

Firm Name, City & State:

FEI Number:

Inspection Date(s):

FCE Number:

Investigators:

DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION

PROCESSING IN STEAM-AIR 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. Attach the diagram to the EIR as an exhibit. Measure and verify retort plumbing - record on this form. Report all pipe sizes as inside diameter (ID). Cross-sectional area = 3.14r^2 (r = 1/2 diameter).

Steam-air retorts are manufactured by a variety of different manufacturers. They are normally horizontal batch-type still or rotary end-over-end retorts. Steam-air has been used in some installations as the heating medium in continuous rotary, hydrostatic and hydrolock retorts. Photographs are an excellent means of enhancing the description of a retort system.

Steam-air retorts are covered by 113.40(j), "Other Systems" and must meet the requirements found in applicable sections of 113.40. The retorts and operating procedures must be carefully evaluated to ensure that they comply with Part 113. Some of the questions in this form are designed to capture information useful in evaluation of the retort system and may not indicate a deviation from LACF Regulations, Part 113. The FDA "Guide to Inspections of Low Acid Canned Foods, Part 2," should be used as a guide when conducting inspections of steam-air retort systems.

Before entering the retort, you must confirm with the firm that you are following the firm's Standard Operating Procedures designed to meet OSHA confined space requirements. If the firm insists that only plant personnel enter the retort, witness the measurement procedure and data collection. To obtain OSHA confined space information and safety procedures, see the confined space presentation on the FDA ORAU web site. If the firm is not aware of the OSHA confined space requirements or does not have a confined space program, DO NOT ENTER THE RETORT.

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

RETORT DESCRIPTION

Table with 4 columns: RETORT NO., TYPE OF RETORT (Vertical, Horizontal, Other), LENGTH OR HEIGHT, DIAMETER.

RETORT MANUFACTURER:

RETORT MODEL:

TEMPERATURE RANGE OF THERMAL PROCESS (E.G., 245/250/260 DEGREES F):

NUMBER OF BASKETS OR CRATES PER RETORT:

PROCESSING MODE: Static Still, Agitating, End-over-End, Axial, Rocking

ARE THERE ANY PROTRUSIONS INSIDE THE RETORT OR THE RETORT DOOR CASING THAT COULD DAMAGE CONTAINERS DURING LOADING/UNLOADING OF CRATES? Yes No

COMMENTS:

Firm Name:

FEI Number:

COMPUTER CONTROLS

DOES A COMPUTER CONTROL ANY OF THE RETORT FUNCTIONS? Yes No

EXPLAIN:

DOES THE FIRM HAVE DOCUMENTATION ON HAND WHICH INDICATES THAT THE COMPUTER SYSTEM HAS BEEN VALIDATED? Yes No

EXPLAIN:

IS RECORD KEEPING PART OF THE COMPUTER FUNCTION? Yes No

IF YES, DOES THE RECORD KEEPING COMPLY WITH 21 CFR PART 11? Yes No

EXPLAIN:

AGITATION

IS THE AGITATING RETORT OPERATED IN THE STILL MODE? Yes No

COMMENTS:

HAVE PROCESS ESTABLISHMENT TESTS DETERMINED THAT RETORT CRATE POSITION IS CRITICAL TO THE PROCESS OR COME-UP PROCEDURE? Yes No

IF YES, DESCRIBE THE CRATE POSITION RECOMMENDED BY THE PROCESS AUTHORITY:

HOW DOES THE FIRM DETERMINE CRATE POSITION?

WAS THE RECOMMENDED CRATE POSITION BEING USED DURING THE INSPECTION? Yes No

COMMENTS:

EXPLAIN HOW THE RETORT ROTATION SPEED IS DETERMINED:

EXPLAIN HOW THE RETORT ROTATION SPEED IS RECORDED:

STEAM-AIR MIXTURE

WHAT PRESSURE IS USED DURING THERMAL PROCESSING? (NOTE WHETHER SEVERAL DIFFERENT PROCESSING TEMPERATURES ARE USED; PLEASE NOTE THE PRESSURE AT EACH TEMPERATURE. IF THE FIRM PROCESSES DIFFERENT CONTAINER TYPES, PLEASE NOTE THE PRESSURE FOR EACH CONTAINER TYPE.)

COMMENTS:

Firm Name:

FEI Number:

WHAT IS THE PERCENTAGE OF STEAM-AIR MIXTURE USED DURING PROCESSING:

(NOTE - THE PERCENTAGE OF STEAM-AIR RETORT CAN BE DETERMINED BY DIVIDING THE ABSOLUTE RETORT PRESSURE (PSIA) BEFORE ADDING AIR (STEAM TABLE PRESSURE PLUS ATMOSPHERIC PRESSURE - 14.7 PSI) BY THE ABSOLUTE RETORT PRESSURE AFTER ADDING AIR; EXAMPLE - 10 PSIG AT 240 DEGREES F (FROM STEAM TABLE) PLUS 14.7 PSI/15 PSIG + 14.7 PSI = 24.7 PSIA/29.7 PSIA = 83%.)

E.g., 10 PSI (generated by temp. of 240 degrees F) + 14.7 PSI Atmospheric pressure = 24.7

15 PSI gage reading on retort + 14.7 PSI Atmospheric pressure = 29.7 (24.7/29.7 x 100 = 83% steam)

HOW IS STEAM ADDED TO THE RETORT?Steam Spreader Other

IF OTHER, EXPLAIN:

IS THE STEAM SPREADER OR OTHER SYSTEM IN A GOOD STATE OF REPAIR? Yes No

COMMENTS:

DESCRIBE THE LOCATION WHERE COMPRESSED AIR IS ADDED TO THE RETORT:

IS THE COMPRESSED AIR HEATED PRIOR TO BEING ADDED TO THE RETORT? Yes No

COMMENTS:

IS A DIFFUSER USED ON THE AIR ENTRY TO ENSURE MIXING OF THE AIR AND STEAM? Yes No

COMMENTS:

HAS THE AREA WHERE AIR ENTERS THE RETORT BEEN IDENTIFIED AS A COLD SPOT IN THE RETORT? Yes No

COMMENTS:

HOW IS PRESSURE CONTROLLED IN THE RETORT?

Set Pressure Relief Valve Card Reader Computer Program Analog Controls Other

EXPLAIN:

DOES THE FIRM HAVE DOCUMENTATION THAT INDICATES THE PERCENTAGE OF AIR OR AIR PRESSURE PARAMETERS CRITICAL TO THE THERMAL PROCESS? Yes No

DESCRIBE THESE PARAMETERS:

DOES THE FIRM MONITOR AND RECORD RETORT PRESSURE DURING PROCESSING? Yes No

COMMENTS:

Firm Name:

FEI Number:

IF A PRESSURE GAGE IS PRESENT, IS IT GRADUATED IN DIVISIONS OF 2 LBS. OR LESS? Yes No

(NOTE - STEAM-AIR RETORTS **SHOULD** BE EQUIPPED WITH A PRESSURE GAGE TO INDICATE PROCESSING PRESSURE THAT CAN BE USED TO CALCULATE THE RATIO OF STEAM TO AIR IN THE RETORT.)

COMMENTS:

DO THE PRESSURES NOTED MEET THOSE ESTABLISHED BY THE TEMPERATURE DISTRIBUTION STUDIES? Yes No

EXPLAIN:

DOES THE FIRM HANDLE DEVIATIONS FROM PROCESSING PRESSURES AS PROCESS DEVIATIONS? Yes No

EXPLAIN:

WHAT METHOD IS USED TO MIX THE STEAM AND AIR?

Fan

Bleeders

Other

DESCRIBE:

IS WATER OR CONDENSATE ADDED TO THE STEAM-AIR MIXTURE? Yes No

EXPLAIN:

HOW DOES THE FIRM ENSURE THAT THE FAN IS OPERATING?

Indicator Light

Computer Monitoring

Visual Inspection

DESCRIBE INSPECTION FREQUENCY:

MERCURY-IN-GLASS THERMOMETERS/TEMPERATURE INDICATING DEVICES

IS THE RETORT EQUIPPED WITH A MERCURY-IN-GLASS (MIG) THERMOMETER? Yes No

COMMENTS:

IS THE RETORT EQUIPPED WITH ANOTHER TYPE OF TEMPERATURE INDICATOR DEVICE? Yes No
IF SO, DESCRIBE THE INDICATOR.

COMMENTS:

ARE SCALE DIVISIONS EASILY READABLE TO 1°F (.5°C)? Yes No

COMMENTS:

NO. OF DEGREES F OR C/IN. OF GRADUATED SCALE: _____ . (TEMP. RANGE MUST NOT EXCEED 17°F (8°C) PER INCH (4°C/CM) OF GRADUATED SCALE - 113.40(A)(1). ALSO, SEE LACF GUIDE, P. 14.)

COMMENTS:

Firm Name:

FEI Number:

DATE TEMPERATURE INDICATING DEVICE LAST TESTED FOR ACCURACY: _____

(THERMOMETERS **SHALL** BE TESTED FOR ACCURACY AGAINST A KNOWN ACCURATE STANDARD THERMOMETER UPON INSTALLATION AND AT LEAST ONCE A YEAR THEREAFTER; RECORDS OF ACCURACY CHECKS THAT SPECIFY DATE, STANDARD USED, METHOD USED AND PERSON PERFORMING THE TEST **SHOULD** BE MAINTAINED. EACH THERMOMETER **SHOULD** HAVE A TAG, SEAL OR OTHER MEANS OF IDENTITY THAT INCLUDES THE DATE IT WAS LAST TESTED FOR ACCURACY - 113.40(A)(1).)

STANDARD USED FOR THE TEST:

NAME AND TITLE OF PERSON WHO PERFORMED TEST:

IS THE LAST TEST DATE IDENTIFIED ON THE TEMPERATURE INDICATING DEVICE? Yes No

COMMENTS:

DESCRIBE THE FIRM'S ACTIONS REGARDING MIG THERMOMETERS/TEMPERATURE INDICATORS THAT WERE OUT OF CALIBRATION:

IS THE MIG THERMOMETER MERCURY UNDIVIDED? Yes No

(A THERMOMETER THAT HAS A DIVIDED MERCURY COLUMN OR THAT CANNOT BE ADJUSTED TO THE STANDARD **SHALL** BE REPAIRED OR REPLACED - 113.40(A)(1).)

COMMENTS:

WHEN TEMPERATURE INDICATING THERMOMETERS ARE FOUND TO BE PROVIDING READINGS ABOVE THE ACTUAL TEMPERATURES, DOES THE FIRM EVALUATE PRODUCTS PRODUCED USING THOSE THERMOMETERS? Yes No

DESCRIBE THE FIRM'S PROCEDURES (NOTE - IF THE ACTUAL TEMPERATURE IS BELOW THAT REQUIRED BY THE SCHEDULED THERMAL PROCESS, THIS WOULD BE A PROCESS DEVIATION AS PER 113.89.):

IS THE TEMPERATURE INDICATING THERMOMETER LOCATED WHERE IT IS EASY TO READ ACCURATELY?..... Yes No

COMMENTS:

THE SENSOR BULB IS LOCATED IN THE Retort Shell External Well

COMMENTS:

DIAMETER OF OPENING TO EXTERNAL WELL: _____

HOW DOES THE FIRM ENSURE THAT THE TEMPERATURE MEASURED IN THE WELL IS REPRESENTATIVE OF THE TEMPERATURE IN THE RETORT SHELL?

TEMPERATURE RECORDER

TYPE OF TEMPERATURE RECORDER: Round Circular Chart Strip Chart Other

COMMENTS:

Firm Name:

FEI Number:

IS THE TEMPERATURE CHART ADJUSTED TO AGREE AS NEARLY AS POSSIBLE WITH BUT NOT HIGHER THAN THE KNOWN ACCURATE MERCURY-IN-GLASS (MIG) THERMOMETER DURING THE PROCESSING PERIOD? Yes No

(SHALL REQUIREMENT OF 113.40(b)(2))

NOTE ANY DIFFERENCE BETWEEN THE RECORDING THERMOMETER AND THE MIG THERMOMETER AND WHICH READING IS HIGHER:

IS THERE A MEANS OF PREVENTING UNAUTHORIZED ADJUSTMENTS? Yes No

(A MEANS OF PREVENTING UNAUTHORIZED CHANGES IN ADJUSTMENTS SHALL BE PROVIDED. A LOCK OR NOTICE FROM MANAGEMENT STATING "ONLY AUTHORIZED PERSONS ARE PERMITTED TO MAKE ADJUSTMENTS," POSTED AT OR NEAR THE RECORDING DEVICE, IS A SATISFACTORY MEANS OF PREVENTING UNAUTHORIZED CHANGES - 113.40(b)(2).)

COMMENTS:

IS THE CHART DRIVE TIMING MECHANISM ACCURATE? Yes No

IF NO, EXPLAIN:

IS THE RECORDER COMBINED WITH A STEAM CONTROLLER? Yes No

COMMENTS:

THE TEMPERATURE SENSING BULB IS INSTALLED IN THE Retort Shell External Well

IF THE TEMPERATURE SENSING BULB IS INSTALLED IN AN EXTERNAL WELL, HOW DOES THE FIRM ENSURE THAT THE TEMPERATURE SENSED IS REPRESENTATIVE OF THE TEMPERATURE IN THE RETORT SHELL?

AUTOMATIC STEAM CONTROLLER

IS THE STEAM CONTROLLER AUTOMATIC? Yes No

(EACH RETORT SHALL BE EQUIPPED WITH AN AUTOMATIC STEAM CONTROLLER TO MAINTAIN THE RETORT TEMPERATURE - 113.40(a)(4).)

COMMENTS:

IS THE STEAM CONTROLLER TEMPERATURE ACTUATED? Yes No

EXPLAIN THE OPERATION OF THE TEMPERATURE CONTROL SYSTEM:

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? Yes No

(AIR OPERATED TEMPERATURE CONTROLLERS SHOULD HAVE ADEQUATE FILTER SYSTEMS TO ASSURE A SUPPLY OF CLEAN, DRY AIR - 113.40(a)(2).)

COMMENTS:

Firm Name:

FEI Number:

COME UP PROCEDURE

DOES THE FIRM USE A STEAM BY-PASS DURING COME-UP? Yes No

EXPLAIN:

DOES THE FIRM (VENT) PURGE AIR FROM THE RETORT PRIOR TO THE THERMAL PROCESS? Yes No

COMMENTS:

DESCRIBE THE FIRM'S PURGE PROCEDURE:

DESCRIBE THE PROCEDURES USED BY THE FIRM TO BRING THE RETORT UP TO OPERATING TEMPERATURE:

CAN THE FIRM DOCUMENT ALL STEPS OF THE COME-UP PROCEDURE? Yes No

COMMENTS:

DOES THE FIRM IDENTIFY PROCESS COME-UP STEPS AS CRITICAL ON THE PROCESS FILING FORMS? Yes No

(NOTE - PROCESSING STEPS ARE REQUIRED ON THE PROCESS FILING FORM WHEN THEY HAVE BEEN IDENTIFIED AS CRITICAL TO THE THERMAL PROCESS.)

COMMENTS:

RETORT PLUMBING AND EQUIPMENT ISSUES

WHEN WAS THE LAST MAJOR OVERHAUL OR MAINTENANCE PERFORMED ON THE RETORTS? Yes No

COMMENTS:

DOES THE FIRM CONDUCT A RETORT SURVEY PERIODICALLY (YEARLY), OR AFTER A MAJOR RETORT OVERHAUL OR AFTER MAINTENANCE IS PERFORMED ON CRITICAL EQUIPMENT (RETORTS, FILLER, BOILER CONFIGURATION, ETC.)? A RETORT SURVEY IS NOT REQUIRED BY THE REGULATIONS, BUT IS COMMONLY USED TO DOCUMENT THAT A FIRM'S PROCESSING SYSTEM IS IN COMPLIANCE WITH FDA REGULATIONS AND THAT THE SYSTEM MEETS THE SAME CRITERIA (VALVE TYPE, STEAM SPREADER CONFIGURATION, ETC.) AS WHEN TEMPERATURE DISTRIBUTION STUDIES WERE CONDUCTED.

COMMENTS:

DO THE BOILERS SUPPLY SUFFICIENT STEAM TO THE RETORTS? Yes No

IS THERE SUFFICIENT PRESSURE IN THE HEADER PIPE SUPPLYING STEAM TO THE RETORTS, ESPECIALLY WHEN MORE THAN ONE RETORT IS BEING VENTED? Yes No

COMMENTS:

Firm Name:

FEI Number:

HEAT/TEMPERATURE DISTRIBUTION

NOTE - WITH STEAM-AIR RETORTS THAT INCORPORATE ADDITIONAL AIR OVER-PRESSURE TO MAINTAIN CONTAINER SHAPE AND SEAL INTEGRITY, THE FORMATION OF AIR POCKETS DUE TO CONDENSING STEAM ON THE OUTSIDE SURFACE OF CONTAINERS AND THE LACK OF CONVECTION CURRENTS DURING COME-UP AND PROCESSING ARE PROBLEMS THAT AFFECT HEAT DISTRIBUTION AND ULTIMATELY THE HEATING RATE OF THE PRODUCT TO BE PROCESSED. A FAN USED TO CIRCULATE THE STEAM-AIR MIXTURE IS REQUIRED TO GET PROPER TEMPERATURE AND HEAT DISTRIBUTION THROUGHOUT THE COOKER. THE PROBLEM OF HEAT DISTRIBUTION, WHICH AFFECTS HEAT PENETRATION, CAN BE GREATER IF THE STEAM-AIR MIXTURE IS NOT PROPERLY MIXED AND DISTRIBUTED DURING PROCESSING. AIR POCKETS ON THE OUTSIDE SURFACE OF CONTAINERS CAN READ THE SAME TEMPERATURE AS THE STEAM (AIR POCKETS WILL HEAT TO PROCESSING TEMPERATURES DURING PROCESSING). HOWEVER, BECAUSE HEAT ENERGY WITHIN AIR POCKETS IS LESS THAN THAT WITHIN STEAM, HEAT TRANSFER INTO THE CONTAINER IS SLOWER. HEAT DISTRIBUTION STUDIES OF STEAM-AIR RETORTS SHOULD INCLUDE PLACEMENT OF THERMOCOUPLES IN THE RETORT AS WELL AS INSIDE OF TEST CANS CONTAINING A MATERIAL OF KNOWN HEATING CHARACTERISTICS TO MEASURE TEMPERATURE IN VARIOUS DIFFERENT AREAS OF THE RETORT AS WELL AS THE RATE OF HEAT TRANSFER INTO SELECT CANS. CANS CONTAINING THE TEST MATERIAL SHOWING A SLOWER HEATING RATE REPRESENT THE COLD SPOTS IN THE COOKER WHERE HEAT TRANSFER IS THE SLOWEST. A 5% MIXTURE OF BENTONITE OR ANY OTHER SUITABLE TEST MATERIAL WITH KNOWN HEATING CHARACTERISTICS CAN BE USED AS A TEST MATERIAL TO MEASURE THE HEATING RATE DURING THE PROCESS.

HAVE TEMPERATURE DISTRIBUTION STUDIES BEEN PERFORMED ON THE FIRM'S RETORTS? Yes No

HAVE HEAT DISTRIBUTION TESTS BEEN CONDUCTED ON THE FIRM'S RETORTS? Yes No

IF SO, WHO CONDUCTED THE STUDY, WHAT PROCEDURES WERE FOLLOWED AND WHO EVALUATED THE DATA?

IS THERE DOCUMENTATION SUCH AS A RETORT DIAGRAM AND PARAMETERS USED TO VALIDATE THE TESTS? Yes No

(FOR AN EXPLANATION OF TEMPERATURE DISTRIBUTION, SEE P. 21 OF LACF GUIDE, PART 2. SPECIAL CONSIDERATIONS FOR CONDUCTING TEMPERATURE DISTRIBUTION STUDIES IN STEAM-AIR RETORTS ARE LISTED IN THIS FORM.)

COMMENTS:

HAVE THERE BEEN ANY CHANGES TO THE RETORTS OR THERMAL PROCESSING SYSTEM SINCE THE LAST TEMPERATURE DISTRIBUTION STUDY THAT COULD AFFECT TEMPERATURE DISTRIBUTION? Yes No

(THE RETORT DESIGN, LOADING CONFIGURATION, SMALLEST CONTAINER SIZE AND MANY OTHER FACTORS CAN AFFECT THE ATTAINMENT OF TEMPERATURE DISTRIBUTION IN THE RETORT - SEE PP. 21-22 OF LACF GUIDE, PART 2. A CHANGE IN ANY OF THESE FACTORS COULD NECESSITATE A NEW TEMPERATURE DISTRIBUTION STUDY AND POSSIBLY A NEW VENT SCHEDULE. IF A CHANGE HAS BEEN MADE IN THE THERMAL PROCESSING SYSTEM THAT COULD AFFECT TEMPERATURE DISTRIBUTION, THE FIRM SHOULD HAVE ON FILE DOCUMENTATION OF THE CHANGE, INCLUDING THE REVIEW AND APPROVAL BY A QUALIFIED PROCESS AUTHORITY.)

COMMENTS:

EXPLAIN AND PROVIDE COPIES OF SUPPORTING DOCUMENTS:

DATE OF LAST TEMPERATURE DISTRIBUTION STUDY: _____

NOTE - THE FOLLOWING PARAMETERS (RETORT INSTALLATION, COME-UP PROCEDURES, CONTAINER TYPE, CONTAINER SIZE, CONTAINER POSITION, PRODUCT TYPE, OPERATING PRESSURE, CRATE AND RACK DESIGN AND PARTIAL LOADS) MAY OR MAY NOT AFFECT TEMPERATURE DISTRIBUTION IN THE RETORT. ANY FACTOR THAT CAN INFLUENCE THE MIXING OF STEAM-AIR IN THE RETORT CAN POTENTIALLY HAVE AN EFFECT ON TEMPERATURE DISTRIBUTION IN THE RETORT.

HAS A TEMPERATURE DISTRIBUTION STUDY BEEN PERFORMED ON EACH INDIVIDUAL RETORT? Yes No

HOW MANY RETORTS HAVE BEEN TESTED?

COMMENTS:

Firm Name:

FEI Number:

HAS A TEMPERATURE DISTRIBUTION STUDY BEEN PERFORMED ON EACH CONTAINER SIZE? Yes No

COMMENTS:

HAS A TEMPERATURE DISTRIBUTION STUDY BEEN PERFORMED ON EACH CONTAINER TYPE?
(E.G., GLASS, METAL, PLASTIC) Yes No

COMMENTS:

HAS A TEMPERATURE DISTRIBUTION STUDY BEEN PERFORMED ON EACH CONTAINER
HOLDING ARRANGEMENT/RACKING SYSTEM USED BY THE FIRM? Yes No

COMMENTS:

HAS A TEMPERATURE DISTRIBUTION STUDY BEEN PERFORMED ON EACH INDIVIDUAL
PRODUCT OR PRODUCT TYPE? (E.G., SEAFOOD SOUP VERSUS CANNED TUNA) Yes No

COMMENTS:

DID EACH TEMPERATURE DISTRIBUTION STUDY IDENTIFY A COLD SPOT IN THE RETORT? Yes No

PROVIDE LOCATION AND EXPLAIN:

HAVE TEMPERATURE DISTRIBUTION STUDIES BEEN PERFORMED TO DETERMINE
THE EFFECTS OF TEMPERATURE DROPS DURING COME-UP AND PROCESSING? Yes No

REPORT RESULTS:

HAVE TEMPERATURE DISTRIBUTION STUDIES BEEN PERFORMED TO DETERMINE
THE EFFECTS OF PRESSURE DROPS OR EXCESS PRESSURE IN THE RETORT? Yes No

REPORT RESULTS:

ARE PARTIAL LOADS PROCESSED IN THE FIRM'S RETORTS? Yes No

COMMENTS:

ARE BAFFLE PLATES OR DUMMY LOADS USED DURING THE PROCESSING OF PARTIAL LOADS? Yes No

EXPLAIN:

HAVE TEMPERATURE DISTRIBUTION STUDIES BEEN PERFORMED WITH PARTIAL LOADS? Yes No

COMMENTS:

RETORT CRATES AND RACKS

DESCRIBE THE RETORT CRATES.

DIMENSIONS:

NUMBER OF HOLES:

SIZE OF HOLES:

LOCATION OF HOLES:

Firm Name:

FEI Number:

ARE CONTAINERS POSITIONED IN THE RETORT AS SPECIFIED IN THE SCHEDULED PROCESS? Yes No

COMMENTS:

ARE DIVIDERS, TRAYS, RACKS OR OTHER MEANS OF POSITIONING FLEXIBLE CONTAINERS DESIGNED AND EMPLOYED TO ENSURE EVEN CIRCULATION OF HEATING MEDIUM AROUND ALL CONTAINERS? Yes No

COMMENTS:

ARE DIVIDER PLATES USED? Yes No

DESCRIBE NUMBER OF HOLES AND DISTRIBUTION IN DIVIDER PLATES:

IS THE SAME TYPE OF DIVIDER PLATE USED FOR ALL CONTAINERS? Yes No

DESCRIBE DIFFERENCES:

ARE CONTAINERS PROCESSED WITHOUT DIVIDER PLATES? Yes No

DESCRIBE STACKING ARRANGEMENT (E.G., BRICK, OFFSET, JUMBLE):

IS CONTAINER NESTING POSSIBLE? Yes No

HOW DOES FIRM CONTROL NESTING OF CONTAINERS?

DOES THE FIRM PROCESS?

Metal Cans Yes No

Glass Jars Yes No

Pouches Yes No

Rigid Plastic Yes No

COMMENTS:

DOES THE FIRM PROCESS MORE THAN ONE CONTAINER SIZE? Yes No

LIST ALL CONTAINER SIZES:

METAL CANS –

GLASS JARS –

POUCHES –

RIGID PLASTIC –

IF MORE THAN ONE CONTAINER SIZE OR TYPE IS PROCESSED AT ONE TIME, DESCRIBE PROCEDURE USED:

FOR POUCHES, ARE TRAYS ADEQUATELY DESIGNED WITH POCKETS TO CONTAIN AND RESTRAIN INDIVIDUAL POUCHES DURING PROCESSING? Yes No

COMMENTS:

Firm Name:

FEI Number:

ARE TRAYS OR DIVIDER PLATES IN GOOD CONDITION WITH NO ROUGH OR SHARP POINTS THAT COULD PUNCTURE CONTAINERS? Yes No

COMMENTS:

CONTAINER COOLING

CONTAINERS ARE COOLED BY: Air Water

EXPLAIN CONTAINER COOLING:

TYPE OF VALVE ON WATER COOLING LINES:

WERE WATER COOLING LINES NOTED TO BE LEAKING? Yes No

COMMENTS:

WATER DRAINS

ARE SCREENS USED OVER ALL DRAIN OPENINGS TO PREVENT CLOGGING OF DRAINS? Yes No

COMMENTS:

IS THE DRAIN LINE VALVE WATER TIGHT AND NON-CLOGGING? Yes No

COMMENTS:

OTHER CONCERNS AND OBSERVATIONS

PLEASE EXPLAIN ANY OTHER CONCERNS WITH THE OPERATION OF THIS RETORT SYSTEM: