



## Metal Can Defects

Identification and Classification

Amend.no.1

30/06/93

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### DEFECT: BROKEN CHUCK

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#### CLASSIFICATION:

A broken chuck is considered a serious seam defect, due to absence of tightness at the point of the defect.

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#### DESCRIPTION:

A portion of the double seam which is not properly ironed-out because of a void in the chuck lip (insufficiently tight), and appearing as an irregularity on the countersink wall of the seam.

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#### COMMON SOURCES:

1. Chipped seaming chuck caused by a jam-up, or improper set-up.
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## Metal Can Defects

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**DEFECT: CLINCHED ONLY**

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### CLASSIFICATION:

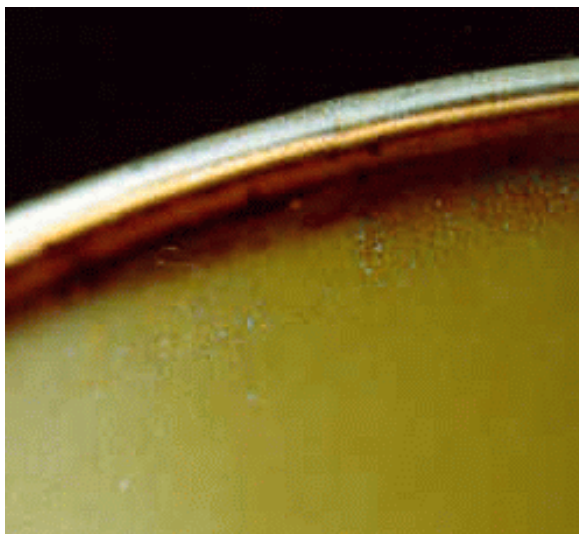
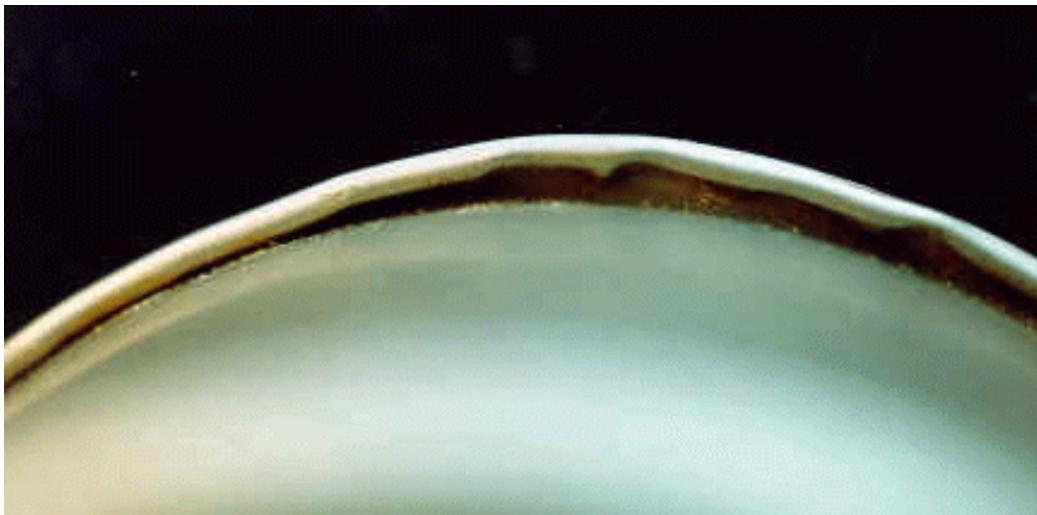
Clinched only is considered as a serious double seam defect.

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### DESCRIPTION:

Only the clinching operation was completed. Cans are removed to check the clinching operation; these cans must be replaced so that the seaming operation will be completed.

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### Metal Can Defects

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**DEFECT: CUTOVER**

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**CLASSIFICATION:**

A cutover is a sharp seam that has fractured and is considered a serious seam defect. A sharp seam is considered a minor seam defect.

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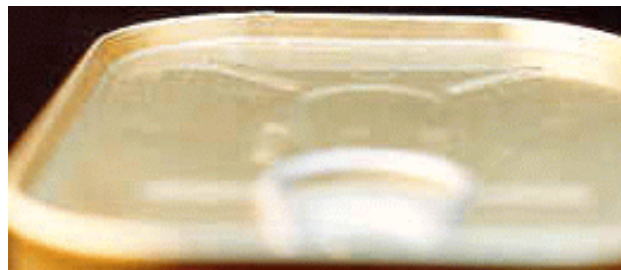
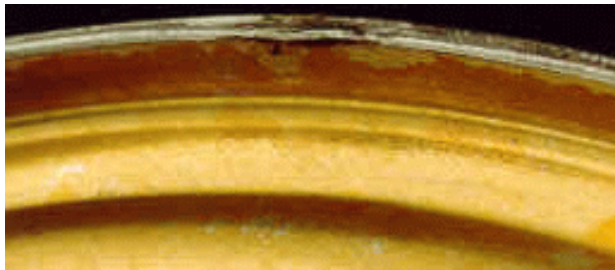
**DESCRIPTION:**

A sharp seam is a sharp fin of metal formed when the seaming panel radius of the end is forced over the top of the seaming chuck flange during the seaming operation. Cutovers are sharp seams which have fractured and often occur at the crossover and with product inclusions but may occur all the way around the double seam; are best detected by running a finger around the inside of the seam. Alternate Terms: Wire Edge, Feather, Feather Edge

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**COMMON SOURCES:**

- |  |                                       |
|--|---------------------------------------|
| 1. Excessive solder in the lap.                                    | 6. Excessive base plate pressure.     |
| 2. Worn seaming chuck.   | 7. Vertical play in the seaming head. |
| 3. Worn seaming rolls.   | 8. Excessively long body hook.        |
| 4. Chuck set too low in relation to first operation seaming rolls. | 9. Inclusion of product in the seam.  |
| 5. Second operation rolls set too tight.                           | 10. Excessive sealing compound.       |
- 







## Metal Can Defects

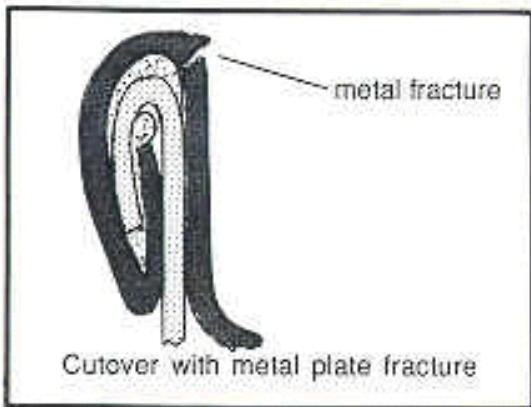
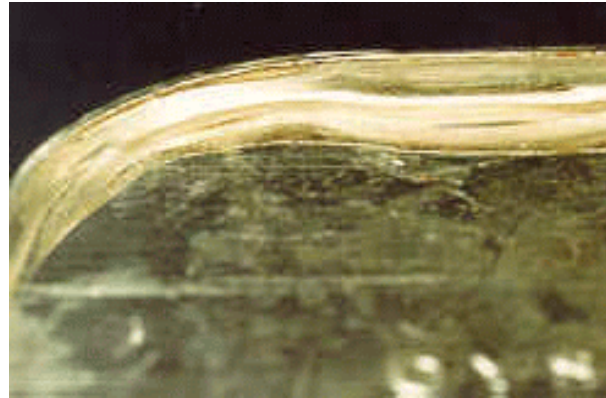
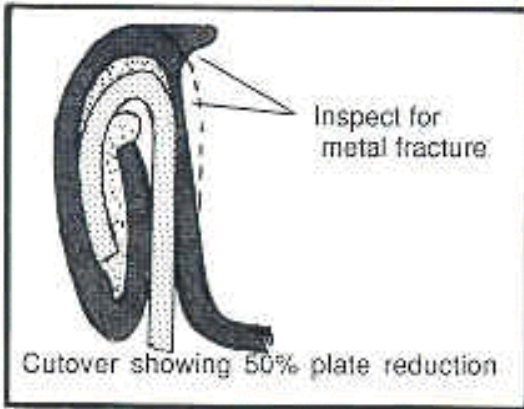
Identification and Classification

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### DEFECT: CUTOVER

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Cutovers are often accompanied by other external double seam defects (as shown above KDC with Cutover)

## Metal Can Defects

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### DEFECT: CUT-DOWN FLANGE (CDF)

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#### CLASSIFICATION:

A cut-down flange is considered a serious seam defect due to the absence of overlap.

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#### DESCRIPTION:

A portion of the body flange which is torn or cut with part of the flange turned back against the can body, without being engaged with the end hook, and may protrude below the bottom of the normal seam. Severe forms of this defect result in a hole in the can body just below the double seam.

A unique type of CDF is the "index fault" found on reformed cans which consists of a characteristic tear in the flange approximately 10-15 mm from the reform ridge on the can body, due to flange damage caused by the reformer picker finger.

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#### COMMON SOURCES:

1. Flange damage during handling of open top cans.
  2. Flange damage during filling.
  3. Flange damage from other canning line equipment.
  4. Flange damage from the grip chain during formation of the can body cylinder.
  5. Mis-indexing of collapsed can body blanks during reforming.
- 





## Metal Can Defects

Identification and Classification

New

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**DEFECT: CUT-DOWN FLANGE (CDF)**

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## Metal Can Defects

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### DEFECT: DROOP

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#### CLASSIFICATION:

The only true assessment is done in a teardown where optical seam measurements of the overlap and seam tightness are assessed applying can manufacturing guidelines.

Any droop assessed as having 25% or less optical overlap will be classified as a serious double seam defect.

Any droop assessed as having 25% to 50% optical overlap will be classified as a minor double seam defect.

When a visual assessment is carried out, the droop will be considered a serious double seam defect if it extends more than 20% of the seam length, or more than 1 cm (3/8") along the seam, or if there is more than one droop on the double seam (confirmation of the classification must be from optical overlap measurements as indicated above).

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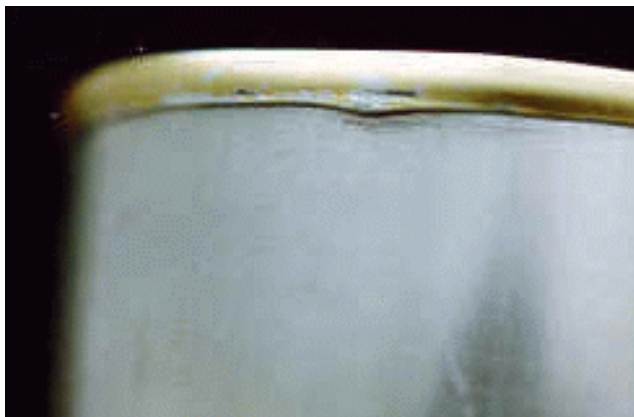
#### DESCRIPTION:

A smooth projection of the end hook of the double seam below the bottom of the normal seam. A droop which shows signs of second operation roll marks will be assessed for classification in terms of overlap; otherwise see FRACTURED SEAM (7.5.7).

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#### COMMON SOURCES:

1. Inclusion of product or foreign material in the double seam.
  2. Excessive amount or unequal distribution of sealing compound.
  3. First operation seam too loose or too tight.
  4. Worn first operation roll groove.
  5. Body hook too long.
- 







## Metal Can Defects

Identification and Classification

New

30/04/89

**DEFECT:** DROOP

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## Metal Can Defects

Identification and Classification

New

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### DEFECT: FALSE SEAM

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#### CLASSIFICATION:

A false seam is considered a serious seam defect due to the absence of overlap.

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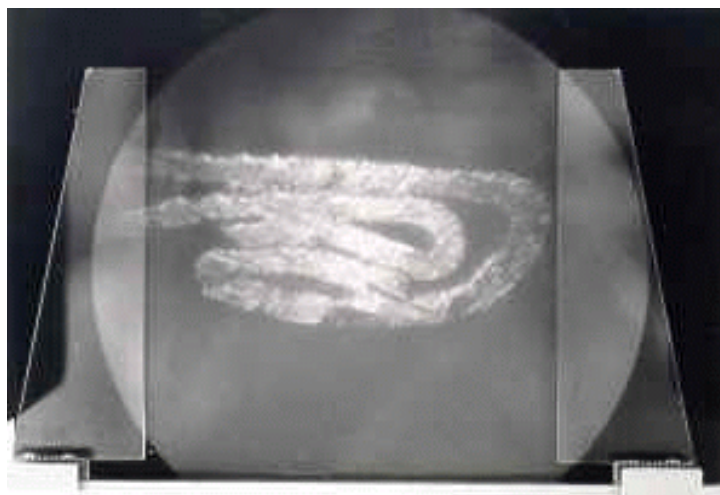
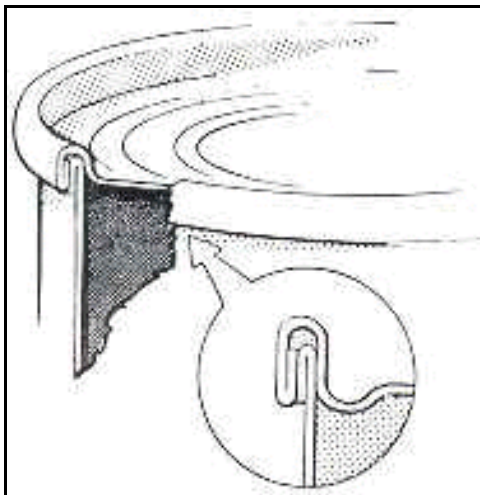
#### DESCRIPTION:

A defect where a portion of the body flange is bent back against the body, without being engaged with the end hook, but does not protrude below the bottom of the end hook radius. This is similar to a knocked-down flange defect where the body flange is visible below the end hook radius. This defect is difficult to observe and requires close visual inspection of the underside of the double seam where sometimes two layers of metal can be seen. Confirmation of this classification often requires a seam cut to observe the configuration of the end curl and body flange.

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#### COMMON SOURCES:

1. Flange damage (bent flange) during shipping, depalletizing, filling the can; from feed screw, the clincher, the seamer; or from product or foreign material on the flange.
  2. Mushroomed can flange.
  3. Damaged or bent end curl.
  4. Misalignment of can during assembly.
- 





## Metal Can Defects

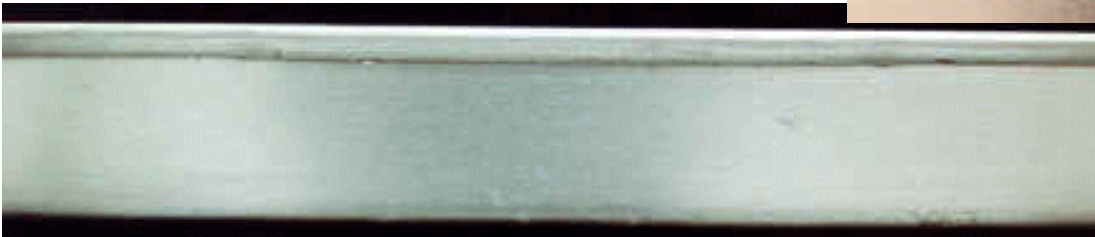
Identification and Classification

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**DEFECT: FALSE SEAM**

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## Metal Can Defects

Identification and Classification

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### DEFECT: FRACTURED SEAM

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#### CLASSIFICATION:

A fractured seam is considered a serious seam defect when the metal is fractured.

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#### DESCRIPTION:

A fracture or break in the end hook radius. This defect may be difficult to observe without magnification. Seams which show second operation roll marks should be closely examined for this defect, particularly at the side seam or if a droop is present.

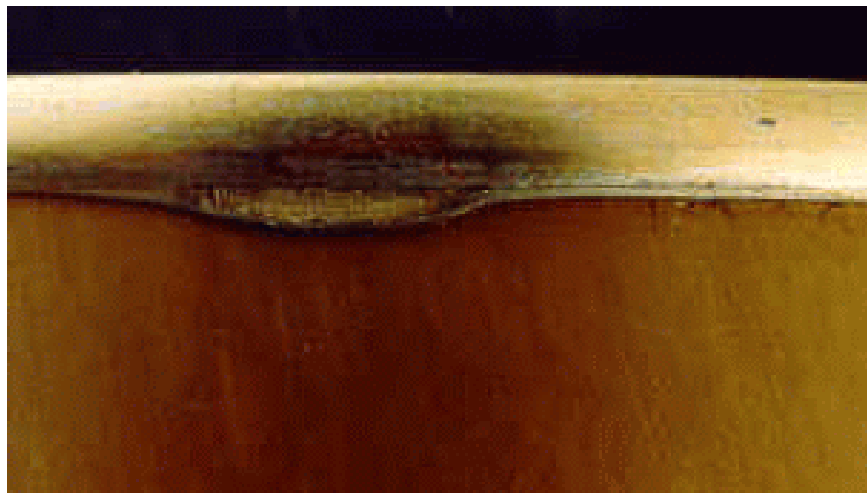
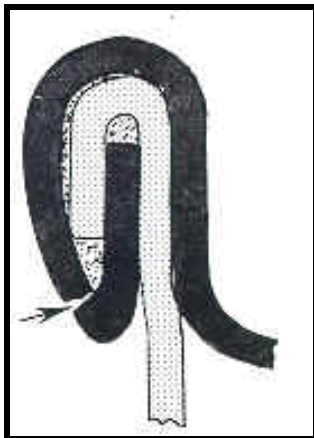
Sometimes designated: Cut Seam (see CUT SEAM 7.7.5)

Alternate Term: Split Droop

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#### COMMON SOURCES:

1. Seam too tight.
  2. Excessive solder in the lap.
  3. Defective end plate.
  4. Excessive sealing compound.
  5. Inclusion of product or foreign material in the seam.
  6. Excessively long end hook resulting from first operation being too tight.
- 







## Metal Can Defects

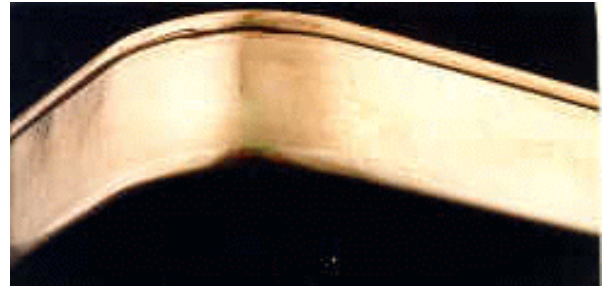
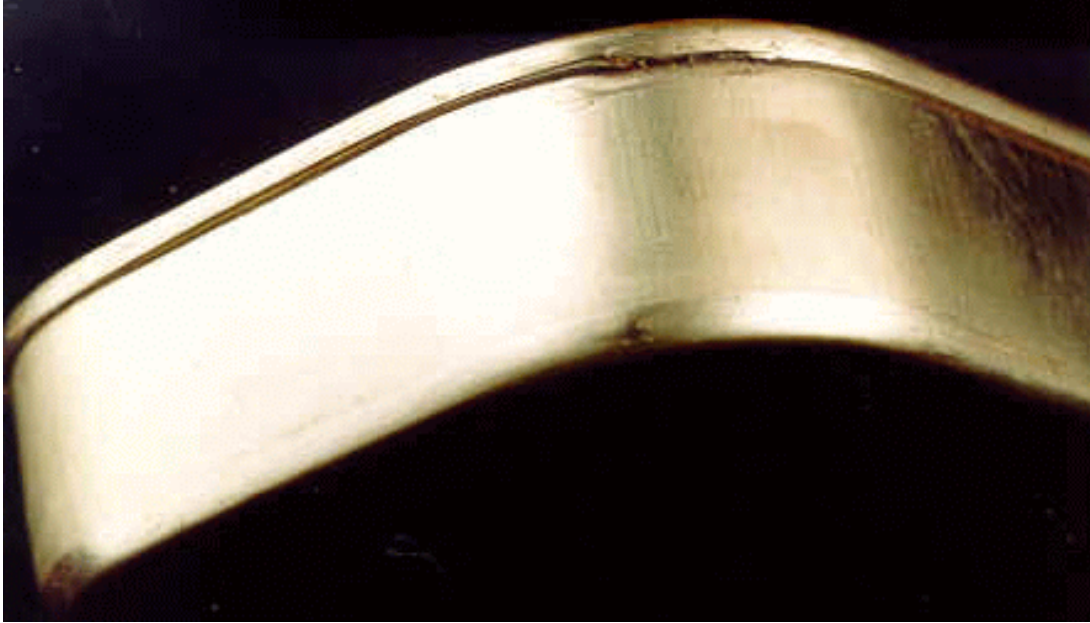
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**DEFECT: FRACTURED SEAM**

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## Metal Can Defects

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### DEFECT: INSUFFICIENT OVERLAP

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#### CLASSIFICATION:

Any portion of the double seam having an optical overlap of less than 25% of the internal seam length is considered to contain a serious double seam defect.

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#### DESCRIPTION:

The can manufacturer provides a guideline for each can size and style outlining the seam measurements and tolerances for which the double seam was designed to ensure an hermetic container. Adequate overlap is an essential requirement for the integrity of a double seam.

The body and end hooks must overlap sufficiently to ensure that the sealing compound is properly held under compression with the correct seam tightness. Calculating overlap by formula provides only an estimate of the overlap. There is no accurate substitute for optical measurement.

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#### COMMON SOURCES:

1. Improper mechanical interlocking of the body flange and end curl.
  2. Incorrect setting of seaming rolls, lifters or base plate loads.
  3. The presence of other material in the seaming areas (e.g., product, excess solder, excess sealing compound, foreign material).
  4. Damaged or incomplete flanges or curls.
-

## Metal Can Defects

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### DEFECT: JUMPED SEAM

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#### CLASSIFICATION:

A jumped seam is considered a serious seam defect due to inadequate seam tightness.

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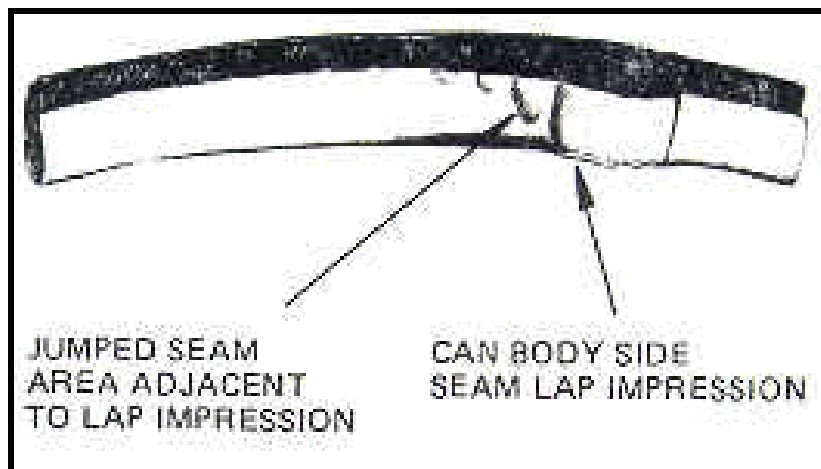
#### DESCRIPTION:

Externally, this defect may appear as a looseness of the seam at one side of the crossover. Internally this defect appears as two or three looseness wrinkles at one side of the crossover. The defect occurs when the seaming rolls jump off the extra thickness of the crossover area. The side of the crossover on which the defect occurs depends on the seaming roll direction in relation to the crossover.

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#### COMMON SOURCES:

1. Operation of the closing machine at excessive speed.
  2. Sluggish acting second operating seaming roll cushion spring.
  3. Second operation seaming roll cushion spring too weak. This defect would be identified on tear down.
  4. Broken cushion spring. This defect would be observable externally.
  5. Can lap too thick at double seam area.
  6. Excessive external solder at can body lap.
  7. Insufficient seam tightness setting.
- 



**Metal Can Defects**

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10/03/06

**DEFECT: KEY TAB NOT PROPERLY TUCKED**

**CLASSIFICATION:**

Key tab not properly tucked is considered a serious double seam defect if:

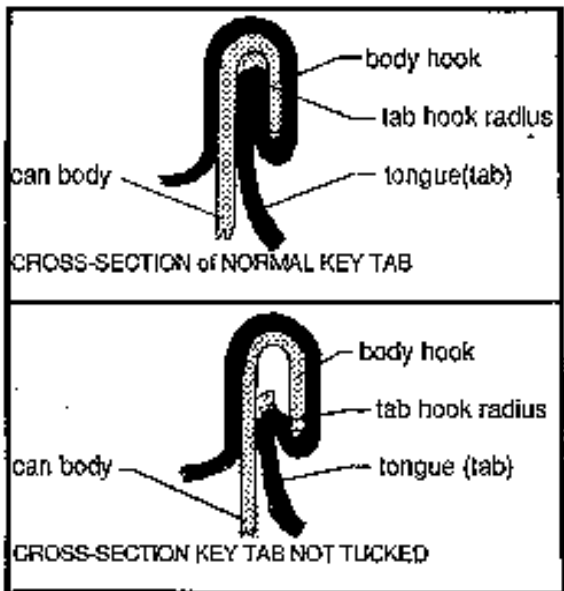
- 1) there is insufficient overlap (7.5.8) present at the key tab area of the double seam; or
- 2) there are vees present adjacent to key tab; or
- 3) there is evidence of leakage.

**DESCRIPTION:**

The key tab portion of end curl not properly incorporated into the double seam resulting in reduced or no overlap. The key tab may be cocked (crooked) or extended downward (partially or completely). Vees may be present on either side of the key tab and the double seam may be fractured.

**COMMON SOURCES:**

1. Defective/damaged can end.
2. Defective/damaged body flange.
3. Improper adjustment of seamer.
4. Worn 1st or 2nd operation rolls.
5. Overfilling of cans with product.
6. Defective sealing compound.





### Metal Can Defects

Identification and Classification

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**DEFECT: KEY TAB SEAMED TO INSIDE**

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**CLASSIFICATION:**

A key tab seamed to the inside of the double seam is considered a serious double seam defect.

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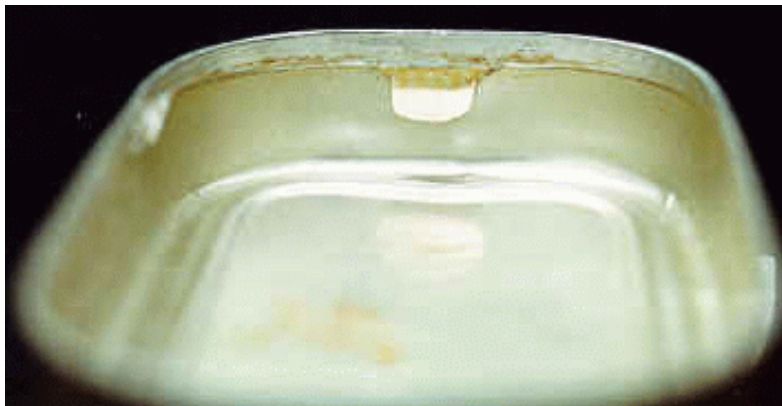
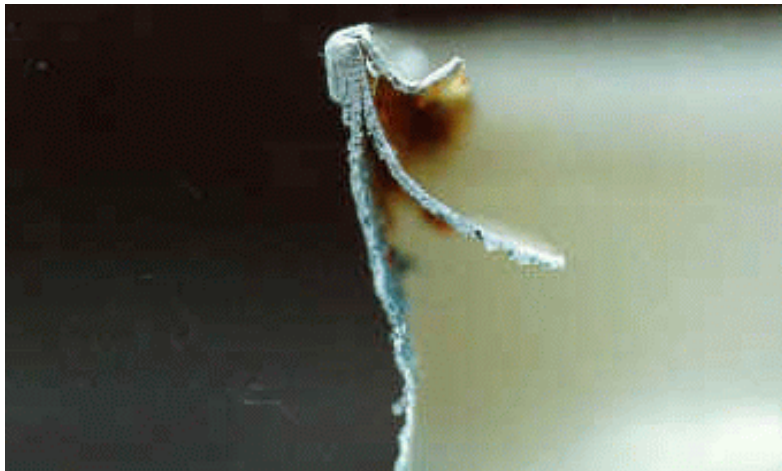
**DESCRIPTION:**

The key tab is not visible from the exterior of the can. There may be vees on either side of the area where the key tab is normally located. The tab is seen on the inside of the can when opened.

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**COMMON SOURCES:**

1. Misfeed of the end to the double seamer.
  2. Key tab damaged prior to seaming.
- 



## Metal Can Defects

Identification and Classification

New

30/04/89

### DEFECTS: KNOCKED-DOWN CURL (KDC)

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#### CLASSIFICATION:

A knocked-down curl is considered a serious double seam defect due to the absence of overlap.

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#### DESCRIPTION:

A portion of the end hook which is not engaged with the body hook but is turned down against the can body exposing the cut edge of the end plate. Variations of this defect can range from a 'V' with the edge of the end plate exposed, to complete knocking-down of the end hook all the way around the can.

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#### COMMON SOURCES:

1. Inclusion of product or foreign material in the seam.
  2. Chuck set too low in relation to the base plate.
  3. Damaged or bent end curl.
  4. Misalignment of can during assembly.
- 





## Metal Can Defects

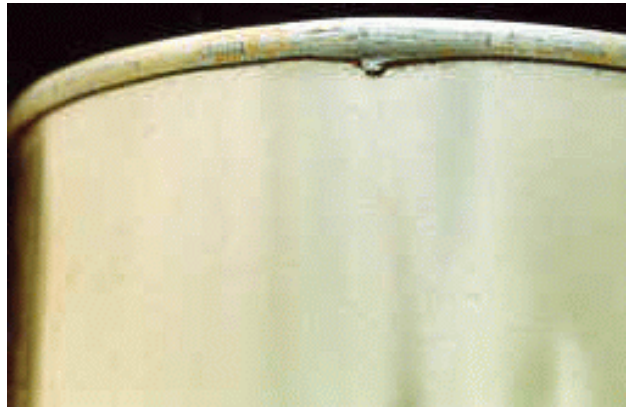
Identification and Classification

New

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**DEFECTS: KNOCKED-DOWN CURL (KDC)**

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## Metal Can Defects

Identification and Classification

New

30/04/89

**DEFECTS: KNOCKED-DOWN CURL (KDC)**

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## Metal Can Defects

Identification and Classification

New

30/04/89

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### DEFECT: KNOCKED-DOWN END (KDE)

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#### CLASSIFICATION:

A knocked-down end is considered a serious seam defect, due to the absence of overlap.

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#### DESCRIPTION:

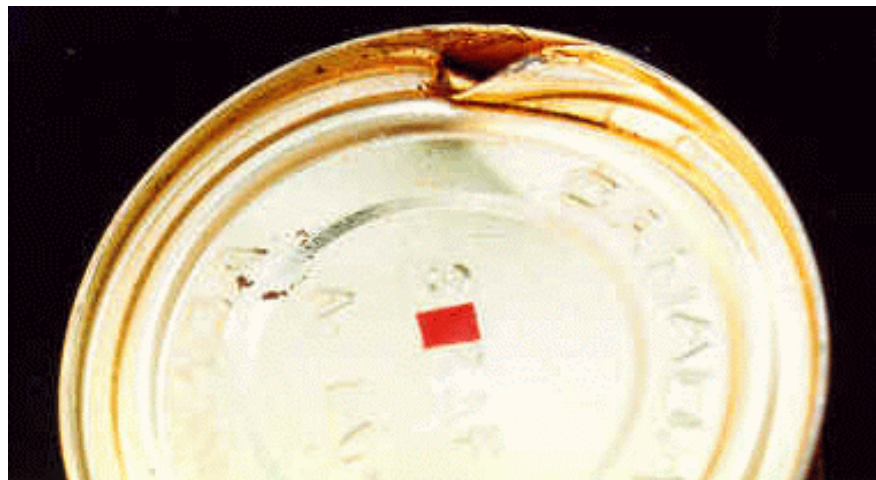
Severe distortion of the can end, as though struck by a downward blow inside the countersink, such that the hooks are disengaged or fail to engage, and part of the curl is pulled back to expose the flange. In severe forms of this defect the end curl is pulled back to expose (form) a hole in the can end.

Alternate Term: Pushed-in Bottom

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#### COMMON SOURCES:

1. Scrap jammed in the seaming head.
- 





## Metal Can Defects

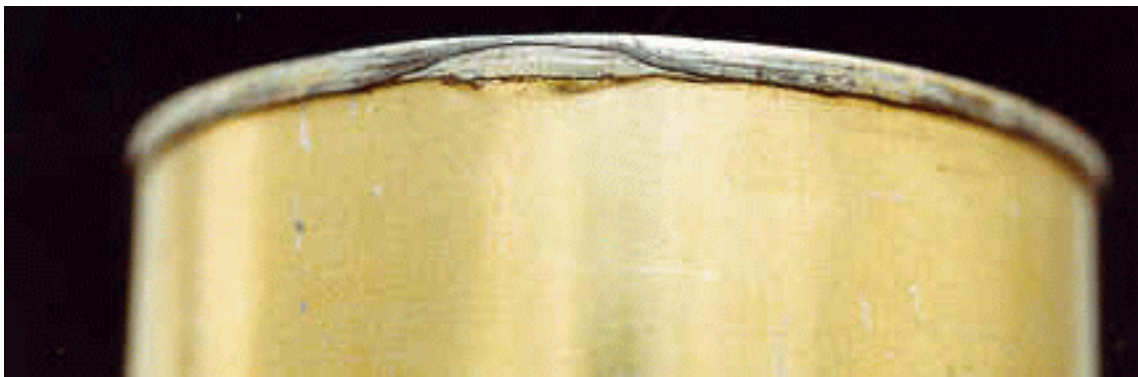
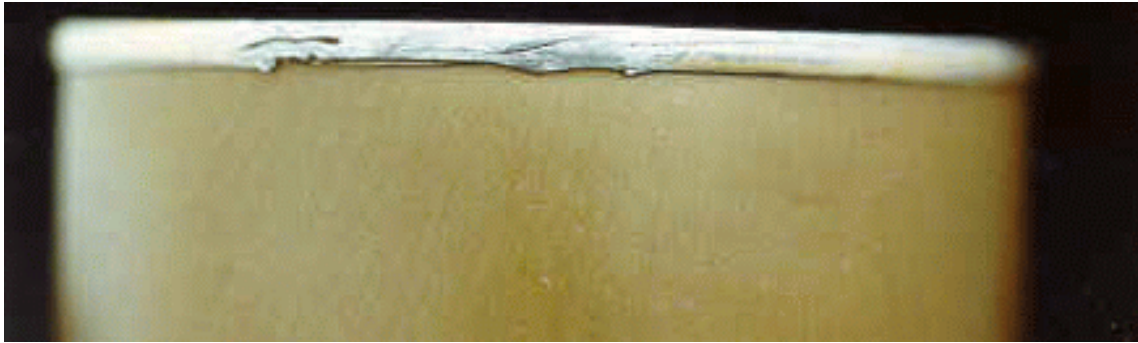
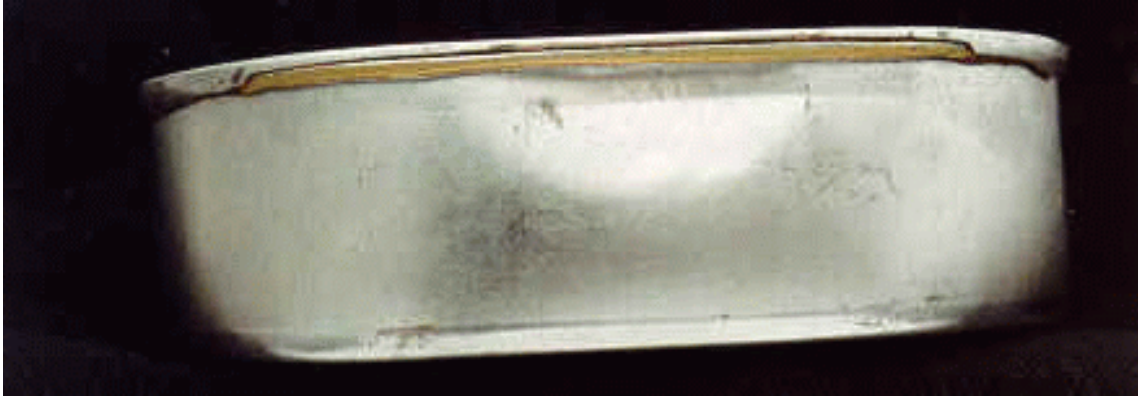
Identification and Classification

New

30/04/89

**DEFECT: KNOCKED-DOWN END (KDE)**

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### Metal Can Defects

Identification and Classification

New

30/04/89

**DEFECT: KNOCKED-DOWN FLANGE (KDF)**

**CLASSIFICATION:**

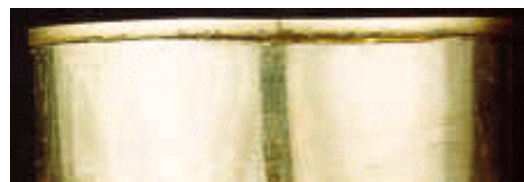
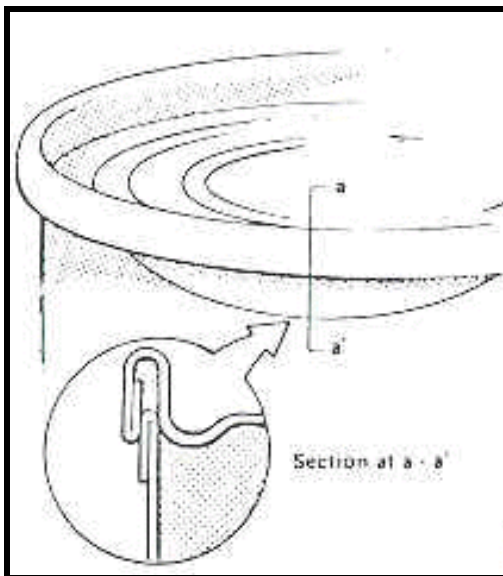
A knocked-down flange is considered a serious seam defect due to the absence of overlap.

**DESCRIPTION:**

A portion of the body flange which is bent back against the body, without being engaged with the end hook, and protruding below the bottom of the end hook radius. This is similar to a false seam defect where the body flange is not readily visible below the end hook radius. Severe forms of this defect involve knocking-down of both the flange and body leaving a distinctive gap between the can end and body. When caused by a feed screw (spacer) on the canning line, the defect has a distinctive "V"-shaped dent to the flange and body with a "signature" scratch down the centre.

**COMMON SOURCES:**

1. Flange damage during filling.
2. Flange damage during shipping or depalletizing.
3. Flange damage from canning line screw feed.
4. Flange damage from the clincher or seamer.
5. Flange damage from product or foreign material on the flange.
6. Mushroomed can flange.
7. Damaged or bent end curl.
8. Misalignment of can during assembly.





### Metal Can Defects

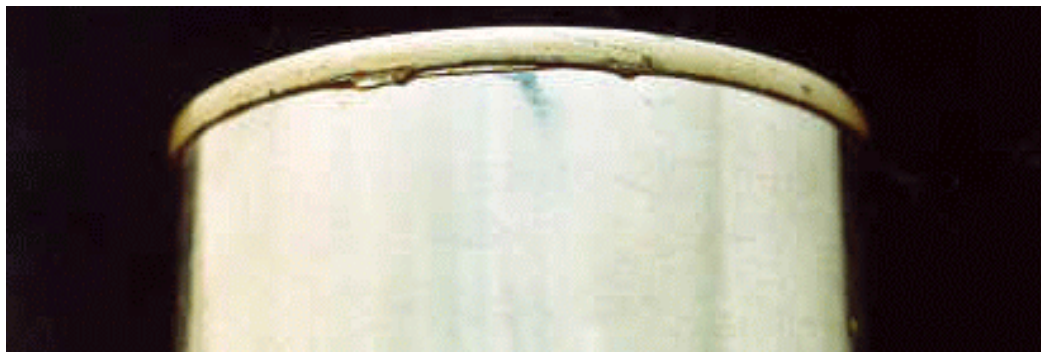
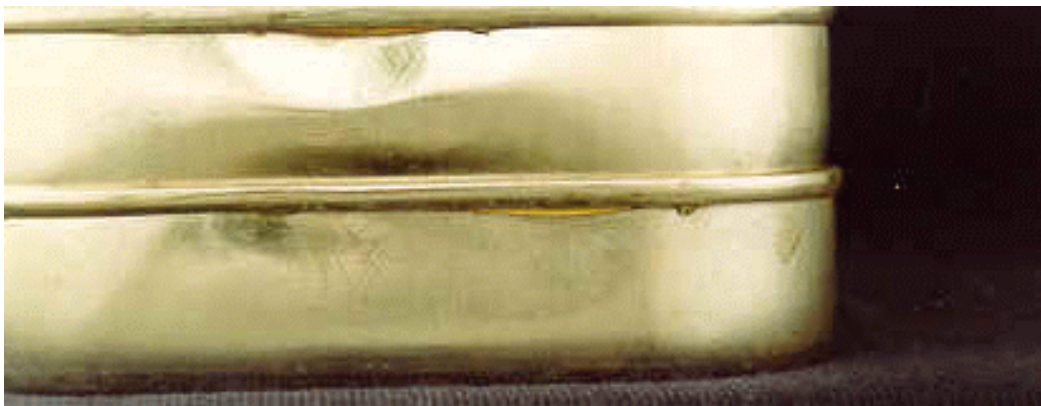
Identification and Classification

New

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**DEFECT: KNOCKED-DOWN FLANGE (KDF)**

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## **Metal Can Defects**

Identification and Classification

Amend.no.4

10/03/06

### **DEFECT: LOOSE SEAMS**

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#### **CLASSIFICATION:**

A loose seam is considered a serious double seam defect if:

- 1) seam tightness is less than the minimum required by the can manufacturer's guidelines; or
  - 2) for round can product where can manufacturer's published guidelines are not available, tightness ratings as specified in table 4.1.5 will be applied; or
  - 3) containers which are non-round and are designed for no vacuum, and where can manufacturer's guidelines are not available, tightness ratings are less than 50%, and for other non-rounded containers and where manufacturer's guidelines are not available, tightness ratings as specified in table 4.1.5 will be applied; or
  - 4) there is any evidence of leakage; or
  - 5) the percentage "free space" exceeds 33% of the combined metal thickness comprising of the double seam or the percentage "compactness" is less than 75% in the prime sealing area.
- 

#### **DESCRIPTION:**

A loose seam is normally characterized by one or more of the following conditions: rounded appearance of the double seam profile (a bowed seam configuration); seam thickness which exceeds accepted can manufacturer's guidelines; the can has a faint or no pressure ridge; and a low tightness rating. In severe examples of loose seams, the body hook and the end hook of a cut out (seam saw cross section) double seam may slide apart. This slippage condition in the double seam would demonstrate loose seam condition.

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#### **COMMON SOURCES:**

1. Loose 1st operation.
  2. Loose 2nd operation.
  3. Worn 1st or 2nd operation rolls.
  4. Improper roll profile.
  5. Defective can end.
  6. Poor can end design.
  7. Pre-wrinkle in seaming panel or end curl.
-



## Metal Can Defects

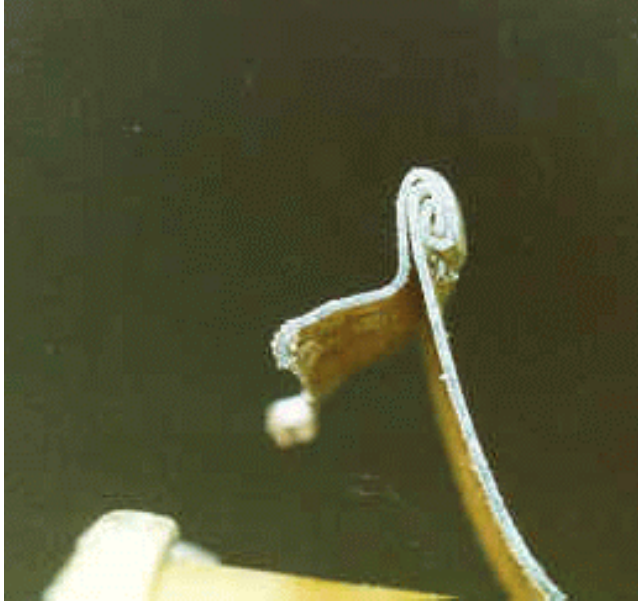
Identification and Classification

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15/12/97

**DEFECT: LOOSE SEAMS**

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## Metal Can Defects

Identification and Classification

New

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**DEFECT: NO SECOND OPERATION**

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### CLASSIFICATION:

No second operation is considered as a serious double seam defect.

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### DESCRIPTION:

Only the first operation was completed. Cans are removed to check the first seaming operation; these cans must be replaced so that the second operation seaming will be completed.

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NORMAL DOUBLE SEAM

NO SECOND OPERATION



## Metal Can Defects

Identification and Classification

New

30/04/89

### DEFECTS: PLEATS

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#### CLASSIFICATION:

A pleat is considered a serious defect if the pleat extends to the bottom of the double seam.

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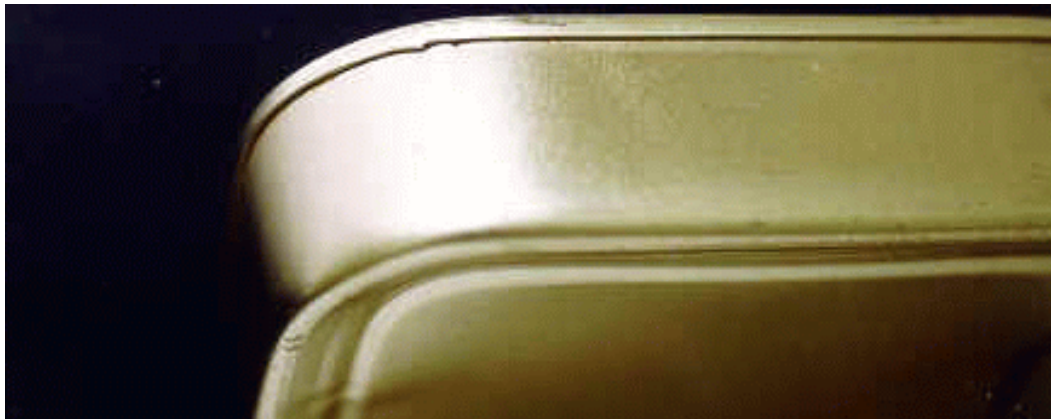
#### DESCRIPTION:

A pleat is a fold in the end hook which may be accompanied by a small vee-shaped projection of the end hook radius and the metal of the fold may be fractured. A pucker is intermediate between a wrinkle and a pleat, where the end hook is locally distorted downwards; it may or may not be externally visible.

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#### COMMON SOURCES:

1. Clincher or first operation rolls set too loose.
  2. Worn rolls.
  3. Second operation rolls set too tight will aggravate the pleat or pucker.
  4. Poor can end design.
  5. Residual wrinkle along end curl.
- 







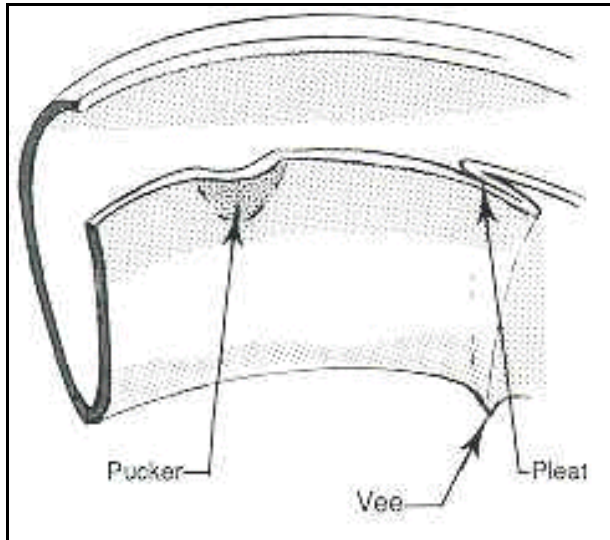
## Metal Can Defects

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### DEFECTS: PLEATS



INSET SHOWS THE END CURL

**Metal Can Defects**

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**DEFECTS: PUCKER**

**CLASSIFICATION:**

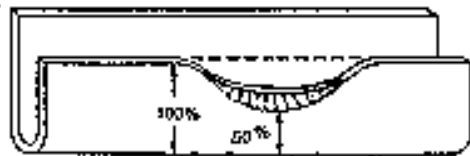
A pucker is considered a serious defect if there is insufficient overlap (7.5.8).

**DESCRIPTION:**

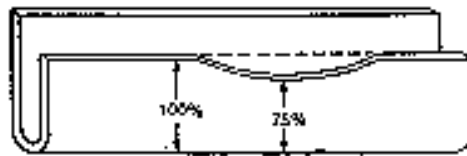
A pucker is intermediate between a wrinkle and a pleat where the end hook is locally distorted downwards; it may or may not be externally visible.

**COMMON SOURCES:**

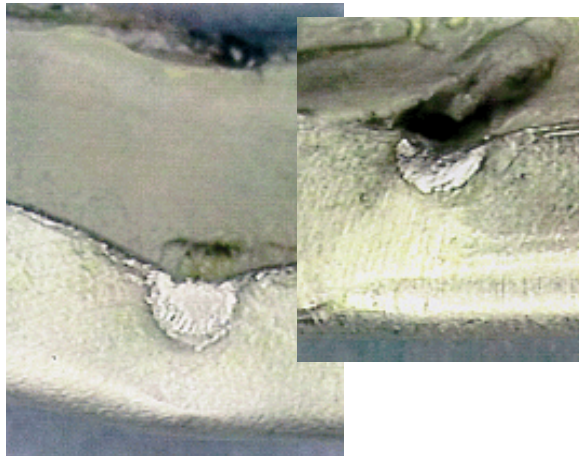
1. Clincher or first operation rolls set too loose.
2. Worn rolls.
3. Second operation rolls set too tight will aggravate the condition.
4. Poor can end design.
5. Residual wrinkle along end curl.



Serious Pucker



Minor Pucker





## Metal Can Defects

Identification and Classification

New

30/04/89

### DEFECT: SEAM INCLUSIONS

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#### CLASSIFICATION:

Seam inclusions are considered as serious double seam defects.

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#### DESCRIPTION:

Extraneous material or product included in the double seam.

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#### COMMON SOURCES:

1. Product over flange.
  2. Scrap metal from a filler jam up.
  3. Solder pellets.
- 



PARCHMENT PAPER FORMED  
INTO DOUBLE SEAM.

## **Metal Can Defects**

Identification and Classification

Amend.no.4

10/03/06

### **DEFECT:    SIDE SEAM DROOP**

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#### **CLASSIFICATION:**

The only true assessment is done in a teardown where optical seam measurements of the overlap and seam tightness are assessed applying can manufacturing guidelines.

Any side seam droop assessed as having 25% or less optical overlap will be classified as a serious double seam defect.

Any side seam droop assessed as having 25% to 50% optical overlap will be classified as a minor double seam defect.

When a visual assessment is carried out, the droop will be considered a serious double seam defect if it extends more than 20% of the seam length, or more than 1 cm (3/8") along the seam, or if there is more than one droop on the double seam (confirmation of the classification must be from optical overlap measurements as indicated above).

---

#### **DESCRIPTION:**

A smooth projection of the end hook of the double seam below the bottom of the normal seam at the crossover. A slight droop at the crossover may be considered normal because of the additional plate thicknesses incorporated in the seam structure. However, excessive droop at this point is not acceptable.

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#### **COMMON SOURCES:**

1. Excess external solder at the can body lap.
  2. Can lap too thick at the double seam area (thick lap).
-



DEFECT: SIDE SEAM DROOP

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### Metal Can Defects

Identification and Classification

New

30/04/89

**DEFECT: SPINNER**

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**CLASSIFICATION:**

A spinner is considered a serious seam defect due to inadequate tightness.

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**DESCRIPTION:**

A spinner is an incompletely ironed out double seam. It occurs when the chuck slips on the can end. This defect is characterized by part of the seam having normal thickness and part of the seam being loose (thick). This defect may be accompanied by a scuffing of the countersink wall radius caused by the chuck slipping. First operation spinner shows signs of vees around can, second operation spinner has incomplete double seam.

Deadhead - this terminology applies for can revolve closing machines.

Spinner - this terminology applies for can standstill closing machines.

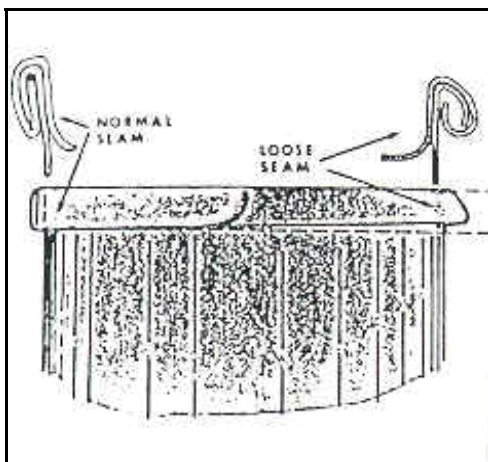
Alternate terms: Deadhead, Skidder, Incomplete Double Seam

Associated Conditions: Scuffed Seam

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**COMMON SOURCES:**

1. Insufficient lifter pressure.
  2. Improper end fit with chuck, size or taper, either too loose or too tight.
  3. Worn seaming chuck.
  4. Incorrect pin height setting. Chuck set too high in relation to base plate.
  5. Seaming rolls binding.
  6. Oil or grease on seaming chuck or lifter.
  7. Any vertical play of seaming chuck spindle.
  8. Improper timing.
- 





## Metal Can Defects

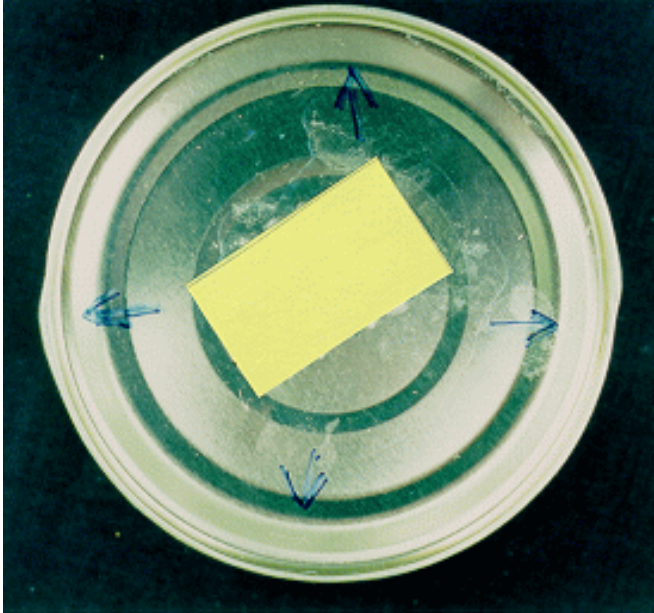
Identification and Classification

Amend. no. 2

15/12/97

**DEFECT: SPINNER**

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Top view showing  
incompletely ironed  
out double seam

Countersink wall radius  
showing scuffing caused  
by chuck slipping





## Metal Can Defects

Identification and Classification

Amend.no.1

30/06/93

**DEFECT: VEE**

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### CLASSIFICATION:

Vees are considered to be serious double seam defects due to the absence of overlap at the point of the vee.

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### DESCRIPTION:

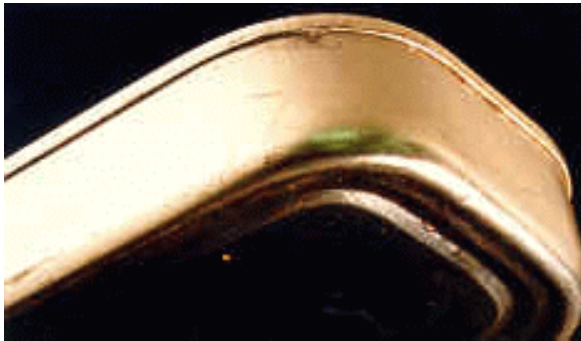
A sharp 'V' shaped projection of the end hook of the double seam below the bottom of the normal seam which results in no overlap.

Alternate Terms: Lip, Spur

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### COMMON SOURCES:

1. Inclusion of product/bones or foreign material in the double seam.
  2. First operation seam too loose.
  3. Worn first operation roll groove.
- 



**MULTIPLE DEFECTS MAY OCCUR -  
AS SHOWN A KNOCKED DOWN CURL  
PLUS A SERIOUS VEE.**





## Metal Can Defects

Identification and Classification

New

30/04/89

**DEFECT: VEE**

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