



## CHAPTER 5, SUBJECT 3

### COMPLIANCE GUIDELINES FOR MECHANICAL CAN SCREENING OPERATIONS USING DOUBLE-DUD DETECTOR AND CHECKWEIGHER

#### 1. SCOPE

This document outlines the requirements an operator of a mechanical can screening facility must meet in order to qualify for a fish export licence (Fish Export Licence policy to be issued at a later date). These same requirements apply when a mechanical screening facility forms part of a registered establishment.

#### 2. AUTHORITIES

*Fish Inspection Act*, R.S.C., 1985, c F-12; Part I  
*Fish Inspection Regulations* (FIR), C.R.C., 1978, c. 802

#### 3. DEFINITIONS

**Biassed Sample** - refers to a sample that has been selected by identifying a specific portion of the total population (see definition for Eject Cans). (*échantillon biaisé*)

**Can Screening Report** - means the report of the screening run containing the information found in Appendix B. (*rapport de tri*)

**Checkweigher** - the first machine in the screening line. The purpose of the checkweigher is to weigh all cans in a lot and to eject those cans above or below designated set-points. (*trieuse pondérale*)

**Coincidental Ejects** - cans that have been ejected from the double dud detector based on both top and bottom end deflections being outside the operating set-points. (*Boîtes éjectées pour double défaut*)

**Commercially Sterile** - the condition obtained in a food that has been processed by the application of heat, alone or in combination with other treatments, to render the food free from viable forms of microorganisms, including spores, capable of growing in the food at temperatures at which the food is designed normally to be held during distribution and storage. (*Food and Drug Regulations*) (*stérilité commerciale*)



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**Compliance Sampling** - the compliance sampling plan for container integrity is based on a two-class attribute acceptance plan.

*Inspection:* sample size (n) is 200 cans and the acceptance number (c) is zero (0) serious defects.

*Reinspection:* sample size (n) is 1250 cans and the acceptance number (c) is zero (0) serious defects. (Reference: Government of Canada Visual Inspection Protocol) (*échantillonnage de conformité*)

**Cull** - means the removal of cans with serious defects from a lot of low-acid or acidified low-acid foods. (Reference: Government of Canada Visual Inspection Protocol) (*élimination sélective*)

**Defective Cans** - a unit which fails to meet one or more dimensional specifications or visual standards outlined in the Metal Can Defects Manual. (*boîte défectueuse*)

**Defect Rate** - means the frequency of serious defects per 100,000 cans screened. (*nombre de défauts*)

**Double Dud Detector** - the equipment designed to identify and eject low vacuum cans. (*détecteur bi-calibre*)

**Eject Cans** - means those cans with end deflections or gross weight outside of the operating set-points for either the dud detector or the checkweigher. These cans are more likely to contain defects than non-ejected cans and form a biased sample of the total population. Eject cans are examined and may be returned to the lot if they are found after inspection to be good order cans. Any potentially defective cans must be held for confirmation and classification of the defect. (*boîtes éjectées*)

**Ejection Rate** - the percentage of ejected cans. (*taux d'éjection*)

**End Deflection** - the vertical distance from the top edges of the double seam to the lowest point on the can end. (*déformation des bouts*)

**Good Order** - meets the requirements of the regulations. (*bon état (en)*)

**Hand Culling** - means a combination of visual and tactile can-by-can examination, to identify and remove defective cans. (*tri manuel*)



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**Inspection** - means the physical examination of a lot of low-acid or acidified low-acid foods to verify that it meets all the requirements of the *Fish Inspection Regulations* and *Food and Drug Regulations*. (*inspection*)

**Inspection Lot** - means a lot limited to one container type and size, one product type and style, originating from one processing establishment normally bearing one identical lot or production day code. (*Reference: Government of Canada Visual Inspection Protocol*) (*lot d'inspection*)

**Laboratory** - means a laboratory acceptable to the regulatory agency having jurisdiction. (*Reference: Government of Canada Visual Inspection Protocol*) (*laboratoire*)

**Leakers** - those cans which have lost hermetic seal (definition from Common Inspection Approach). (*fuyard*)

**Mechanical Screening** - means the use of a double dud detector and checkweigher or other automated equipment to draw a biased sample in order to determine the safety of the lot. (*tri mécanique*)

**Minor Defect** - a minor condition is one which is clearly an abnormal container characteristic, but one which does not result in loss or potential loss of container integrity, and consequently does not represent a potential public health risk. (*Reference: Metal Can Defects Manual*) (*défaut mineur*)

**Operating System** - refers to documented procedures (e.g., standard operating procedures) that are developed, implemented and maintained by the operator of the mechanical screening facility to ensure that the facility is operating in compliance with the requirements of the FIR. (*système d'exploitation*)

**Owner's Representative** - the person duly authorised to act or speak on behalf of the owner of the lot of product. (*mandataire*)

**Qualified Person** - means a person competent to carry out the assigned task, normally gained through experience and/or training. (*personne qualifiée*)

**Reconditioning** - the removal of defective units from the suspect code. (*reconditionnement*)

**Reinspection** - for the purpose of this document, means the

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inspection of a previously screened lot of low-acid or acidified low-acid foods for the presence of serious defects after the lot has been culled. (*réinspection*)

**Screening Run** - a screening run consists of one or more day codes from one production year from one establishment. Each screening run must have cans with uniform ends and bodies. (*lot soumis à l'examen*)

**Serious Defect** - means any container:

- a) which is swollen;
- b) which shows evidence that the hermetic seal is lost or seriously compromised; or
- c) is unsuitable for distribution and sale as stipulated in the *Food and Drugs Act* section 4 and/or sections 27.003 and 27.005 of the *Food and Drug Regulations*.

These defects are described in the Metal Can Defects Manual. Some products may appear slightly swollen due to overfilling by design or due to gas packing. If this is verified by the inspector, these cans are not considered to be swollen. (*Reference: Government of Canada Visual Inspection Protocol and Metal Can Defects Manual*) (*défaut sérieux*)

**Sort** - means the segregation and control of product that has been damaged during storage or transportation. (*tri*)

**Suspect Codes** - means those codes that may contain unacceptable levels of defective cans. (*code suspect*)

#### **4. ROLES AND RESPONSIBILITIES**

- 4.1 The operator of the mechanical screening facility is responsible for the development, implementation and maintenance of a written operating system that provides a reasonable level of assurance that canned fish is assessed to verify compliance with standards for container integrity.
- 4.2 The operator of the mechanical screening facility is responsible for providing information to the owner or the owner's representative, for each screening run specific to the can code, the number of cans in the screening run and the number and classification of any defects identified.



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- 4.3 The operator of the mechanical screening facility is responsible for ensuring that they contact the owner, or the owner's representative, to determine whether any swollen can suspected of not being commercially sterile should be sent to a laboratory for sterility analysis. The operator of the mechanical screening facility is responsible for informing the CFIA office of those lots containing swollen cans that are suspected of being non-sterile and holding the suspect code.
- 4.4 As part of a cannery's Quality Management Program (QMP) Plan, canneries may include can screening as a verification of a critical control point (CCP) in their HACCP plan, or as a CCP.
- 4.5 The cannery is responsible for providing the operator of the mechanical screening facility with information necessary for the operation of the checkweigher and double dud detector, such as the amount of allowable overfill (see point 7.1(5) below).
- 4.6 The cannery is responsible for providing product information to the buyer or the owner's representative to allow for compliance with the labelling requirements of the *Fish Inspection Regulations* and, if applicable, the *Consumer Packaging and Labelling Regulations*. This information includes, but is not limited to, the correct name of the fish species in the container, the container's net weight, and any special labelling information. The operator of the mechanical screening facility is responsible to ensure that they have this information prior to screening any products.
- 4.7 The cannery where the fish was processed is responsible for the identification of product distribution to its first shipping destination under its Lot Accountability and Notification Program.
- 4.8 The cannery where the fish was processed is responsible for the procedures to notify the CFIA of any valid health and safety complaints under its Lot Accountability and Notification Program.

**5. MECHANICAL SCREENING FACILITY AND EQUIPMENT**

- 5.1 Mechanical screening facilities must include in their operating system information on proper can handling procedures to prevent damage to the cans. Can-screening equipment must be constructed and operated so that can



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damage is prevented (e.g., proper loading of the de-palletizer, automated boxing machines timing mechanisms, mechanical push bars, the absence of sharp edges on conveyors, design of eject collection boxes which will avoid abrasion and impact points).

- 5.2 The checkweigher and double dud detector must be installed and maintained according to the manufacturer's instructions, specifically:
- the checkweigher (CW) must be installed before the double dud detector (DDD) in order to remove excessively overweight cans and/or gross leakers before they reach the double dud detector;
  - the DDD equipment must have separate can counters for each can end; and
  - the DDD must ensure that coincidental ejects are accounted for during operation.
- 5.3 Suitable dry storage areas must be available for labelled and unlabelled product and a secure can storage area must be available to store defective cans.
- 5.4 All applicable inspection tools must be properly calibrated, i.e., weigh scales, deflection gauges, and micrometers. A description of the procedures for calibrating equipment must be included in the operating system plan.
- 6. EMPLOYEE QUALIFICATIONS**
- 6.1 The operator of the mechanical screening facility will ensure that qualified persons are available to configure and operate the equipment on the screening line.
- 6.2 Only persons qualified to classify defective cans shall examine the ejected cans. Qualified persons shall classify the defects in accordance with the Metal Can Defects Manual.
- 6.3 The operator of the mechanical screening facility will ensure that qualified persons conduct an evaluation of each screening run, and complete and sign a Can Screening Report (see Appendix B).
- 6.4 Only qualified persons will perform the responsibilities associated with the reconditioning of any suspect codes.



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**7. CHECKWEIGHER (CW)**

The primary purpose of the checkweigher is to weigh all of the cans in a lot and to eject those cans at or below an underweight set-point, and those cans at or above an overweight set-point. Ejected underweight cans may have leaked during the process but may still have maintained a vacuum (e.g., a pin hole that may be sealed by coagulated protein). Ejecting overweight cans will allow the DDD to sample cans with low end deflections due to low vacuum rather than excessive weight.

**7.1 Checkweigher set-up**

The operator of the mechanical screening facility must provide as part of their operating system a description of the set-up procedures they will follow in determining the checkweigher underweight and overweight settings, which includes the following steps:

- 1) *Define the screening run*  
A screening run consists of one or more day codes from one production year from one establishment. Each screening run must have cans with uniform ends and bodies.
- 2) *Sampling to establish checkweigher settings*  
The set-points are determined through the following sampling procedure.
  - a) Sampling is carried out in order to establish checkweigher set-points if company weight data from in-season end-of-line monitoring is not available.
  - b) Sample cans must be representative of the screening run. Therefore, they must be drawn from various locations throughout the pallets and from as many pallets in the screening run as possible.
  - c) For a screening run containing five (5) day codes or less, the minimum sample size is 50 cans.
  - d) For a screening run containing more than five (5) day codes, an additional 10 cans should be sampled for each additional day code, to a maximum of 100 cans.

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- 3) *Calculation of average gross can weight*  
The average gross can weight of each screening run is determined by:
- a) calculating the average weight of the sampled cans; or
  - b) taking the average weight of the can codes as supplied from data gathered by the canner during in-season end-of-line monitoring.
- 4) *Determination of underweight set-points*  
The underweight set-point can be determined by one of the following methods:
- a) Determine the value for  $(t_1)$ , which is a calculation that is equal to the declared weight minus the tolerance. The term  $(t_1)$  is used to describe a defective sample that exceeds the prescribed tolerance by one tolerance unit. The procedure for calculating  $(t_1)$  is outlined in the *Consumer Packaging and Labelling Regulations* (see Chapter 14 of the Fish Products Inspection Manual). These values are dependent on the can label weight. The set point is determined by subtracting the value for  $(t_1)$  from the average gross can weight of the sample.
- OR**
- b) The set-point is determined by deducting 5 grams for each 100 grams of fill weight (calculated to the nearest whole gram).
- OR**
- c) The set-point may be determined by using Quality Control data to determine the average gross weight of the can codes and subtracting three standard deviations to yield a set-point. (Note: The checkweigher calibration adjustment should be set at "0" and should not be changed.)
- OR**
- d) Adjusting the set-point to obtain a minimum 0.25% ejection rate consistently throughout the screening run to ensure ejection of the "population outliers".





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5) *Determination of overweight set-points*

The overweight set-point is determined by the canner as the amount of overfilling that will not result in bulging cans, when the product is heated to a temperature of 35 °C (*reference*: FIR Section 35).

Examples of checkweigher overweight factors for canned salmon are included in Appendix A.

**7.2      Overweight or underweight screening runs**

Screening runs which had been identified as being overweight or underweight can be reconditioned using the screening line, providing the operating set-points of the checkweigher will not compromise the settings used to identify defective cans.

**7.3      Checkweigher operating checks**

- a) Routine operating checks must be completed at least every four hours to: demonstrate that the checkweigher is operating within the specified limits; prevent a loss of control; and allow for adjustments of the checkweigher before a deviation occurs. The procedures must be described in the operating system. The operator must be able to demonstrate that their operating check achieves the desired results. An operating check requires that cans of known weight are run through the checkweigher at the normal operating line speed to verify the acceptance/rejection point of the checkweigher machine. As a minimum, a can that exceeds the checkweigher ejection set-point by 10 grams, and a can that is below the checkweigher set point must be ejected 100 % of the time. See Appendix A for an example of canned salmon operating checks.
- b) If the line speed is changed more than  $\pm 15$  % of the normal operating speed, the checkweigher must be retested as in section a) above.
- c) Each checkweigher must be challenge tested at least once every 40 hours of operation at normal operating line speeds. This activity provides a test of the checkweigher's calibration. For an example of the checkweigher 40-hour challenge testing see Appendix A.



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**8.            DOUBLE DUD DETECTOR (DDD)**

**8.1           A properly operated double dud detector must :**

- eject cans with zero vacuum, and
- select a biased sample from the can population that is most likely to contain defects, i.e., lowest vacuum cans.

**8.2           Double dud detector set-up procedures**

The operator of the mechanical screening facility must provide, as part of their operating system, a description of the set-up procedures they will follow in determining the initial set-point, the minimum set-point and the upper set-point for the double dud detector.

**8.3           Establishing manual dud detector setting**

- a) Sample cans must be representative of the screening run. Therefore, they must be drawn from various locations throughout the shipping pallets and from as many pallets in the screening run as possible.
- b) Sample size should be 50 to 100 cans, depending on the number of codes in the lot. The recommended sample size is 50 cans for up to five (5) day codes, with an additional ten (10) cans for each day code above five codes.
- c) Sample cans must be inspected prior to the DDD to ensure they are good order cans.
- d) Initial set-point: For a 3 % ejection rate, select the second lowest end deflection reading for each end and adjust the DDD for 100 % ejection. For a 7 % ejection rate, select the third lowest end deflection reading.
- e) Minimum set-point: Initial set-point minus 0.005 inches.

**8.4           Establishing automatic double dud detector setting**

- a) Run the first 50 cans per screening run through the auto-DDD.
- b) The operator is to check the cans and print out a histogram to ensure that the set-point is correctly established and all cans were good order. End deflection readings used to establish initial set-

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point for the DDD should **not** be > 0.002 in. from the next value.

- c) The DDD is automatically set to eject 100% of all cans with end deflections below the minimum set-point.

**8.5 Double dud detector operating checks**

- a) Ensure that the target ejection rate is maintained at a 3% minimum total for each screening run. For example, either 1.5 % each end, or 2 % top (code) end and 1 % bottom (integral) end. Set-points may vary during the screening run to attain the target ejection rate (i.e., at 350 cans per minute, approximately five (5) cans per minute should be kicked-out for each end, i.e., 10 cans in total).
- b) Equipment should not operate below the minimum set-points.
- c) If the ejection rate becomes unmanageable and there is a requirement for the set-point to be lower than the established minimum, then the set-up procedure must be repeated to establish new set-points before continuing with the screening run.
- d) The frequency of set-point adjustment should be kept to a minimum, i.e., once per pallet. The target ejection rate (for each end) should be evenly distributed throughout the screening run as described in point a) above.
- e) Cans must all be oriented either all code-end up or all code-end down during the screening run.
- f) For manual DDD only, the screening line operator shall:
  1. calculate and record the ejection rate once per hour and at the end of the screening run; and
  2. verify and record the operating set-point, at least once per hour, or more frequently as necessary to determine that the operating set-point does not fall below the minimum set-point. This is especially important when adjusting the setting downward.

The following procedures should be used to verify the operating set-points.

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- Measure the top and bottom end deflections of 6 good order cans.
- Measure the end deflections of 6 cans ejected for their bottom deflections and 6 cans ejected for their top deflections.
- Record, for each end, the highest end deflection of the ejects and the lowest end deflection of the corresponding good order ends as the operating range.

g) Each double dud detector must be audited (i.e., challenge tested) at least once every 40 hours of operation at normal operating line speeds following a procedure outlined in the operating system. The results of this test must show a unique distribution of the data for ejects as compared with the data for the good order cans. For an example of the DDD 40-hour audit see Appendix A.

**9. HANDLING, CONTROL, AND DISPOSITION OF CANS**

**9.1 Handling ejected cans from the checkweigher**

All cans ejected from the checkweigher (CW) must be manually weighed to identify gross underweight cans (potential leakers), as well as gross overweight cans. All cans ejected must be examined by a qualified person for any defects, with labels removed. Good order cans may be continuously returned to the line before the DDD (refer to Appendix A for information on canned salmon). All defective cans are marked for identification.

If no container defects are found, underweight cans are held for possible re-canning, or re-labelling. Gross overweight cans are destroyed.

**9.2 Handling ejected cans from the double dud detector**

All ejected cans shall be inspected for defects. All defective cans are marked for identification. Good order cans may be returned to the labelling line.

**9.3 Defects properly classified**

All ejected cans identified as being defective must be classified in accordance with the criteria identified in the Metal Can Defects Manual. Information on the screening run, (e.g., classification and number of all defective cans and the number of cans screened) shall be entered into the



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*Can Screening Report* (see Appendix B). The deflections of defective cans must be determined and recorded for evaluation as described below in section 10.2.

#### **9.4 Control and disposition of defects**

All cans classified as containing a serious defect, minor droops, or as being overweight, must be kept in a designated, secure storage area within the establishment where the mechanical screening facilities are located.

All cans with serious defects must be destroyed. Cans with minor droops must either be re-canned or destroyed. Gross overweight cans must be destroyed.

An accurate system must be in place to control defective cans requiring destruction. The status of these defects must be recorded on the *Can Screening Report* and initialled by the appropriate personnel once the defective cans have been destroyed.

### **10. SCREENING RUN EVALUATION AND DECISION**

To decide on the acceptability of the can screening run, the screening establishment must evaluate:

- can screening line performance;
- defects ejected by the checkweigher and double dud detector; and
- defect rate of the screening run.

#### **10.1 Can screening line performance**

The validity of the screening run results is dependent on both the checkweigher and double dud detector maintaining the target ejection rate throughout the entire screening run.

##### **10.1.1 Provide selective sampling by ejecting a target 3 %.**

Can screening operating records must demonstrate that a 3 % biased sample of cans with low-end deflection and with low weight were ejected by the can screening line.

##### **10.1.2 All cans in screening run passed through both machines**

A review of the operating records for both the checkweigher and the double dud detector indicates that all the cans passed through both the checkweigher and double dud

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detector before being labelled.

The evaluation must demonstrate that the can screening line was operating properly as described in this document. If this is not the case, the results of the can screening run are not valid and cannot be used.

**10.2 Evaluation of the defective cans ejected by the can screening line**

When an evaluation of the defective cans ejected by the can screening line shows that:

- a majority of the deflections of the defective cans are within the tolerance limit of the DDD 40-hour challenge test (Appendix A); or
- a considerable number of cans had the same type of defects,

there is a potential for an unacceptable number of serious defects still being present in the good order labelled production. In this case, the can screening warehouse must contact the owner or the owner's representative, who in consultation with the canner should take the appropriate actions to verify that there is no unacceptable number of serious defects present in the good order labelled production. An accurate record of the decision and any relevant information must be kept.

**10.3 Evaluating the defect rate of the screening run**

An evaluation of the defects by classification, canning line and by production code should be done, to determine if a particular code or type of defect was the major contribution to the defect rate.

When the serious defect rate is less than 25 per 100,000 cans, the can screening run results are acceptable and the product can be released for market.

When a screening run is found to have a serious defect rate of greater than 25 per 100,000 cans, the operator of the mechanical screening facility must contact the owner or the owner's representative, who in consultation with the canner should conduct an assessment to decide as the best way to:

- a) cull the lot; or
- b) conduct a compliance sample of the screening run,

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using a sample size sufficient to be confident that the identified defect has been removed from the good order product.

A single serious defect identified in a small screening run (under 4,000 cans) would exceed the defect rate of 25 per 100,000. This screening run may be evaluated as acceptable if the canner has Quality Control data or data from other screening runs for the same code indicating that the code is acceptable.

**11. CULLING OF SCREENING RUNS**

When a decision has been made to cull the screening run, an evaluation of the screening run and the type of defects should be used for guidance as to whether the defects are linked to a specific code and the best method for culling. Based on this evaluation, the owner or the owner's representative, in consultation with the canner, may choose one of the following culling options.

**11.1 Screening line**

Results of the evaluation indicate that the suspect code or screening run will be successfully culled through the use of a screening line. Set-up and/or operating procedures should be followed that would ensure the particular defects are removed by the screening procedure. An evaluation of the culled lot should be performed to verify that the defective cans are removed.

**11.2 Mechanical seam-scanning device**

The results of the evaluation indicate that the suspect code will be successfully culled through the use of a mechanical seam-scanning device. The owner or the owner's representative may choose to utilize mechanical seam-scanning equipment to cull the suspect code, e.g., use of a Can Guard to remove cans with specific types of double seam defects.

**11.3 Hand culling**

The results of the evaluation indicate that hand culling will be successful in bringing a suspect code or entire screening run in compliance. Visual and tactile can-by-can examination (hand culling) must be carried out under the following conditions:

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- a) The hand culling crew must maintain concentration during the operation, otherwise the hand culling must be stopped.
- b) Good lighting must be provided in the inspection areas to properly inspect cans and avoid eyestrain or fatigue. Section 1.7 of Chapter 5, Subject 1 of this manual sets out the light intensity levels that must be available.
- c) The hand culling crew must not use gloves unless either the fingers are cut off or one glove is removed. This is to ensure that defective seams can be identified with bare fingers.
- d) The evaluation indicates that either the suspect code will be successfully reconditioned without the removal of the labels, or the labels must be removed due to the location or type of defect.

Removing the label from the individual cans would not be necessary during a screening run where it can be demonstrated that the label would not interfere with the culling. However, the labels would have to be removed from each sample can during compliance sampling for can integrity assessment in accordance with the Government of Canada, *Visual Inspection Protocol*.

**12. SHIPMENT MEETS REGULATORY REQUIREMENTS**

**12.1 Final shipment information**

The operator of the mechanical screening facility must describe and implement a method to trace each shipment to the first shipping destination. The operator of the mechanical screening facility must maintain the following information for each shipment:

- the fish species;
- the quantity;
- the method of transportation including manifest, container numbers or other information sufficient to trace the location of each shipment;
- the date of shipment; and
- the date on which each shipment was mechanically screened.





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## 12.2 Label and carton information

The operator of the mechanical screening facility must describe the procedures to be followed to ensure that label and carton information match the regulatory product information provided to them by the canner.

## 13. RECORDS

The following records are maintained by the operator of the mechanical screening facility. Examples of each record are included in the operating system.

- a) The owner of each lot of canned product.
- b) Each screening run of canned product shall have an operating log for the double dud detector detailing the operating information at that specific time (i.e., set-points, total cans screened, ejects). The printed auto DDD record will be considered a permanent operating record for the screening line.
- c) Each screening run of canned product shall have an accurately completed *Can Screening Report*. This report must detail the quantities, disposition and classification of all defective cans, must be signed by the qualified person responsible for the operation of the screening line, and must be verified by a person responsible for the screening establishment operation.
- d) The shipping records sufficient to identify or trace the canned product to the first destination.
- e) Correct label information for each screening run.
- f) The label being placed on each can matches the label information provided by the canner.
- g) The outside carton information meets regulatory requirements, (i.e., proper can code shown on carton).
- h) Notification to the owner or the owner's representative of any lot being screened, the can code, number of cans in the screening run and the number and classification of any defects identified.
- i) Documentation of the results of routine operating checks and 40-hour challenge test completed on both the checkweigher and double dud detector.

**APPENDIX A**

**DOUBLE DUD DETECTOR AND CHECKWEIGHER OPERATING CHECKS  
FOR CANNED SALMON**

This appendix describes the specific set-point determination procedures and operating checks for screening canned salmon, using double dud detector and checkweigher.

**1. Determination of "Underweight" Checkweigher Set-points**

- a) Subtract specific weight factors ( $t_1$ ) from the average can weight of the sample. These weight factors are dependent on the can label weight. The term " $t_1$ " is used to describe a defective sample that exceeds the prescribed tolerance by one tolerance unit. The procedure for calculating " $t_1$ " is outlined in the *Consumer Packaging and Labelling Regulations* (see Chapter 14 of the Fish Products Inspection Manual).

**OR**

- b) The set-point is determined by **deducting** 5 grams for each 100 grams of fill weight (calculated to the nearest whole gram).

**OR**

- c) The set-point may be determined by using quality control data to determine the mean gross weight of the screening run and subtracting three standard deviations to yield a set-point. (**Note:** The checkweigher calibration adjustment should be set at "0" and should not be changed.)

**OR**

- d) Adjusting the set-point to obtain a minimum 0.25% ejection rate consistently throughout the screening run will provide for the ejection of the "population outliers".

**2. Determination of "Overweight" Checkweigher Set-points**

For canned salmon, the overweight checkweigher set-point is determined by adding the following weight factors to the label weight of the can:

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CAN SIZE	LABEL WEIGHT	WEIGHT FACTOR
301 x 106	106 grams	15 grams
307 x 111 307 x 111.40	170 grams 180 grams	22 grams 22 grams
307 x 115 307 x 200.25	213 grams 213 grams	25 grams 25 grams
301 x 408	418 grams	30 grams

**3. Checkweigher routine operating check**

Routine operating checks will be completed at a frequency included in the operating system. Cans of known weight must be run through the checkweigher at the normal operating line speed to verify the acceptance/rejection point of the checkweigher machine. Cans that deviate from the checkweigher ejection set-point by 10 grams must be ejected 100 % of the time.

**First test**

The checkweigher passes if a can that is 10 grams below and 10 grams above the set point is ejected.

If the cans are not ejected, then conduct a second test by running the cans through the checkweigher 5 to 10 times.

**Second test**

If the test results are 100 % ejection, then the checkweigher passes.

If the can does not eject 100 % of the time, then re-calibrate the checkweigher and re-test.

**4. Checkweigher 40-hour challenge test**

Both the underweight and overweight set-points must be tested.

- a) *Underweight Set-point*: Use a minimum of five (5) cans with exact weights in increments of 2 grams. For example, if the ½-lb. underweight eject set-point is 256 grams, then test the checkweigher with cans weighing 256, 254, 252, 250, and 248 grams respectively. Repeat this test 5 times. The results of the test should agree with the chart below. Use either the pass criteria for ejection rate, or ejections per

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5 challenges, depending on the number of cans used during the test.

<b>Test weight (grams)</b>	256	254	252	250	248
<b>Pass criteria ejection rate</b>	50%	75%	90%	100%	100%
<b>Pass criteria, ejections per 5 challenges</b>	2/5	3/5	4/5	5/5	5/5

- b) *Overweight Set-point*: Use a minimum of five (5) cans with exact weights in increments of 2 grams. For example, if the ½-lb. overweight eject set-point is 276 grams, then test the checkweigher using cans weighing 276, 278, 280, 282, and 284 grams, respectively. Repeat this test 5 times. The results of the test should follow the following chart. Use either the values pass criteria for ejection rate, or ejections per 5 challenges, depending on the number of cans used during the test.

<b>Test weight (grams)</b>	276	278	280	282	284
<b>Pass criteria Ejection rate</b>	50%	75%	90%	100%	100%
<b>Pass criteria, ejections per 5 challenges</b>	2/5	3/5	4/5	5/5	5/5

**Results of Checkweigher 40-hour challenge**

**First test**

If test results were as specified in above tables, then the checkweigher passes.

If test results are lower than the above ejection rates, then conduct a second test.

**Second test**

If test results were as specified in above tables, then the checkweigher passes.

If the test results are lower than the above ejection rates, then re-calibrate the checkweigher and re-test.

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New                              05/03/24

**5.            DDD Routine operating check**

Check automatic double dud detector sensor calibration using the following procedures:

- measure the end deflection of a can,
- pass the can through the auto-DDD, and
- compare the digital readouts to the actual measurements.

**First Test**

If the DDD readout is within 0.005 inches of the end deflection of the test can, the set-point calibration is acceptable.

If the DDD readout is not within 0.005 inches of the end deflection of the test can, then retest.

**Second Test**

If the DDD readout is within 0.005 inches of the end deflection of the test can, the set-point calibration is acceptable.

If the DDD readout is not within 0.005 inches of the end deflection of the test can, then adjust the DDD and retest.

**6.            DDD 40-hour audit**

Each double dud detector machine must be tested at least once every 40 hours of operation at normal operating line speeds using the following criteria:

- a) At the time of drawing the 40-hour sample, the auto-double dud detector should be in automatic mode.
- b) Sample 25 top ejected cans, 25 bottom ejected cans, and 25 good order cans.
- c) Measure the end deflections of the sampled cans. Ejected cans only require measurements of top or bottom end deflections as appropriate, while good order cans require measurement of both top *and* bottom end deflections (i.e., total of 100 measurements).
- d) Plot end deflections on a graph with the end deflection measurements along the horizontal axis and the number of measurements on the vertical axis.

**First Test**

The DDD operation is acceptable if the a graphical plot of

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the end deflections of good order and ejected cans shows that:

- the mean of good order cans is greater than the mean of the ejected cans; and
- the maximum overlap is 0.010 inch between good order cans and low deflection eject cans.
- If the results exceed the above criteria, then retest.

**Second Test**

If the DDD meets the above criteria for an acceptable test, then the DDD operation is acceptable.

If the DDD does not meet the above criteria, then the equipment must be adjusted and retested.

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Status New

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**APPENDIX B  
CAN SCREENING REPORT**

<b>Date</b>		<b>Lot #</b>		<b>Inspection #</b>	
<b>Packer</b>		<b>Screening Co.</b>			
<b>Ctn/can size</b>		<b>Lot Size</b>		<b>Label Order #</b>	
<b>Label</b>			<b>Quantity (ctn.)</b>		
<b>Destination</b>				<b>Marks</b>	
<b>CAN CODE</b>	<b>QUANTITY (ctn.)</b>	<b>CAN CODE</b>	<b>QUANTITY (ctn.)</b>		
1		6			
2		7			
3		8			
4		9			
5		10			

Manual Dud Detector Settings (0.001")\*    Canner's End \_\_\_\_\_    Manufacturer's End \_\_\_\_\_  
 \* attach automated Dud Detector computer printout

Checkweigher Settings (grams):    Underweight Setting \_\_\_\_\_    Overweight Setting \_\_\_\_\_

Serious Defects					
	Total		Total		Total
Abrasion, Severe		False Seam		Knocked Down Flange	
Cut-over		Fractured Bottom Profile		Metal Plate Flaw	
Cut Down Flange		Fractured Seam		Pin Hole	
Cut Seam		Knocked Down Curl		Scrap-in-die Mark	
Double End		Knocked Down End		Vee	
Droop					
Minor Defects					
Droop, Minor		Flipper		Overweight	

Total Serious Defects: \_\_\_\_\_ Total Minor Defects: \_\_\_\_\_

Total Cans Screened: \_\_\_\_\_ Total Cans Labelled: \_\_\_\_\_

DEFECT RATE \_\_\_\_\_ /100,000 cans    SIGNATURE: \_\_\_\_\_

Remarks: \_\_\_\_\_