



Metal Can Defects

Identification and Classification

New

30/04/89

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DEFECT

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DEFECT: ACID SALTS CORROSION

CLASSIFICATION:

Acid salts corrosion is considered a serious three piece can defect.

DESCRIPTION:

Acidic residues on the outside of the side seam area that result in rusting, or any deposit of salts on the inside of the can.

COMMON SOURCES:

1. Acidic residues on the side seam solder, picked up from the solder bath when it is charged with "acid crystals" used to keep the solder roll clean and "tinned".
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DEFECT: COLD SOLDER

CLASSIFICATION:

Cold solder is considered a serious three piece can defect.

DESCRIPTION:

A discontinuity (gaps or voids) or a rough and spongy irregularity of the side seam solder fillet which could result in a pathway through the side seam. The cold solder condition will most easily occur in the lap area at the extremities of the side seam, but cannot be properly checked unless the side seam and double seam are torn down for examination.

COMMON SOURCES:

1. Solder temperatures too cold.
-



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DEFECT: DISTORTED REFORM RIDGE

CLASSIFICATION:

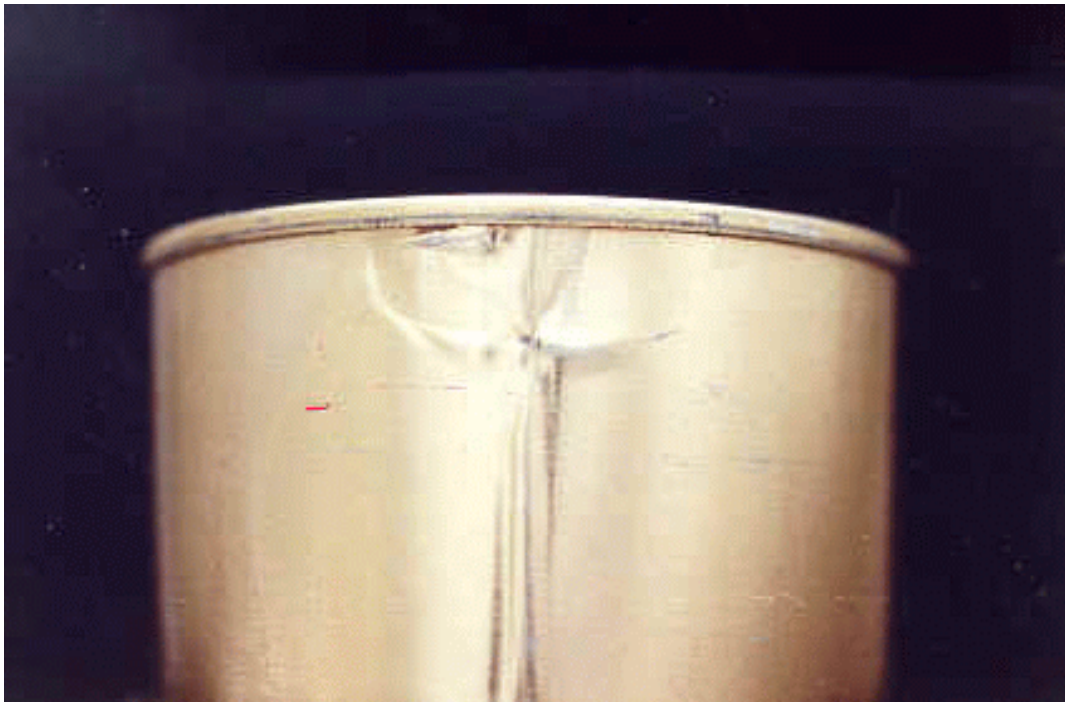
A distorted reform ridge is considered a serious three piece can defect.

DESCRIPTION:

Creasing of the body and flange area on the reform ridge of reformed cans such that it affects the integrity of the double seam or fractures the metal plate.

COMMON SOURCE:

1. Improper flattening of can body cylinders.
 2. Improper reforming of flattened can body cylinders.
-



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DEFECT: EXCESSIVE SOLDER

CLASSIFICATION:

Excessive solder is considered a serious three piece can defect, if:

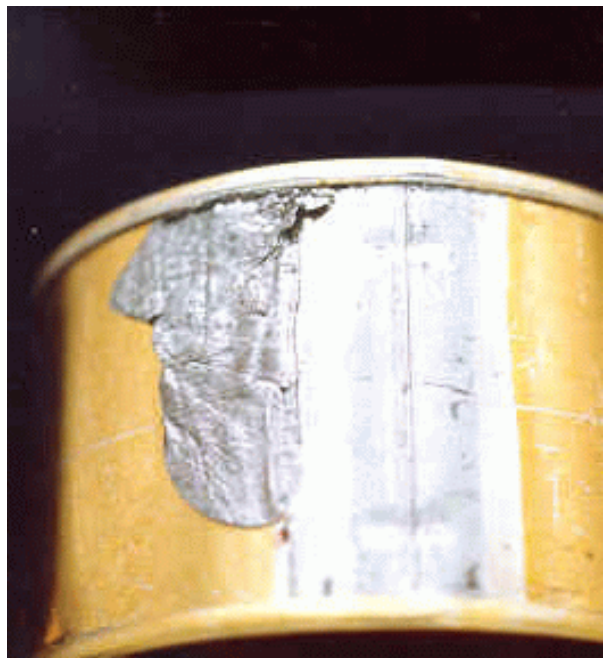
- 1) a solder ridge 1/2 the can height in length by 0.4 mm (1/64") in thickness on the outside is found; or
 - 2) the excess solder interferes with the forming of the double seam.
-

DESCRIPTION:

Excessive solder at the customer lap area of the side seam which may cause deformation of the double seam at the crossover, resulting in excessive side seam droop, a raised seam, or a jumped seam. Excessive solder may also cause a pleat to form in the side seam lap. A thick lap is a condition where the side seam contains excess solder between the laps.

COMMON SOURCES:

1. Improper wiping of the solder.
-



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DEFECT: FLUX STAINS

CLASSIFICATION:

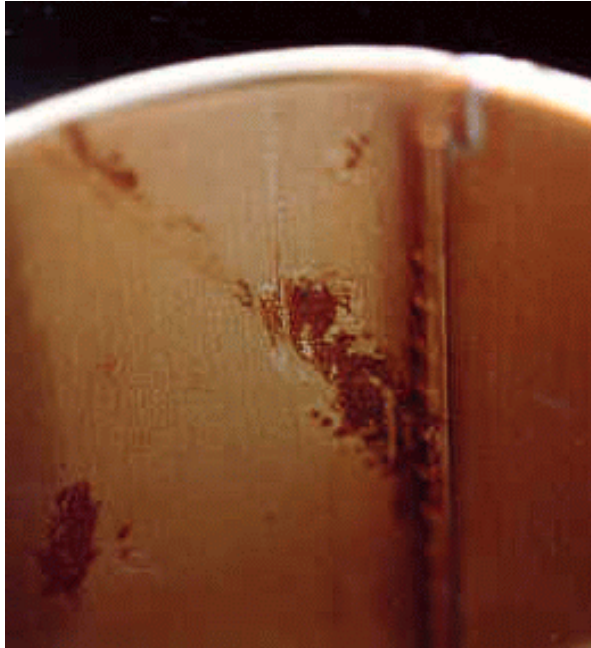
Flux stains are considered as minor three piece can defects.

DESCRIPTION:

Dark brown resinous staining on the inside surface of the side seam or lap. The fluxes used for the manufacture of food cans in Canada are non-toxic and will not impart off-odors or off-flavours to the product.

COMMON SOURCES:

1. Excessive flux during the side seam soldering operation.
-



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DEFECT: INSUFFICIENT SOLDER

CLASSIFICATION:

Insufficient solder is considered a serious three piece can defect if the solder fillet is incomplete along the outside of the side seam and is accompanied by a defective sweat.

DESCRIPTION:

Solder voids in the outside side seam fillet resulting in incomplete soldering of the side seam. The fillet is the strip of solder deposited along the intersection of the two walls of folded metal plate of the side seam. A TURNED CAN, depending on the degree of turning, results in a solder void or an incomplete fillet along the outside of the side seam.

A sweat is the action of bonding together, by application of heat, of surfaces to which solder has already been applied. A defective sweat is the result of improper solder temperature or incorrect flux application.

COMMON SOURCES:

1. Contamination of the side seam area such that solder bonding is prevented.
 2. Improper or insufficient flux application.
 3. Turning of the can body prior to solder application.
 4. Excessive wiping of the solder.
 5. Solder temperature too hot.
-



CONTAMINATION



EXCESSIVE WIPING

Metal Can Defects

Identification and Classification

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DEFECT: INVERTED INSIDE COATING

CLASSIFICATION:

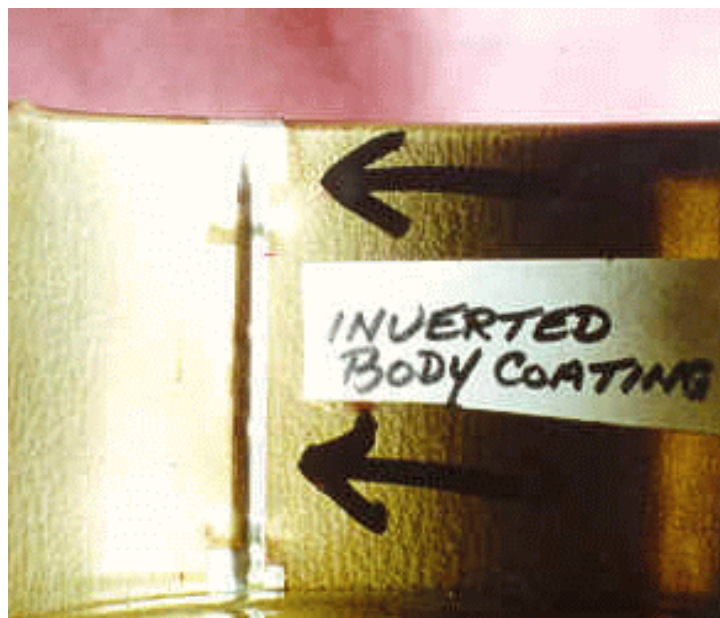
The inverted inside coating is considered a serious three piece can defect for a soldered can. On a welded can it is considered a minor defect unless there is product/container incompatibility.

DESCRIPTION:

The inside coating margin pattern is visible. Plain rectangular areas show at each end of the side seam. These plain areas are normally concealed in the side seam. Soldering will be incomplete due to coated areas in the side seam fold.

COMMON SOURCES:

1. Misfeed (backward feed) of sheets to slitter (machine which cuts sheets into body blanks).
 2. Misfeed (backward feed) of body blanks to body maker.
-



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DEFECT: MIS-LOCKED SIDE SEAM

CLASSIFICATION:

A mis-locked side seam is considered a serious three piece can defect.

DESCRIPTION:

Failure of the side seam hooks to interlock along their entire length. Complete soldering of the side seam is not always possible. The side seam most probably will not leak.

COMMON SOURCES:

1. Misassembly of the side seam hooks.
 2. Side seam hooks damaged prior to assembly.
 3. Improperly formed side seam hooks.
-



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DEFECT: MIS-NOTCH

CLASSIFICATION:

A mis-notch is considered a serious three piece can defect when a 0.8 mm (1/32") gap extends into the depth of the flange.

DESCRIPTION:

A gap in the side seam lap area where the notched or cut away section is not overlapped by metal plate resulting in an incomplete flange.

COMMON SOURCES:

1. Misalignment during notching of the body blank.
-



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DEFECT: NECKED-IN CAN

CLASSIFICATION:

A necked-in can is considered a serious three piece can defect. This classification only applies to those cans which were not designed to be necked-in.

DESCRIPTION:

A can body which has an end diameter that is unintentionally smaller than the main body cylinder diameter. Either one or both ends of the body cylinder may be necked-in.

Necked-in cans are now commonplace in the beverage industry and the technology may appear in other food containers. Necked-in cans are intentionally necked-in to strengthen the can body. The can ends for such cans are intentionally smaller in diameter.

COMMON SOURCES:

1. Misassembly of the body blank edges during formation of the side seam.
-



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DEFECT: NOTCHER TRIM STILL ATTACHED

CLASSIFICATION:

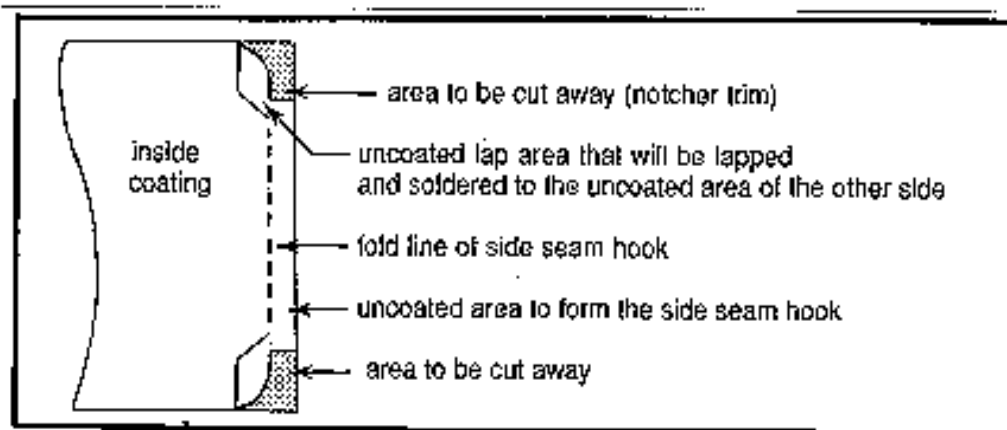
Notcher trim still attached is considered a serious three piece can defect due to additional metal formed into the double seam.

DESCRIPTION:

Extraneous metal at the side seam lap area having the shape of the section of body blank that is normally cut away prior to the formation of the side seam hooks.

COMMON SOURCES:

1. Notching die failed to make a clean cut.
-



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DEFECT: OFF REGISTER BODY BLANK COATING

CLASSIFICATION:

An off register body blank coating is considered a serious three piece can defect when complete soldering of the side seam is not possible.

DESCRIPTION:

An off register or misplacement of the inside and/or outside coating. This may result in coating of the margin(s) along the body blank edges which will form the side seam. This misplaced coating prevents soldering. The side seam margin will appear elsewhere on the can body giving the can a turned appearance.

COMMON SOURCES:

1. Off register coating application.
 2. Off register slitting of sheets into body blanks.
-



Metal Can Defects

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DEFECT: OPEN OR WEAK LAP

CLASSIFICATION:

Open or weak lap is considered a serious three piece can defect if the solder bond at the lap is broken either before or after flexing the lap inward 2.4 mm (3/32").

DESCRIPTION:

A condition where light finger pressure on an empty can will cause the bonded (soldered) lap joint to open. When empty cans with weak laps or open laps are seamed, the lap joint solder frequently fractures resulting in an open lap and leakage. Such an open lap is sometimes difficult to observe, and cans with this defect appear "normal" except for gross liquid loss.

COMMON SOURCES:

1. Solder temperatures too hot or too cold.
 2. Improper or insufficient flux during soldering.
 3. Laps insufficiently tightened (see section 3.3.1).
-



Metal Can Defects

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DEFECT: OUT-OF-SQUARE BODY

CLASSIFICATION:

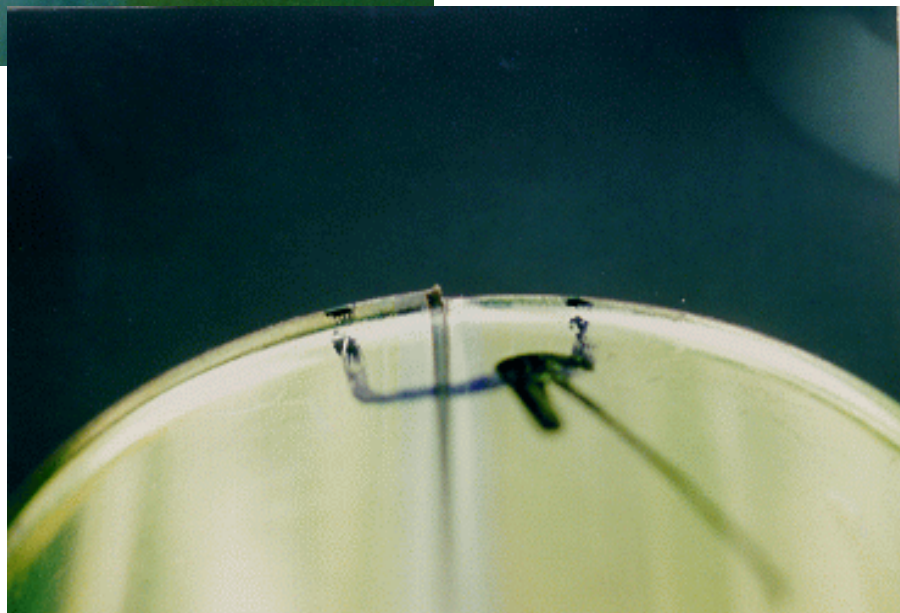
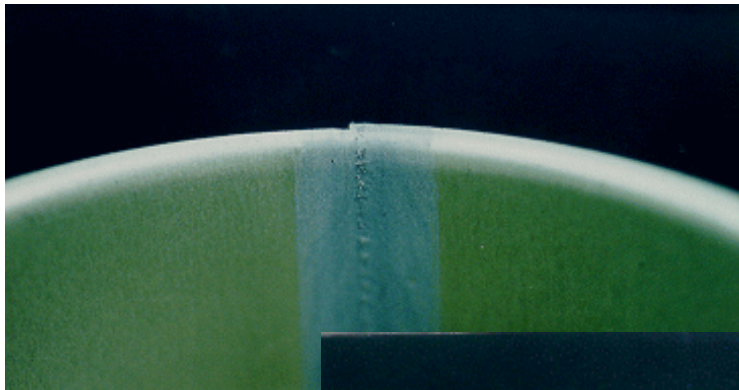
An out-of-square body is considered a serious three piece can defect.

DESCRIPTION:

A can body with a step in the flange of the lap area due to the lap members being misaligned by 0.79 mm (1/32") or more. Also called "high ends".

COMMON SOURCES:

1. Misalignment of the body blank edges during formation of the side seam.
 2. Out-of-square body blank.
-



Metal Can Defects

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DEFECT: SOLDER PELLETS

CLASSIFICATION:

The occurrence of extraneous, loose or easily dislodged solder pellets, flakes, or strings of solder are considered serious as a product contaminant. The presence of solder pellets will seldom compromise can integrity, unless they are in the double seam (see SEAM INCLUSIONS 7.5.19).

DESCRIPTION:

The presence of solder droplets or pellets adhering to the inside surface adjacent to the side seam of the open-top can. Solder pellets are considered foreign material in the can.

COMMON SOURCES:

1. Solder splash during the side seam soldering operation.
-



Metal Can Defects

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15/12/97

DEFECT: TURNED BACK LAP

CLASSIFICATION:

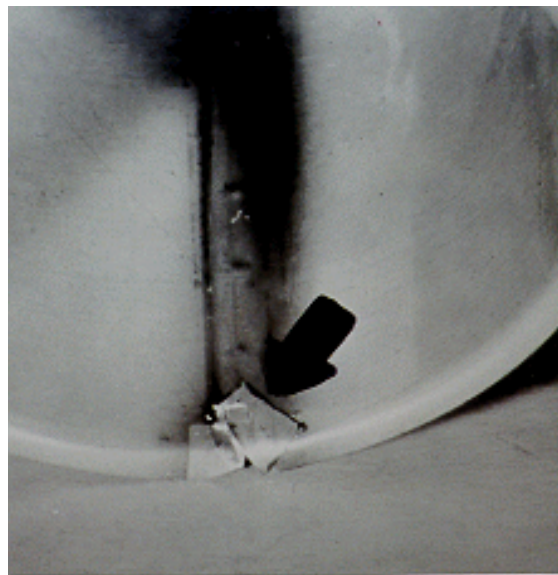
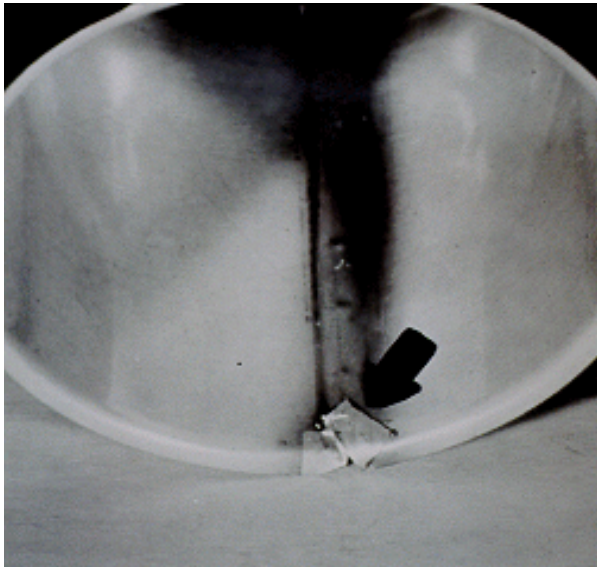
A turned back lap is considered a serious three piece can defect.

DESCRIPTION:

A condition where one of the overlapping edges (laps) of the can body has been turned back during formation of the side seam. Such a defect will most probably result in an open (leaking) side seam.

COMMON SOURCES:

1. Damaged slit notch (a step in forming the lap).
-



Metal Can Defects

Identification and Classification

Amend.no.4

10/03/06

DEFECT: BURNED WELD

CLASSIFICATION:

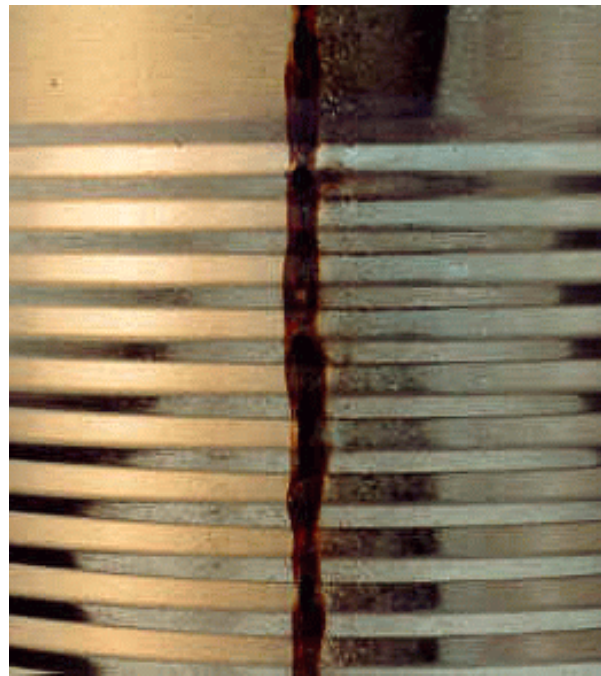
A burned through weld is considered a serious weld defect.

DESCRIPTION:

Excessive local heat due to the presence of foreign materials. This results in a burned through condition.

COMMON SOURCES:

1. Foreign material in weld, for example, inside or outside coating, dirt, oil or grease.
 2. Contaminated weld wire.
-





Metal Can Defects

Identification and Classification

New

30/04/89

DEFECT: OPEN WELD

CLASSIFICATION:

An open weld is considered a serious weld defect.

DESCRIPTION:

An incomplete or parted side seam weld bond.

COMMON SOURCES:

1. Incorrect side seam overlap.
 2. Insufficient current.
 3. Damaged or defective body blank.
 4. Tapered side seam overlap.
 5. Cold or weak weld.
-





Metal Can Defects

Identification and Classification

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DEFECT: TURNED BACK CORNER

CLASSIFICATION:

A turned back corner is considered a serious weld defect.

DESCRIPTION:

A triangular hole at either end of the side seam.

COMMON SOURCES:

1. Corner of body blank turned back prior to welding.
 2. Unwelded or weakly welded area of side seam turned back during flanging and/or double seaming operation.
-



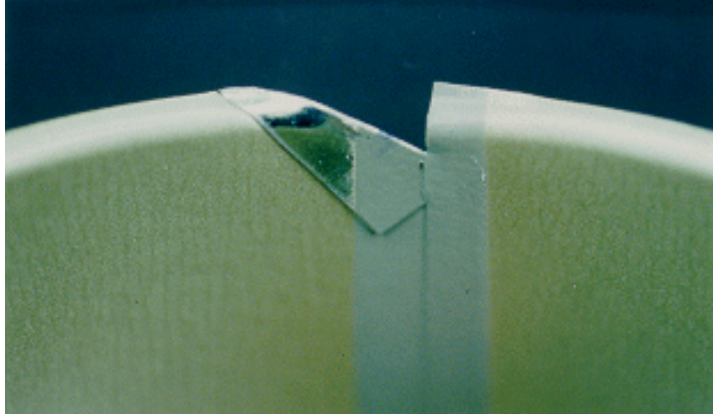
Metal Can Defects

Identification and Classification

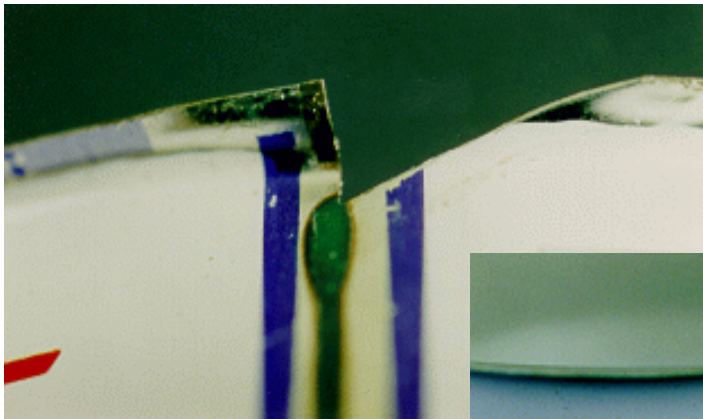
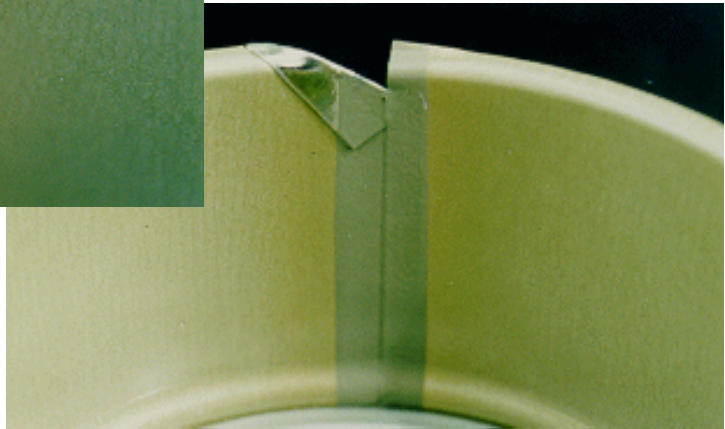
Amend.no.2

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DEFECT: TURNED BACK CORNER



OPEN TOP - CAN INTERIOR



CAN EXTERIOR





Metal Can Defects

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Amend.no.2

15/12/97

DEFECT: FLANGE BURRS

CLASSIFICATION:

Flange burrs are considered as serious can manufacturing defects if the burr protrudes greater than or equal to 0.50 mm (0.020"). Flange burrs are considered minor can manufacturing defects, if the burr protrudes between 0.50 mm and 0.25 mm (0.020" and 0.010").

DESCRIPTION:

A rough protrusion of metal plate (a burr) on the cut edge of the flange.

COMMON SOURCES:

1. The flange trim press does not cleanly shear the flange to the desired length.
-



Metal Can Defects

Identification and Classification

Amend.no.2

15/12/97

DEFECT: FLUTED BODY

CLASSIFICATION:

A fluted body defect is generally considered a minor defect. If the flutes extend into the flange area it is considered a serious defect, when the degree of wrinkling is sufficiently pronounced so as to interfere with the formation of double seams, compromising its integrity.

DESCRIPTION:

One or more deep wrinkles on the tapered body.

COMMON SOURCES:

1. Can body moves during the drawing operation.
-



Metal Can Defects

Identification and Classification

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DEFECT: FRACTURED BOTTOM PROFILE

CLASSIFICATION:

Fractured bottom profile is considered a serious two piece can defect if:

- 1) there is a complete fracture of the countersink radius; or
 - 2) the metal stress on the countersink radius weakens or scores the metal at the radius and a fracture is imminent.
-

DESCRIPTION:

A fractured bottom profile radius of a two piece style can or a pinched bottom profile radius which may fracture during processing or handling.

COMMON SOURCES:

1. Inadequate lubrication of the plate prior to drawing.
 2. Misaligned punch and die.
-



Metal Can Defects

Identification and Classification

New

30/04/89

DEFECT: INCOMPLETE BOTTOM PROFILE

CLASSIFICATION:

An incomplete bottom profile is considered a minor two piece can defect provided that the can does not buckle during retorting.

DESCRIPTION:

The integral end profile is not completely formed. This end is then weaker and may buckle during retorting.

COMMON SOURCES:

1. The punch does not complete its stroke into the die.
-



Metal Can Defects

Identification and Classification

New

30/04/89

DEFECT: MALFORMED or INCOMPLETE ABUSE BEAD

CLASSIFICATION:

A malformed or incomplete abuse bead is considered a serious can manufacturing defect if the metal plate is deeply abraded or creased.

DESCRIPTION:

The abuse bead on the two piece body is misaligned or incomplete. The metal plate may be abraded, creased or dented to varying degrees.

COMMON SOURCES:

1. The can slips during the beading operation resulting in an incomplete abuse bead.
 2. The can misfeeds at the entrance to the beading machine.
-



Metal Can Defects

Identification and Classification

Amend.no.2

15/12/97

DEFECT: SCRAP-IN-DIE MARKS

CLASSIFICATION:

Scrap-in-die marks are considered serious can manufacturing defects if:

- 1) the metal plate is fractured; or
- 2) the marks are sharp, angular, deep impressions and indicative of potential fracture with handling; or
- 3) the marks have broken the inner coating, exposing metal which will react with a corrosive product; or
- 4) the formation of the flange is affected.

Scrap-in-die marks are considered minor can manufacturing defects if the marks are smooth, round, and the impressions are shallow.

DESCRIPTION:

An abnormal mark or impression in the metal plate which may vary in size, shape, and depth. If the scrap mark affects the formation of the flange, double seam defects may result.

Refer to the section on **DAMAGED COATING (7.7.7)** for additional information on fractured coating.

COMMON SOURCES:

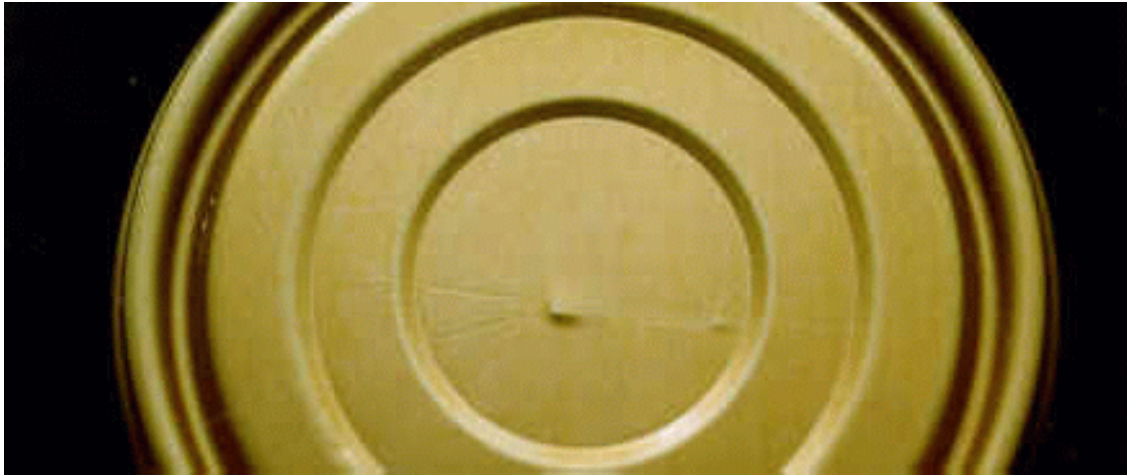
1. Pieces of metal plate (scrap) or other foreign material caught in the die during formation of the two piece can body.
-



Metal Can Defects
Identification and Classification

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DEFECT: SCRAP-IN-DIE MARKS



Metal Can Defects

Identification and Classification

Amend.no.1

30/06/93

DEFECT: WRINKLED FLANGE

CLASSIFICATION:

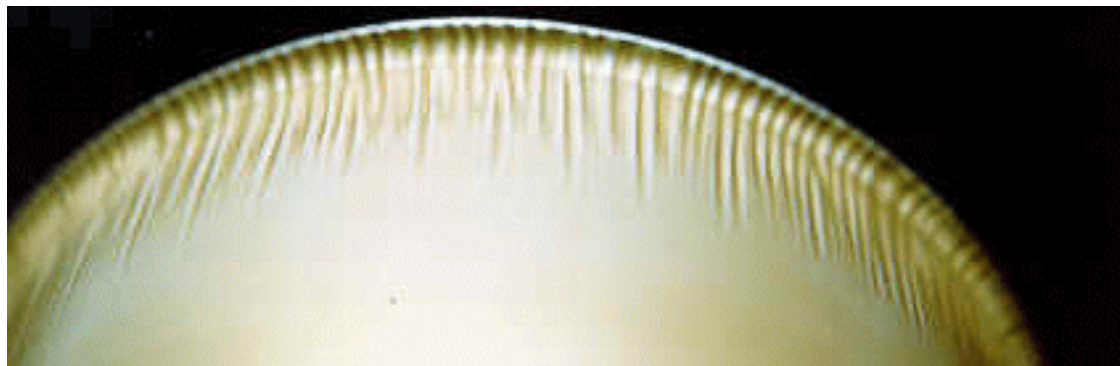
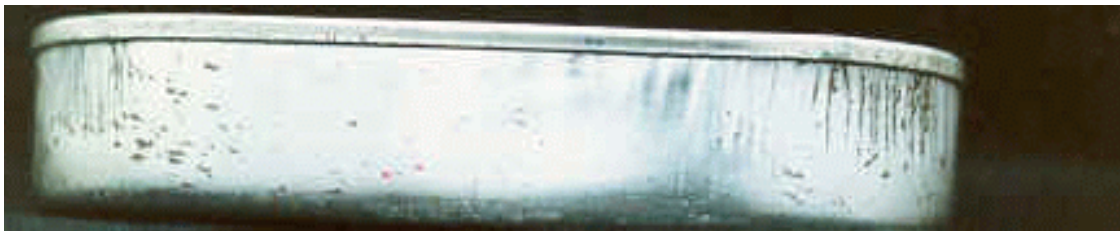
Wrinkled flange is considered a serious two piece can defect when the degree of wrinkling is sufficiently pronounced so as to interfere with the formation of the double seam, compromising its integrity.

DESCRIPTION:

Wrinkles in the walls of a two piece style can body extending into the flange area. The resulting flange thickness may be outside of guidelines, or wrinkles may form open channels through the double seam.

COMMON SOURCES:

1. Improper drawing characteristics of the metal plate, such as temper.
 2. Can body blank moves during the drawing operation.
-



Metal Can Defects

Identification and Classification

Amend.no.4

10/03/06

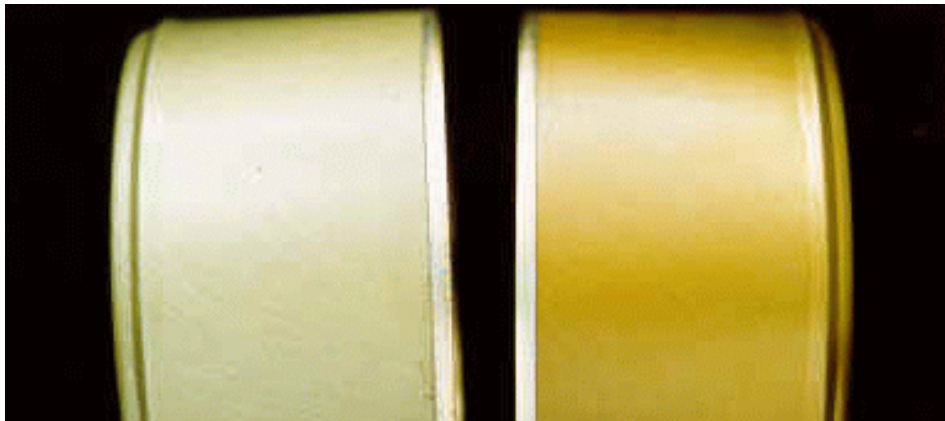
DEFECT: COATING INSIDE OUT

CLASSIFICATION:

Coating inside out is considered a serious defect for three piece cans and for two piece cans, if the metal is exposed to a corrosive product, otherwise coating inside out is considered a minor defect for two piece cans.

DESCRIPTION:

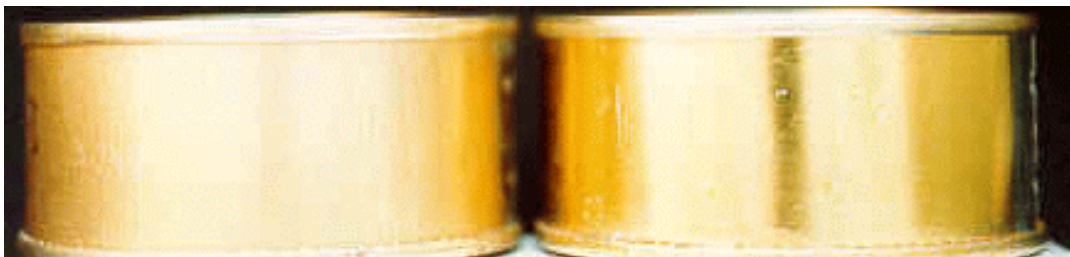
The inside coating is on the outside of the can, and the outside coating, if present, is on the inside of the can. In three piece cans, this results in coating being present in the area to be soldered which will preclude complete soldering of the side seam. In two piece cans, the hermeticity of the can will not be affected, however, the incorrect (outside) coating, if present, will be in contact with, and may react with, the product.



INSIDE THE

COATING ON OUTSIDE

OUTSIDE COATING
TWO PIECE CANS



INSIDE COATING ON THE OUTSIDE

OUTSIDE COATING

THREE PIECE CANS



Metal Can Defects

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DEFECT: COATING INSIDE OUT



THREE PIECE CAN - INSIDE VIEW



THREE PIECE CAN - OUTSIDE VIEW

Metal Can Defects

Identification and Classification

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DEFECT: DOUBLE BODY

CLASSIFICATION:

A double body is considered a serious can body defect for both two piece and three piece cans.

DESCRIPTION:

In a three piece can, this defect occurs when two body blanks form the body of one can. The double seams are often thicker and longer but otherwise normal in appearance. Often the outer body will buckle and the side seam may appear mislocked or incompletely soldered.

COMMON SOURCES:

1. Two body blanks which are "stuck together" when fed into the body maker.
 2. One body cylinder slid inside the other following formation of the cylinders on the roll former of three piece cans.
 3. Two tapered two piece bodies nested tightly together.
 4. Two pieces of metal plate formed together into a two piece body.
-

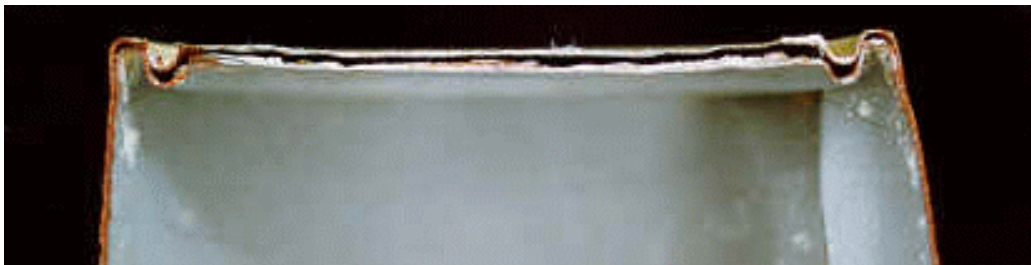


BODY BUCKLING



TWO BODIES FORMED TOGETHER

THREE PIECE CAN



TWO PIECE CAN - DOUBLE BODY

Metal Can Defects

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Amend.no.2

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DEFECT: INCOMPLETE FLANGE

CLASSIFICATION:

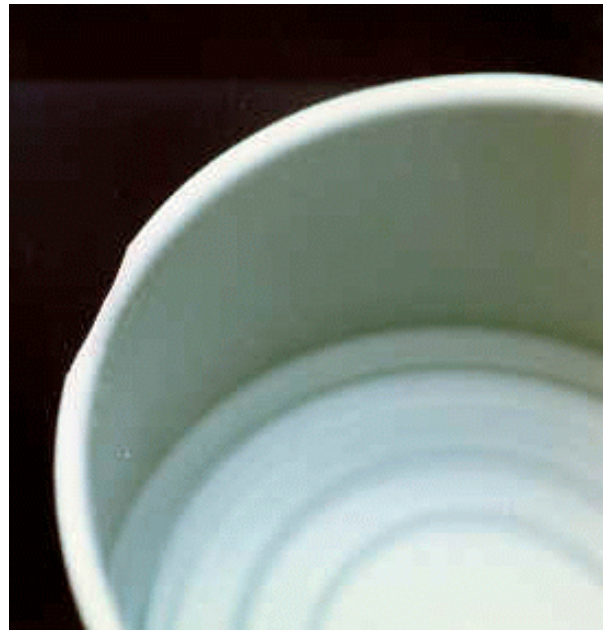
An incomplete flange is considered serious if the flange is reduced by 0.4mm (.016") or more. An incomplete flange is considered minor if the flange is reduced by less than 0.4mm (.016").

DESCRIPTION:

Clips or cuts in the flange resulting in reduced or zero overlap in the double seam.

COMMON SOURCES:

1. Plate misfeed under die.
 2. Inadequate trim allowance on strip.
 3. Plate moves during the draw.
 4. Starting flange on drawn can (1st operation) too short.
-



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DEFECT: INCOMPLETE FLANGE

