ARE PERMITTED TO MAKE ADJUSTMENTS, IS A SATISFACTORY MEANS OF PREVENTING UNAUTHORIZED CHANGES.)

Adjustment of the reel speed changes the process time and may affect the agitation of the product. The reel speed calculated to provide the process time would be entered on the FDA 2541a (Scheduled Process Filing Form) in Part D column titled "Reel Speed" in revolutions per minute (rpm). A minimum reel speed (slower than the reel speed providing adequate-processing time) may be determined during process establishment to provide for adequate product agitation. This minimum reel speed should be entered on Form 2541a, Part D in the column titled "Other" along with an explanation of "minimum reel speed". Minimum reel speed for agitation may be less than the reel speed established for the process time. Reel speeds greater than the established reel speed for adequate agitation of the product. In cases where a minimum reel speed for agitation is not identified by the processing source, determine if agitation is critical to the process. Note some processes are established without considering agitation. If agitation is critical to the process, the firm should have information that identifies the minimum rpm required to achieve adequate product agitation in the container. This reel speed may be the same as that established to provide for process time.

Reel speed and process time can be determined using the following formulas. To use these formulas, known values can be entered into the formula to determine unknown values or to check the values supplied by the firm on the process filing form. The capacity of the retort is normally stamped on the end of the cooker reel shaft. The approximate number of reel steps for the FMC system for each container size is provided in the table below. Please be aware that some reels may be altered. In some cases, the firm may process a smaller can size in a reel designed for a larger container (e.g. 300 in a 303 x 307 reel).

CONTAINER SIZE	NUMBER OF STEPS PER TURN OF REEL	
211		
300-303		
303-307		
401-404		
603	24	
DETERMINE THE REEL SPEED THE RETORT REEL AND REPO	BY TIMING 10 REVOLUTIONS OF RT RESULTS (IN SECONDS):	
SECONDS FOR 10 REVS = (	10 RVS)X(60 SECS) X (REEL STEPS) X (PROCE	-SS TIME//CAPACITY
ACTUAL PROCESS TIME =	MIN.	
IS THE ACTUAL PROCESS TIME CALCULATE THE PROCES SPE <i>CONTAINERS PER MINUTE</i> = CONTAINERS PER MINUTE = _	E AT LEAST EQUAL TO THE MINIMUM PROCES ED IN CONTAINERS/MIN USING THE FORMUL CAPACITY/PROCESS TIME (MIN)	S TIME FILED WITH FDA Yes No
CALCULATE THE REEL SPEED <i>RPM = CAPACITY/(REEL STE</i> REEL SPEED (RPM) =	AS REVOLUTIONS PER MINUTE (RPM) USING PS) X (PROCESS TIME) 	THE FORUMLA:
IS THE REEL SPEED CALCULA EQUAL TO THE MINIMUM REEL (IF NO, THE LOT COULD BE UN	TED ABOVE AS CONTAINERS PER MINUTE AN . SPEED FILED WITH FDA? NDER PROCESSED AND SHOULD BE HANDLEI	D/OR REVOLUTIONS PER MINUTE AT LEAST Yes No D D AS A PROCESS DEVIATION. )

ALTERNATE FORMULAS WHICH CAN BE USED TO DETERMINE SECONDS FOR 10 REVOLUTIONS OF THE REEL: (10 REV) X (60 SECS) X (#REEL STEPS)/(CPM) (10 RVS) X (60 SEC)/RPM COMMENTS: EMERGENCY STOPS (113.40(c)(8) IF EMERGENCY STOPS ARE NOT OBSERVED DURING PROCESSING OR REVIEW OF RECORDS, ANSWER THE FOLLOWING QUESTIONS BY REVIEW OF WRITTEN SOPS OR INTERVIEW WITH MANAGEMENT. INDICATE HOW THIS INFORMATION WAS OBTAINED: Processing Observation Review of Processing Records Review of Sops Interview with Management COMMENTS: IN THE CASE OF A JAM OR BREAK DOWN DURING PROCESSING OPERATIONS NECESSITATING COOLING THE RETORT. IS THE RETORT OPERATED IN SUCH A WAY THAT ENSURES THAT THE PRODUCT IS COMMERCIALLY STERILE? Yes No 🗌 (THIS CAN BE ACHIEVED BY REPROCESSING OR REPACKING & REPROCESSING.) No 🗌 (SHALL REQUIREMENTS) COMMENTS: IF OPERATED AS A STILL RETORT, ARE ALL CONTAINERS GIVEN A FULL, STILL RETORT PROCESS BEFORE THE N/A No No 🗌 (SHALL REQUIREMENTS) COMMENTS: IF ANY CONTAINERS ARE IN THE RETORT INTAKE VALVE OR IN TRANSFER VALVES BETWEEN COOKER SHELLS AT THE TIME OF BREAKDOWN, ARE THE CONTAINERS REPROCESSED, REPACKED AND REPROCESSED, OR DISCARDED? Yes No 🗌 (**SHALL** REQUIREMENT - (113.40(c)(8)(i)) COMMENTS: IS BOTH THE TIME AT WHICH THE REEL STOPPED AND THE TIME THE RETORT WAS USED FOR A STILL RETORT PROCESS MARKED ON THE RECORDING CHART AND ENTERED ON OTHER PRODUCTION RECORDS? ...... Yes 🗌 No 🗌 N/A (SHALL REQUIREMENT - (113.40(c)(8)(ii)) COMMENTS: IF THE RETORT IS COOLED FOLLOWING AN EMERGENCY STOP. ARE SUBSEQUENT HANDLING METHODS USED FOR CONTAINERS IN THE RETORT AT THE TIME OF STOPPING AND COOLING ENTERED ON PRODUCTION RECORDS? N/A Yes No

DESCRIBE ANY INCIDENCES OF EMERGENCY STOPS THAT WERE NOT HANDLED ACCORDING TO 113.40(c)(8):

TEMPERATURE DROPS (113.40(c)(9)		
IF TEMPERATURE DROPS ARE NOT OBSERVED DURING THE INSPECTION OR REVIEW OF PROCESSING RECORDS, ANSWER THE FOLLOWING QUESTIONS BY REVIEW OF THE FIRM'S SOPS OR INTERVIEW WITH MANAGEMENT. INDICATE HOW THIS INFORMATION WAS OBTAINED:		
Processing Observation Review of Processing Records Review of Sops Interview with Management COMMENTS:		
IF THE TEMPERATURE OF THE RETORT DROPS BELOW THE TEMPERATURE SPECIFIED IN THE SCHEDULED PROCESS WHILE CONTAINERS ARE IN THE RETORT, IS THE REEL STOPPED PROMPTLY?		
IF YES, IS AN AUTOMATIC DEVICE USED TO STOP THE REEL?		
BEFORE THE RETORT IS RESTARTED, ARE ALL CONTAINERS IN THE RETORT GIVEN A COMPLETE SCHEDULED STILL RETORT PROCESS IF THE TEMPERATURE DROP WAS 10°F OR MORE BELOW THE SPECIFIED TEMPERATURE? Yes I No I N/A I		
IF YES, ARE BOTH THE TIME AT WHICH THE REEL STOPPED AND THE TIME THE RETORT WAS USED FOR A STILL RETORT PROCESS MARKED ON THE RECORDING CHART AND OTHER PRODUCTION RECORDS?		
Yes         No         N/A           (SHALL REQUIREMENTS)         Ves         No         N/A		
ALTERNATIVELY, IF THE TEMPERATURE DROP IS 10°F OR MORE, IS CONTAINER ENTRY TO THE RETORT STOPPED AND THE REEL RESTARTED TO EMPTY THE RETORT?		
IF YES, ARE THE DISCHARGED CONTAINERS EITHER: Reprocessed  Repacked & Reprocessed , or Discarded ?		
ARE SUBSEQUENT HANDLING METHODS USED FOR CONTAINERS IN THE RETORT AT THE TIME OF THE TEMPERATUR DROP ENTERED ON PRODUCTION RECORDS?		
IF THE TEMPERATURE DROP IS LESS THAN 10°F, IS THE PRODUCT GIVEN AN AUTHORIZED EMERGENCY STILL PROCES BEFORE RESTARTING THE RETORT REEL?		
IS CONTAINER ENTRY INTO THE RETORT STOPPED AND AN AUTHORIZED EMERGENCY AGITATING PROCESS USED BEFORE CONTAINER ENTRY TO THE RETORT IS RESTARTED?		

COMMEN	ITS:
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DURING AN EMERGENCY AGITATING PROCESS, ARE CONTAINERS PREVENTED FROM	ENTERING TH	E RETOR	٢?
	Yes	No	N/A
COMMENTS:			
WHEN EMERGENCY PROCEDURES ARE USED, ARE PROCESSES AND PROCEDURES N RECORDS?	NOTED ON PRO	DUCTION	
	Yes	No	N/A
COMMENTS:			

DESCRIBE ANY INCIDENCES OF TEMPERATURE DROPS THAT WERE NOT HANDLED ACCORDING TO 113.40(C)(9):