Deposit Return Scheme Ireland CLG

Specification for Reverse Vending Machines to be used in The Republic of Ireland

March 2025
V1.1

DISCLAIMERS

All information contained in this specification document is provided in the strictest confidence and has been made available solely for the purpose of advising Reverse Vending Machine Suppliers and Return Point Operators of the minimum specification reverse vending machines must attain in order to be approved for use in the Deposit Return Scheme Ireland. No party may disclose the contents of this document without the express permission of the Deposit Return Scheme Ireland CLG (Referred to as DRSI for the purposes of this document).

While all reasonable steps have been taken to ensure that the information set out in this document is factually correct, no representation or warranty, express or implied, is or will be made or given in relation to the accuracy or the completeness of any information contained in this document or otherwise provided by or on behalf of DRSI, in writing or otherwise, to any interested party or its advisers. No responsibility or liability for any loss or damage arising as a result of reliance on this document, or for the information contained in this document, or for any omission is or will be accepted by DRSI or by any of its officers, employees, agents or professional advisers. No officer, employee, agent, or professional adviser of DRSI has any authority to give or make any representation or warranty, express or implied, in relation to such information. DRSI officers, employees, agents and professional advisers expressly disclaim any and all liability arising out of such documentation or information and any errors or omissions in or from the documents and information.

DRSI reserves the right to change the specification at any time.

GLOSSARY OF TERMS:

API: Application Protocol Interface
DPA: Data Processing Agreement
DRSI: Deposit Return Scheme Ireland CLG
EAN: European Article Number
EPOS: Electronic Point of Sale
PET: Polyethylene terephthalate
QR codes: Quick Response codes
REST API: REpresentational State Transfer Application Protocol Interface
RPO: Return Point Operator
RVM: Reverse Vending Machine
UPC: Unique Product Code
2D data matrices: 2-dimensional data matrices

1.0 INTRODUCTION

ABOUT DRSI.

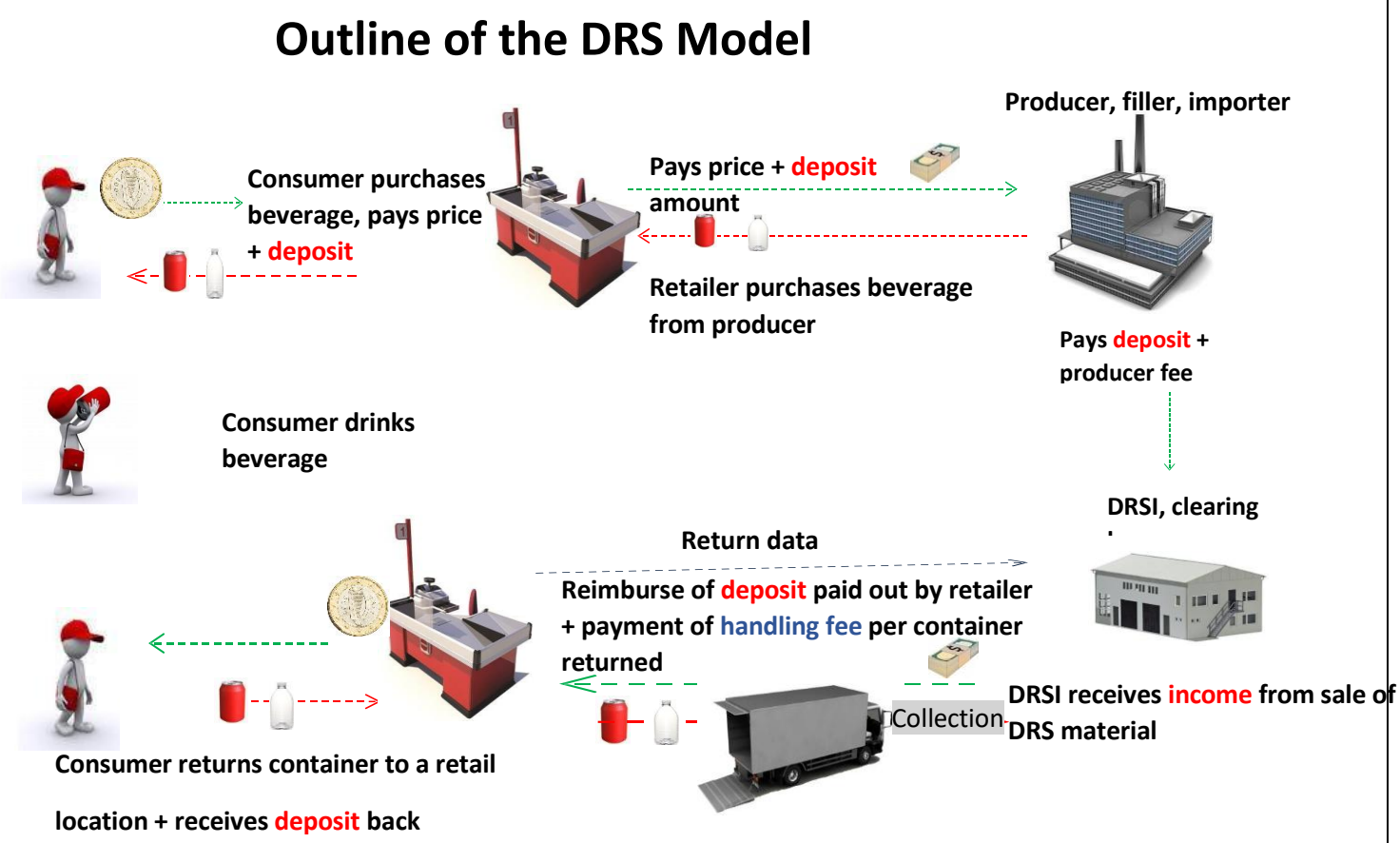
Deposit Return Scheme Ireland CLG (DRSI) is a newly established company formed by beverage producers and retailers to operate Ireland's Deposit Return Scheme and fulfil their obligations under the Separate Collection (Deposit Return Scheme) Regulations 2021.

Under the Deposit Return Scheme, the consumer pays a small deposit in addition to the retail price when buying a beverage sold in a PET plastic bottle or aluminium or steel can. This deposit is fully refunded when the empty beverage container is returned for recycling.

The introduction of a Deposit Return Scheme (DRS) will increase recycling rates for beverage containers, reduce litter and prevent waste. As a circular economy project, DRS is focused on plastic bottles and aluminium/steel cans, to ensure that more of these are captured for higher quality of recycling and maximising resource use.

DRSI is now engaging with key stakeholders to put in place the necessary infrastructure required to launch and operate the Scheme.

The following is a process flow of how the Scheme will work:



2.0 BACKGROUND

The purpose of this document is to advise Reverse Vending Machine Suppliers of the minimum specification RVM's must achieve in order to attain certification by DRSI so that they can be used in the Deposit Return Scheme in the Republic of Ireland.
Only RVM Suppliers that complete a self-certification process and provide this documented proof will be included in the Scheme.
DRSI does not at this stage intend to purchase any RVM's, however Retailers in Ireland will purchase the certified RVM's directly from the RVM Suppliers.
Whilst the up-front and ongoing (maintenance, etc.) costs of the RVM's will be a matter between the Retailers and RVM Suppliers, DRSI requires that it is kept abreast of such costs as the Deposit Return Scheme together with costs attributed to container producers assists in the funding of the RVM costs that the Retailers bear in the first instance.
It is expected that the Deposit Return Scheme in the Republic of Ireland will commence in February 2024.

Once the scheme goes live in February 2024 it is expected that approximately 2 billion containers will need to be processed annually within 6 years.
2 billion containers equates to circa 40,000 tonnes of material.
The following is the expected uptake for the first 6 years:

3.0 SPECIFICATIONS

The following is the minimum specifications that all RVM's must attain to be allowed to operate in ROI. DRSI reserves the right to change the specification at any time. RVM performance targets and requirements will be reviewed on an ongoing basis.

Containers

3.1 Container Identification

Every container within the scope of the scheme must be identifiable by an RVM. The RVM must then be able to process it correctly and pay out the correct deposit related to the container.
To facilitate this, the scheme will be responsible for creating a Container Masterfile. This is a file for an RVM to use in the identification of containers registered with the scheme. This will provide information on the characteristics and barcode of each container, and the deposit associated with it. The scheme will provide the Container Masterfile to each RVM Supplier, who will ensure their active RVMs have access to it when processing containers.
Each container will have a DRSI approved logo on it to indicate its inclusion in the scheme.
The RVM specification approved methods for container recognition and their associated accuracy targets are listed in this document.

3.2 Container Scope

Single use beverage containers are the focus of this scheme. PET bottles, Aluminium Cans and Steel cans - between 150ml and 3000ml - are within the scope of the scheme. Further container details will be outlined in our material specification. An RVM must be able to accept 100% of in-scope containers that meet our material specification.
RVM's must be capable of accepting:

- With a minimum width of 50mm.
- With a maximum width of 120mm.
- With a minimum height of 100mm.
- With a maximum height of 360mm.

Width must not exceed height. Height is inclusive of caps.

3.3 Non-Scheme Containers

RVMs may accept non-scheme containers if agreed in advance with DRSI. Approved non-scheme containers will be added to the Container Masterfile. Non-scheme containers will automatically carry a deposit of €0.00.

3.4 Barcode Recognition

Barcode recognition is the main method of container identification. Containers will not be accepted without barcode recognition to validate the container. Therefore, all RVMs must be able to meet a number of criteria in relation to barcodes.
All RVMs must be able to read the barcodes on both cylindrical and non-cylindrical container.
RVMs must be able to store the Container Masterfile in order to validate the barcodes read. Each container will have instructions on how to handle it, and whether a container has a deposit value against it or not.
RVMs must be capable of reading barcodes at a maximum of 30 degrees tilt. It is expected that RVMs can read and recognize at least 99.5% of undamaged barcodes at maximum tilt.
RVM's must be capable of reading EAN-8, EAN-13 and UPC barcode formats.
RVM's must be capable of reading 2D data matrices and QR codes.
RVM's must conform to the appropriate standards and align with our material and technical specifications.

3.5 Weight Detection
RVMs are only required to accept empty containers. To identify partially filled or fully filled containers, an RVM should use weight detection. This weight detection requires an accuracy of at least 95%. Containers should weigh no more than 100 grams including any excess liquid. If a container is identified as not empty, the container should be rejected.

3.6 Metal Detection
All RVMs must be able to detect Aluminium and Steel containers. The metal detection rate must have an

accuracy level of at least 90%.

3.7 Shape Recognition
There are two types of possible shape recognition: Basic Shape Recognition and Silhouette Shape Recognition.
All RVMs must have the ability to perform basic shape recognition. The Container Masterfile will include basic information on the dimension (height and width) of each container. RVMs require an accuracy level of at least 95% for basic shape recognition.

3.8 Silhouette Shape Recognition
All RVM's must have the ability to perform Silhouette Shape recognition. RVM Suppliers will be expected to apply their own recognition logic and maintain their own silhouette database. DRSI will give adequate notice to RVM Suppliers for when Silhouette Shape Recognition is to be brought into use and what containers will be required to be capable of Silhouette Shape Recognition.

3.9 Recognition Combinations
The minimum recognition combinations for a container to be accepted by an RVM is:
Barcode Recognition + Basic Shape Recognition + Weight Detection + Metal Detection.
A combined accuracy level of at least 95% is required across this combination.

3.10 Fraud
All RVMs must ensure all recognition methods relate to the same physical container without human interaction. The RVM must recognize if a container moves in the wrong direction and ensure there are no physical objects connecting the user to the drinks container. The container that is scanned must be the container that is

accepted by the machine. All attempts of fraud such as these must be detected and recorded.

3.11 Logo Recognition
Logo recognition is not a prerequisite for the launch of the scheme. DRSI is looking to reduce the scheme's exposure to fraud and may require Logo Recognition in the future.

Container Handling
3.12 Co-Mingled Collections
All RVM's must provide the container material in a co-mingled format for collection. Shredded or fragmenting of this material must not occur. An impalement rate of 0.1% is acceptable whereby the co-mingled material cannot be separated and further processed into either PET or Aluminium/Steel bales. This requires a single

compactor capable of effectively compacting each type of material. If this is not possible, two material specific compactors will be required.

3.13 Volume Reduction & Flattening

Compactors must reduce the volume of a PET Beverage container by at least 55% and the volume of an Aluminium/Steel Container by at least 75%. RVMs must maintain this level over the duration of its life. The compactor should destroy the barcode and all compacted containers should be rejected when attempted to be returned again.

Return Point Operator Operations

3.14 Installation & Changes

The installer must set-up each RVM with the Unique Store/RPO Identifier, to be determined and provided by DRSI. If the location of an RVM changes after installation, the RVM Supplier must notify DRSI. The installer must then update the Unique Store/RPO Identifier on the RVM.

The connection to an RVM must be tested upon installation to ensure deposits and handling fees are communicated to the scheme in relation to the correct RVM and return point.

DRSI must be notified of any changes to the RVM infrastructure 15 days in advance, be it a new installation or the movement of a current RVM.

3.15 Consumer Interface

An RVM needs to be easy to use and must give useful and relevant information to the user in a consistent manner. DRSI will help standardize the delivery of information to the user.

The RVM must provide for the placement of DRSI branding on both the physical machine and the electronic display. DRSI will release information on the branding requirements separately.

The RVM must display relevant messages to the customer. DRSI will provide a baseline of standard messaging and images to be consistent across all return points. This will also be included in the branding requirements.

3.16 Consumer Receipts

An RVM must provide a deposit receipt for the customer. The customer must have the option for a paper receipt if they wish. An electronic receipt may be offered instead if a customer chooses. The format and content of the receipt must be standardized and will be set by DRSI.

3.17 Deposit Repayment

All Return Points must offer the customer the option to redeem their deposit. This must be available as a Paper cash voucher to be redeemed by the customer.

The Return Point Operators and RVM Suppliers can look to develop other methods of repayment in addition to the above. This can provide customers with a choice to opt in to donate money, engage with a Retailer's Loyalty program or provide an electronic receipt if the RPO chooses.

DRSI recommends that RPOs validate the RVM vouchers with their own EPOS systems.

Technology & Data

3.18 Availability

All RVMs in the DRSI system must be available for connection at least 99.5% of the time. They will require power and access to the internet to connect to the RVM suppliers and DRSI. This availability will be calculated as a yearly average. Time offline must be tracked and reported to ensure minimal downtime.

RVM software and firmware must be kept up to date with the latest software available, or at a minimum the n-1 latest.

The Container Masterfile must be uploaded onto each RVM regularly, at a frequency to be defined by DRSI. The RVM must be capable of having these updates done remotely.

If an RVM goes offline, the data stored on the RVM must not be lost. If the RVM has network issues, then the RVM must be able to queue and send transaction data for the next time it connects. If the RVM is offline for 2 or more days, the RVM Supplier must inform DRSI.

The RVM Supplier must provide a report with information relating to the RVM ID and the reason the RVM is offline. This will be defined by DRSI.

3.19 DRSI Interface & Integration

RVMs must be capable of complying with a DRSI Interface.

RVM Suppliers must be capable of complying with a DRSI Interface.
The Interface is yet to be determined but will consist of well-established file format.
DRSI will operate a REST API which RVM Suppliers shall be expected to adhere to.

3.20 Back-up

An RVM must store detailed transaction data for 2 weeks after the transaction data is uploaded to the RVM Supplier as a back-up. This is in the event that data is lost or corrupted during transfer or processing by an RVM Supplier.
In the case of data loss from an RVM, DRSI must be informed within 2 days and provided with accurately recreated data. This is the responsibility of the RVM Supplier. The report structure will be developed by DRSI.

3.21 Data Integrity

All RVM data must be handled confidentially due to its sensitive nature. The integrity of this data must be maintained and access restricted. Only authorized users should have access to the RVM data, the data must be protected with user access and authorization controls. All default passwords must be changed immediately. The RVMs must provide an audit record of any changes made to the data. Information must be captured such as:

- Who made the change.
- What time the change was made at.
- What was changed.

3.22 Data Processing Agreement

All RVM Suppliers will require approval to operate in the Irish Market. RVM Suppliers will be required to enter into a DPA with DRSI prior to the installation of approved RVMs onto the market.

3.23 Container Masterfile

The Container Masterfile is a file that contains information on the approved containers registered in the scheme. This file has a list of the data attributes of each container, which is used to validate the container when it is presented to an RVM. An RVM should be able to store at least 100,000 drink containers within its local database. Only DRSI has the ability/permission to edit this file.
The latest Container Masterfile will be provided by DRSI to the RVM Suppliers on a weekly basis. The RVM Supplier must ensure this updated file reaches each RVM within 48 hours. A second attempt must be made for this update to each RVM should the first fail. The RVM Supplier must update DRSI should a machine not have successfully received an update of the Container Masterfile after the 48 hours, with a reason for no update and the previous update date recorded.

3.24 Transactions

An RVM must record every container that has been returned successfully, as well as unsuccessful attempts. Every successful and rejected container represents a transaction, both of which must be registered and reported.
RVM transactional data will be required and DRSI will issue a format.
RVMs must store a local record of transactions. These must be Date and Time stamped. Any of this transactional data held locally cannot be lost. DRSI recommends that the RVM hold a record of its transaction data for at least two weeks after transfer of data to the RVM Supplier's Database.
Payments are made to stores based on a date-to-date calculation of what has been returned and deposit accepted through the machine.
DRSI will use RVM information for statistical and improvement purposes.

3.25 Emptying Receipts

An RVM must automatically generate an emptying receipt every time the RVM is emptied. An emptying receipt details the contents of a bag that has been taken out of the RVM. This information in full should be sent to DRSI daily. A summary of this emptying receipt must be automatically emailed to a pre-agreed email address, which will be provided by the RPO to the RVM Supplier. The summary of the emptying receipts should contain:

- Store ID.
- RVM ID.
- Bin ID.

- Container count by deposit value.
- Bag weight.
- Total value (Deposit value and handling fee).
- Date of issue.

3.26 Rejection Reports

Rejections must be tracked and reported for each RVM. Rejections represent failed transactions and attempted deposit redemptions. This provides value for identifying fraud. The report structure will be developed by DRSI.

3.27 Certification

The onus will be on the RVM Suppliers to certify that the RVM's meet the above specification. The RVM Suppliers should advise DRSI when they are in a position to show that the machines meet the specification and a time and place that is convenient for all parties.

When an RVM or RVM Supplier is not fully in accordance with the Specification at the time of testing, the RVM Supplier will be expected to show how they have met the current areas of the specification, and the plans and documentation for the remaining development. This will then come down to the discretion of DRSI for approval. The testing plan for verification purposes, will be developed between RVM suppliers and DRSI in the coming months.

Both RVMs and RPOs must be in compliance with any relevant standards in place in the Republic of Ireland, both for the machine itself and the operations surrounding the RVM. This includes the requirement for accessibility of RVMs. RVM Suppliers and RPOs must ensure the machines are accessible. Compliance by other stakeholders will be outlined in other relevant documents, such as the material specification.

While every effort has been made to provide comprehensive and accurate information on the requirements and specifications, RVM Suppliers must form their own conclusions about the solution needed to meet the specifications.