



# Risk control briefing note 5

## Deposit Return Schemes: Return Vending Machines – Fire Safety



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# 1 Introduction

This fire safety briefing note provides guidance on the risks and controls associated with Deposit Return Schemes (DRS) and specifically the use of Reverse Vending Machines (RVMs). These schemes will impose legal responsibilities on UK manufacturers, retailers, hospitality providers, and wholesalers to recycle returned drinks containers.

This document has been developed in response to Deposit Return Schemes being introduced for retailers in the UK, although the principles have applications in other territories.

# 2 Scope

The recommendations in this briefing note have been produced to minimise the likelihood and consequences of a fire involving RVMs and focus on some of the key aspects of safety and property protection. The advice provided should be applied in conjunction with the manufacturer's instructions and the fire risk assessment for the premises.

The recommendations focus on the positioning, fire protection, and management of RVMs to minimise the risk of fire and prevent fire spread, both within buildings and to any adjacent buildings/structures. Other than under Management Controls no specific consideration has been given to manual (bagged) recycling returns/collections.

# 3 Deposit Return Schemes

What are Deposit Return Schemes?

The objectives are simple – to reduce litter and plastic pollution by recycling drinks bottles and cans. Customers will be encouraged to recycle by reclaiming the small deposit they have paid when returning to the retailer. This can be either over the counter or using reverse vending machines which retain the containers and issue a voucher to redeem in store. The returned container can be from any source and does not have to have been sold by the participating retailer. For every scheme container returned to store, retailers will receive a handling fee from the scheme administrator to cover the costs associated with taking part.

The scheme is proposed to start in the UK in October 2025 with glass bottles being excluded in the first phase. There are a range of reverse vending machines of different sizes and configurations and several suppliers in the market although the principles of each machine are similar in operation. Currently the main operators are:

- Sielaff
- Diebold Nixdorf
- Ecovend
- RVM Systems
- Recyclever
- Envipco
- Tomra.

Drinks containers are deposited through an opening at the front of the machine and collected in open topped bins. The machines can be free standing in store or arranged like an ATM through a wall/opening.



Source: Reproduced by kind permission of Sielaff UK Ltd

Very large double, and even triple, machines can be housed in externally-sited, purpose-built structures as illustrated below.



Source: Reproduced by kind permission of Tesco UK Ltd

Plastic and aluminium containers are scanned and crushed, and glass containers will be scanned and broken into bins through impact or mechanical means. They are then placed in segregated or co-mingled bags within storage bins until full or a predefined limit is reached. Bins are then emptied by employees as part of wider store recycling procedures, with bagged items stored pending collection.

## 4 Risk Control Recommendations

The loss experience with RVMs has yet to be fully established and documented.

However, based on known losses from other external exposures, such as waste skips and bins, it is reasonable to foresee the loss potential arising from the proximity of machines and housings to existing structures. Loss causation can be varied, but the presence of electrically powered machines mixed with sufficient combustible loading from plastic bottles presents an inherent fire risk. External machines and housings could also be vulnerable to malicious damage and arson, given the exposed locations and typically unrestricted public access. Increasing volumes of recycled materials as a result of these schemes will also place pressure on existing site recycling procedures and management of waste materials pending collection off site.

For these reasons, consideration should be given to adopting the risk control recommendations set out in this section. Whilst this guidance does consider the installation of RVMs internally, the focus is on the location and management of external RVMs.

### 4.1 Fire Risk Assessments

A suitable and sufficient fire risk assessment should be undertaken by a competent person in accordance with relevant national regulations. The assessment should include all RVM units, whether located internally, attached to the main building, or as detached buildings within the perimeter of the site.

The fire risk assessment should consider the good practice set out in these recommendations together with the potential for deliberate fire-setting from sources within or outside the business. Where necessary, suitable preventive or protective actions should be identified that are proportional to the risk and implemented to protect both the main premises together with the RVMs provided on site.

The fire risk assessment should be subject to periodic review, including changes to either the equipment or to the layout of the premises.

## 4.2 Location – Separation

In consultation with a leading UK retailer, the following guidelines have been established based on a range of store sizes reflective of both high street and retail park layouts.

Where site specific issues prevent the adoption of this guidance then risk assessments in collaboration with insurers should be undertaken to establish the best solution.

RVMs should be placed on a non-combustible base with all services rising from below and hard-wired to avoid trailing leads. Inside the store, RVMs should be sited against solid walls and not below any combustible ceilings or obstructing exits/fire exits.

All RVMs should be installed in accordance with the manufacturers' instructions. Where multiple units are required, any interlinking arrangements should follow the manufacturers or suppliers' recommendations. Where RVMs are sited externally outside of any housing then suitably rated electrical supplies should be used.

Table 1 below sets out recommended locations, separation distances and protection options for RVMs.

Within the table, maximum RVM holding capacities are listed. However, for operational reasons a lower working capacity (50%) may be appropriate to reduce the fire load and increase the frequency of emptying RVMs.

Store Size <sup>Note 1</sup>	RVMs Internally	RVMs Externally	Enclosure Construction	Comments
<b>Large size retail store – Sprinklers (&gt;3,000m<sup>2</sup> retail sales area)</b>	Position RVMs where they are directly protected by the store fire sprinkler system and/or fire detection system where installed. Consider extending Sprinkler protection within the RVM.	<p>RVMs should not be closer than 15 metres Note 2 to the store and/or neighbouring building(s) unless they are adequately sprinkler protected or other approved fire suppression systems are installed.</p> <p>RVMs located 15-20 metres from the store and/or neighbouring building(s), should be fitted with fire detection linked to the main store system.</p> <p>RVMs located 20 metres or more from the store and/or neighbouring building(s), do not require fire detection, although beneficial.</p>	<p>No enclosures required for internal RVMs.</p> <p>Externally, RVMs should be fully enclosed within a non-combustible housing with roller shutters that are closed and secured after hours.</p>	<p>RVMs = Reverse Vending Machines</p> <p>Internally means positioned within the footprint of the premises.</p>

Store Size <sup>Note 1</sup>	RVMs Internally	RVMs Externally	Enclosure Construction	Comments
<b>Medium size retail store – No Sprinklers (&lt;than 3,000m<sup>2</sup> but more than 500m<sup>2</sup> retail sales area)</b>	<p>Maximum three RVMs, each with a 1,500 PET compacted bottle capacity.</p> <p>Fire detection installed above. Consider fixed fire suppression systems. <sup>See note 3</sup></p>	<p>One RVM with a 1,500 PET compacted bottle capacity and no detection.</p> <p>One RVM no larger than a 4,500 PET compacted bottles capacity or two RVMs (capacity 1,500 each) with fire detection linked to the store systems fitted.</p>	<p>No enclosures required for internal RVMs.</p> <p>Externally, RVMs should be fully enclosed within a non-combustible housing with roller shutters that are closed and secured after hours.</p>	<p>PET = Polyethylene Terephthalate Plastic</p> <p>If extra recycling capacity is required, then additional RVMs should be sited externally, in accordance with the prescribed spatial separation distance and detection requirements for large format stores.</p> <p>Remove bins. In store, RVMs should be emptied and bins removed for overnight storage.</p>
<b>Small size retail store (&lt;500m<sup>2</sup> retail sales area)</b>	One RVM with a 1,500 PET compacted bottle capacity.	One RVM with a 1,500 PET compacted bottles capacity and no detection.	Externally, RVMs should be fully enclosed within a non-combustible housing with roller shutters that are closed and secured after hours.	
<b>Petrol stations - Forecourts</b>	N/A	<p>One RVM no larger than 1,500 PET compacted bottle capacity and no fire detection.</p> <p>Ingress protection rated for intended use should be provided.</p> <p>RVMs must be located a minimum of 4m from fuel dispensers and storage tank fill points and outside of any other hazardous zones 1 or 2.</p> <p>Greater separation may be required from gaseous-fuel dispensers and storage, based on risk assessment <sup>Note 4</sup></p>		<p>The RVM shall be positioned to avoid impeding the following:</p> <p>Line of sight of employees working in the kiosk of the forecourt area.</p> <p>Remote monitoring cameras or installed VSS.</p> <p>Access to emergency shutdown devices or emergency firefighting equipment.</p> <p>Access or egress from site.</p> <p>Tanker delivery stand access/egress or emergency routes.</p>

**Note 1:** This guidance relates to retail stores and surface parking areas only. Installing RVMs in underground car parks is not recommended and should be avoided.

**Note 2:** Separation distance: 15m has been established as a safe minimum. Variations on this distance can be considered based on the respective size and fire loading of the machines and housings. See Further Information section for guidance.

**Note 3:** Water mist fire suppression systems require independent testing by an accredited test body such as BRE/FPA, or similar internationally recognised test body. If gas suppression systems are considered appropriate then these should be designed to code, (e.g. BS EN, NFPA, CEA, FM Global) and suitably commissioned.

**Note 4:** Ref. Energy Institute, APEA, (Design, construction, modification, and decommissioning of filling stations), 4th Ed.

### 4.3 Security

- External enclosures should be physically secured outside trading hours to prevent malicious access. Roller shutters and doors should be locked with approved padlocks and locking devices.
- For larger RVMs in areas with prevailing high crime and arson rates, as demonstrated by local experience, consideration should be given to installing monitored intruder alarms.
- Consideration should be given to locating units wherever possible within the field of vision of existing Video Surveillance Systems (VSS), aka CCTV, that may be present.
- To reduce the risk of vandalism to units and to increase user safety, they should be positioned in a highly visible and well-lit area that allows maximum surveillance by staff, security personnel, and other customers.

### 4.4 Management Controls

Clear operating procedures should be established in line with manufacturers' guidance and existing good operating practice, and should cover the following:

- Opening and closing routines.
- Clear signage should be prominently displayed adjacent to the RVM on what can and cannot be recycled.
- Inspections throughout the day as part of the general store self-inspection programme by staff and/or security personnel, with any remedial actions identified and followed through to completion.
- Cleaning/housekeeping protocols to remove debris and avoid equipment blockages.
- Emptying of machines and frequency – in non-sprinklered locations this should be daily and overnight when closed.
- Suggested Collection frequencies:
  - Small retail with manual returns – 1-2 per fortnight
  - Medium retail with manual and RVM returns – 1-2 per week
  - Large retail with RVM returns 5-7 per week.
- Where practicable, no stored combustible materials, stock etc. should be located within an area around the RVM, as determined by a risk assessment.
- Review management of additional materials within existing site recycling processes. This will require assessment of the impact on storage arrangements in yard areas and the need for additional waste collections to reduce the build-up of combustibles in proximity to buildings.
- Establish inspection and maintenance programmes of machines to prevent breakdowns and malfunctions. All equipment, including safety cut out devices, should be installed, operated, and maintained in accordance with the RVM manufacturers' OEM manuals. Servicing and maintenance should be carried out by the supplying/installing company.
- Lease contracts should be clear on respective responsibilities relating to the management and monitoring of RVMs.
- Site Emergency response plans should be reviewed to ensure that these include what to do in the event of an incident involving an RVM.
- Fire risk assessments should be updated, and the local fire service notified of the change on site.

## 4.5 Fire Protection

- Provision of appropriate portable fire extinguishers should be available and immediately accessible for use by trained staff in the case of a fire. Provision and maintenance should be in accordance with respective national regulations.
- Where stores do not have fixed fire protection, such as sprinklers, consideration should be given to installing an automatic fixed fire extinguishing system to protect the RVM, limit damage to property, and minimise interruption to store operations.
- If gas suppression systems are considered appropriate then these should be designed to code, (e.g. BS EN, NFPA, CEA, FM Global) and suitably commissioned.
- Water mist fire suppression systems require independent testing by an accredited test body such as the BRE/FPA or similar internationally recognised test body.
- System maintenance and testing etc.

## 4.6 Employee Training

Employees who use, operate, maintain, and clean the machine should receive appropriate instruction, including on:

- The correct method of using, cleaning, and maintaining the equipment in accordance with the manufacturer's instructions.
- The safety features that are incorporated into the equipment and the correct method for setting these for the operation that is to be undertaken.
- The maximum period between checks.
- The method for shutting down the equipment safely in an emergency.
- The emergency procedures in the event of a fire involving the equipment.
- The mode of operation of the automatic and manual fire protection equipment that is provided.

# 5 Conclusions

This briefing note raises awareness of what Deposit Recovery Schemes (DRS) are and highlights the potential risks for users with respect to the location, protection, and management of Reverse Vending Machines (RVMs).

Although the impact of these schemes has yet to be felt in the UK there is some anecdotal evidence from Europe that fires have occurred and therefore planning to ideally avoid incidents and/or limit any negative impacts is appropriate.

As these schemes come online, scheme scales and usage will quickly ramp up so establishing consistent and practical risk control standards prior to adoption makes commercial sense.

This briefing note will be subject to revision as experience develops and practices evolve.

## 6 Further Information

### References

- *Deposit Return Scheme*, Zero Waste Scotland ([depositreturnscheme.zerowastescotland.org.uk/faqs](https://depositreturnscheme.zerowastescotland.org.uk/faqs))
- Applicable National Fire Safety Regulations
- *Waste Industry Health & Safety Forum: Reducing fire risk at waste management sites issue 3* – March 2020
- Assessment of safe distances: RISCAuthority Fire and Explosion Toolkit: recommended safe separation distances:

Enclosure length	Fire severity moderate-severe, m	Safe separation, m
5 metres	9-12	11
10 metres	11-15	13
15 metres	13-18	16
20 metres	14-20	17
25 metres	15-22	19

- Safety distances between waste containers and buildings: CFP A-E Guideline No 7:2022 F
- Reducing risk at waste management sites, WISH (Waste Industry Safety and Health Forum), 2020



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