

ISC Inline Seam Control

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Benefits

- Gain a Higher Level of Product Quality in Canning Lines
- Minimize Scrap and On-Hold Production
- Avoid Open Cans that mess-up Mass Transport and Cooker
- Prevent Big Damage in case of Reoccurring Defects (Broken Chuck e.g.)
- Optimize Preventive Maintenance and Set-ups
- Straight forward Integration even into existing Seamer
- Fast Return on Investment



PRECISELY REJECT FAULTY CANS

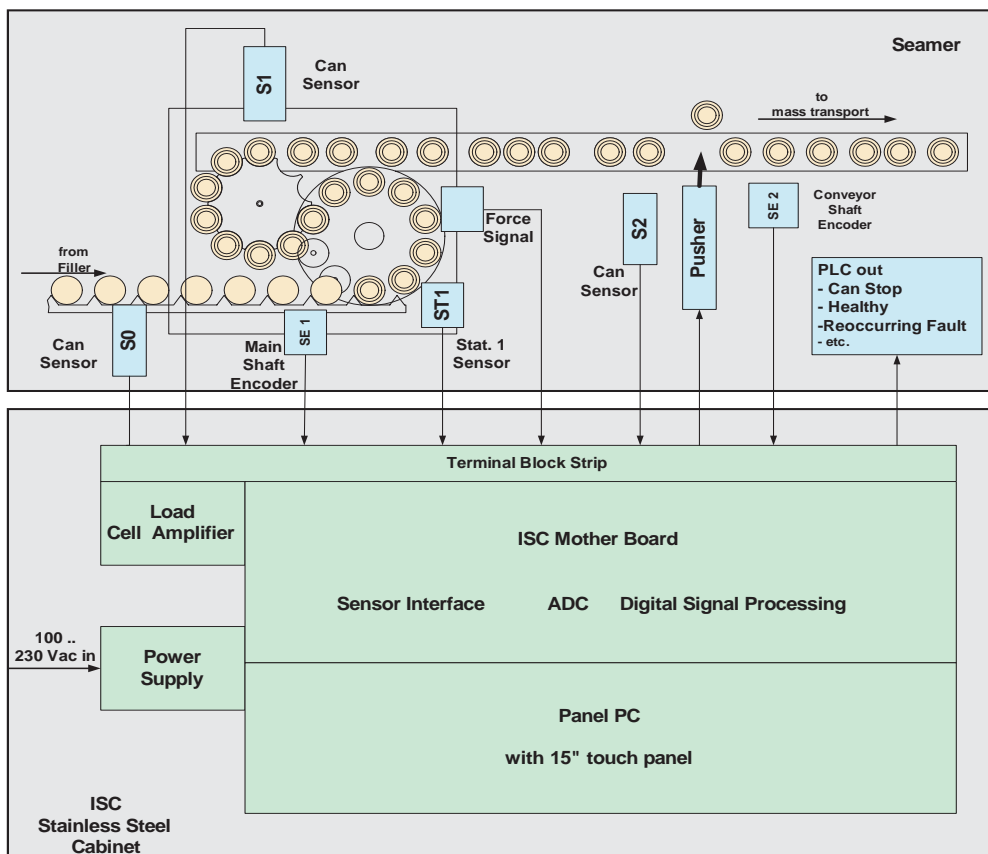


Key Features

- Seaming force monitoring inside a seamer
- Online detection of faulty double seams
- Fully automatic seam tightness inspection
- Checks each and every can
- Rejects random and series seam defects
- Copes with max. speed of seamer (>1200 cans/min)
- Data dumps for statistical process control (SPC)
- Can tracking for direct reject pusher activation
- Reliable operation in harsh seamer environment
- Can eject function for standard quality checks

ISC cabinet with touch panel PC
(other configurations available)

Components



The mechanical key element of the ISC system is an upgraded 2nd operation cam with integrated dynamic load sensors. Few add on standard parts (can sensors, shaft encoders) ensure exact speed synchronisation, can tracking, and precise can rejection.

A compact IP65 stainless steel cabinet contains all hardware and software components to operate the system.

That includes power supplies, instrumentation amplifier, force profile digitizer, digital signal processors, digital I/O interface, touch panel PC (HMI) etc.

For remote operation the PC can be separated from the cabinet/machine, e.g. up to 60m.

ISC System Layout

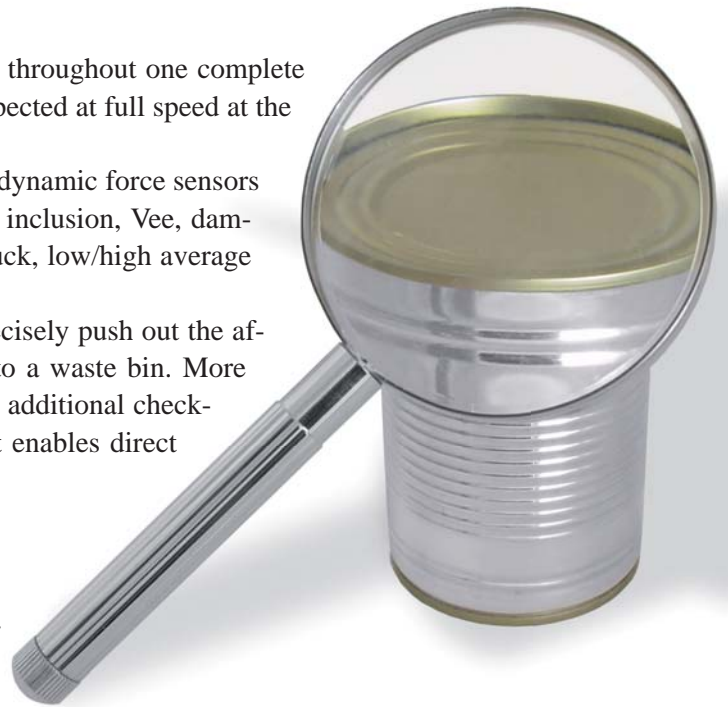


Working Principle

ISC scans an entire force profile checking for critical anomalies throughout one complete can rotation. Every and each individual double seam is fully inspected at full speed at the dwell of the second operation seaming cam.

Digital signal processing is applied to the electrical signal of the dynamic force sensors to check for random and reoccurring type of faults like product inclusion, Vee, damaged can, knockdown flange, missing lid, double lid, broken chuck, low/high average seaming force etc.

In case of a seam defect event a piston or flap is activated to precisely push out the affected can. In a simple set-up the faulty can is just dumped into a waste bin. More sophisticated set-ups deflect the can onto a parking conveyor for additional checking. ISC implements an integrated can tracking mechanism that enables direct handling of a simple pusher set-up.



Software

Main purpose of the ISC system is an instantaneous defect recognition and line synchronous reaction in case of seaming defects. The online software runs in a Digital Signal Processor (DSP) and performs adaptive signal filtering, defect extraction, can tracking and rejector activation.

The graphical user interface (HMI) runs on a touch panel PC. During routine production no operator action is required and the system typically displays the main production menu for quick monitoring of general line / system information, like counts of good and bad cans. By touch of a finger tip sub-windows are opened. A line menu presents the inspection statistics based on individual stations and defect classes. Two graphic menus show force profiles of individual cans as well as seaming defect history for diagnostic / maintenance. Adapting the system to optimum detection performance is done in a parameter menu by defining thresholds, reject conditions, filter parameters and other features. The system adaptation to different machine types, station numbers, PLC interfacing and operator languages is fully software configurable.

Main Production Menu

| Head | Cans | Rejects | Avg. Force | Inclusion | | Knocked Down | Smashed | Tightness | |
|---------|-------|---------|------------|-----------|-------|--------------|---------|-----------|-----|
| | | | | Small | Large | | | High | Low |
| Head 1 | 15765 | 1 | 2.27 | 0 | 1 | 0 | 0 | 0 | 0 |
| Head 2 | 15773 | 5 | 2.09 | 2 | 0 | 3 | 0 | 0 | 0 |
| Head 3 | 15788 | 1 | 2.41 | 0 | 0 | 0 | 0 | 0 | 1 |
| Head 4 | 15784 | 2 | 2.39 | 0 | 0 | 1 | 1 | 0 | 0 |
| Head 5 | 15784 | 8 | 1.98 | 4 | 1 | 3 | 0 | 0 | 0 |
| Head 6 | 15780 | 1 | 2.38 | 1 | 0 | 0 | 0 | 0 | 0 |
| Head 7 | 15782 | 1 | 2.45 | 0 | 0 | 0 | 0 | 0 | 1 |
| Head 8 | 15791 | 3 | 2.42 | 2 | 0 | 1 | 0 | 0 | 0 |
| Head 9 | 15785 | 2 | 2.29 | 1 | 0 | 0 | 1 | 0 | 0 |
| Head 10 | 15783 | 3 | 2.30 | 1 | 0 | 2 | 0 | 0 | 0 |

Line Menu with individual Seamer Head Statistics



Defect Rejection

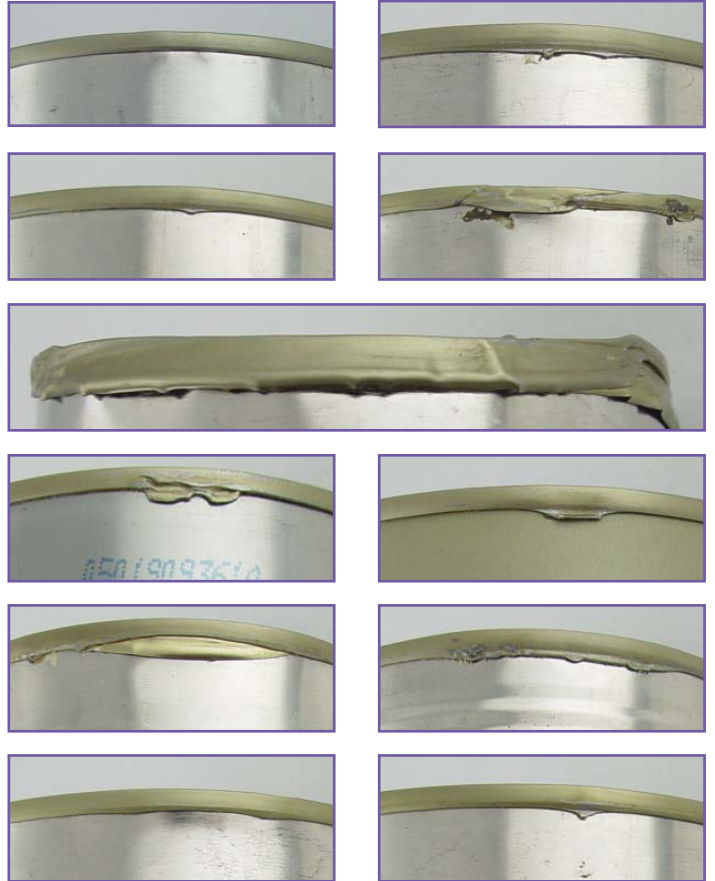
ISC efficiently rejects the majority of serious double seam defects.

| Type of Defect | Detection |
|--------------------------------|-----------|
| Product Inclusion (Droop, Vee) | ● |
| Cut Down Flange | ● |
| Double End / No End | ● |
| Too Tight or Loose | ● |
| Broken Chuck | ● |
| Metal on Chuck | ● |
| Knocked Down Curl / End | ● |
| Knocked Down Flange | ● |
| False Seam | ● |
| Spinner / Skidder | ● |

Efficiencies depend on size and individual characteristics of the defects. The picture gallery of ISC rejected cans provides a representative cross-section.

Faulty Seam Reject Samples

Selection of rejected cans during routine operation



References

World wide more than 25 systems are successfully commissioned over the past years. ISC operation focuses on high volume and ambitious food and pet food lines.

Mechanical designs for 2nd op cam upgrades are available for a wide range of different seamer brands (in co-operation with seamer makers)

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