P H A
Paul Horsley Acoustics Ltd
Acoustics & Noise Control Consultancy

Noise Survey

Noise Impact Assessment for the
Deposit Return Scheme (DRS) for
ALDI Retail Stores Located in England and Scotland

Our Reference – J3419

Revision - 1

Report compiled by - Paul Horsley MIOA

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Limitations

The assessments and interpretation have been made in line with legislation and guidelines in force at the time of writing, representing best practice at that time.

All of the comments and opinions contained in this report, including any conclusions, are based on the information obtained by Paul Horsley Acoustics Ltd during our investigations.

There may be other conditions prevailing on the site which have not been disclosed by this investigation, and which have not been considered by this report. Responsibility cannot be accepted for conditions not revealed by the investigation.

Any diagram or opinion of the possible configuration of the findings is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

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1.0 ALDI Deposit Return Scheme (DRS)

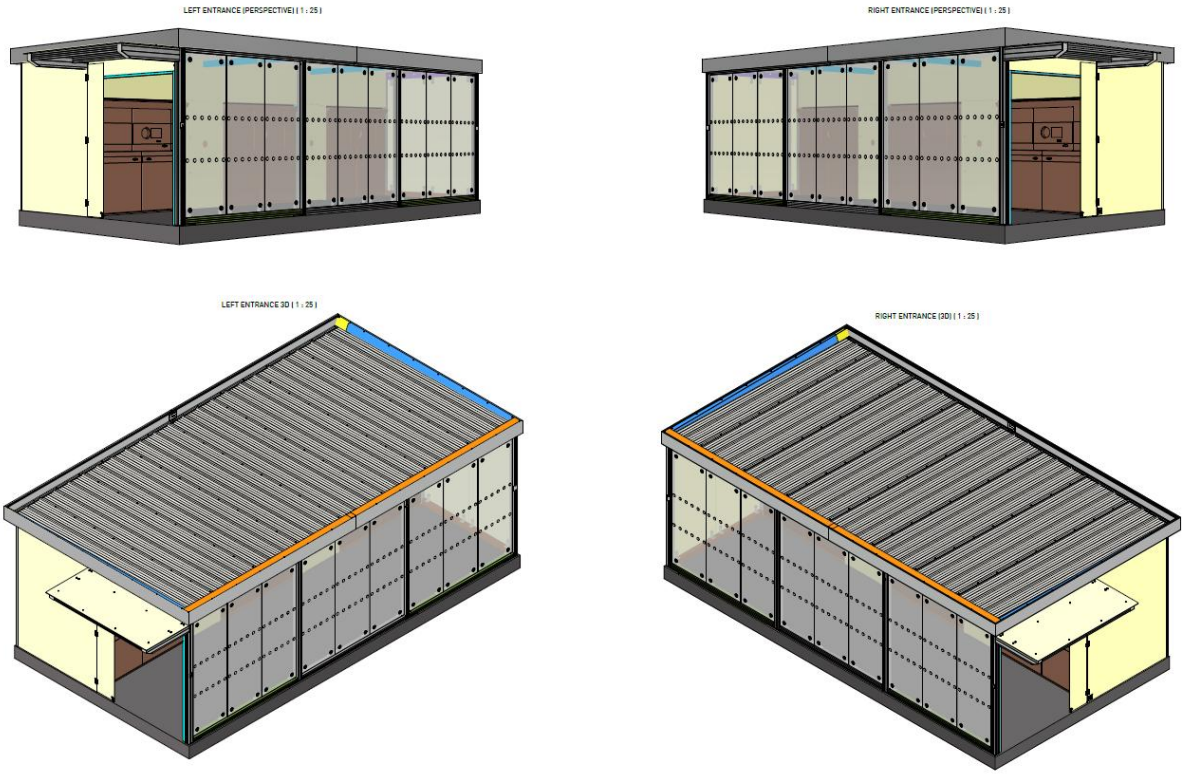
The UK government has announced the design of a national Deposit Return Scheme which will enable drinks containers to be recycled into higher quality items.

The scheme is programmed to be operational for England and Scotland from October 2027.

The scheme will work by charging a small deposit for the drink's container at time of purchase. The customer will then return their empty PET plastic bottle or steel/aluminium can using the Deposit Return Scheme via a Reverse Vending Machine (RVM) located at the retailer's premises or over the counter at smaller outlets. Upon return of the empty bottle / can, the customer will receive the refund of the deposit paid at purchase.

It is ALDI's intention to use the former return scheme method via multi feed automated Reverse Vending Machines positioned outside the store building within the carpark area at the most convenient location for customers to allow for maximum uptake of the scheme.

It is anticipated that the RVM units will be located within a self-contained housing having a footprint of 4.1m wide x 8.7m long (including a 1m external canopy over the entrance door), as per the sketch below indicating Left-handed and Right-handed enclosure examples.



For the purposes of this assessment the following assumptions are applicable to any ALDI store for which this report is to be utilised.

- Any new DRS RVM unit at any ALDI retail store will be located within the bounds of the site under consideration.
- The individual RVM's will be positioned together inside their own bespoke acoustically rated compound outside the store generally within, but not limited to, the carpark area of the site.

2.0 Design Target Limits

The design intent of the customer use of the RVM system is for parity with the store opening times. Since there are variances in the individual store opening times throughout the UK no actual operating times will be specified.

However, it can be determined that no ALDI stores in the UK are open to the public outside of daytime periods, deemed as 07.00 to 23.00 hours, therefore, the relevant period of assessment for the RVM's is daytime periods only. No nighttime public use of the units will take place.

Use has been made of the relevant National and International Standards with regards noise and limiting noise levels set for a typical store.

Based upon the limiting recommendations of WHO 1999 and PAN1/2011 the following design target noise limits have been utilised for a typical site, for the activity under consideration to a Noise Sensitive Receptor, NSR.

To ensure that the RVM systems do not generate any loss of amenity to the nearby noise sensitive receptors, usually residential premises a design limit for the operational noise contribution of the equipment will be set at -10 dB below the accepted limits.

2.1 Table of Recommended DRS Design Target Noise Limits

Period	WHO and PAN1/2011 External Noise Limits	Proposed DRS Design Target Noise Limits at NSR's
Daytime (0700 – 2300 Hrs)	LAeq, 16 Hours – 50 dB	LAeq, 16 Hours – 40 dB

3.0 Deposit Return Scheme Noise Sources

The Deposit Return Scheme proposal will be administered at the individual ALDI stores via a multi feed Reverse Vending Machine system located external to the main building, usually within the car park area at the front of the store.

The primary identified potential noise sources associated with the introduction of the DRS RVM system are as follows:

- Product Feed
- RVM System Operation
- RVM Disposal Bin Replenishment
- Disposal Bin Collection

If we account for each process individually, we can attribute a noise source to the process and ultimately build up a noise profile for the installation. The noise profile can be modelled as follows:

3.1 Product Feed

The Product Feed element of the DRS will involve customers inserting the empty PET bottle / can into an allocated opening in the face of the RVM. This is a circular hole in the front of the machine.

The noise attributable to this process has been assessed as negligible, therefore, 0 LAeq dB will be applicable.

It is anticipated that the DRS user will be an existing customer of the specific ALDI store and as such will not provide additional noise to the current sound scape associated with the operation of the ALDI store itself.

3.2 RVM System Operation

Once the PET bottle / can has been inserted into the RVM it will be scanned and sent along a short internal conveyor where it will be crushed and deposited into a collection bin positioned at the non-customer facing side of the unit internally behind a partition.

Based upon actual testing of the operational noise level of the internal workings of the RVM unit, a TOMRA S2, the output associated with process ranges between 73 LAeq dB to 78 LAeq dB when observed inside the enclosure with all internal RVM's operating simultaneously.

The impulse noise associated with a PET bottle popping when being crushed prior to offloading into the collection bin was recorded at 89 LAMax dB.

The entire cycle operation takes 10 seconds to complete for 1 No product item.

3.3 RVM Deposit Bin Replenishment

Once the internally located collection bins, consisting of 54 litre wheeled totes, are full, they will be moved into the store warehouse area by staff. It is anticipated that the collection bins will be moved into the store warehouse by the most appropriate route possible, in the majority of cases this will be through the store entrance to the warehouse.

The replenishing empty collection bins will be put in place via the same route, taking the totes from the warehouse into the DRS housing. It is anticipated that the bins will require changing on a daily basis, however, this is all dependent upon customer use and demand.

If we base the external noise of the transitioning full bin into the store, the noise associated with the movement will be up to 40 dBA at 1m, based upon slight impact noise from movements of the bin over a smooth tarmac surface. However, this will be a short duration event, with an anticipated maximum exposure period of 30 seconds transit period between unit and store. Once inside the store there will be no further external noise associated with the relevant bin movements.

3.4 Disposal Bin Collection

Once the bins are full, they will be collected from the store using the current store service vehicles. The bins will form part of the existing return scheme, currently utilised for cages, pallets and racks from any ALDI store as a standard process.

The bins containing the recyclable PET bottles and cans will be returned where they will be collected by the scheme administrator for onward distribution for post collection processing.

There will be no additional or specialist vehicles used for the waste collection at the individual stores, therefore, the collection process will not provide any additional noise source to the existing ALDI store operations.

The noise attributable to this collection process has been assessed as negligible, therefore, 0 LAeq dB will be applicable.

4.0 DRS Noise Impact Assessment

If we assume that the DRS units are accessible to the customers during opening times only, it can be determined that a daytime assessment between 07.00 to 23.00 is the relevant period, since no ALDI UK store open for trading to the public outside of these hours.

To provide a thorough assessment of the actual noise levels likely to be produced by the RVM installation at any location throughout the UK, specific acoustic testing of the sound insulation of the actual DRS enclosure has been conducted.

Specific noise tests of the TOMRA S2 unit have been conducted inside the enclosure at customer infeed location and within the rear space behind the unit installation when under typical operational conditions for both PET bottle and can insertions.

Based upon the results of the actual 'Live' tests conducted for the scheme, it is possible to calculate the effect of the external noise produced by the DRS installation for all elevations of the enclosure at any distance.

These calculated output contribution levels can be compared against the limiting design target to determine the minimum distance from the unit to any noise sensitive receptor before noise can be classified as producing a loss of existing amenity.

4.1 DRS Enclosure Sound Insulation Testing Methodology

Testing was conducted on 24th June 2026 at a specific ALDI store. Measurements were made by Paul Horsley MIOA, principal director and acoustician of Paul Horsley Acoustics Limited.

The equipment used to conduct the testing is described below.

Svantek Sound and Vibration Analyser, SVAN 979, Type 1, Serial No 92932
Svantek Preamplifier, SV 17 Microphone Serial No 106523
GRAS Pre-Amplifier, Type GRAS 40AE, Serial No 370153
Castle dBCal Calibrator Serial No 074042
Tripod
ANV Remote Controlled Pink Noise Generator
Alexis RA500 Power Amp
Dodecahedron Speaker and cabling

The acoustic test procedures adopted, to determine the sound reduction properties of the ALDI DRS enclosure, follow those of BS EN ISO 140-4:1998, "Acoustics - Measurement of sound insulation in buildings and of building elements. Part 4: Field measurements of airborne sound insulation between rooms."

The sound level meter was calibrated using the calibrator before and after each measurement cycle. No variances were noted between cycles and the results obtained can be deemed and verified as accurate.

The sound level meter was paired up to the computer and the appropriate Building Acoustic programme activated. All recordings were automatically stored and processed within the programme.

Background noise levels were recorded using an Leq, 1/3 octave band frequency setting on fast response over 30 second periods external to the test DRS enclosure. This involved measuring 10 No locations in total around the enclosure.

The Dodecahedron speaker was positioned on the tripod within the centre of the enclosure, and the connected sound source was activated. The sound output level was adjusted and set to operate at least 15 dB above the highest measured background level to avoid undue influence in the received results. The sound level was recorded over 30 second intervals at various locations within the DRS enclosure to ascertain the reverberant sound level within the enclosure.

With the sound source still operating, recordings were monitored external to the enclosure at 10 No positions. These recordings were made at a distance of 1m from the relevant tested facade of the enclosure.

The external reverberation time was measured. This involved providing a high volume, high energy randomly generated sound pulse outside of the enclosure and recording the sound level decay using a 1/3 octave band procedure. 10 No sample periods were recorded as prescribed within BS EN ISO 3382 and averaged to determine the overall reverberation time of the external area.

The recorded data gathered has been utilised to determine the sound insulation of the specific acoustic enclosure façade.

Where appropriate, the testing was repeated for all 4 No side elevations of the DRS enclosure under consideration. Due to access limitations the roof could not be directly acoustically tested, and Manufacturers test data is used for the roof facade.

The results of the sound insulation testing conducted on the ALDI DRS enclosure are as follows.

Elevation	Rear Facade	Right Hand Facade	Glass Front Facade	Left Hand Facade	Roof
Sound Insulation, DnT,w dB	37.0 dB	34.0 dB	28.0 dB	33.0 dB	25.0 dB

Test Certification available for inspection upon request.

4.2 DRS Unit Operational Sound Testing

To determine the sound produced by the Tomra S2 RVM whilst in operation, noise monitoring was conducted accordingly.

At the customer infeed location, a PET bottle was fed into the machine, where it was scanned, accepted, crushed and deposited into the receiving tote bin. The process was noise monitored at the ear location of the customer.

The process was repeated, however, on this occasion the noise monitoring was conducted at the rear of the enclosure adjacent to the actual Tomra machine. This location is a restricted area and not open to the public, however, since it is an enclosed area, it is relevant to noise emanating from the rear of the equipment.

Further noise monitoring was conducted externally to the enclosure at the rear of the unit with the input process taking place.

The whole exercise was repeated for an aluminium can insertion into the Tomra S2 RVM.

The noise monitoring was recorded in 1/3 octave band with LAeq dB and LAF Max dB indices being recorded for the duration of the process. The time period was 10 seconds for each input cycle.

4.3 Calculated Methodology

The purpose behind the above scenarios is so that an assessment of the noise levels at the varying distances from the DRS installation can be made in advance of the actual development.

The appropriate model for the assessment of noise breakout from the DRS enclosure is given by considering the internal noise level within the enclosure, the area of the facade likely to generate noise and the distance to the observer.

The calculation encompassing all these factors is given by:

$$\mathbf{L_2 = L_1 - R + 10Log\ S - 20\ log\ r - 14,\ dB}$$

Where;

L_2 is the sound pressure level in dB at distance **r** metres from the specific façade under consideration

L_1 is the sound pressure level inside the unit adjacent to the facade where the breakout will occur

S is the area of specific facade, m^2

R is the Sound Reductive Index, SRI, of the façade, as tested, dB.

Using the above calculation, it is possible to determine the noise contribution of the DRS installation at any distance and for all facades of the unit.

4.4 Impact Assessment Results Matrix

Below is a matrix of noise contribution levels resulting from the operation of the Tomra S2 RVM units located within the ALDI UK DRS enclosure based upon relevant façade considerations.

		Noise Level Contribution, dBA, at Distance From Relevant Façade, m																			
Specific Façade	Assessment Indices	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	20	25	30	40	50
Rear Façade	LAeq dB	35.7	29.7	26.2	23.7	21.7	20.1	18.8	17.6	16.6	15.7	14.9	14.1	13.4	12.8	12.2	9.7	7.7	6.2	3.7	1.7
	LAFmax dB	44.6	38.6	35.1	32.6	30.6	29.0	27.7	26.5	25.5	24.6	23.8	23.0	22.3	21.7	21.1	18.6	16.6	15.1	12.6	10.6
Left-Hand Solid Façade	LAeq dB	37.2	31.2	27.7	25.2	23.2	21.6	20.3	19.1	18.1	17.2	16.4	15.6	14.9	14.3	13.7	11.2	9.2	7.7	5.2	3.2
	LAFmax dB	51.3	45.3	41.8	39.3	37.3	35.7	34.4	33.2	32.2	31.3	30.5	29.7	29.0	28.4	27.8	25.3	23.3	21.8	19.3	17.3
Glass Front Facade	LAeq dB	46.2	40.2	36.7	34.2	32.2	30.6	29.3	28.1	27.1	26.2	25.4	24.6	23.9	23.3	22.7	20.2	18.2	16.7	14.2	12.2
	LAFmax dB	60.3	54.3	50.8	48.3	46.3	44.7	43.4	42.2	41.2	40.3	39.5	38.7	38.0	37.4	36.8	34.3	32.3	30.8	28.3	26.3
Left-Hand Entrance Façade	LAeq dB	38.2	32.2	28.7	26.2	24.2	22.6	21.3	20.1	19.1	18.2	17.4	16.6	15.9	15.3	14.7	12.2	10.2	8.7	6.2	4.2
	LAFmax dB	52.3	46.3	42.8	40.3	38.3	36.7	35.4	34.2	33.2	32.3	31.5	30.7	30.0	29.4	28.8	26.3	24.3	22.8	20.3	18.3
Roof	LAeq dB	51.2	45.2	41.7	39.2	37.2	35.6	34.3	33.1	32.1	31.2	30.4	29.6	28.9	28.3	27.7	25.2	23.2	21.7	19.2	17.2
	LAFmax dB	65.3	59.3	55.8	53.3	51.3	49.7	48.4	47.2	46.2	45.3	44.5	43.7	43.0	42.4	41.8	39.3	37.3	35.8	33.3	31.3

Design Target Values	
Less Than 40 LAeq dB	Achieved
Gretater Than 40 LAeq dB	Exceeded

Comparison of the above calculated noise levels due to DRS operations with the design target noise levels of 40 dB LAeq for daytime periods at noise sensitive premises gardens indicates that noise is not an issue with respect to loss of amenity for distances of 3m and above from the relevant unit façade installation.

The predicted noise levels fall within the accepted noise limit design targets for daytime periods and as such the DRS operations should not give rise to complaints relating to noise for distance in excess of 3m from the installation.

At distances less than 3m from the DRS installation, there may be a possibility that the operation of the DRS is audible at the receptor position, depending upon local background noise climate.

However, since the design targets for the operation of the DRS installation has been set at -10 dBA below the accept WHO noise limits for external sources, the noise produced should not result in any loss of amenity for distance below 3m from the installation, should such an occasion arise.

It should be noted that the calculations presented within the above assessment are based upon a worst-case scenario of direct line of sight between the DRS unit and the recipient. It has not accounted for any sound transmission reduction that may be applicable to barrier effects between the DRS and the recipient, which should be considered for the individual installations.

5.0 Mitigating Noise Control

Based upon the findings from the above assessments of the operation of the DRS installation at an ALDI store, all noise levels fall below the design target limits set for the site, taking account of both National and International Standards with regard to noise levels.

As such no additional mitigating noise control measures are required for the plant and equipment for a typical ALDI site in order to maintain the amenity of the noise sensitive receptor.

Mitigation may be required for situations where a noise sensitive receptor is located at 3m or less from the DRS installation to ensure that the proposed noise limits are not exceeded.

Mitigation measures are a bespoke item for each site where they are considered necessary and would need to be assessed individually to ensure that the correct level of mitigation has been selected to suit, however, if at design stage the DRS installation can be placed in excess of the 3m minimum distance from a noise sensitive receptor, no additional mitigation measure will be necessary.

6.0 Report Summary

Any DRS installation at an ALDI store introduces noise sources into the area.

This report has tested the DRS enclosure on all facades and assessed the specific noise source of the operation of the Tomra S2 RVM units which is to be installed within the enclosure as well as all the other likely noise sources to be introduced into an area as a consequence of a typical ALDI DRS installation.

Use has been made of the relevant National and International Standards with regards noise and limiting noise levels for daytime (07.00 to 23.00) since the DRS will only be available for customer use during store opening times in the UK and no ALDI store trade during nighttime periods.

Based upon the limiting recommendations of WHO 1999 and PAN1/2011 the following design target noise limits have been utilised for a typical site, for the activity under consideration to a Noise Sensitive Receptor, NSR.

Table of Recommended DRS Design Target Noise Limits

Period	WHO and PAN1/2011 External Noise Limits	Proposed DRS Design Target Noise Limits at NSR's
Daytime (0700 – 2300 Hrs)	LAeq, 16 Hours – 50 dB	LAeq, 16 Hours – 40 dB

Using the direct test data results it has been possible to complete an impact assessment for the noise sources associated with the ALDI DRS installation. It has been concluded that the noise from operation and servicing of the DRS installations, is not likely to have a detrimental effect or unduly impact on the amenity of a noise sensitive receptor at a distance of 3m or greater for during daytime operations as the design target limits have been demonstrated as being achieved.

Mitigating noise control will not be necessary for the DRS installation at a typical ALDI store. However, at distances less than 3m, from the relevant DRS enclosure and the recipient, mitigation measures may be necessary to ensure that the amenity of the noise sensitive recipient is not compromised.