Occupational Noise Report

6th July 2020

APEX ENVIRONMENTAL

QUICK REFERENCE GUIDE	
Date/s of Assessment:	6th July 2020
Next Survey Due:	July 2022
Date Report Issued:	15th July 2020
Project Number:	A17560
Order Number:	GORDON
Assessment Physical Address:	1 Goshawk Road, New Germany
Client Contact/s:	Gordon Rechner
Revision:	00
APEX REFERENCES	
Department of Employment and Labour AIA Number:	OH 0084-CI 034
a SANAS Accredited Inspection Body No.	OH 0084
Company Name:	Apex Environmental cc
Physical Address:	40 Beechgate Crescent, Southgate Business Park, Umbogintwini, 4126
Postal Address:	P.O. Box 2079, Amanzimtoti, 4125
Contact Details:	Tel: +27 (0)31 9141004 Fax: +27 (0)31 9142199 www.apexenviro.co.za
Your Consultant:	Miss. M. Chamberlain: michell@apexenviro.co.za Registered Occupational Hygiene Technologist (SAIOH) Legal Knowledge: Occupational Hygiene (Cert 6364) (DUT) International Certificate of Operational Competence in Occupational Hygiene (ICertOH – BOHS-UK)
Technical Signatory:	keegan seeram Digitally signed by keegan seeram Date: 2020.07.16 07:27:55 +02'00'

Apex Environmental cc, Co Reg: CK 98/44018/23 VAT Reg: No 4330176167
Members: R.W. Randolph MPH Occ.Hyg. (Wits), ROH (SAIOH); S.J. Chester MPH Occ.Hyg. (Wits), ROH (SAIOH); K. Seeram B-Tech Env.Health ROH (SAIOH)

Note: Opinions and interpretations expressed herein are outside the scope of SANAS accreditation.

TABLE OF CONTENTS

ATTACHED ITEMS:

- ANNEXURE 1 – MEASURED NOISE POSITIONS
- AIA APPROVAL CERTIFICATE
- CALIBRATION CERTIFICATES
- SAIOH CERTIFICATE (OCCUPATIONAL HYGIENIST REGISTRATION)

LIST OF DEFINITIONS AND ABBREVIATIONS

ALARP	As Low as Reasonably Practicable. Reasonably practicable has a corresponding meaning.
Assessment	A programme to determine any risk from exposure to noise associated with the workplace to identify the steps that need to be taken to remove, reduce or control such hazard.
Attenuation	The proven capability of hearing protectors to reduce the equivalent noise level to which the wearer thereof is exposed.
Approved noise inspection authority	An approved inspection authority for the monitoring of noise in the workplace.
A-Weighted network	An electronic filter in a sound level meter which approximates, under defined conditions the frequency response of the human ear.
dB(A)	Decibels on A-weighted network.
Equivalent 8-hour rating level ($L_{Req,8h}$)	The rating level normalized to a nominal 8-hour working day as indicated in SABS 083.
Hearing Conservation Programme (HCP)	A programme aimed at preventing hearing impairment.
Hearing Protective Equipment (HPE)	Ear muffs or ear plugs which are of a type, or conform to a standard approved by the minister.
Noise-Rating Limit (NRL)	The legal limit defined as the 8-hour rating level which is 85 dB (A) – Noise-Induced Hearing Loss Regulations, 2003.
Noisy process	An alternative to noise zoning, noisy processes are processes, tools, instruments, machinery or work tasks where, although the measured sound output was excessive i.e. ≥ 85 dB(A), the eight-hour equivalent rating level cannot be accurately calculated due to significant daily variations in exposure times.
Noise zone	A zone within which the Noise-Rating Limit is equal to or exceeds 85dB (A) when measured in accordance with SANS 10083
Reasonably practicable	Practicable having regard to- (a) the severity and scope of the hazard or risk concerned; (b) the state of knowledge reasonably available concerning that hazard or risk and of any means of removing or mitigating that hazard or risk; (c) the availability and suitability of means to remove or mitigate that hazard or risk; and (d) the cost of removing or mitigating that hazard or risk in relation to the benefits deriving therefrom.

1. EXECUTIVE SUMMARY

Until long-term engineering interventions can, as far as reasonably practicable, eliminate or adequately reduce noise levels to below the legal limit i.e. Noise Rating Limit (NRL) of ≥ 85dB(A), the far Eastern Section of the Production Factory (that consist of the New Original Die Cutter Machine, Baking Cases / Presses and Paper Plates) should continue to be designated as a **Noise Zone.** Specific demarcation of approximately three (3) meters should be introduced to the specified boundary. *Refer to Annexure 1 for the specified Noise Zone boundary.*

Due to the nature of the work, i.e. intermittent use of noisy machinery, employees typically may not always use their hearing protection when operating this equipment. Noise levels from noisy machinery tend to fluctuate significantly depending upon the type of work and frequency with which the work is undertaken. Daily exposure times of these employees are highly variable and consistent compliant noise levels or compliant employee exposure levels cannot be guaranteed. Therefore, it is recommended that operation of the Guillotine, Blue Compressor and the Clicking Press be demarcated as **Noisy Processes.**

As a component of your Hearing Conservation Programme, employees accessing **Noise Zones** and work with **Noisy Processes** must continue to be provided with and wear hearing protectors and undergo audiometric screening. In addition, relevant signs must continue to be posted in conspicuous places as well as on the noisy machinery. Audiometric screening should also be undertaken in terms of Regulation 8 of the Noise Induced Hearing Loss Regulations as read in conjunction with SANS 10083, sections 14 – 20.

2. PURPOSE

2.1 To undertake noise measurements in terms of the requirements of the Noise-Induced Hearing Loss Regulations, 2003, framed under the Occupational Health and Safety Act of 1993.

2.2 To undertake a basic audit of the Hearing Conservation Programme.

2.3 To submit recommendations aimed at reducing employee exposures to noise.

3. RESULTS

3.1 Noise Monitoring Results

Key:

Noise levels, normalized to a nominal 8-hour work day, exceed the Noise Rating Limit [NRL ≥ 85dB (A)].

Measured levels of concern however due to:
a) a high variability in task frequency and duration,
b) potential accumulated noise exposure from other processes or areas,
an accurate 8-hour equivalent noise exposure level is difficult to calculate. Therefore, treat as a Noisy Process and include potentially exposed employees in your Hearing Conservation Programme.

Table 1: Operator Exposure Monitoring Results

Sound level measurements were taken to determine the relevant operator's exposures during each task. Sound pressure levels were taken in close proximity to the operator's ear i.e. in the near field position (close to the power source).

N°	Sample Location / Description	Measured Sound Pressure Level dB(A)	$Laeq_{8h}$ Equivalent Continuous A-weighted Sound Level dB(A)	Exposure Characteristics
Production Factory				
1	New Original Die Cutter Machine	85.5	**85.0**	For each of the machines tested, the noise was measured over a period of time equivalent to approximately 5 operating cycles of each machine. Each measurement was taken at the position at which an operator would normally stand / sit. The main noise generated by the presses (Baking Cases Section) could be attributed to the mechanical clutches (during pressing) as this also contributes significantly to the noise dose received by the press operators. Noise generated from the Die Cutter and the Paper Plate machines are mainly attributed to electrical motors, cylinders and cutting dies operating at high speeds. Employees work 8hour shifts, however, when taken into consideration the 1hour lunch break, employee noise exposure was calculated over a 7hour shift with the respective average time spent undertaking each task. The calculated noise levels exceed the noise rating limit for hearing conservation and this Section should remain demarcated as a **Noise Zone.** The Noise Zone boundary should be implemented at approximately three (3) meters from this section. *See Annexure 1 for Noise Zone boundary.*
2	Baking Cases	87.9	**87.0**	
3	Paper Plates	88.0	**87.0**	

Operator Exposure Monitoring Results (Continued…)

Nº	Sample Location / Description	Measured Sound Pressure Level dB(A)	$Laeq_{8h}$ Equivalent Continuous A-weighted Sound Level dB(A)	Exposure Characteristics
4	Old Original Die Cutter Machine	82.3	82.0	This machinery does not generate high noise levels when in operation. The noise levels are mainly attributed to the background noise from the Die Cutter, Baking Cases and the Paper Plates Departments.
5	Splitter Machine	82.8	82.0	
6	Cord Printer	82.0	82.0	
7	Printer GT052	81.5	82.0	
8	Crepe Machine	79.4	79.0	
9	New Compressor	82.1	82.0	
10	Boiler Room	79.9	79.0	
11	Guillotine	91.0	85.0	The Guillotine and Clicking Press emits impulsive sound that is characterized by brief excursions of sound pressure which significantly exceed the background noise. Due to the intermittent use of this machinery, the Guillotine, Clicking Press and the Blue Compressor should be demarcated **as Noisy Processes.**
12	Clicking Press	86.4	85.0	
13	Blue Compressor	92.3	79.0	

Table 2: Area Noise Monitoring Results

Nº	Sample Location / Description	Measured Sound Pressure Level dB(A)	$Laeq_{8h}$ Equivalent Continuous A-weighted Sound Level dB(A)	Exposure Characteristics
Administration Offices				
14	Ground Floor / Radanie's Office	Door Closed	Door Open	These noise levels exceed the recommended level for offices 45d(B) A, (*SANS 10103 - The measurement and rating of environmental noise with respect to annoyance and to speech communication).* Where employee complaints arise, additional noise controls should be considered e.g. insulation of entrance doors or installation of barrier panels / curtains and double glazed windows..
		60.7	68.6	
15	Open Plan Office	Door Closed	Door Open	
		62.4	77.2	
16	Gordon's Office	Door Closed	Door Open	
		62.3	70.3	

3.3 Hearing Conservation Programme Audit

An effective HCP can eliminate or minimise noise hazards and prevent noise induced hearing loss. Strong commitment by the management and active involvement by the employees are critical for the success of the HCP. Therefore, management should take the appropriate steps to encourage employee participation in the development and implementation of the HCP.

Table 3: HCP Audit Results

Aspect	***Noise Induced Hearing Loss Regulations***	Requirement	Findings
Noise Zones and Noisy Processes	*Regulation 9(a)(b)*	Noisy areas and processes must be properly identified and demarcated	The following **Noisy Processes** require additional demarcation: - a) Operation of the Guillotine b) Operation of the Blue Compressor c) Operation of the Clicking Press In the case of the above machinery (not necessarily operated in a noise zone), an indication that hearing protection equipment must be worn should be posted. Where practicable, the sign should be affixed in a prominent position on the machine or equipment *(Ref: SANS 10083)*. **See Example Figure below.**
Engineering Control	*Regulation 9(d) and 10(2)(a)*	Identify engineering noise reduction opportunities	Opportunities for engineering intervention exist, such as: - • *Large motor pumps and compressors*: *Enclosure Isolation* in such a way that the enclosure structure be separated / isolated from the equipment to ensure mechanical vibrations are not transmitted to the enclosure panels or any surrounding surfaces, which can re-radiate noise. • Continuous Maintenance: ○ replacement or adjustment of worn or loose parts; ○ balancing of unbalanced equipment; ○ lubrication of moving parts; ○ use of properly shaped and sharpened cutting tools
Administrative Controls	*Regulation 10(2)(b)*	Implement administrative controls to limit the number of persons exposed and the duration of exposure.	Gordon's Productions adequately fulfils the requirements of this regulation.
Hearing Protection Equipment	*Regulation 12(1)(a)*	The HPE must be capable of keeping exposure to below the NRL.	The NRR of 28 is applied to the disposable ear plugs used by plant operators. In addition, the SNR of 24 is applied to the ear muffs used by plant operators.

HCP Audit Results (Continued…)

Aspect	***Noise Induced Hearing Loss Regulations***	**Requirement**	**Findings**
Hearing Protection Equipment	*Regulation 12(2)(a)(b)(c) and Regulation 2(1) and 2(3)(e) of the General Safety Regulations*	Hearing protectors are accessible and readily available	Gordon's Productions adequately fulfils the requirements of these regulations.
	Regulation 12(1)(b)(c)	Hearing protectors must be of the correct type and properly used	
Information and Training	*Regulation 4 and 12 (1)(c)*	Exposed employees must be formally informed, instructed, trained and supervised	
Audiometric Screening	*Regulation 8*	Establish an audiometric testing programme	Ensure that employees undergo baseline, periodic and exit audiometric screening as part of the hearing conservation program. Frequency of the periodic screening should be undertaken as recommended by the Occupational Health Practitioner (OHP). The baseline audiometry results will serve as a reference for ail future decisions regarding the hearing acuity of that employee and will form part of his/her service and medical surveillance record. The results of the baseline and exit audiometry form part of the employee's medical surveillance records, and should be retained in accordance with this standard and legal requirements
Record Keeping	*Regulation 11*	Keep records of Assessments, Monitoring, Training, Medical Surveillance (including employment history) and Maintenance of Control Measures for a period of 40 years	Gordon's Productions adequately fulfils the requirements of this regulation
Reviewing the HCP	Periodically review the HCP to determine its effectiveness and identify areas for improvement.		The current HCP is not adequately reviewed and requires additional input in the following aspects: • Demarcation of Noisy Processes - an indication that hearing protection equipment must be worn should be posted on noisy machinery • Control – Review past engineering and solutions and evaluate their current relevance • Audiometric Screening - Ensure that employees undergo baseline, periodic and exit audiometric screening as part of the hearing conservation program

4. LIMITATIONS

The results obtained were indicative of the conditions that prevailed during the test period. Changes in production rate, processes and other factors which affect noise transmission, may cause a variation in the noise level readings.

In areas where the temperature and humidity was deemed to significantly impact on noise levels, temperature and humidity readings will be stated in the table of results above. Furthermore, if the temperature and humidity in any area where noise levels are to be taken, are deemed to fall outside the function parameters of the Sound Level Meter (as stated in the Sound Level Meter Operation Manual), then these conditions will also be stated in the table of results above as well as in the Limitations paragraph of this report.

5. DISCLAIMER

The Department of Employment and Labour document (OHS 3/1/1/8/1) 'Requirements for Approval as an Approved Inspection Authority: Occupational Health and Hygiene' lists under *Section 9. Format and Content of Reports* – Paragraph 9.8, that '*Specific recommendations to control and identified risks should be made. This will ensure that the employer is able to obtain assistance towards complying with the requirements of the Act'*. The results and recommendations contained in this report are therefore a reflection of the on-site conditions during the on-site survey period. It should however be noted that opinions and interpretations expressed herein are outside the scope of SANAS accreditation.

Apex Environmental makes no warranty or guarantee as to the absolute correctness and suitability of the contents of this report. The final responsibility lies with the client to ensure the correctness and suitability of these recommendations. Apex Environmental shall not in any way be liable for any loss suffered by the client as a result of such recommendations and observations. The information and recommendations provided in this report have been made in good faith with professional integrity.

All information obtained by Apex Environmental shall be treated as private and confidential as prescribed by the Protection of Personal Information Act (Act No. 4 of 2013). Information obtained through onsite observations and monitoring will not be disclosed by Apex Environmental unless required by law and authorized by contractual commitments.

6. METHOD STATEMENT

Each measurement was taken in accordance with the SANS 10083 Code of Practice, - *The Measurement and Assessment of Occupational Noise for Hearing Conservation Purposes*.

7. QUALITY ASSURANCE

Details of recommended requirements, specifications and conditions that are to be contained in written reports are issued in terms of SANS ISO/IEC 17020 - "*Conformity assessment – Requirements for the operation of various types of bodies performing inspections*".

The Sound Level Meter was field-tested (calibrated) before and after the survey period and found to be within the 1 dB(A) acceptable limit of deviation:

Pre-survey calibration: 114.0 dB(A)
Post survey calibration: 114.0 dB(A)

The Sound Level Meter and Calibrator used in this assessment are externally calibrated on a biennial (sound level meter) and annual basis (calibrator) according to Apex Environmental's SANAS 17020 accreditation requirements which complies with the national standard for Approved Inspection Authorities in this regard.

8. EQUIPMENT SPECIFICATIONS

Description	Serial Number	Date of Calibration	Next Due	Calibration Certificate Number
Casella Cel 240	1993262	22 October 2019	22 October 2021	MASC M/18-2400X
Quest QC-10 Calibrator	QE 5120165	11 March 2020	11 March 2021	L77187

9. UNCERTAINTIES OF MEASUREMENT

In accordance with the uncertainties of measurement, the estimate for a 95% confidence level is as follows:-

Sound Level Meter	± 0.3dB
Microphone	± 0.8dB
Sound Level Calibrator	± 1.0 %

10. CLIMATIC CONDITIONS

Temperature : 24°C
Humidity : 41%

11. CERTIFICATION STATEMENT

This is to certify that the attached report has been compiled and issued under the authority, direction and the responsibility of an Apex Occupational Hygienist.

12. REPRODUCTION OF REPORTS

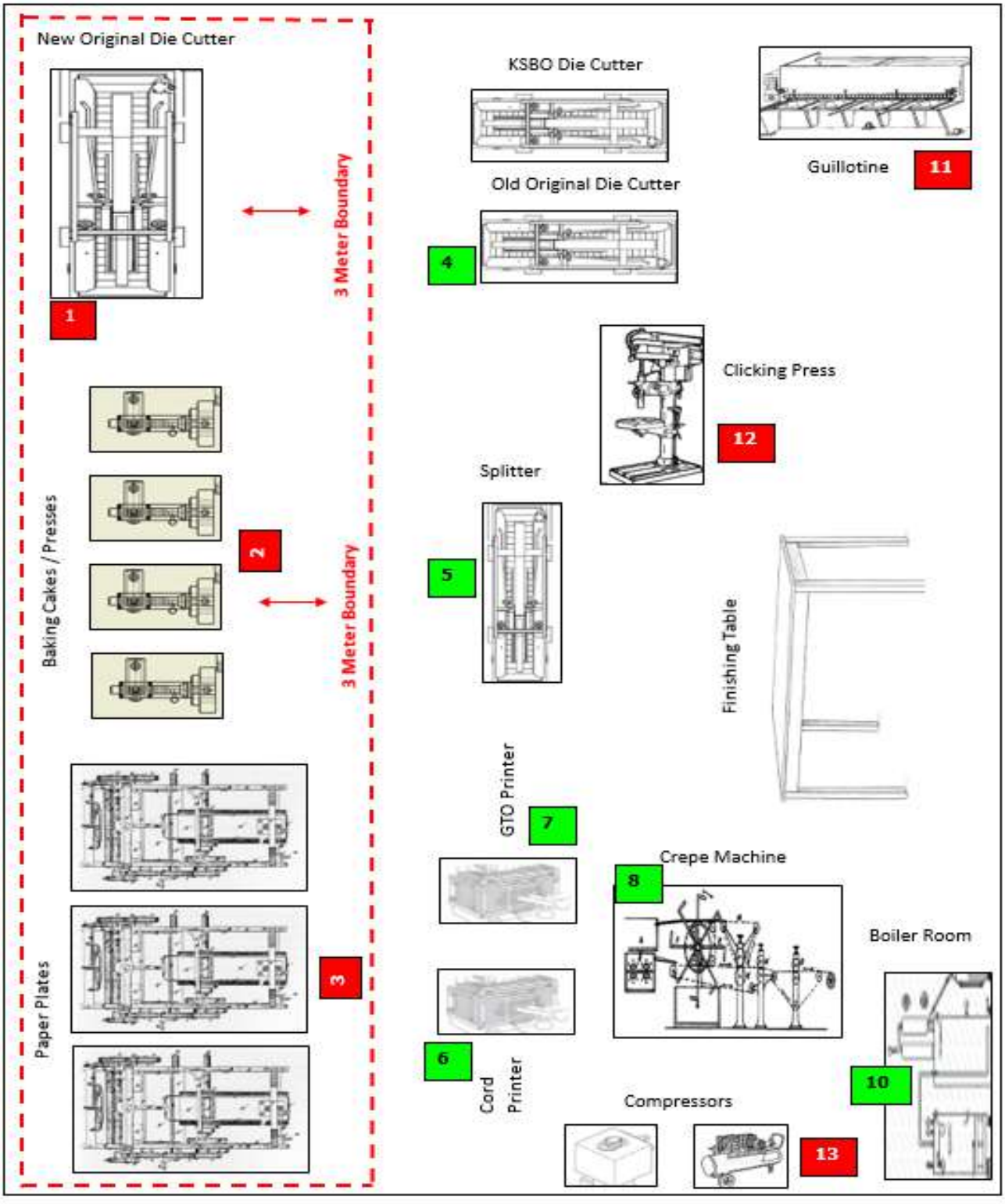
13. DOCUMENT CONTROL

Document Nº:	APEX-RT-025
Compiled by:	Robert Randolph
Approved by:	Sean Chester
Revision Nº:	003
Document date:	6th January 2020
Document review date:	13th December 2019

ANNEXURE 1 - PLANT LAYOUT – MONITORED NOISE POSITIONS

Key: Compliant noise results

Non-compliant noise results



labour

Department:
Labour
REPUBLIC OF SOUTH AFRICA

National Department of Labour
Republic of South Africa

APPROVED INSPECTION AUTHORITY

Registered in accordance with the provisions of the Occupational Health and Safety Act, Act 85 of 1993, as amended.

This is to certify that:

APEX ENVIRONMENTAL CC

has been approved by the Department of Labour as a Type A, Approved Inspection Authority: Occupational Health and Hygiene under the following regulations:

- Asbestos Regulations 8, 18 & 21.
- Hazardous Chemical Substances Regulations 6 & 12.
- Lead Regulations 7 & 14.
- Noise Induced Hearing Loss Regulation 7

CHIEF INSPECTOR

Valid from: **06 March 2019**
Expires: **05 March 2023**
Certificate Number: **OH0084- CI 034**

The Southern African Institute for Occupational Hygiene

This is to certify that

Keegan Seeram

ID Number: 8103245105089

Has satisfied the requirements of
the Constitution of the Institute
and on recommendation of the Professional Certification Committee
is registered as an

Occupational Hygienist (OH)

Member Number: 0400

Valid until: 31 January 2021

Mr Sean Chester

Chairman: Professional Certification Committee

Member ID: 33914622

Certificate ID: 33914622-18623

Issued by the Southern African Institute for Occupational Hygiene

SAQA Professional Body ID: 844

IOHA Recognised Certification Scheme

IOHA

CASELLA

Certificate of Conformity and Calibration

Instrument Model:-	**CEL-240**	**Microphone Type:-**	Internal
Serial Number	1993262	Serial Number	N/A
Firmware revision	V509-02		

Instrument Class/Type:- 2

Applicable standards:-

IEC 61672: 2002 (Electroacoustics - Sound Level Meters), IEC 60651: 1979 (Sound Level Meters), IEC 60804: 2000 (Integrating-averaging Sound Level Meters), ANSI S1.4A: 1985 (Specifications For Sound Level Meters), ANSI S1.43: 1997 (Specifications For Integrating-Averaging Sound Level Meters)

Note:- *The test sequences performed in this report are in accordance with the current Sound level meter Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superceeded Sound Level Meter Standards - IEC60651 and IEC60804.*

Test Conditions:-	20 °C	**Test Engineer:-**	Marcus Meintjies
	30 %RH	**Date of Issue:-**	October 22, 2019
	847 mBar		

Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2008 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

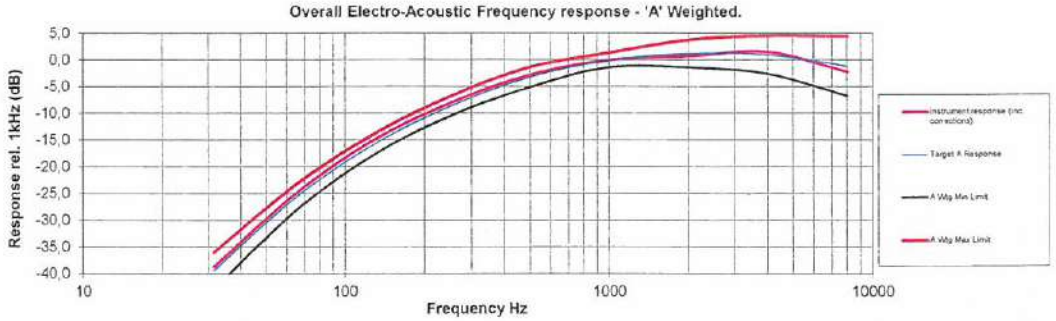
Test Summary:-

Self Generated Noise Test	**All Tests Pass**
Electrical Signal Test Of Frequency Weightings	**All Tests Pass**
Frequency & Time Weightings At 1 kHz	**All Tests Pass**
Level Linearity On The Reference Level Range	**All Tests Pass**
Level Linearity Tests (including range control)	**All Tests Pass**
Toneburst Response Test	**All Tests Pass**
Hide Overload Indication Test	**All Tests Pass**
Acoustic Tests	**All Tests Pass**

Combined Electro-Acoustic Frequency Response - *A Weighted*

Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)

The following A-Weighted frequency response graph shows this instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.



Casella
Regent House, Wolseley Road, Kempston, Bedford MK42 7JY United Kingdom
Tel: +44 (0) 1234 844100
Fax: +44(0) 1234 841490
E-mail: info@casellasolutions.com

Casella Inc.
415 Lawrence Bell Drive, Unit 4 Buffalo, NY 14221, USA
Toll Free (800) 366-2966
Tel: (716) 276 3040
Fax: (716) 276 3043
E-mail: info@casellaUSA.com

Ideal Industries India Pvt.Ltd.
229-230, Spazedge, Tower -B Sohna Road, Sector-47, Gurgaon-122001, Haryana (India)
Tel: +91 124 4495100
E-mail: Casella.Sales@ideal-industries.in

Ideal Industries China
No. 61, Lane 1000, Zhangheng Road, Pudong District Shanghai, 201203, China
Telephone: 0086-21-31263188
Fax: 0086-21-61605906
Email: Info@casellasolutions.cn

Tested to CEL-24X test sheet TP448 revision 01-10

Mining And Surface Certification (Pty) Ltd

(Pty) Ltd: 2015/021934/07

IN TERMS OF REGULATION 21.17.2 OF THE MINERALS ACT (INCORPORATION THE MINE HEALTH AND SAFETY ACT) AND REGULATION 9 (1) OF THE ELECTRICAL MACHINERY REGULATIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT

MASC Report No	19-6078	Issue Date	07 August 2019
Client Reference	11194		
IA CERTIFICATE	MASC M/18-2400X	*) Batch Report must be read in conjunction with IA Certificate	
Requested by	AMS Haden Suite 247, Private Bag X09, WELTEVREDENPARK, 1715		
Manufacturer	AMS Haden Suite 247, Private Bag X09, WELTEVREDENPARK, 1715		
Description	Sound Level Meter		
Equipment	Sound Level Meter	Type	Cel-246
Subject: The verification and batch testing of equipment for compliance with original IA Certificate according to: • SANS 96: 2006 "Batch sampling and acceptance criteria for explosion-protected apparatus (EPA)"			
Batch Size: 5		Batch Serial No:	1993567, 1993277, 1993349, 1993352 and 1993262
Sample Size: 2		Sample Serial No:	1993352 and 1993262
Identification:	All units must be marked according to the original type approval.		
Assessment Result:	The selected samples were inspected and compared to the original type approval documentation kept on record by MASC (ref no 15-1752). The samples COMPLIED with the evaluated criteria.		
Special conditions of safe use "X": • Refer to IA certificate			
Conditions of manufacture: • Refer to IA certificate			
Validity of this report:	This report only covers the serial numbers of the equipment listed in this report. Other identical units will only be covered by additional testing/inspection of those serial numbers. Any modification to the equipment, or exceeding its ratings, or using it in another atmosphere as described above, will invalidate this report.		

D.P Visser
TECHNICAL SPECIALIST

M Dekker
TECHNICAL OFFICER

This document will not be supported by MASC for certification purposes outside the borders of South Africa.
According to the relevant requirements of the MHS Act and the OHS Act, production units of explosion protected equipment are required to comply with third party quality assurance (an approved mark scheme or batch testing by an accredited test laboratory).

Apparatus in hazardous locations is subject to the following provisions as applicable, which shall be adhered to:
SANS 10086 requirements;
Any conditions mentioned in the above certificate;
Any relevant requirements of the MHS Act and code of practice enforced in terms of regulations 21.17.2 of the minerals act;
Any restrictions and conditions enforced by the chief inspector of mines, principal inspector (Group I equipment) or chief inspector of factories (Group II equipment).

Mining And Surface Certification (Pty) Ltd
Unit 5 Lelyta Park, 45 Jurg Ave, Hennopspark Ext 87
Centurion, 0157

T0444

IA – CERTIFICATE

IN TERMS OF REGULATION 21.17.2 OF THE MINERALS ACT (INCORPORATION THE MINE HEALTH AND SAFETY ACT) AND REGULATION 9 (1) OF THE ELECTRICAL MACHINERY REGULATIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT

Ex – Type Examination Certificate number:	**MASC M/18-2400X**
Equipment:	**CEL-240/CEL-244/CEL-246 Sound Level Meters**
Serial No:	*All units must be covered by a valid batch report / accepted product certification mark*
Applicant:	**AMS Haden Instrument & Mining Services**
Address:	**Suit 247 Private Bag X09 Weltevreden Park 1715**
Manufacturer:	**AMS Haden Instrument & Mining Services**
Address:	**Suit 247 Private Bag X09 Weltevreden Park 1715**

DESCRIPTION:

The unit is a handheld device, with a plastic housing consisting of three parts. The front part houses the keypad, with three control buttons. The front also houses a display. A microphone is fitted in a steel tube and mounted on the top part of the housing. The main PCB and three Duracell plus 1.5V Alkaline batteries are located inside the unit.

This report does not cover the functionality or accuracy of the unit.

MARKING

The following marking must identify the unit. The marking must be indelible, visible and chemically stable

Certificate Holder:	AMS Haden
Type:	CEL-240 / CEL-244 / CEL-246 Sound Level Meter
Ex Rating:	Ex ia I Ma
IA No:	MASC M/18-2400X
Serial Numbers:	*"See conditions of certification"*

Warning: Use only Duracell ultra-power MX1500 AA Alkaline-Manganese Dioxide batteries

/. COMPLIANCE...

COMPLIANCE:

The unit as described above and in letter number MASC **18-2400** is hereby certified "Explosion Protected" Ex ia I Ma and is suitable for use in hazardous locations as stated below and as tested, assessed and inspected in accordance with the relevant requirements of SANS Standards:

The evaluation was conducted according to the requirements of:

i) **SANS (IEC) 60079-0 : 2012 "Explosive atmospheres – Part 0: Equipment — General requirements"**
ii) **SANS (IEC) 60079-11: 2012 "Explosive atmospheres – Part 11: Equipment protection by intrinsic safety 'i'"**

Location	Zone 0 & 1	Coal dust (Methane): Underground
Hazard Frequency	---	Continuous as could occur under normal operating conditions in hazardous area.
Environment	Group I	Methane and coal dust
Limiting Temperature	150°C	Group I
Ambient Temperature	-20°C to 40°C	

The use of apparatus in hazardous locations is subject to the following provisions as applicable, which shall be adhered to:

iii) SANS 10086 requirements;
iv) Any conditions mentioned in the above report;
v) Codes of Practice enforced in terms of Regulations 21.17.2 of Minerals Act, by Chief Inspector of Mines;
vi) Any restrictions and conditions enforced by Chief Inspectors of Mines, Principal Inspector (Group I equipment) of Chief Inspector of Factories (Group II equipment);
vii) Any relevant requirements of the MHS Act or the OHS Act.

CONDITIONS OF CERTIFICATION:

CONDITIONS OF MANUFACTURE:

- Fuse F1 must be fully encapsulated to at least 1mm to free air.
- A 0,5mm solid insulation must be kept between cells.
- Fuse F1 and Resistor R1 must be incorporated in the battery supply line.

SPECIAL CONDITIONS OF USE (X):

- Use only Duracell ultra-power MX1500 AA Alkaline-Manganese Dioxide batteries or Duracell plus AA 1,5V Alkaline MN1500 batteries.
- The IP54 rating of the unit must be maintained.

/. According...

Mining and Surface Certification (Pty) Ltd Reg No: 2015/021934/07
Directors: Roelof Viljoen & Francois du Toit
Unit #5, Lelyta Park, 45 Jurg Avenue, Hennopspark Ext 87, Centurion, 0157
P.O. Box 14344, Clubview, 0014
Tel: 012 653 2959 ◊ Fax: 086 605 8568
e-mail: info@masc-ex.co.za

According to the relevant requirements of the MHS Act and the OHS Act, production units of explosion protected equipment are required to comply with third party quality assurance (an approved mark scheme or batch testing by an accredited test laboratory).

D.P Visser
TECHNICAL SPECIALIST

Mining And Surface Certification

This document is issued based on Mining And Surface Certification's Standard Contract terms and conditions available on request.

While every endeavour is made to ensure that a test / assessment is representative and accurately performed, and that a report is accurate in the quoted results and conclusions drawn from the test / assessment, MASC or its members/employees shall in no way be liable for any error made in carrying out the test / assessment or for any erroneous statement, whether in fact or in opinion, contained in a report issued pursuant to a test / assessment.

MASC takes no responsibility for any non-conformances, exclusions or any results / assessments not in compliance with the standards. By marking the equipment in accordance with the documentation / standard, the manufacturer attests on his own responsibility that the equipment has been constructed in accordance with the applicable requirements of the relevant standards and that the routine verifications and routine tests have been successfully completed and the product complies with the documentation and standard(s).

This document is only for use and application in South Africa. It is issued based on National interpretations and accepted practises.

Mining and Surface Certification (Pty) Ltd Reg No: 2015/021934/07
Directors: Roelof Viljoen & Francois du Toit
Unit #5, Lelyta Park, 45 Jurg Avenue, Hennopspark Ext 87, Centurion, 0157
P.O. Box 14344, Clubview, 0014
Tel: 012 653 2959 ◊ Fax: 086 605 8568
e-mail: info@masc-ex.co.za

Technology Solutions
Measurement Science Laboratory

Certificate of Calibration

ANSI National Accreditation Board (ANAB) is a member of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Agreement (MRA). This arrangement allows for the mutual recognition of technical test and calibration data by the member accreditation bodies worldwide. For more information on the arrangement please consult www.ilac.org. The accuracies of all measurements were traceable to the SI (International System of Units) through NIST, NMISA, PTB or International Measuring Standards, unless otherwise noted. The uncertainties of measurement were estimated for a coverage factor of k=2 which approximates to a 95% confidence level.

American Standard Calibration Laboratory
Measurement Science Laboratory

Certificate No	L77187	As Found/As Left	Rev 0
Manufacturer	Quest Technologies		
Description	Acoustic Calibrator		
Model No	QC-10		
Serial No	QE5120165		
Plant No	AE009		
Calibrated for	Apex Environmental		
Address	Unit 4, 40 Beechgate Crescent, Southgate Business Park, Umbogintwini, 4126		
Temperature	23.2 °C ± 2 °C		
Relative humidity	54.1 % rh ± 5 % rh		
Barometric Pressure	853 mbar ± 5 mbar		
Date of calibration	11 March 2020		
Expiry date	11 March 2021	Issue Date	11 March 2020

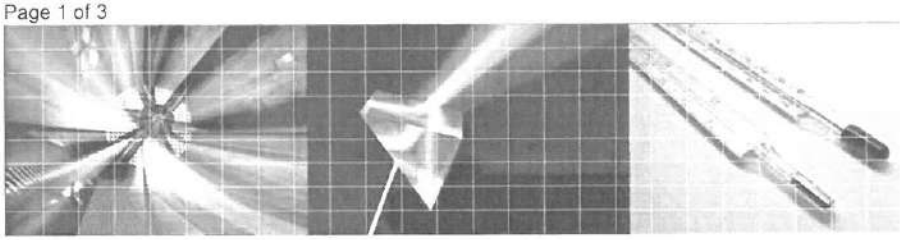
Calibrated by *E Terblanche*

Digitally signed by Terblanche Enrico
Date: 2020.03.11 07:15:29 +02'00'

This certificate is issued without alteration, and in accordance with the conditions of accreditation granted by ANAB Copyright of this certificate is owned by Technology Solutions & American Standard Calibration Laboratory and may not be reproduced other than in full, except with the prior written approval. It is a correct record of the measurements performed at the time of calibration. Subsequently the accuracy will depend on factors such as care exercised in handling the instrument and frequency of use. Recalibration should be performed after a period which has been chosen to ensure that, under normal circumstances, the instruments accuracy remains within the desired limits. The results relate to the device under calibration.

Technical Signatory *E Terblanche*

Digitally signed by Terblanche Enrico
Date: 2020.03.11 07:15:44 +02'00'



Hards Laboratories cc
T/A Technology Solutions
C3 Prospect Close
43 Regency Drive
R21 Corporate Park, Irene
Tel: +27 (0) 12 345 5358
Fax +27 (0) 12 345 3263

Technology Solutions
Measurement Science Laboratory

Certificate of Calibration

Certificate No L77187 As Found/As Left Rev 0

Standards and Equipment used

Description	Asset No	Cal due
Omnical Sound Level Calibrator	TS302	03 March 2021
Hand-held Analyzer; Microphone & Preamplifier	TS268	31 May 2020
Memory-Loc Barometer	TS085	13 October 2020

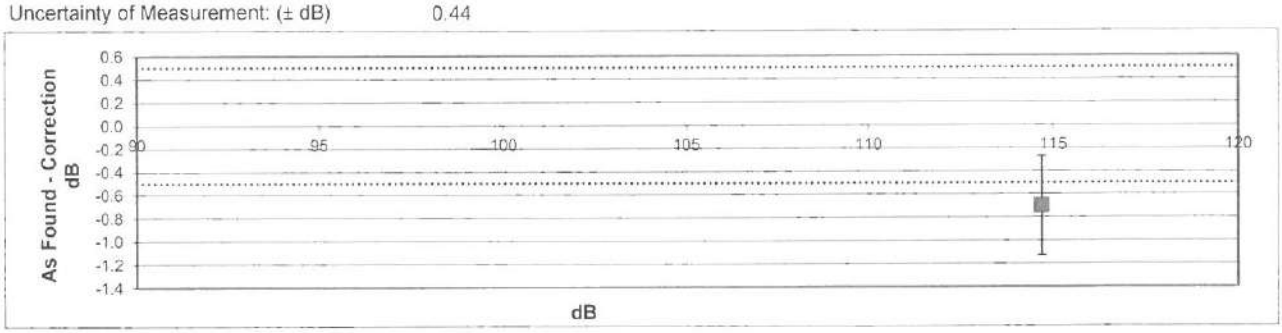
Procedure TS PL 021

Results - As Found

Function dB (IEC 651 Type 1) ± 0.5 dB

Sound Pressure Level Setting (dB)	UUT Sound Pressure Level reading (dB)	Sound Pressure Level correction (dB)
114.0 dB, 1 kHz	114.70	-0.70

Uncertainty of Measurement: (± dB) 0.44

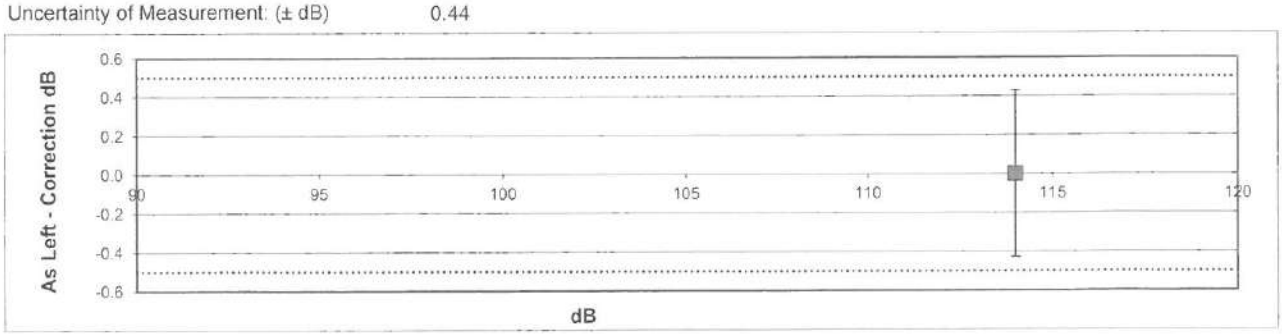


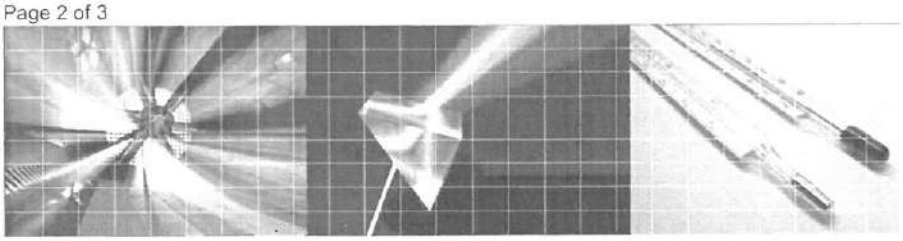
Results - As Left

Function dB (IEC 651 Type 1) ± 0.5 dB

Sound Pressure Level Setting (dB)	UUT Sound Pressure Level reading (dB)	Sound Pressure Level correction (dB)
114.0 dB, 1 kHz	114.00	0.00

Uncertainty of Measurement: (± dB) 0.44





Hards Laboratories cc
T/A Technology Solutions
C3 Prospect Close
43 Regency Drive
R21 Corporate Park, Irene
Tel: +27 (0) 12 345 5358
Fax +27 (0) 12 345 3263

Technology Solutions
Measurement Science Laboratory

Certificate of Calibration

Certificate No **L77187** As Found/As Left Rev 0

Compliance with Specifications - ILAC-G8

When a specification describes an interval with an upper and lower limit, a statement of compliance or non-compliance with specification is made where the ratio of the expanded uncertainty interval to the specified interval is reasonably small and fit for purpose.

Compliance: If the specification limit is not breached by the measurement result plus the expanded uncertainty with a 95% coverage probability, then compliance with the specification can be stated (See Case 1 of Fig.1). This can be reported as "Compliance" or "Compliance – The measurement result is within (or below) the specification limit when the measurement uncertainty is taken into account". In calibration this is often reported as "Pass";

Non-compliance: If the specification limit is exceeded by the measurement result minus the expanded uncertainty with a 95% coverage probability, then noncompliance with the specification can be stated. (See Case 4 of Fig.1) This can be reported as "Non-compliance" or "Non-compliance – The measurement result is outside (or above) the specification limit when the measurement uncertainty is taken into account". In calibration this is often reported as "Fail";

If the measurement result plus/minus the expanded uncertainty with a 95 % coverage probability overlaps the limit (See Case 2 and 3 of Fig.1), it is not possible to state either compliance or non-compliance. Where applicable in this report this condition is referred to as "Undetermined" and the user of the device must determine fitness for use in their measurement processes.

In cases where measurement uncertainty is not taken into account when making compliance statements, the shared risk approach is implemented and noted according on the calibration certificate.

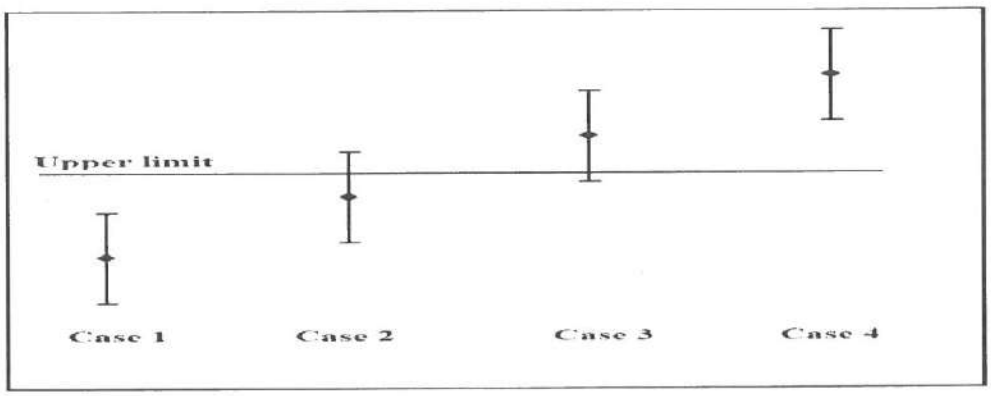
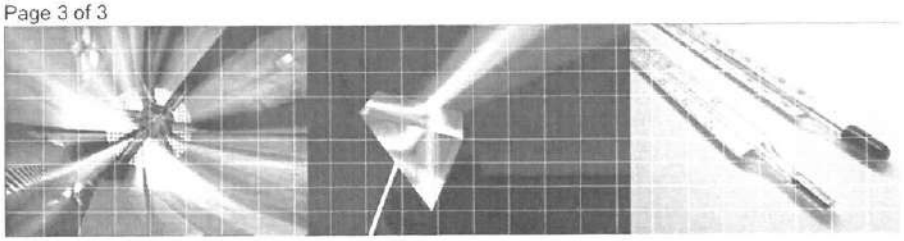


Fig. 1

Comments

The Correction Must be Added Algebraically to the UUT Reading to Obtain the Corrected Value.

End of Calibration Certificate



Hards Laboratories cc
T/A Technology Solutions
C3 Prospect Close
43 Regency Drive
R21 Corporate Park, Irene
Tel: +27 (0) 12 345 5358
Fax +27 (0) 12 345 3263