Beverage Can Makers Europe Recommendations on Filling Line Can Handling Best Practices

BCME
Beverage Can
Makers Europe

BCME is a European trade body which represents the

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CROWN
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BCME was established to promote the beverage Can in Europe and does so through the issue of statistics, an annual market report and environmental studies.

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Contents

Beverage Can Makers Europe **Recommendations on Filling Line Can Handling Best Practices**

1 Introduction

The aim of this booklet is to provide clear recommendations / guidance on Best Practice for handling the 2-piece Can (whether it be Aluminium or Steel) through Filling Lines.

If adopted, this will assist in achieving the following:-

a) Efficient Filling Line performance

b) Lower Spoilage

c) Less Can damage and improved appearance of the filled Can leaving the Filling Line

1st Issue

2 Can and End Traceability

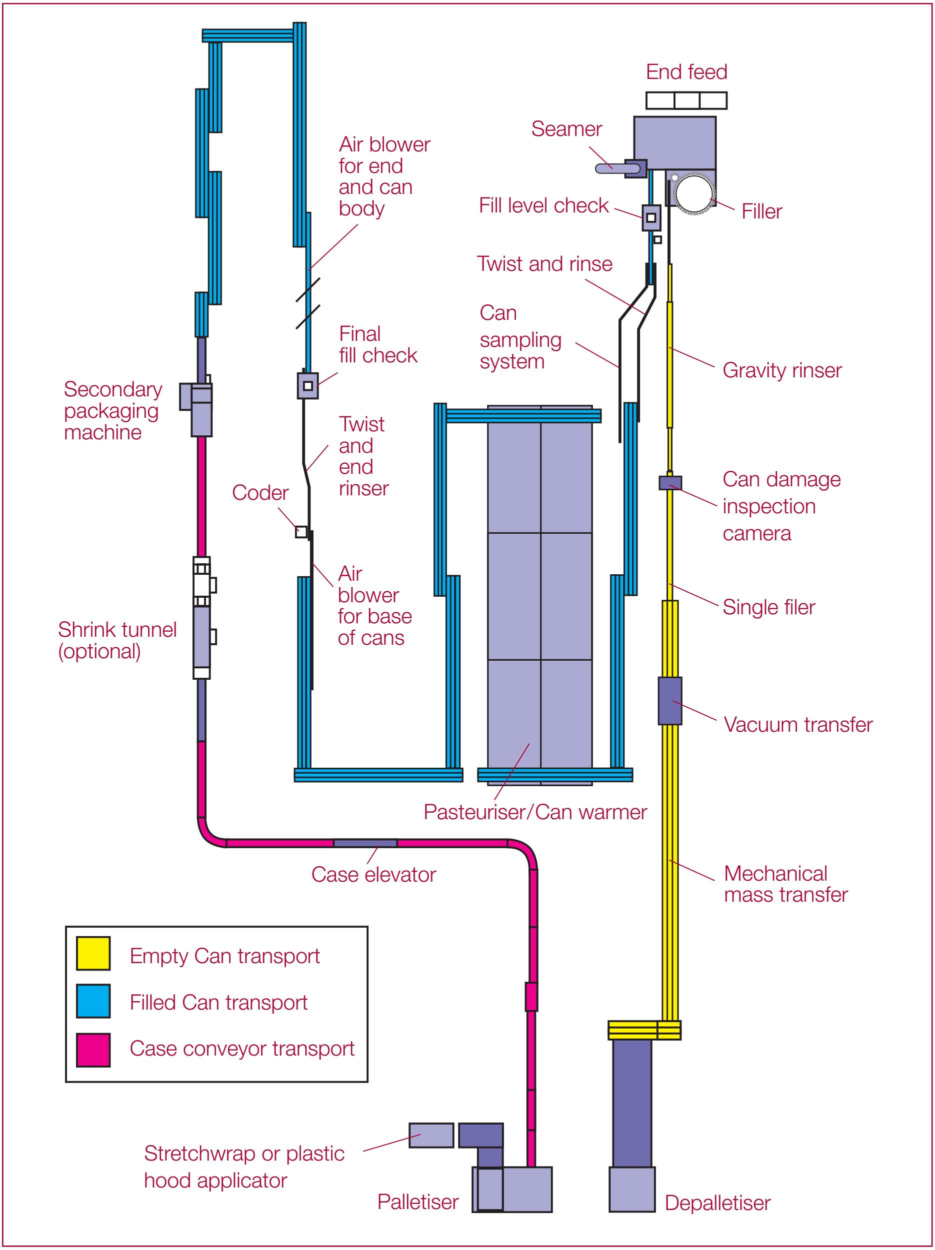
On arrival at the Customer Filling Site, Can and End deliveries should be checked against the batch ticket details, to ensure that they comply with the Orders placed.

Information provided by the manufacturer on sequential Pallet tickets should be recorded by the Customer, as the Cans and Ends are being used, to give full traceability. In this way, any problems that occur subsequently on filled Cans, will allow the Can / End Supplier to trace back through their manufacturing records and allow the Customer to do the same, during a joint investigation to identify the root cause(s) of the problem.

Filled Cans must be coded such that the necessary filling information can be readily established, including the time of filling. With the Customer records of sequence Pallet tickets used, as recommended above, it will be possible to relate filled Cans back to empty Can / End manufacturing times. It is not acceptable to rely purely on the Manufacturing Codes on the individual Cans or Ends.

If the above is carried out, it will meet the Customer obligation to adhere to the European Community Regulation (EC1935/2004) regarding Traceability.

3 Typical Filling Line Layout



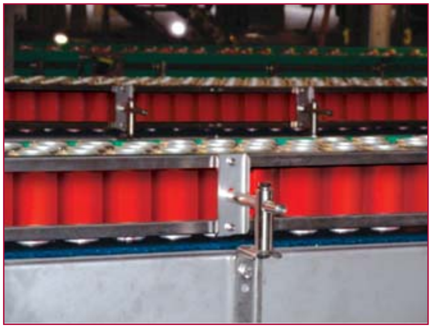
4 Recommendations for different Areas of the Filling Line

4.1 General Recommendations

It is recommended that on all empty or filled Can conveyors, side guides are flat faced, with the contact points near the base and shoulder of the Cans, away from the midwall. Round or radiused guides should be avoided, as they will cause damage to the midwall of the Cans; the only exception to this is on Can twists.

Brackets and fixings supporting conveyor or combiner side rails must be strong enough to support the Cans, without any deflection, under a normal build back situation. (See pictures 1 and 2)

Picture 1



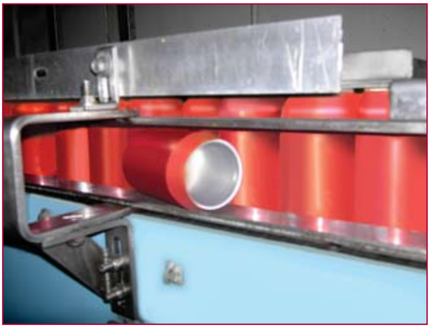
Picture 2

Where Cans are going to be running on a mass conveyor, the distance between the side guides should be set such that there is an even distribution pattern of the Cans across the conveyor. This will avoid the risk of damage to the Can. (See picture 3)

Picture 3

To maintain a smooth Can flow and good traceability, it is recommended that accumulation of empty and filled Cans is achieved by wider Can conveyors, rather than by the use of off-line accumulation tables.

To allow fallen Cans to be removed from the conveyors, gaps should be created between the side rails, which will allow fallen cans to be pushed out. This can be done easily on 90° Corners, Can Combiners, or where the Can changes direction. (See picture 4)



Picture 4

Where there are right-angled bends on a mass conveyor in the direction of Can flow, any side guides used on the bend should be formed to a parabolic shape, thus allowing the Can pattern to be maintained around the corner and avoid the risk of Can damage. (See picture 5)

Picture 5

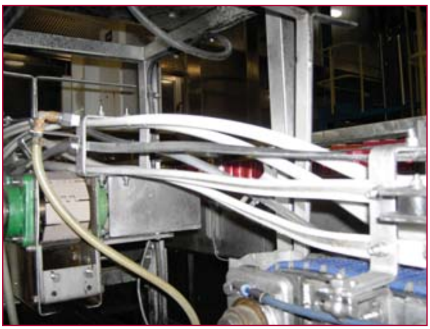
Wherever possible, the use of static deadplates on conveyors should be avoided, with parallel conveyor transfers being carried out, or driven live transfers and right-angled corners using driven bend conveyors. (See picture 6)

Picture 6

The use of brass or copper must be avoided on any area where they could be in direct contact with the Can, as this could lead to Can corrosion. This includes deadplates and methods of fixing.

All conveyor belts or Can cables used to transport loose empty or filled Cans should be made of plastic to protect the coating on the base of the Can, as well as optimise the mobility of the Can on the filling line.

All Can twists should be covered with a hard wearing, low friction plastic material and have no sharp corners or protrusions. The only exception to this is mirror-polished or hard-chromed steel top rails, which should be used on all twists for empty Cans. (See pictures 7 and 8)

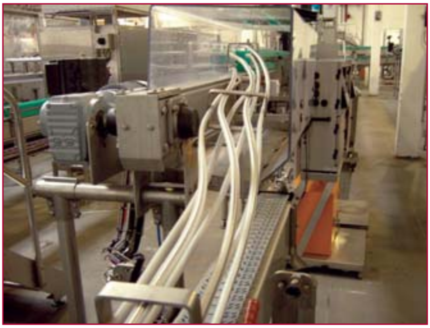


Picture 7

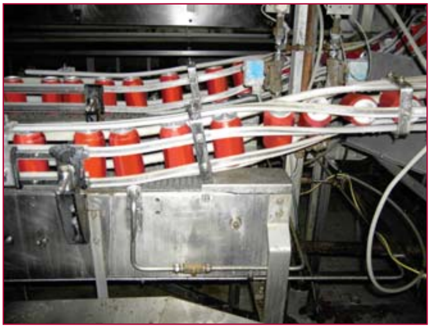
Picture 8

Wherever Cans are being inverted, it is recommended that this is carried out by the use of drop twists, rather than in-line twists, as this will reduce the risk of Can damage.

Over the length of the twist, there should be enough vertical drop to allow the Can to accelerate away. On filled Cans, this should be self clearing without any Can to Can contact, thus minimising the risk of Can damage; this covers line running and stop conditions.
(See pictures 9 and 10)



Picture 9



Picture 10

Where Can sensors are used as part of the line controls, they should be motion sensors. Pressure sensors are not recommended.

Line control philosophy should be based on moving the Cans smoothly, avoiding pressurising the Cans, whether they are empty or filled.

It is recommended that, wherever possible, anti-static materials are used which are in contact with the Can. This covers both empty and filled Can conveyors.

When mass conveyors are used, it is recommended that instead of long conveyors with a single drive, shorter parallel conveyors should be used with individual electrically variable speed drives. This will allow a modulated speed control system to be installed with inverter drives to reduce pressure on the Cans. (See pictures 11 and 12)

Picture 11

Picture 12

Where Cans are being combined to single file, this should be carried out over the maximum distance, with multi-speed belts being used to accelerate the Can as it goes through the Combiner, towards the point of single file at the discharge conveyor. (See picture 13)

Picture 13

Where Can twists or conveyor side guides are covered in plastic material, there should be no gaps on the material, with all joints flush. Where there are multiple side guides, the joints should be staggered and securely fixed either side of the joint to prevent movement of the plastic covering over time. (See picture 14)

Picture 14

Following the previous recommendations of this section, it is important that every effort is taken to minimise the risk of abrasion to the artwork and the base of the Can. While the damage to artwork is obvious, the effect of damage to the Can Rim Varnish will be mobility issues, which must be avoided.

4.1.a Use of Conveyor Lubricants

Track lubricant should be used on conveyor belt surfaces of Filling Lines, to maintain Filling Speeds when running Aluminium and Steel Cans, especially on the Filler / Seamer Transfer. This is covered in more detail on Pages 21 and 26.

Some Customers are converting Conveyors on their Filling Lines to so-called Dry Lubricants, which should not be confused with Tracklube. If a Customer is considering this, they should do the following before deciding to introduce Dry Lubricants:-

a) Check directly with the Manufacturer of the Conveyor(s) involved, to see if it is capable of running with a Dry Lubricant.

b) Check that the Dry Lubricant being considered is compatible with the Can Coatings.

c) Carry out checks in advance to ensure that the Dry Lubricant does not cause any increase of Line pressure on Conveyors and thus the Can, giving the same level of protection to the Can as Tracklubes. This is covered on Page 26 of this Manual.

d) Ensure that Dry Lubricants are not considered for use on the following parts of the Filling Line and that only a continuous flow of Tracklube is used :-

  i) Filler Discharge Deadplate

  ii) Filler / Seamer Transfer Strip.

  iii) Seamer Infeed Deadplate.

If the above is not adhered to, it could have a major effect on the Filling Line Performance due to Can Mobility issues, especially when running Aluminium Cans.

Because there are a number of different Tracklubes, with different levels of Lubricity, it is not possible to recommend a % of concentration for the areas detailed above in d). This should be discussed with the Tracklube Supplier who knows the composition of his Product and its performance parameters, to ensure that it is Fit-for-Purpose on the running of both Aluminium and Steel Cans.

Whatever concentration of Tracklube is recommended by the Tracklube supplier, it should involve a higher % of concentration in the areas detailed in d) above, than on Can Conveyors.

4.2 Depalletiser

See Section 4.1 for General Recommendations, as they affect Depalletisers.

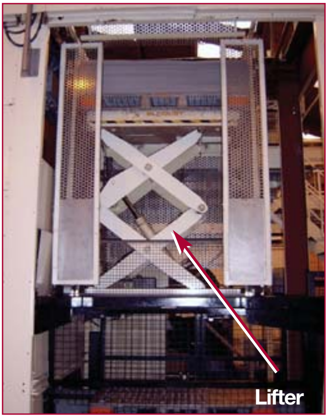
If, as a result of transport or handling damage, there are crushed or damaged Cans on the Pallets, these should be removed at the Depalletiser before they enter the Empty Can Conveyors / Can Cables. If this is not done, damage will occur to adjacent Cans further down the Line and possible leakage in filled Can stock.

Where layer pad grippers are fitted on the Depalletiser, it is recommended that crocodile-type grippers are used and they should be positioned to grip the layer pad in the void created by the Can layer formation, wherever possible. This will avoid any unnecessary Can damage and Line disruption.

To optimise Traceability, it is recommended that an automatic barcode scanner is installed on the pallet infeed conveyor to read the pallet ticket details on the Can pallet, prior to entry to the Depalletiser hoist.

During the automatic stacking operation of layer pads on the Depalletiser it is recommended that, when the layer pads are being dropped in to the layer pad bin, they are controlled on all 4 faces by guides along the length and breadth of the layer pad, with minimum clearance.

It is recommended that a scissor lift is fitted on the layer pad stacker and it is controlled, so that it indexes vertically with the distance that the layer pad drops always being between 25mm and 50mm (See picture 15). If a scissor lift is not installed on the layer pad stacker, the maximum distance that the layer pad should fall is 1 metre.



Picture 15

It is recommended that the vertical drop from the layer pad on to the Depalletiser deadplate is no more than 3mm, which will minimise the risk of fallen Cans, especially on larger Can sizes.

It is recommended that the deadplate between the hoist and the take away conveyor should be wide enough to hold a minimum of four rows of Cans in the direction of movement of the Sweep plate, which will provide support for each layer being depalletised and reduce the risk of fallen Cans.

The deadplate should be fixed without any projection above the surface, thus ensuring that the Cans transfer smoothly on to the Depalletiser discharge conveyor.

The Sweep plate on the Depalletiser should be covered with foam rubber to minimise Can damage and should have the minimum size of opening to accommodate the layer pad grippers; again, this will minimise the risk of Can Damage and support the layer.

The Sweep movement should be as smooth as possible, as sharp movements can cause Can damage as well as fallen Cans, which in turn will cause more Can damage if not removed immediately.

If any Cans fall over during the depalletising operation, they must be checked for damage and, if damaged, they should be removed. If they are undamaged, they should be placed upright, using a plastic coated hook, which will prevent damage to the internal lacquer. For hygiene reasons, fingers should not contact the inside of the Cans. Whatever method is used for placing Cans upright, anything used in contact with the inside of the Can must be clean and maintained in such a way that there is no risk of any form of contamination being passed on to the inside of the Can.

It is recommended that the Depalletiser conveyor belt should be made from plastic and those made from other materials should be avoided (whether it is steel, rubber or fabric). This will minimise any abrasion of the lacquer on the base of the Can.

Where the takeaway conveyor is at right angles to the Depalletiser, there should be two sections of belt, each with different drives and controls. The purpose of the first belt is to transport Cans away from the hoist area, with the second metering the Can flow on to the cross feed takeaway conveyor, without creating any pressure on the Cans. (See pictures 16, 17 and 18)

Picture 16

Picture 17

Picture 18

4.3 Empty Can Conveyors

See Section 4.1 for General Recommendations, as they affect Empty Can Conveyors

The angle of incline or decline of any empty Can conveyor should not exceed 5°, whether it be by conventional slat conveyors or air conveyors.

Mass conveyors are preferred to single conveyors for the transportation of Cans to the Empty Can Rinser from the Depalletiser, which will optimise the storage capacity and allow a constant Can flow, reducing the risk of Can damage.

Where Can cables are used, the cable should be covered in plastic and be supported with the sledge type guides and not wheels. Nylon corner sheaves should also be used to prevent any metal being in contact with the base of the Can.

On Can cable installations, there should be a suitable number of drive points, to allow a line control system to be designed to eliminate pressure on the Can and provide a proper build back system, without causing Can damage.

Air conveyors tend to be used on high speed filling lines and have proved to be efficient, particularly on combining Cans to single file. There should be an adequate amount of individual fan control units built in to the mechanical design and control philosophy, to prevent Cans being moved at excessive speeds and cause Can damage. The aim should be that the individual fan control units regulate the flow of Cans towards the Can Rinser, rather than moving them at high speed when there are gaps in the Can flow.

Where air conveyors are used, they should have the capability of being primed using a cascade stop-start system for changeovers on Can designs.

The empty Can conveyer system should run fully primed between the Combiner and Filler infeed and the control of Can flow into the filler is achieved by a Can stop mechanism on the Filler infeed.

The Can stop used should not damage the midwall, as this will give disruption during the Filling / Seaming process and could lead to leakage.

Where air conveyors are used, a vacuum transfer unit is normally installed, but controls should be installed which will allow them to be primed at a label change, without Cans running at high speed through empty air conveyors causing Can damage. (See pictures 19 and 20)

Picture 19

Picture 20

A vacuum transfer unit can be placed on the mass conveyor system just prior to the single filing of Cans to the filler. If set properly, with good line controls, the unit will remove fallen Cans from the mass pack, minimising the risk of jams in the Can Combiner.

If a vacuum transfer is installed, it must have a metering conveyor feeding it, along with a control system linked in to the filler and conveyors:-

a) To give an air gap around the Can flow (around 80% Density of Can distribution, versus a mass conveyor), allowing fallen Cans to drop out

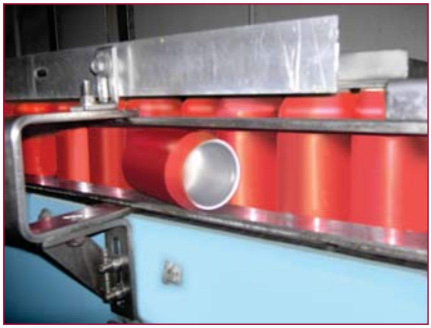
b) To stop the Can flow under build back from the Line Controls

c) To prevent Cans being driven over the vacuum belt

d) To accommodate different Can sizes and metals

The combining of Cans from mass pack to single file must be carried out smoothly, over the maximum possible distance to maximise Can mobility. The space between top and bottom side rails should be set at a distance to allow fallen Cans to be rejected between the rails. If done, this will optimise Can mobility, thus minimising the risk of gapping and resulting in Can damage.
(See pictures 21 and 22)

Picture 21



Picture 22

An air blower with frequency control can be used to ensure a continuous flow of Cans into the rinser, especially on high speed Filling lines. This will avoid gaps on the Can flow and minimise the risk of Can damage.

If a single lane Rinser is used, the discharge of the Combiner should be directly in line with the Rinser.

Where space is available on the Line Layout, it is recommended that there is a straight section of conveyor between the discharge of the Combiner and the infeed to the Rinser. Ideally the length should be 3 metres.

If the installation of a quality camera prior to the Rinser is being considered for the removal of potentially damaged Cans, care should be taken on the choice of camera and the settings used, or this could lead to excessive spoilage where no Can damage exists.

4.4 Empty Can Rinser

The established method of rinsing empty beverage Cans is by a pressurised Treated Water flush through a gravity rinser, where the inside of the Can, including the Can Base is cleaned. First the Can should be partially inverted to allow the Can to be rinsed, then it should be re-inverted to allow any residual water to drain out from the neck of the Can, prior to running on to the Filler infeed conveyor.

For the above to be effective, there needs to be some basic parameters adhered to, on its design and installation.

To operate smoothly, the drop angle on the rinser should be a minimum of 35°. Prior to the Rinsing and draining operation the Cans should be rotated through 135°. As the Can enters the Rinser discharge twist, it should rotate another 225° in the same direction, to give full inversion of the Can, which will minimise the retention of rinse water or contamination in the Can. This is important on all Can bodies and Neck diameters. (See picture 23)

Picture 23

The length of the water spray section should be calculated to give a 2 second efficient rinse time. This is obviously proportional to the speed of the Filler.

The water nozzles should be directed towards the direction of Can flow at an angle of 15° to assist the Cans through the rinsing section. This will help to overcome the braking effect on the Can flow, caused by the base being pushed against the bottom rail of the rinser by the water pressure.

The rail that is in contact with the Can flange should be either mirror polished or hard chromed. This will assist in Can mobility through the Rinser and minimise the risk of damage to the flange of the Can.

At the discharge of the rinser in to the discharge twist, the top and bottom rails of each should be offset and overlapped. This will prevent Cans jamming, with the overlap and offset preventing water being carried over and dropping in to the Can in its upright position. The maximum distance between top and bottom rails should be the height of the empty Can + 5 mm.

The line control should be set to keep the rinser twists and the filler infeed conveyor full of Cans at all times while in production, with an empty out switch for Product changes.

In order to minimise any risk of contamination of the Can, a Dry Section can be included in the Rinser prior to the rinsing section, which will operate with ionised air and vacuum extraction to remove lightweight debris.

An inverted Can sensor should be installed to prevent inverted Cans being fed to the Filler and damaging filling valve tubes.

If running different Can heights and diameters, it is recommended that a single lane Rinser is installed, with quick changeover twists for size changes.

If an Ionised Air Rinser for empty Cans is being considered, which does not use water, the following should be noted;

a) The recommendations on Can twists, Rinser Angles and full rotation of Cans are the same for Air Rinsers as Water Rinsers.

b) Water will still need to be used to rinse the Cans on the Seamer discharge, as detailed in the BCME Stress Corrosion Recommendations.

4.5 Filler / Seamer

See Section 4.1 for General Recommendations as they affect the Filler / Seamer area.

If there is a possibility of running different Can diameters (either in the short or long term) this should be discussed with the Filler supplier before ordering, to review options of quick changeover parts. Ideally the filling valves should be capable of running different Can neck diameters, with minimum adjustments.

The control of Can flow into the filler is achieved by a Can stop mechanism on the Filler infeed. The Can stop used should not damage the mid wall, as this will give disruption during the Filling / Seaming process.

If there is a conventional Filler infeed conveyor, its speed should be linked to changes in speed of the Filler to avoid excessive pressure on the Can.

The Filler infeed conveyor, infeed scroll and star wheel should have correct control of the Can, with the correct clearance for the Can diameter being run.

If a top rail is used above the Filler infeed conveyor, it should be made from a flat polished stainless steel bar wider than the neck diameter of the Can with a polished contact face. Round bar should not be used as it damages the flange of the Can. Side rails should be flat faced with correct contact on the Can away from the midwall, with no gaps and joints should be flush and in line along their length.

All guides and transfer points on the Filler infeed should be set accurately to give proper control of the Can without causing any damage or instability as it enters the Filler. This should also be done on the Filler discharge and the Seamer infeed.

Specification and control of filling levels is important because of the effect on air contents and in-Can pressures during pasteurisation.

The Filler discharge deadplate should be manufactured from a hard wearing material (ideally with a hard-chromed surface if made from metal), with good Can handling practices used on the step down to the Filler / Seamer transfer with the clearance between the Can and the Filler discharge guides to optimise Can control and stability. This should include an adequate flow of a non-corrosive tracklube lubricant to assist in smooth movement of the Can.

For the best performance on running both aluminium and steel Cans, a low friction plastic transfer strip or, alternatively, a metal strip with a hard wearing coating should be used between the Filler/Seamer. Additionally a non-corrosive tracklube lubricant must be applied continuously on the upper surface of the transfer strip in the direction of Can flow, to give an uninterrupted layer. A similar lubrication system should be installed on the Filler discharge to optimise Can mobility.

Where damage has been caused to a Can, resulting in an unfilled Can leaving the Filler, these can be removed automatically on the Filler / Seamer Transfer. This will minimise the risk of a Seamer stoppage. (See picture 24)

Picture 24

A Bubble-Breaker should be fitted above the Filler / Seamer transfer, prior to the Seamer infeed, which will assist in maintaining Product quality.

The Seamer infeed deadplate and Seamer discharge deadplate should be manufactured from a hard wearing material (ideally with a hard-chromed surface if made from metal), with good can handling practices used on transfer points and clearance between Can and the side guides to improve Can control and stability. This should include an adequate flow of a non-corrosive tracklube lubricant to assist in the smooth movement of the Can.

Because of the different flange and end thicknesses in the Industry, it is recommended that Seamers should have a quick change seaming cam to maintain Seam quality.

The 2nd Operation seaming cam on the Seamer should be capable of being withdrawn easily and quickly to allow 1st Operation seam checks to be carried out with the minimum of line downtime.

If it is intended to run Ends of different diameters, you should contact your Seamer manufacturer about quick change parts, to minimise the conversion time.

The Seamer should also include a full under-cover gassing system, capable of achieving the BCME specification, where the total air in the headspace and dissolved in the beverage must not exceed 2ml for 33cl and 50cl Cans. Headspace air contents must be controlled because of the oxidation effect on the product and corrosion rates will also be accelerated if air contents are higher than specified above.

On the End supply system to the Seamer, the settings and line controls should give an adequate pressure to maintain a consistent flow of Ends to the Seamer without over pressurising. The gap control should be set to control the flow of Ends to the infeed(s) of the Seamer, such that the Ends are fed under gravity in to the scroll(s). If this is not achieved, damage could occur to the End, resulting in misfeeds leading to potential seaming defects, as well as damage to the Seamer. Contact your Seamer supplier for details of the recommended stack height of Ends between the Gap Control Unit and the End Infeed Scroll.

Can control in the Seamer is critical to avoid possible crush or other damage to the Can, so it is important to ensure that all timing is set properly and excessive base plate pressure is avoided. See your local Supplier CTS department for recommendations covering your Seamer set-up parameters.

The seaming chuck wall surface should be sufficiently rough to give a positive drive to the end during the seaming operation. If not, the result may be incomplete seam formation, skidders and leaking seams.

There are a number of external coatings available on seaming rolls, which result in lower friction levels during the seam formation, helping to prevent aluminium build up in the seaming roll profile, as well as extending the useful life of the seaming rolls. Please contact your Seamer supplier for the coatings they have available.

To allow the filled / seamed Can to run efficiently through the filling line, without causing marking or damage, the in-can-pressure leaving the Seamer should be at least 1.5 bar. If the pressure is lower than this, there is an increased risk of damage on the filling line. If this is not possible, you should contact your Can supplier who will give you advice on the safe level of Filled Goods stacking at lower in-can-pressures. The Seamer discharge conveyor should have lubricant applied on the upper surface to optimise Can stability.

The filled and seamed Cans should be inverted after the Seamer to assist in the detection of seam or End leaks. This is normally achieved by a drop twist turning the Cans through 180°. (See picture 25).

Picture 25

It is recommended that a level detector is installed after the Seamer discharge twist, while the filled Cans are still in single file, to identify any gross leakage as quickly as possible after seaming.

Alternatively, this can be achieved with a Can inversion system. (See pictures 26 and 27).

Picture 26

Picture 27

At this point, the Can End and Can body should be thoroughly rinsed to remove any product present on the Can and End. This will also minimise the biological contamination of the Can warmer / Pasteuriser and assist in minimising the risk of stress corrosion. The water for rinsing can be taken from the empty Can rinser, thus lowering the consumption of water.

4.6 Pasteuriser / Can Warmer / Retort

During the heating processes the internal pressure in the filled Can must not exceed specifications laid down by your Can Supplier. Please contact your Supplier for details.

Avoid scratching of the coating during loading of the retort.

Where product is chilled prior to filling, the filled Cans need to be raised to a temperature above the dew point before packing, in order to avoid condensation in filled stock.

Chemicals are used in tunnel Pasteurisers to prevent formation of bacterial slime, corrosion and scale. It is recommended that a professional Water Treatment company is employed by the Customer to give a full Water Treatment programme, which will prevent the following Quality issues on filled Cans:-

a) Dome Staining on aluminium Cans

b) Rusting on the bases of steel Cans

c) Tab Staining of the End

d) Deterioration of the print on the Can

For further recommendations on Pasteuriser operations, see BCME recommendations.

4.7 Filled Can Conveyors

See Section 4.1 General Recommendations, as they affect Filled Can Conveyors.

Wherever possible, filled Can conveyors should be horizontal. If the layout of the filling line prevents this, the angle of incline or decline should not exceed 5°, or Can mobility issues could occur.

Because of the weight of filled Cans, the line controls on filled Can conveyors should be designed to prevent conveyors continuing to run under filled Cans on a line stoppage, as this will create pressure on them and possibly damaging the print, but also giving excessive abrasion on the base of the Can.

All filled Can conveyors should have lubrication applied to the upper surface to minimise Can to Can pressure, but also to minimise damage to the coating on the base of the Can. This is normally achieved by non-corrosive tracklube lubricant. But consideration may be given to so-called ‘dry’ lubricants, as long as they give the same level of protection to the Can, compared to the tracklube.

In order to minimise the risk of stress corrosion, the BCME have made recommendations in their booklet, including guidance on how to measure residual water on the End.

4.8 Rinsing / Drying / Coding / Fill Check Equipment

See Section 4.1 General Recommendations, as they affect this area.

The recommendations outlined in the BCME Stress Corrosion Technical Bulletin must be achieved.

Unless running conveyors which are rated as being capable of running dry without track lubrication, every effort should be taken to ensure that the amount being applied to the conveyors is not excessive, as this could lead to foaming and contaminate the Can or End.

Filled Can rinsers and driers must be installed on filled Can conveyors. They should be electrically interlocked to the drive of the conveyor such as:-

a) If the rinsers or driers are not switched on electrically, the conveyor(s) they are mounted on will not run.

b) If the conveyors are not switched on, the rinsers and driers will shut down.

c) The Water used on the Can rinsers at the Seamer discharge and prior to packaging should meet the following Specifications, or the risk of Stress Corrosion will increase:-

    Should have a pH between 6.5 and 7.5

    Chloride levels should be less than 10ppm

    Nitrates and Sulphates should be less than 15ppm

On a Filling line with/without a Pasteuriser or Can Warmer, the Can and End rinsing and drying equipment should be located as near as is practically possible to the Packaging area, regardless of whether it has been rinsed on the Seamer discharge twist.

Where rinsing of the filled Can takes place, it should always be when the Cans are in single file and carried out in the twist with the Can in the horizontal position, such that as much of the water as possible is removed prior to the drying unit.

Where no Pasteuriser or Can Warmer is installed on a Can filling line, the design should be such that the time for a Can to travel from the Seamer discharge to the base coding unit must be more than 90 seconds. This is to optimise the performance of applying ink codes to the base of the Can and identifying any micro-leakage of filled Cans at the level detectors prior to packaging.

4.9 Packaging / Case Conveyors / Palletisers

See Section 4.1 for General Recommendations, as they affect this Section.

Any dead plates on packaging equipment should be manufactured from plastic or chrome plated stainless steel.

The controls on packaging equipment should be designed such that conveyor belts do not continue to run under stationary Cans.

Changes in secondary packaging can have an influence on the level of moisture retained in a pack, especially on moving from carton to plastic film; this should be considered when considering moving to another type of secondary packaging. Shrink filmed trays are prone to entrap moisture and need to be ventilated at both ends by applying the film as a banderol. Perforated film is recommended.

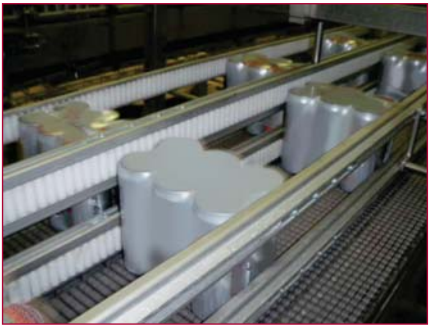
Any board used in trays or boxes should comply with acceptable specifications for chloride and sulphate, commonly max 0.05% calculated as NaCl and 0.2% as Na2SO4.

While most commercially available Packaging machines are relatively standard in their installation, we recommend that this is reviewed in detail, with regards to handling of the filled Cans. All guides used should be flat-faced and avoid contact on the midwall, which is the weakest part of the Can. Solid full height side guides are recommended, ideally polished stainless steel, with hard chromium plating which will give the necessary control but also protect the Can. (See pictures 28 and 29)

Picture 28

Picture 29

If Roller guides are used to control the side of the Can, they should have full contact with the bottom sidewall and the shoulder of the Can. Contact with the midwall must be avoided, whether it be on Packaging machines, case conveyors, case turners or Palletisers, due to the risk of damage to the midwall of the Can. (See picture 30)



Picture 30

Case conveyors should be in short lengths and, where possible be inline, with metering conveyors used to give the capability of an effective line control system. If this is done, it will be positive for line efficiencies, but will also avoid major case jams, causing Can and case damage which sometimes happen with build backs on long case conveyors. It will also keep the cases running square to the conveyors at the transfer points and avoid misalignment.

Where there is a need for right-angled corners on case conveyors, it is recommended that they are driven and they are used to accelerate the linear speed of the cases, but also designed to be running empty on a build back situation. They should also be capable of running efficiently without the use of any side guides.

If the above is completed and the case conveyor transfer points are set up correctly, there should be minimal need for any side rails to realign the cases. If there is a need for guides to realign the cases, they should be full height guides, avoiding any localised contact on the midwall of the Can.

Where the line control philosophy involves using roller conveyors as a means of accumulation, an accelerator belt needs to be fitted immediately after it to space out the cases.

For Case Turners, many of the recommendations for case conveyors apply, but it is also recommended that this should be carried out without causing impact to the case, but rather be completed with differential speed belts.

For Palletisers, many of the recommendations for case conveyors apply.

Case layer collating bars should be in correct contact with the packs, be in good condition and not be able to damage Cans or Packs. The speed of movement on the cases should not be excessive and their movement smooth.

Pallets being used on the Palletiser should be checked prior to use, to ensure that there are no protrusions or damage on the pallet, which could lead to damage to the filled Cans.

If there is any sign of leakage on the packs being palletised, the leaking cases must be removed as soon as possible, before other cases are affected.

Failure of one Can in a shrink-wrapped pack will normally release moisture and consequently initiate corrosion in the remaining Cans within the pack. If there is a leaking case, it should be destroyed, as the remaining Cans will probably have started to be affected by corrosion.

5 Review of the Booklet

This booklet has been drawn up to give guidance on how Can handling should be approached on Filling Lines and highlight some elements of Best Practice which should be worked towards as your Filling Lines are installed, but also as existing Filling Lines are developed.

If you have any questions or wish any further information on the points raised, please contact the local CTS department of your Can Supplier(s).

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