Appendix 10.7

Calibration Certificates

Coolglass Wind Farm EIAR Volume 3

Coolglass Wind Farm Limited

SLR Project No.: 501.V00727.00006

26 June 2023

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 05 October 2021 **Certificate Number: UCRT21/2224**

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

B. Giles

Customer	SLR Consulting Limited 2nd and 3rd Floors 15 Middle Pavement Nottingham NG1 7DX			
Order No.	422-17278			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	00710361
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	10903
	Rion	Microphone	UC-59	19635
	Rion	Calibrator	NC-75	34713324
		Calibrator adaptor type if applicable		NC-75-022
Performance Class	1			
Test Procedure	TP 10. SLM 61672-3:2013 *Procedures from IEC 61672-3:2013 were used to perform the periodic tests.*			
Type Approved to IEC 61672-1:2013	Yes *If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013*			
Date Received	05 October 2021	ANV Job No.	UKAS21/10653	
Date Calibrated	05 October 2021			

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	Initial Calibration		

CERTIFICATE OF CALIBRATION	Certificate Number UCRT21/2224
UKAS Accredited Calibration Laboratory No. 0653	Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1				
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion		
Date provided or internet download date	19 March 2021				

	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes

Total expanded uncertainties within the requirements of IEC 61672-1:2013	YES		
Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Customers Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	05 October 2021		
Calibrator cert. number	UCRT21/2215		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	93.95	dB	Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz	Calibration check frequency
Reference level range	Single	dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.

Environmental conditions during tests	Start	End	
Temperature	23.00	22.90	± 0.30 °C
Humidity	38.5	37.6	± 3.00 %RH
Ambient Pressure	99.25	99.33	± 0.03 kPa

Indication at the Calibration Check Frequency					
Initial indicated level	93.9	dB	Adjusted indicated level	94.0	dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±				0.10	dB

Self Generated Noise

Microphone installed - Less Than 17.6 dB A Weighting

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	11.4	dB	UR	15.2	dB	UR	20.8	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

..... END .....

Calibrated by: C. Hirlav R 3

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 05 October 2021 **Certificate Number: UCRT21/2223**

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

B. Giles

Customer	SLR Consulting Limited 2nd and 3rd Floors 15 Middle Pavement Nottingham NG1 7DX

Order No.	422-17278			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	00710359
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	10901
	Rion	Microphone	UC-59	19633
	Rion	Calibrator	NC-75	34713324
		Calibrator adaptor type if applicable		NC-75-022
Performance Class	1			
Test Procedure	TP 10. SLM 61672-3:2013			
	Procedures from IEC 61672-3:2013 were used to perform the periodic tests.			
Type Approved to IEC 61672-1:2013	Yes			
	If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013			
Date Received	05 October 2021		ANV Job No.	UKAS21/10653
Date Calibrated	05 October 2021			

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	Initial Calibration		

CERTIFICATE OF CALIBRATION	Certificate Number UCRT21/2223
UKAS Accredited Calibration Laboratory No. 0653	Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1				
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion		
Date provided or internet download date	19 March 2021				
	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections		
Uncertainties provided	Yes	Yes	Yes		
Total expanded uncertainties within the requirements of IEC 61672-1:2013	YES				
Specified or equivalent Calibrator	Specified				
Customer or Lab Calibrator	Customers Calibrator				
Calibrator adaptor type if applicable	NC-75-022				
Calibrator cal. date	05 October 2021				
Calibrator cert. number	UCRT21/2215				
Calibrator cal cert issued by Lab	0653				
Calibrator SPL @ STP	93.95	dB	Calibration reference sound pressure level		
Calibrator frequency	1000.00	Hz	Calibration check frequency		
Reference level range	Single	dB			
Accessories used or corrected for during calibration -	Extension Cable & Wind Shield WS-15				
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.					

Environmental conditions during tests	Start	End		
Temperature	23.40	23.20	± 0.30	°C
Humidity	39.4	38.3	± 3.00	%RH
Ambient Pressure	99.21	99.24	± 0.03	kPa

Indication at the Calibration Check Frequency				
Initial indicated level	94.0 dB	Adjusted indicated level	94.0	dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±			0.10	dB

Self Generated Noise									
Microphone installed -	Less Than	17.0	dB	A Weighting					
Microphone replaced with electrical input device -				UR = Under Range indicated					
Weighting	A			C			Z		
	11.8	dB	UR	15.6	dB	UR	22.8	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k*=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

..... END .....

Calibrated by: B. Bogdan R 2

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 05 October 2021 **Certificate Number: UCRT21/2222**

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

B. Giles

Customer	SLR Consulting Limited 2nd and 3rd Floors 15 Middle Pavement Nottingham NG1 7DX

Order No.	422-17278			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	00710358
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	10900
	Rion	Microphone	UC-59	19632
	Rion	Calibrator	NC-75	34713324
		Calibrator adaptor type if applicable		NC-75-022
Performance Class	1			
Test Procedure	TP 10. SLM 61672-3:2013			
	Procedures from IEC 61672-3:2013 were used to perform the periodic tests.			
Type Approved to IEC 61672-1:2013	Yes			
	If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013			
Date Received	05 October 2021		ANV Job No.	UKAS21/10653
Date Calibrated	05 October 2021			

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	Initial Calibration		

CERTIFICATE OF CALIBRATION	Certificate Number UCRT21/2222
UKAS Accredited Calibration Laboratory No. 0653	Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1				
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion		
Date provided or internet download date	19 March 2021				
	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections		
Uncertainties provided	Yes	Yes	Yes		
Total expanded uncertainties within the requirements of IEC 61672-1:2013	YES				
Specified or equivalent Calibrator	Specified				
Customer or Lab Calibrator	Customers Calibrator				
Calibrator adaptor type if applicable	NC-75-022				
Calibrator cal. date	05 October 2021				
Calibrator cert. number	UCRT21/2215				
Calibrator cal cert issued by Lab	0653				
Calibrator SPL @ STP	93.95	dB	Calibration reference sound pressure level		
Calibrator frequency	1000.00	Hz	Calibration check frequency		
Reference level range	Single	dB			
Accessories used or corrected for during calibration -	Extension Cable & Wind Shield WS-15				
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.					

Environmental conditions during tests	Start	End		
Temperature	22.80	23.20	± 0.30	°C
Humidity	40.4	39.5	± 3.00	%RH
Ambient Pressure	98.89	99.22	± 0.03	kPa

Indication at the Calibration Check Frequency					
Initial indicated level	94.0	dB	Adjusted indicated level	94.0	dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±				0.10	dB

Self Generated Noise					
Microphone installed -	Less Than	16.2	dB	A Weighting	
Microphone replaced with electrical input device -			UR = Under Range indicated		

Weighting	A			C			Z		
	11.5	dB	UR	14.6	dB	UR	20.3	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k*=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

..... END .....

Calibrated by: C. Hirlav R 3

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 05 October 2021 **Certificate Number: UCRT21/2220**

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

B. Giles

Customer	SLR Consulting Limited 2nd and 3rd Floors 15 Middle Pavement Nottingham NG1 7DX

Order No.	422-17278			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	00710362
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	10904
	Rion	Microphone	UC-59	19636
	Rion	Calibrator	NC-75	34713324
		Calibrator adaptor type if applicable		NC-75-022
Performance Class	1			
Test Procedure	TP 10. SLM 61672-3:2013			
	Procedures from IEC 61672-3:2013 were used to perform the periodic tests.			
Type Approved to IEC 61672-1:2013	Yes			
	If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013			
Date Received	05 October 2021		ANV Job No.	UKAS21/10653
Date Calibrated	05 October 2021			

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	Initial Calibration		

CERTIFICATE OF CALIBRATION	Certificate Number UCRT21/2220
UKAS Accredited Calibration Laboratory No. 0653	Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1			
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion	
Date provided or internet download date	19 March 2021			

	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes

Total expanded uncertainties within the requirements of IEC 61672-1:2013	YES		
Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Customers Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	05 October 2021		
Calibrator cert. number	UCRT21/2215		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	93.95	dB	Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz	Calibration check frequency
Reference level range	Single	dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.

Environmental conditions during tests	Start	End	
Temperature	23.30	23.60	± 0.30 °C
Humidity	40.3	38.7	± 3.00 %RH
Ambient Pressure	99.02	99.11	± 0.03 kPa

Indication at the Calibration Check Frequency					
Initial indicated level	93.9	dB	Adjusted indicated level	94.0	dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±				0.10	dB

Self Generated Noise				
Microphone installed -	Less Than	17.1	dB	A Weighting
Microphone replaced with electrical input device -				UR = Under Range indicated

Weighting	A			C			Z		
	12.2	dB	UR	16.2	dB	UR	23.4	dB	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

..... END .....

Calibrated by: B. Bogdan R 2

MTS Calibration Ltd,
The Grange Business Centre,
Belasis Avenue,
Billingham TS23 1LG,
England
Telephone: 01642 876 410

CERTIFICATE OF CALIBRATION

Approved Signatory:

Tony Sherris

Issued by: MTS Calibration Ltd

Date of Issue: 12 August 2022 **Certificate Number:** 37295

Sound Level Meter

Sound Level Meter Periodic Tests to EN 61672-3: 2013 Class 1

Client: Environmental Measurements
Unit 12, Tallaght Business Centre
Whitestown Business Park
Co.Dublin 24, Ireland

Instrument Make: Larson Davis
Instrument Model: LxT1L
Serial Number: 0004479

Associated Equipment	Make	Model	Serial number
Preamplifier	PCB	PRMLxT1L	042636
Microphone	PCB	377B02	339594
Calibrator	Brüel & Kjær	4231	3014620
Calibrator supplied by	MTS for this calibration		

The measurements were performed at The Grange Business Centre, Belasis Avenue, TS23 1LD. The results only apply to the items tested.

Periodic tests were performed in accordance with procedures from IEC 61672-3:2013 Class 1

Test results summary, detailed results are shown on subsequent pages.

Tests performed	Section	Results of test	Page	Comments
Calibration Certificate	22		1	
Additional information			2	
Indication with Calibrator Supplied	10	No Limit	3	
Self-Generated Noise	11	No Limit	3	
Frequency and Time-weightings at 1kHz	14	Complies	3	
Long term stability	15	Complies	3	
High stability	21	Complies	3	
Acoustic Tests	12	Complies	4	
Frequency Weighting A	13	Complies	5	
Frequency Weighting C	13	Complies	6	
Frequency Weighting Z	13	Complies	7	
Level Linearity	16	Complies	8	
Level Linearity Range Control	17		n/a	SLM only has one range
Tone-burst Response	18	Complies	9	
Peak C sound level	19	Complies	10	
Overload indication	20	Complies	11	

The instrument required a replacement microphone in order to meet the above specifications.

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3: 2013 for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2: 2013, to demonstrate that the model of sound level meter fully conformed to the Class 1 specifications in IEC 61672-1: 2013, the sound level meter submitted for testing conforms to the Class 1 specifications of IEC 61672-1: 2013

Additional tests performed	Reference	
Microphone full frequency response	37310	See additional certificate
Filter calibration, third octave or octave	37295F	See additional certificate

Calibration Certificate

Certificate Number 2021012148
Customer:
Environmental Measurement
Unit 12 Tallaght Business Centre
Whitestown Business Park
Dublin, 24, Ireland

Model Number	LxT SE	***Procedure Number***	D0001.8378		
Serial Number	0006600	***Technician***	Ron Harris		
Test Results	**Pass**	***Calibration Date***	28 Sep 2021		
Initial Condition	As Manufactured	***Calibration Due***			
		Temperature	23.76	°C	± 0.25 °C
Description	Sound Expert LxT	***Humidity***	50.2	%RH	± 2.0 %RH
	Class 1 Sound Level Meter	***Static Pressure***	85.46	kPa	± 0.13 kPa
	Firmware Revision: 2.404				

Evaluation Method Tested electrically using Larson Davis PRMLxT1L S/N 070099 and a 12.0 pF capacitor to simulate microphone capacitance. Data reported in dB re 20 µPa assuming a microphone sensitivity of 23.6 mV/Pa.

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8384:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61252:2002	ANSI S1.25 (R2007)
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1
IEC 61260:2001 Class 1	ANSI S1.11 (R2009) Class 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2017. **Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.**

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

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Correction data from Larson Davis LxT Manual for SoundTrack LxT & SoundExpert Lxt, I770.01 Rev O Supporting Firmware Version 4.0.5, 2019-09-10

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 µPa

LARSON DAVIS - A PCB PIEZOTRONICS DIV.
1681 West 820 North
Provo, UT 84601, United States
716-684-0001

ilac-MRA A2LA ACCREDITED Cert. #3622.01

LARSON DAVIS A PCB PIEZOTRONICS DIV.

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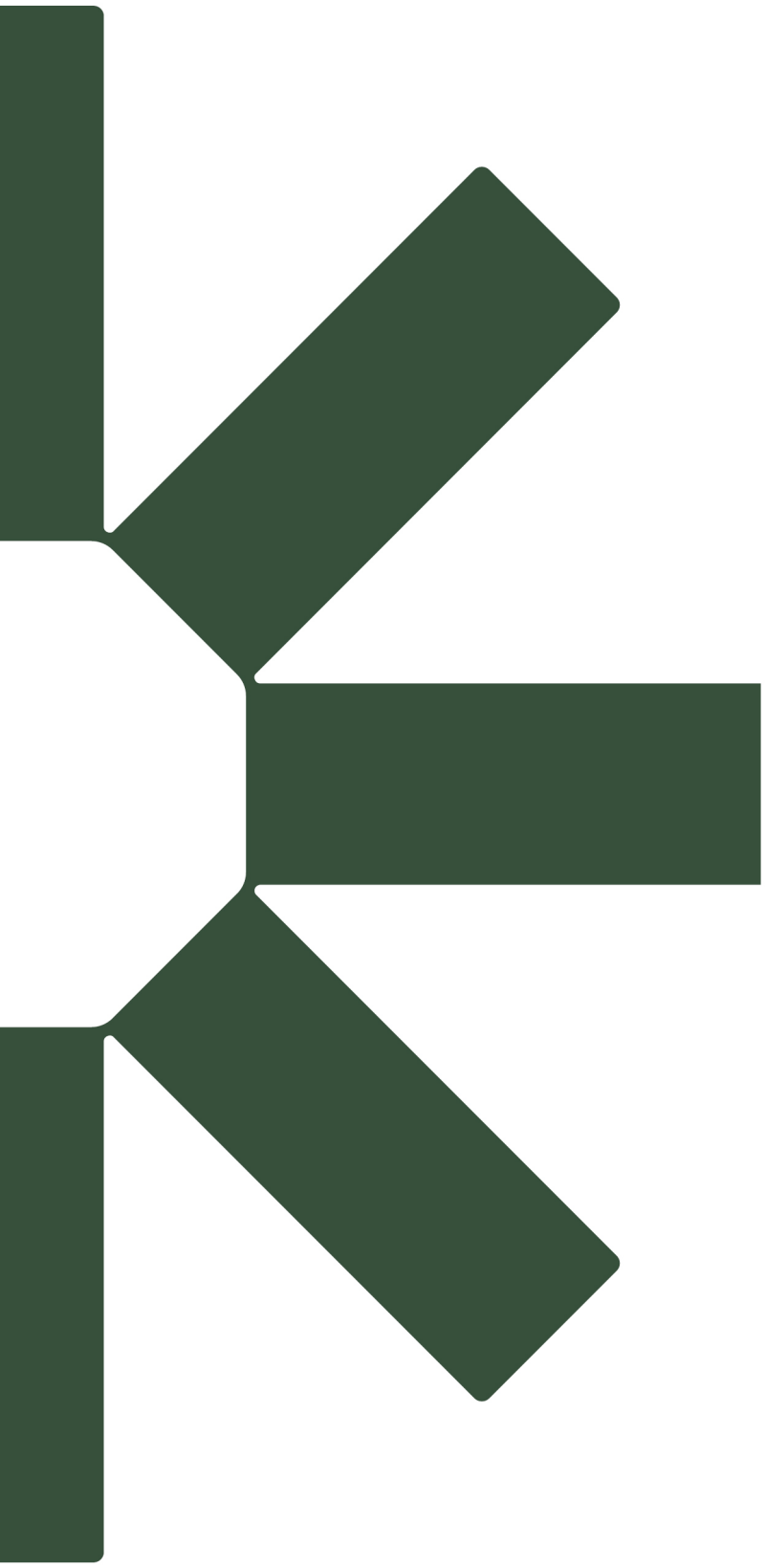

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