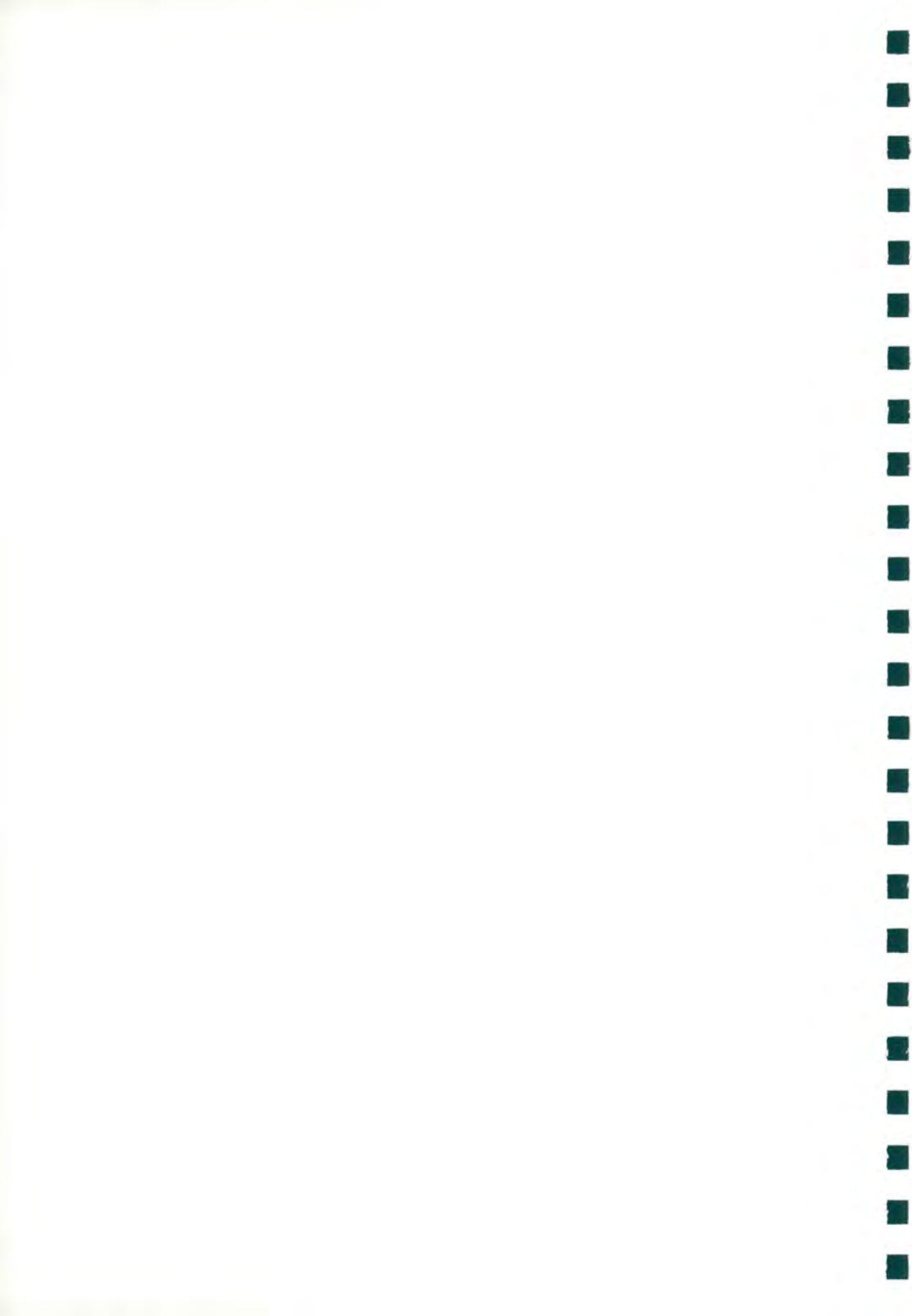


Manuals of food quality control

17. Unacceptable visible can defects – a pictorial manual

Food
and
Agriculture
Organization
of
the
United
Nations





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FAO
FOOD AND
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PAPER

14/17

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Rome, 1998

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The purpose of this manual is to assist canners, distributors, retailers and inspectors to identify unacceptable defects in metal cans. The contents of cans having unacceptable defects should not be consumed.

External defects which show visible evidence that a metal can is without a hermetic seal or that microbiological growth had occurred in the container's contents are unacceptable.

This manual can be used in conjunction with the following recommendations adopted by the FAO/WHO Codex Alimentarius Commission and published in the Codex Alimentarius, Volume 1B (General Requirements - Food Hygiene):

1. Recommended International Code of Hygienic Practice for Low-Acid and Acidified Low-Acid Canned Foods;
2. Guidelines for the Salvage of Canned Foods Exposed to Adverse Conditions;
3. Guideline Procedures to Establish Microbiological Causes of Spoilage in Low-Acid and Acidified Low-Acid Canned Foods;
4. Guideline Procedures for the Visual Inspection of Lots of Canned Foods for Visible Defects.

This Manual was prepared by the Codex Alimentarius Committee on Food Hygiene and is published in the FAO Manuals of Food Quality Control at the request of the Executive Committee of the Codex Alimentarius Commission. FAO wishes to thank the Committee and the following member countries and organizations for their contributions.

CANADA

Fisheries and Oceans Canada
Health Canada
Food Institute of Canada

UNITED KINGDOM

Department of Health
Ministry of Agriculture, Fisheries and Food
Campden Food and Drink Research Association
Unilever Research

UNITED STATES OF AMERICA

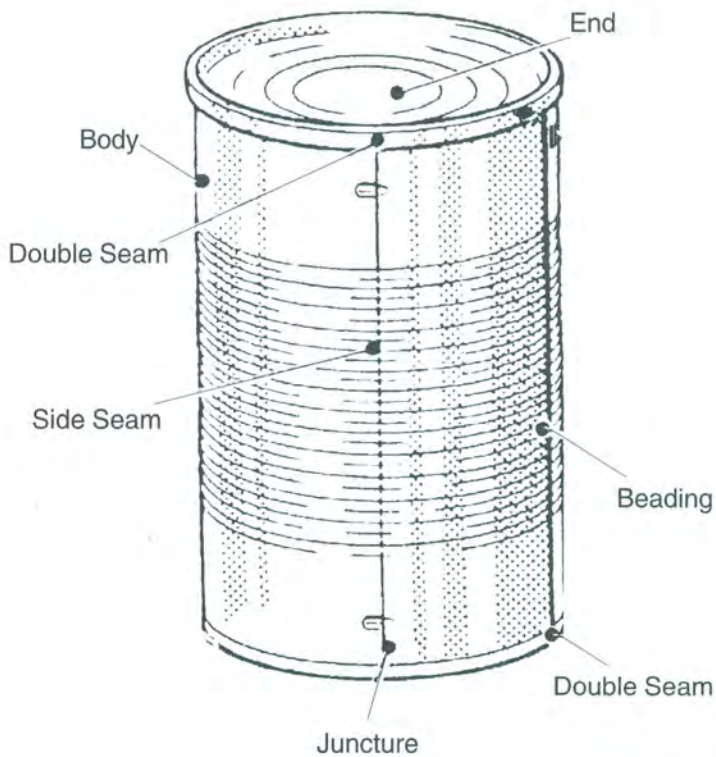
Food and Drug Administration
Department of Agriculture
National Food Processors Association

FRANCE

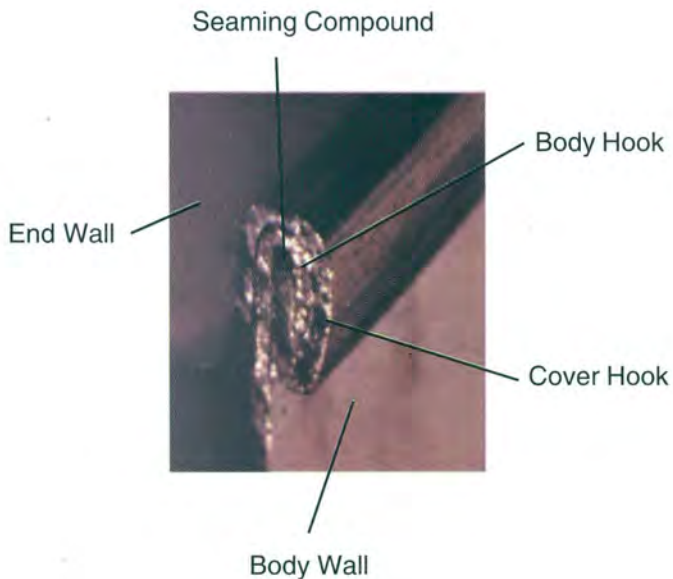
Chambre Syndicale Nationale des Industries de la Conserve

SPAIN

SOIVRE - Secretaría de Estado de Comercio
Instituto de Agroquímica y Tecnología de los Alimentos (CSIC)



Three piece can



Double Seam

Metallic containers (cans) can have a variety of shapes, e.g. cylindrical, pear-shaped, rectangular, etc, the formation of the double seam does not change nor does the nomenclature even when the geometric characteristics or shape of the can are changed.

UNACCEPTABLE
VISIBLE CAN DEFECTS
A PICTORIAL MANUAL

ALL VISIBLY SWOLLEN CANS ARE CONSIDERED AS UNACCEPTABLE DEFECTS

The degrees of swelling vary from slight to severe and are usually referred to as: flipper, springer, soft swell and hard swell.

Definitions:

- a) Flipper: A slight distension of one end of the container where outside pressure will return the end to a normal position but will cause the other end to flip out.
- b) Springer: A slight distension of the container end where pressure will return the end to a normal position until the pressure is released.
- c) Soft Swell: A can with a slight bulging of both ends which will yield when pressure is applied, but will not return and retain its original unswollen position.
- d) Hard Swell: A severe and permanent bulging at both ends of the can which does not yield to finger pressure.

1.1 HARD SWELL

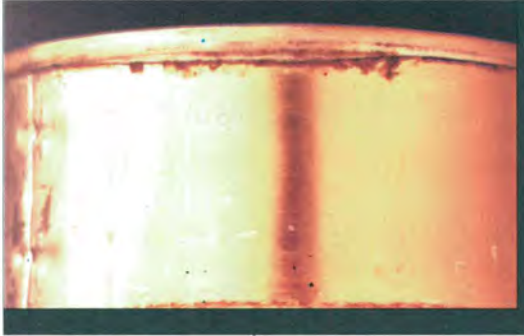


1.1 Hard Swell



1.2 Hard Swell

2.1 DROOPS/VEEES/SPURS



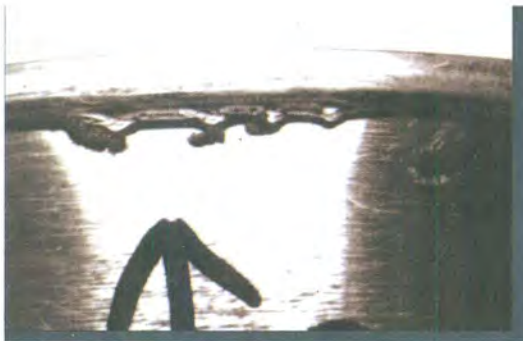
2.1.1 Droop



2.1.2 Droop

These conditions are unacceptable when there is evidence of loss of integrity (e.g. product leakage, loss of vacuum). This may be difficult to assess and situations may occur where expert evaluation is required.

2.1 DROOPS/Vees/SPURS (CONTINUED)



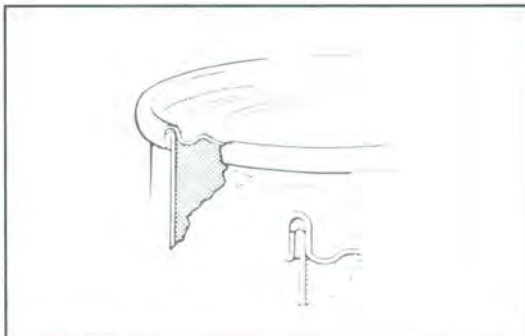
2.1.2a Vees



2.1.2b Vees

The above are examples of unacceptable vees.

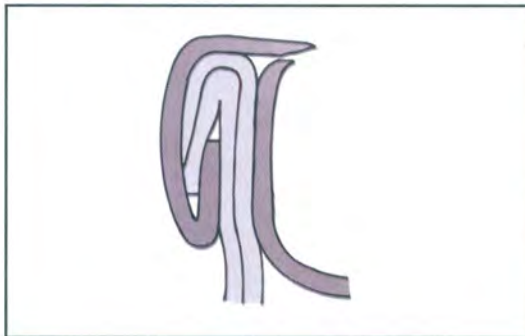
2.2 FALSE SEAM



2.2.1 False Seam

A Knocked Down Flange and a Knocked Down Curl are variations of a false seam. The false seam depicted in the above illustration is very difficult to observe by visual, external examination, and some may only be seen upon a tear down evaluation of the double seam.

2.3 FRACTURED CUTOVER OR CUT-THROUGH



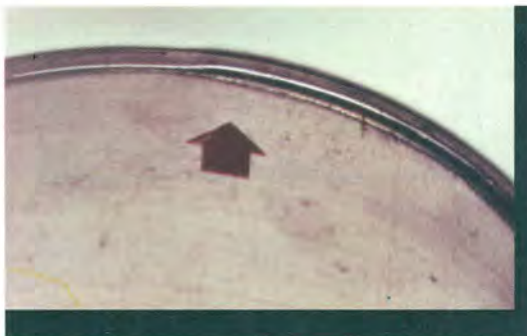
2.3.1 Cutover with metal plate fracture



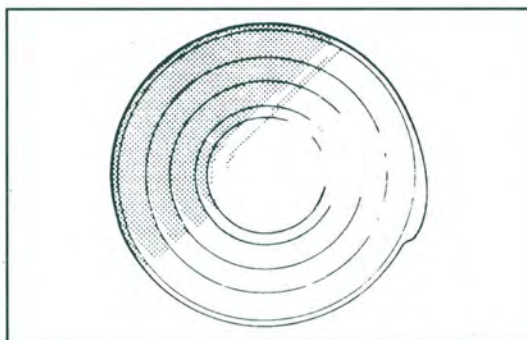
2.3.2 Cutover, Cut-through - the plate is fractured

This defect may be difficult to observe. It occurs most frequently at the cross-over of soldered cans and can be felt as a sharp edge on the inside edge of the cover.

2.4 INCOMPLETE DOUBLE SEAM

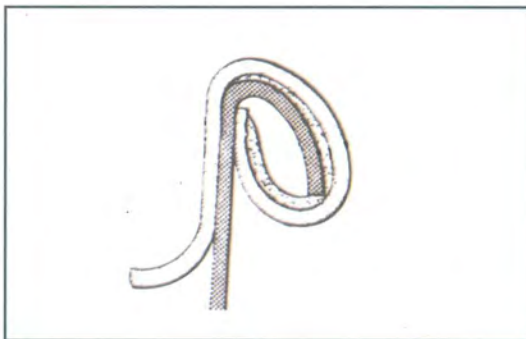


2.4.1a Deadhead or Skidder



2.4.1b Deadhead or Skidder

2.4 INCOMPLETE DOUBLE SEAM (CONTINUED)



2.4.2a Loose Double Seam



2.4.2b Loose Double Seam

2.5 KNOCKED DOWN CURL



2.5.1 Knocked Down Curl



2.5.2 Knocked Down Curl

2.5 KNOCKED DOWN CURL (CONTINUED)



2.5.3 Knocked Down Curl - a cross section

2.6 KNOCKED DOWN FLANGE

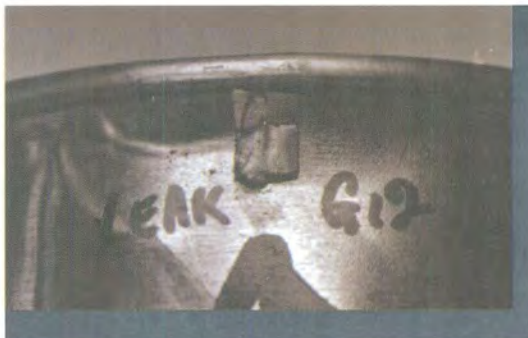


2.6.1 Knocked Down Flange



2.6.2 Knocked Down Flange

2.7 TORN FLANGE

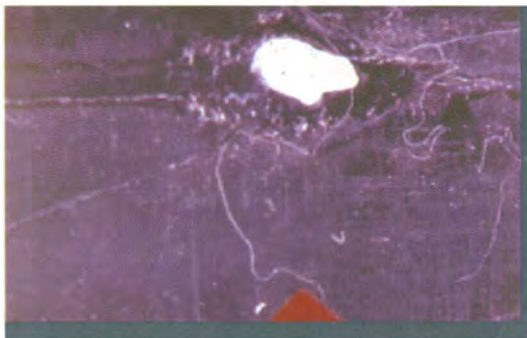


2.7.1 Torn Flange

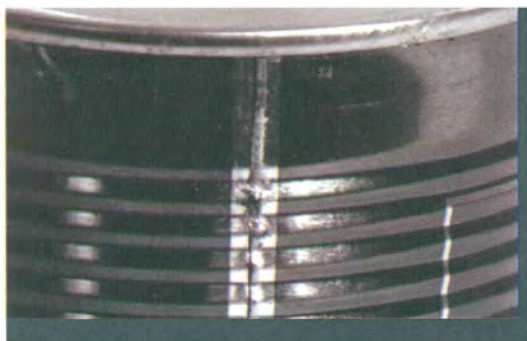


2.7.2 Torn Flange - visible hole

3.1 WELDED SEAMS

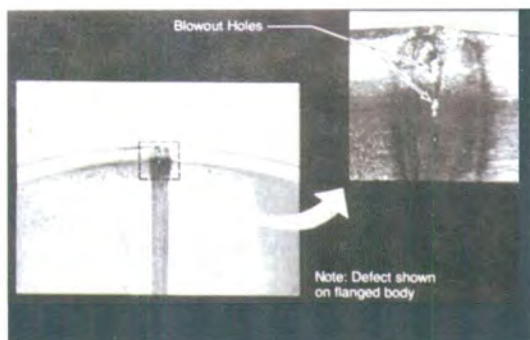


3.1.1a Defective Weld - burn through

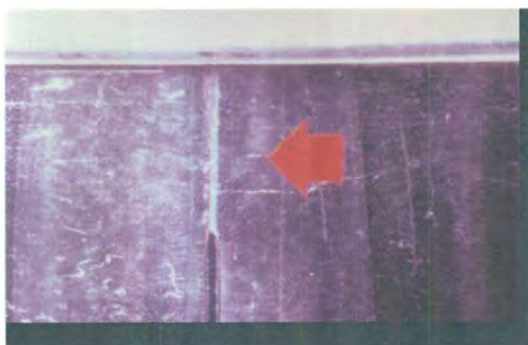


3.1.1b Defective Weld - burn through

3.1 WELDED SEAMS (CONTINUED)

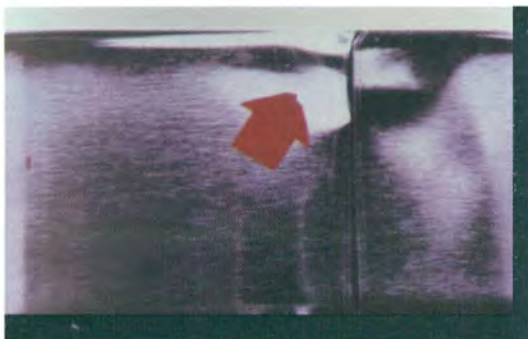


3.1.2 Defective Weld - blow out



3.1.3 Incomplete Weld

3.1 WELDED SEAMS (CONTINUED)



3.1.4 Cold or Weak Weld



3.1.5 Torn Back Corner

Various defects can occur during the formation and welding of side seams which can lead to loss of integrity. This section (3.1) has shown some of the more common unacceptable defects.

3.2 SOLDERED SEAMS



3.2.1 Incompletely soldered side seam



3.2.2 Cold solder - the solder will appear darker (grey, oxidized)

Various defects can occur during the formation of a side seam which could lead to a loss of container integrity. In this section are some of the common unacceptable defects.

3.2 SOLDERED SEAMS (CONTINUED)



Normal



Mislocked



3.2.3 Mislocked Side Seam

4.1 SEVERE BODY DENTS



4.1.1 Severe Body Dents - leakage evident



4.1.2 Severe Body Dent - this is an unacceptable defect as the plate is fractured resulting in leakage

Any denting of the container which results in leakage or fracture of the metal plates is considered as an unacceptable defect. Dents to or involving the double seam or side seam are of concern as they may have permitted leakage with no visible evidence. Expert opinion should be sought to evaluate the severity of such defects.

4.1 SEVERE BODY DENTS (CONTINUED)



- 4.1.3 Severe Body Dent - defects of this type should be closely examined for evidence of leakage or plate fracture. If evidence is found, the container is unacceptable.

4.2 FRACTURED BEADING



- 4.2 Fractured Beading

5.1 CODE FRACTURE



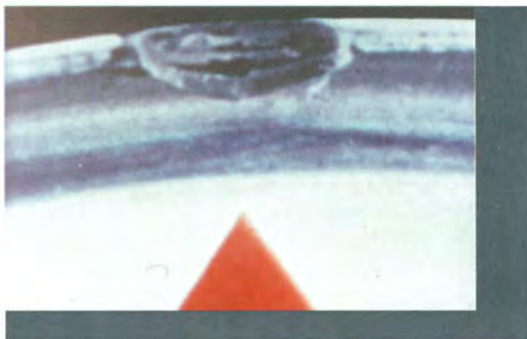
5.1.1 Fractured Embossing



5.1.2 Fractured Embossing - leakage evident

Note: Magnification may be necessary to identify plate fracture at embossing.

5.2 CUT SEAM



5.2.1 Cut Seam - the end plate is cut through



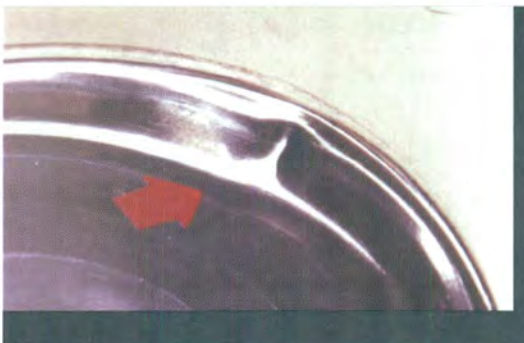
5.2.2 Cut Seam

5.2 CUT SEAM (CONTINUED)



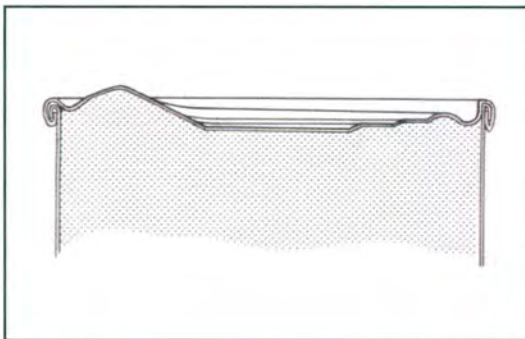
5.2.3 Cut Seam

5.3 PEAKED/BUCKLED



5.3.1 Peak/Buckle

5.3 PEAKED/BUCKLED (CONTINUED)



5.3.2 Peak/Buckle

Note: A Peak/Buckle defect is unacceptable when there is loss of integrity. This may be difficult to assess and situations may occur where expert evaluation is required.

5.4 RIVET FRACTURE



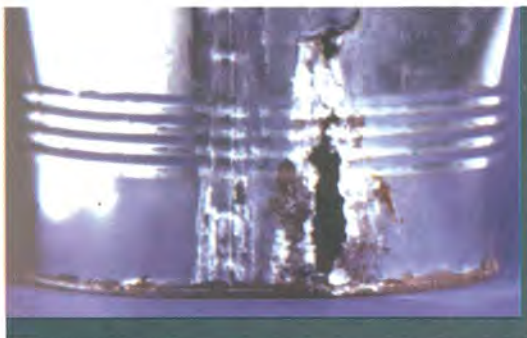
5.4.1 Rivet Fracture

5.5 SCORE FRACTURE



5.5.1 Score Fracture

6.1 EXTERNAL CORROSION



6.1.1 Perforated Corrosion

Corrosion of the external surface resulting in pitting is a concern. It is considered an unacceptable defect when the container is perforated and leakage has occurred. In absence of any evidence of perforation and/or leakage, there is still concern because adverse conditions such as elevated temperature and humidity will encourage further corrosion which may result in perforation. Expert evaluation is required to appraise the extent and potential seriousness of non-perforated corrosion.

6.1 EXTERNAL CORROSION (CONTINUED)



6.1.2 Perforated Corrosion - leakage evident

6.2 FRACTURED PLATE



6.2.1 Fractured Plate

6.3 PERFORATION



6.3.1 Perforation

6.4 PUNCTURE



6.4.1 Puncture

6.5 SLICED, CUT



6.5.1 Sliced or cut

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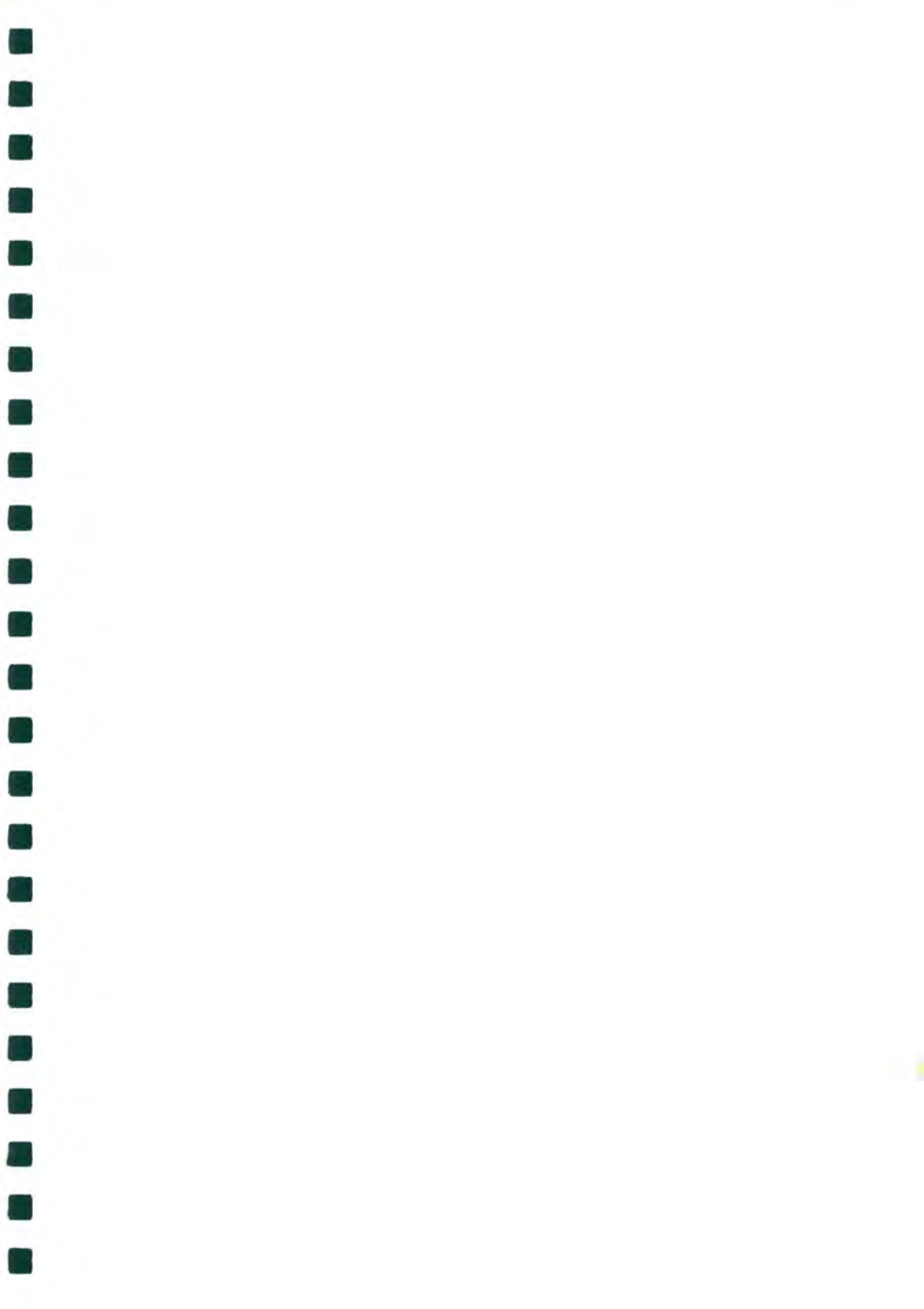
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