

Gammatec NDT Supplies SOC Ltd

Group	Logistics	Service, Calibration and Quality Control of LED Film Viewers		
Document	Work Instruction			
Document No.	5.1.24.0			
Revision No.	5	Effective from	7 December 2018	Page 1 of 14

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Approved	P. Borchardt	

DISTRIBUTION

DEPT
Quality
EWS

NAME	DEPT

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1. PURPOSE/OBJECTIVES

The objective of this procedure is:

- 1.1 To outline the steps taken in the Quality Control Checking and calibration of the Gammatec LED viewer.

2. SCOPE

This procedure is applicable to all personnel within Gammatec NDT Supplies SOC Ltd Electrical Workshop

3. RESPONSIBILITIES AND AUTHORITIES

3.1. **Managing Director**

The Managing Director is responsible for ensuring that the necessary responsibilities and authorities are defined, assigned and communicated to the applicable personnel within the company.

3.2 **Electronic Workshop Manager/Supervisor**

- Is responsible for ensuring that the necessary responsibilities and authorities are assigned and communicated to the applicable personnel.
- Is responsible for ensuring that this work instruction is available at point of use.
- Is responsible for delegation and prioritising of work to his staff.
- Is responsible for ensuring that all Repair, Testing and Calibration is recorded on the relevant work sheets and is available for review when required during processing.
- Is responsible for ensuring that all calibrations conducted are traceable to National / International standards, or Manufacturers specification (where required).
- Is responsible for ensuring that customers stated requirements are met for Repair, Testing and Calibration.
- Is responsible for the training, and certification of technicians in accordance with the approved Quality Policy and Work instructions.
- Is responsible for regular reviewing and updating of this work instruction to ensure that it remains current.
- Is responsible for the prompt implementation of corrective/preventive measures regarding any non-conformances originating from the Electrical Workshop.

3.3 **Electronic workshop technician**

- Is responsible for adherence to the requirements this work instruction.
- Is responsible for ensuring that the required resources and tools are correctly maintained.
- Is responsible for prompt reporting any problems or non-conforming situations to the EWS Manager / Supervisor for advice or resolution.

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3.4. SHEQ Manager

- Is responsible for ensuring that the necessary responsibilities and authorities are assigned and communicated to the applicable personnel.
- Is responsible for ensuring that this work instruction is available at point of use.
- Is responsible for ensuring that tools and resources are identified and provided as required.
- Is responsible for regular reviewing and updating of this work instruction to ensure that it remains current.
- Is responsible for the prompt implementation of corrective/preventive measures regarding any non-conformances originating from the Quality Department.

3.5. QC Supervisor

- Is responsible for ensuring that the necessary responsibilities and authorities are understood and adhered to.
- Is responsible for ensuring that this work instruction is available at point of use.
- Is responsible for supervision and delegation of tasks to the QC Inspectors.
- Is responsible for ensuring that the required resources and tools are correctly maintained.
- Is responsible for prompt resolution of any reported quality problems reported.
- Is responsible for prompt reporting of any non-conforming situation to the SHEQ Manager for advice or resolution.

3.6. QC inspector

- Is responsible for adherence to the requirements this work instruction.
- Is responsible for ensuring that the required resources and tools are correctly maintained.
- Is responsible for prompt reporting of any non-conforming situation to the QC Supervisor for advice or resolution.

4. REFERENCES

- 4.1 ISO 9001 Quality Management System.
- 4.2 ASTM 1390-12 Illuminators Used for Viewing Industrial Radiographs
- 4.3 Applicable procedures and work instructions within Gammatec NDT Supplies SOC Ltd.
- 4.4 Regulatory requirements as applicable within Gammatec NDT Supplies SOC Ltd.

5. DEFINITIONS

- 5.1 **EWS** – Electrical Workshop
- 5.2 **QC** – Quality Control

6 PROCEDURE

6.1 Equipment required

- Surface Candela meter (AccuMax Readout Unit Model: XR-1000) and Probe XS555/L.

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- Dark safety glasses.
- Film measurement template.

6.2 Discussion of the process – QC of Standard LED Viewer.

6.2.1. Ensure when taking measurements that **NO DRAGGING/SLIDING** of probe against the surface of the viewer screen is done. Pick up the probe and place it in the selected position of measurement.

6.2.2. New Viewer

6.2.2.1. Bodywork

Check that there are no cracks, dents or scratches on the bodywork
 Check that housing is square with no gaps between the joints
 Check that all screws are in place and tightened
 Check that the Film rest rail at bottom of viewing screen is in place
 Check that the Footrest is operating correctly

6.2.3.2. Screen

Check that Screen is securely mounted in viewer housing
 Check that there are **NO** scratches or other blemishes

6.2.3.3. Power Supply

Check the Power lead for any damage or loose connections to cable or plugs
 Check the Power Supply, leads and connectors for any damage and loose connections
 Check that power is supplied to the Viewer.
 Check that the Power Switch is securely mounted in the viewer housing
 Check that ON/OFF operation is correct
 Check that Selector Switch activates individual panels in the LED 3.8 viewer.
 Check that Fuse cover is in place
 Check that Fans are securely mounted in viewer housing (Visual check)
 Check that fans are operating. (Use a piece of paper and verify suction in and blowing out of air)

6.2.3.4. Footswitch

Check that Panel Mount connector is securely mounted in the viewer housing
 Check that Cable is securely connected at Footswitch and Connector
 Check that Connector fits and clips in the Panel Mount connector correctly
 Check that Footswitch is operating correctly (Depress = Bright, release = Dim)
 Check that no obvious signs of damage to Footswitch are evident.

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6.2.3.5. Dimmer Control

Check that Potentiometer is securely mounted in viewer housing
 Check that Dimmer control turns smoothly from lock to lock
 Check that there is no flickering of the LEDs during dimming/brightening

6.2.3.6. Identity Plate

Check that rating information on back of the LED 3.8 viewer is clearly visible and legible as per the example in Figure 1.

DIMMABLE LED INDUSTRIAL FILM VIEWER				
MANUFACTURER	Gammatec NDT Supplies SOC Ltd			
MAKE	Gammatec			
MODEL	LED 3.8			
SERIAL #	LED xxx			
Description	Min.	Typ.	Max.	Frequency
Input Voltage (VAC)	100VAC	230VAC	240VAC	50/60Hz
Input Current (mA)	4.5A Max.			
Over temperature protection 70°C automatic cut off				
Environment	Operation	10 ~ +50°C	Storage	10 ~ +85°C
Max Brightness	70000cd/m ²	DRY VIEWING ONLY		

Figure 1

6.2.3.7. Screen Uniformity

Uniformity must be greater than 0.5 across the viewing surface of the screen. The screen shall be divided into sections utilising a template and the readings noted as per the example in Figure 2. Measurements are in cd/m².

Note: Ensure that the viewer is switched on to full luminance and running for 5 minutes before taking measurements. All panels for the LED 3.8 viewer.

47000	50000	57000	61000	65000	62000	63000	60000	54000
48000	54000	64000	67000	68000	66000	64000	58000	55000
46000	52000	58000	62000	66000	65000	61000	57000	52000

Figure 2

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Uniformity shall be calculated by taking the **average** of the four lowest and four highest readings in Figure 2 as per the example in Figure 3:

Readings	Lowest <i>L_{min}</i>	Highest <i>L_{max}</i>	Uniformity >0.5
	46000	64000	<i>L_{min}</i> 49750
	47000	66000	<i>L_{max}</i> 65500
	52000	67000	= 0.76
	54000	68000	
Average	49750	65500	

Figure 3

6.2.3.8. Luminance

The maximum Luminance and maximum viewing density shall be determined by entering the highest reading in Figure 2 in the Y input of the Film Density Calculator (**Appendix 1**) and pressing Enter. The X value then indicates the maximum allowable viewing density to be displayed on the unit calibration sticker together with the maximum brightness as per the example in Figure 4.

Maximum luminance	Viewing Density
68000	3.8

Figure 4

The minimum Luminance required for a new viewer is **70 000cd/m²** to achieve a viewing density of **3.84**.

NB!!! Ensure data for each new LED 3.8 viewer is saved under <G:\Gammatec Documentation\POLICIES,PROCEDURES,WORK INSTRUCTIONS\Electrical Workshop\4. Print Media\LED3.8>

The results of the above-mentioned examinations shall be recorded on the Examination Record for LED Viewers as shown in **Appendix 2**.

Note: Ensure that the “reference calibration equipment” stated on the examination record are within calibration validity period.

The Viewer Verification sticker (**Appendix 3**) must be put on unit when issuing the Certificate of Conformance (**Appendix 4**).

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6.2.4. Used Viewer

6.2.4.1. Bodywork

Ensure that Viewer housing is complete with no gaps between the joints or broken panels which would allow insertion of any object into the viewer or loss of light intensity.

Check that all screws are in place and tightened

Check that the Film rest rail at bottom of viewing screen is in place

Check that the Footrest is operating correctly

6.2.4.2. Screen

Ensure that Screen is securely mounted in viewer housing

Check that Scratches or other blemishes do not interfere with the viewing area.

6.2.4.3. Power Supply

Check the Power lead for any damage or loose connections to cable or plugs

Check the Power Supply, leads and connectors for any damage and loose connections

Check that power is supplied to the Viewer.

Viewer earthing must be checked using a Multi-meter (Continuity Test) between moulded plug earth pin and female kettle lead insert earth slot.

Check that the Power Switch is securely mounted in the viewer housing

Check that ON/OFF operation is correct

Check that Selector Switch activates individual panels in the LED 3.8 viewer.

Check that Fuse cover is in place

Check that Fans are securely mounted in viewer housing (Visual check)

Check that fans are operating. (Use a piece of paper and verify suction in and blowing out of air)

6.2.4.4. Foot switch

Check that Panel Mount connector is securely mounted in the viewer housing

Check that Cable is securely connected at Footswitch and Connector

Check that Connector fits and clips in the Panel Mount connector correctly

Check that Footswitch is operating correctly (Depress = Bright, release = Dim)

Check that no obvious signs of damage to Footswitch are evident.

6.2.4.5. Dimmer Control

Check that the Potentiometer is securely mounted in the viewer housing

Check that the Dimmer control turns smoothly from lock to lock

Check that there is no flickering of the LEDs during dimming/brightening process

Check that the Dimmer push button is securely mounted in the viewer housing

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Check that the Operation of the Dimmer Push button is correct: Depress- bright, Release and Depress- Dim

6.2.4.6. Identity Plate

Check that where applicable, the Identity Plate has been fitted and that the Rating information on left side panel is clearly visible and legible as per Figure 1, S/N and Manufacturers address plate is fitted and visible.

6.2.4.7. Screen Uniformity

AS per 6.2.3.7.

6.2.4.8. Luminance

As per 6.2.3.8.

The results of the above-mentioned examinations shall be recorded on the Examination Record for LED Viewers as shown in **Appendix 2**.

NB!!! Ensure data for each LED 3.8 viewer is stored and compared with original data found in:

<G:\Gammatec Documentation\POLICIES,PROCEDURES,WORK INSTRUCTIONS\Electrical Workshop\4. Print Media\LED3.8>

Findings to be sent to QA/QC manager, EWS manager and supervisor for review.

Note: Ensure that the “reference calibration equipment” stated on the examination record are within calibration validity period.

6.2.5 QC Verification

If all results obtained are acceptable and within the stated tolerances the QC inspector will generate the Certificate of Conformance in **Appendix 4** if applicable. Details on the Calibration sticker issued by EWS must correspond to the Examination Record.

QC will hand over the completed unit along with the Sales Order, Examination Record and Certificate of Conformance to Stores after signing off the QC section on the Job Card.

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7. RECORDS

Records generated by this procedure are as follows:

Record	Location/Responsible	Retention Period
Examination Record	EWS/Archive	5 years
Certificate of Conformance	QC/Archive	5 years

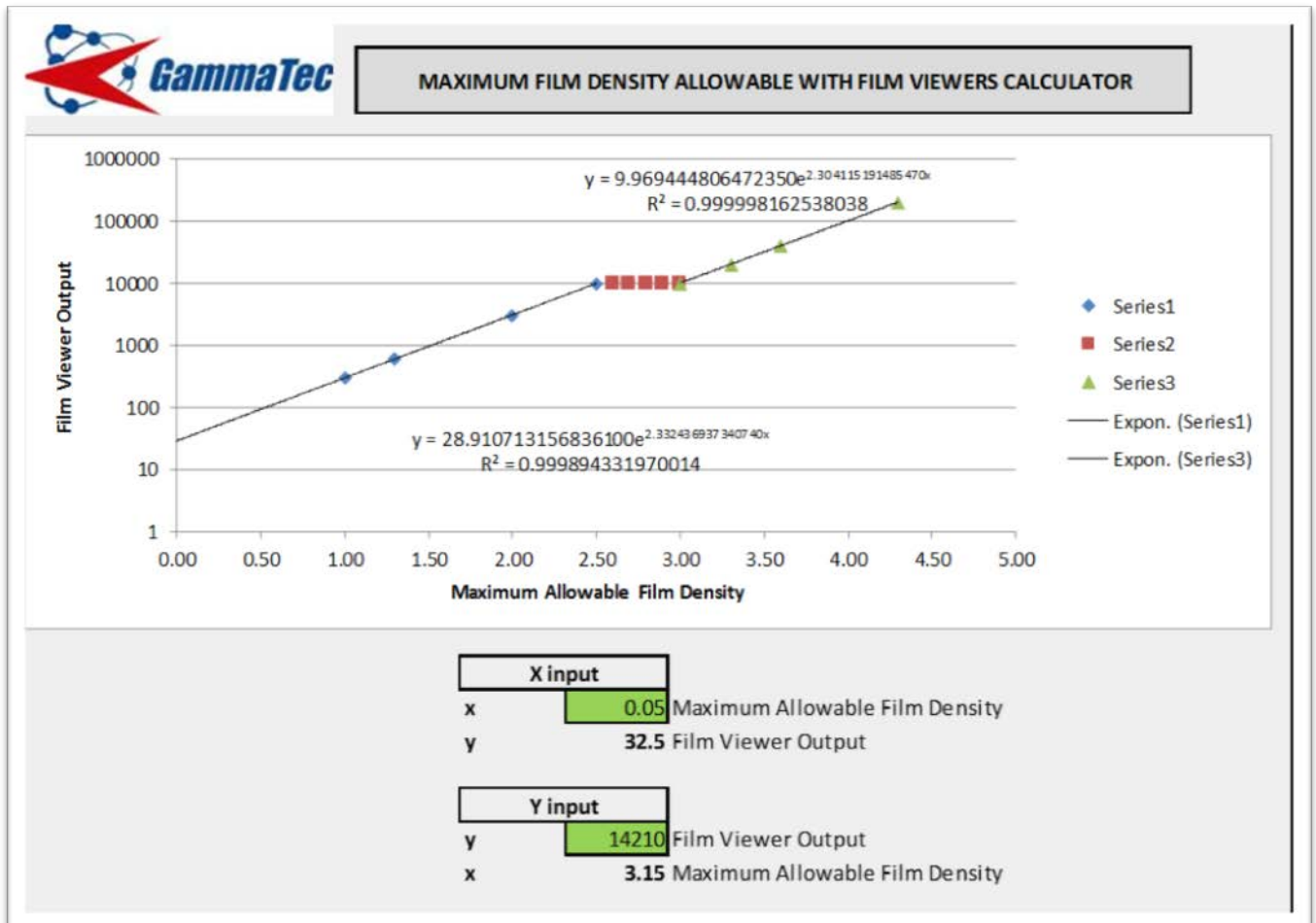
8. RECORD OF REVISION / RECORD OF CHANGES

RECORD OF CHANGES, REVISIONS AND CANCELLATIONS		
DATE	NATURE / DETAIL OF CHANGE	REV. NO.
15 February 2012	New	0
16 September 2013	Extensively revised	1
21 November 2014	Revised	2
23 October 2015	Section 7.1.1 and 7.1.5 Amended, Appendixes added	3
7 December 2015	6.2.3.11 & 6.2.4.12 amended to include calibration reference equipment	4
November 2018	Updated	5

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Appendix 1



Appendix 2


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GAMMATEC	SYSTEMS PROCEDURE VERIFICATION OF PURCHASED PRODUCT PMIGSA/LOG-005.01.024.002	REV 4	ISSUE DATE Nov 2018								
EXAMINATION RECORD											
Customer: _____		Record No.: _____									
Reference Standard: ASTM E 1390-12											
Item: Film Viewer											
Make and Model: _____											
Serial No.: _____											
EXAMINATION OF	NEW	USED		REMARKS							
	GC	EWS	GC								
BODYWORK											
SCREEN											
POWER SUPPLY											
FOOT SWITCH											
DIMMER CONTROL											
IDENTITY PLATE											
LUMINANCE											
CONTINUITY TEST											
Screen luminance uniformity in cd/m²											
PANEL 1		PANEL 2		PANEL 3		PANEL 4					
53790	58300	58800	58910	58840	50180	50630	58390	52550			
58450	61280	60940	60350	50960	50970	60150	58000	53780			
51390	55630	55220	55090	53810	53800	53840	53780	47790			
Readings	Lowest Lmin	Highest Lmax	Uniformity Lmin/Lmax > 0.5		Maximum Luminance	Viewing Density					
	47750	61280	Lmin =	51322,5	61280	3,79					
	51390	60940	Lmax =	60680							
	52550	60350	0,85								
	53600	60150									
Average	51322,5	60680									
LUMINANCE METER	VERIFICATION		Correction Factor		X 1.0						
Make and Model	Spectroline Accumax XRP-3000		Uncertainty (30kcd/m ²)		-0.2%						
Calibration date	20/07/2018										
Calibration due date	20/07/2019										
Sensor	XB 555 / L										
Serial No	2000267										
Calibration date	20/07/2018										
TECHNICIAN						QUALITY CONTROL					
NAME _____						NAME _____					
SIGN _____						SIGN _____					
DATE _____						DATE _____					

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Serial No.: _____

Maximum Brightness: _____

Maximum Viewing Density: _____

Verification Due Date: _____

Verification done by: _____

Prestiga 108803(b)

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CERTIFICATE OF CONFORMANCE

CERTIFICATE No:

CUSTOMER

DESCRIPTION

FILM VIEWER

MODEL

SERIAL No.

MEASURED BRIGHTNESS

cd/m²

MAXIMUM VIEWING DENSITY

SUPPLIER

GAMMATEC NDT SUPPLIES SOC LTD

COUNTRY OF ORIGIN

SOUTH AFRICA

DATE

DATE EXPIRY

REPORT

The above equipment was tested by Gammatec NDT Supplies and meets the requirements of ASTM E 1390-12.

QUALITY ASSURANCE