

**Polilight Field Optical and Calibration Test (PL500 and PL500SC)**

**Document Revision History**

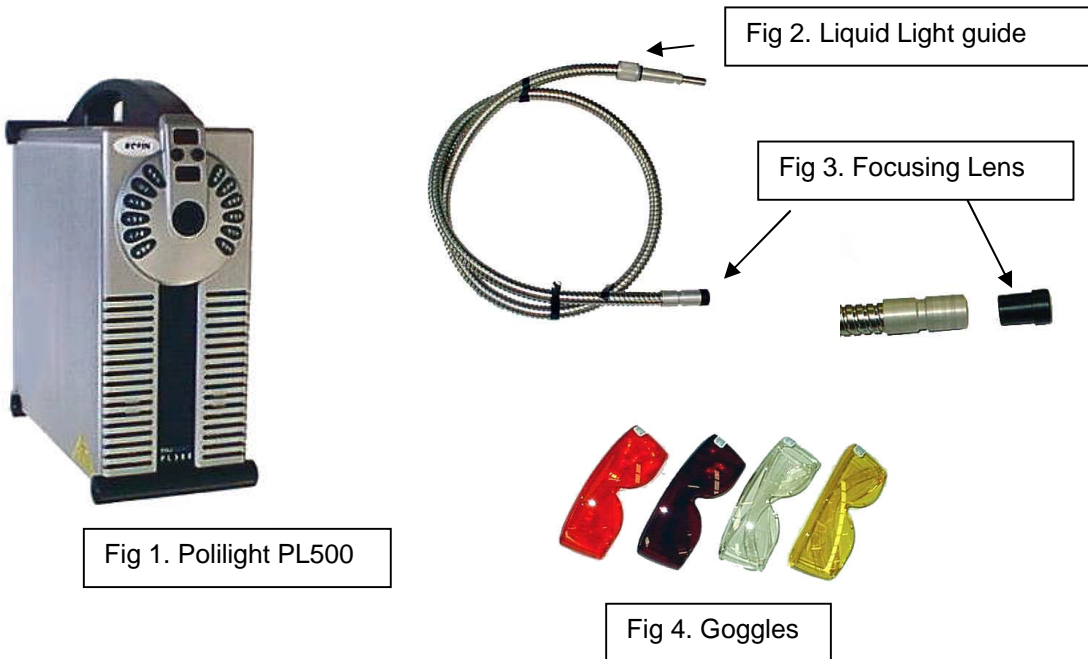
Revision	Approval date of previous version	Section(s) revised and brief description	Change Control Reference #
01	NA	Original	
02	18/11/2008	Revise wording in section 5.3.15. and update 1.	DMRN # 080
03	11/05/2009	Fix typo's & new Calibration sheet layout.	DMRN # 110

**1. Application**

This document describes a set of tests to be performed in the field by Polilight users. The tests are designed to check the Polilight optical system is performing to specification and that the unit is suitable for use. This is a calibration and performance check.

This test is applicable to Polilight Models POL.0004, POL.0004, (also can be applied to POL.0010 and POL.0011, some operating instructions (i.e. button pressing) need to be interpreted, but results are identical.)

These tests do not confirm the use of the Polilight for any specific application, but rather check the integrity of the Polilight internal optical filters, and check for other mechanical/maintenance issues that may result in reduced optical performance.



**2. Safety Instruction**

At no time should the operator, or any person in the vicinity, directly view the output of the Polilight. Eye protection goggles should be worn appropriately when performing optical power tests.

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**3. Material and Equipment**


- |   |               |
|---|---------------|
| 1 x Polilight PL500 (or PL500 SC version)   | Ref Fig 1     |
| 1 x Liquid light guide (with focusing lens) | Ref Fig 2 & 3 |
| 4 x Goggles (Clear, yellow, orange, red)    | Ref Fig 4     |

**4. Attachments and Related Records**

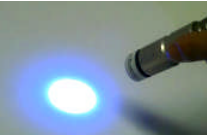



Test Certificate (Appendix 1)

**5. Procedure**



Photocopy the Test Certificate page (last page of this document), fill in the information fields and record results of the following tests. When completed this page becomes your test record.

Step #	Procedure and Test Plans	Diagrams and Records	Results
5.1	<p><b>Liquid light guide integrity check.</b></p> <p>All Polilights use a liquid light guide for UV and Visible light bands. (Optional Infra Red light guide is a glass fibre bundle)</p> <p><b>Note:</b> All Polilight light guides are designed to use a quartz focusing lens which inserts into the output end of the light guide. This lens provides an even illumination output beam. This lens is often lost or forgotten about by users. We recommend its use for best results.</p> <ol style="list-style-type: none"> <li>1. Remove the liquid light guide from Polilight and remove focusing lens from the light guide.</li> <li>2. Holding each end of the light with both hands, point one end towards a light (over head light or a window) and examine the other end. Repeat for both ends. Ref pictures here.</li> <li>3. If the light guide has been physically damaged in some way, the likely effect will be bubbles appearing the liquid. Any bubbles in the guide are easy to see inside the quartz end tips at either end of the light guide. Bubbles will significantly reduce the output intensity of the Polilight.</li> </ol>	<p>Ref Fig 3.</p> 	<p>Record result on test certificate at 5.1</p>
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Step #	Procedure and Test Plans	Diagrams and Records	Results
5.2	<p><b>Self test mechanical.</b></p> <p>The Polilight PL500 and PL500SC units all perform an internal mechanical self check when first turned on.</p> <ol style="list-style-type: none"> <li>1. Insert the light guide (ensure insert and twist lock into position. If the light guide is not inserted properly the Polilight will not turn on.)</li> <li>2. Turn on the power to the unit. (PL500 rear switch, SC unit rear switch &amp; front panel standby switch).</li> <li>3. The Polilight will automatically perform a number of internal filter wheel and motor checks.</li> <li>4. If all internal checks are OK then the internal map will ignite and the 450 (blue) band will automatically selected and output band will come on.</li> </ol>		Record Pass/Fail result on test certificate 5.2.
5.3	<p><b>Internal Optical Filter check</b></p> <p>The internal optical filters within a Polilight are all “interference” type optical filters. They can not change their optical characteristics unless they are physically damaged. Physical damage (broken) will likely result in more light being emitted above the filter band. This test is designed to check for light leakage above the nominated filter band, using the safety goggles supplied with the Polilight.</p> <ol style="list-style-type: none"> <li>1. Insert the light guide (with focusing lens) into the Polilight and turn the unit on. The unit should start and illuminate with the 450 (blue) band.</li> <li>2. Select the UV output band and direct onto a white piece of paper (ie normal A4). You should see bluish fluorescence.</li> <li>3. Place the clear safety goggles between the light guide and the paper and the fluorescence should disappear (do not look directly into UV beam without clear safety goggles on.) NOTE Goggles can melt if held too close to light guide for too long.</li> <li>4. Select the Polilight <b>415 band</b>. This should appear as a purple colour on the paper.</li> <li>5. Inserting the <b>yellow</b> goggles after the light guide should make all colour disappear.</li> </ol>	   	<p>If 450 (blue) comes on and no error reported on front panel = Pass. Record result on test certificate 5.3.1</p> <p>Record results on test certificate 5.3.2.</p> <p>Record results on certificate 5.3.4</p>

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Step #	Procedure and Test Plans	Diagrams and Records	Results
	<p>6. Select the <b>450 band</b>. This should appear as a blue colour on the paper.</p> <p>7. Inserting the <b>orange</b> goggles after the light guide should make all colour disappear.</p> <p>8. Select the <b>470 band</b>. This should appear as a light blue colour on white paper.</p> <p>9. Inserting the <b>orange</b> goggles after the light guide should make all colour disappear.</p> <p>10. Select the <b>490 band</b>. This should appear as a light blue (or greenish) colour on white paper.</p> <p>11. Inserting the <b>orange</b> goggles after the light guide should make all colour disappear.</p> <p>12. Select the <b>505 band</b>. This should appear as an aqua blue (or light green) colour on white paper.</p> <p>13. Inserting the <b>orange</b> goggles after the light guide should make all colour disappear.</p> <p>14. Select the <b>530 band</b>. This should appear as a light green colour on white paper.</p> <p>15. Inserting the <b>orange</b> goggles between the light guide and the colour <b>should NOT be blocked</b>. Down tuning the filter to T30 should make all colour disappear. (Note: The Polilight by default is in Power mode. To change to Tune mode hold down the 530 button and display will change from P:7 to t:0). Tune to t:30 using up down buttons. At t:30 all light should be blocked or at least be significantly diminished.</p> <p>16. Select the <b>555 band</b>. This should appear as a green colour.</p> <p>17. Inserting the <b>red</b> goggles between the light guide and paper and the light should disappear.</p>	  <p>Use technique as above</p> <p>Use technique as above</p> <p>Use technique as above</p> <p>Use technique as above</p> <p>Use technique as above</p>	<p>Record results on certificate 5.3.6</p> <p>Record results on certificate 5.3.8</p> <p>Record results on certificate 5.3.10</p> <p>Record results on certificate 5.3.12.</p> <p>Record results on certificate 5.3.14</p> <p>Record results on certificate 5.3.15</p> <p>Record results on certificate 5.3.16</p>

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Step #	Procedure and Test Plans	Diagrams and Records	Results
	<p><b>Note 1 :</b> With the following bands the goggles will not block the light bands. These light bands are designed for illumination of evidence to reduce backgrounds and not for fluorescence. They are often tuned to obtain better matching.</p> <p><b>Note 2 :</b> The following colours may not reproduce exactly on colour printers. Also colour monitors produce differing effects. Essentially the colours are yellow, orange and red.</p> <p>18. Select the <b>590 band</b>. This should appear as a yellow colour<sup>Note 2</sup>. Shining the light on the colour patch here should make the colour patch disappear into the background. (Some filter tuning may help)</p> <p>19. Select the <b>620 band</b>. This should appear as a light orange colour<sup>Note 2</sup>. Shining the light on the colour patch here should make the colour patch disappear into the background. (Some filter tuning may help)</p> <p>20. Select the <b>650 band</b>. This should appear as a light red colour<sup>Note 2</sup>. Shining the light on the colour patch here should make the colour patch disappear into the background. (Some filter tuning may help)</p>	    	<p>Record result on certificate 5.3.18.</p>  <p>Record result on certificate 5.3.19.</p>  <p>Record result on certificate 5.3.20.</p>
5.4	<p>Review test certificate sheet. If all tests are “Pass”, then the unit is fit for use. Sign and date certificate and file. Update any instrument logs and calibration labels.</p> <p>Any problems, issues or questions can be reported to Rofin using <a href="mailto:service@rofin.com.au">service@rofin.com.au</a> email.</p> <p><b>End of Test</b></p>		



Rofin Australia Pty Ltd




**Calibration Method**

Document No.  
MTC POL.00XX Polilight Field  
Optical and Calibration Test

**Polilight Test Certificate**

Date		Test performed by:	
Polilight Type		Serial Number	

Test Results		Result - Pass / Fail		Comments	
5.1	Liquid Light Guide Integrity Check				
5.2	Self Test Mechanical				
5.3	Internal Optical Filter Check				
1	Start up check				
	Wavelength	Light Colour		Result	Comments
	450				
2	UV Check				
	nm	Colour of light on white paper	Goggles	Colour Blocked Yes / No	Result Pass / Fail
	350		Clear		
	Wavelength Check				
	nm	Colour of light on white paper	Goggles	Colour Blocked Yes / No	Result Pass / Fail
4	415		Yellow		
6	450		Orange		
8	470				
10	490				
12	505				
14	530				
15	530	Tuning of filter from 0 – 30			
16	555		Red		

5.3		Back Ground Colour Check		
Wavelength	Colour	Test Colour Patch	Results Pass/Fail- Comment	
18	590	Yellow		
19	620	Orange		
20	650	Red		

Unit Result Pass / Fail		Verified by:		Date:	
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