Using The Sper Scientific Light Meter

Tank Farm Operating Procedure

Industrial Hygiene

USQ # NA/4

CHANGE HISTORY (≤ LAST 5 REV-MODS)

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
<th>Summary of Changes</th>
</tr>
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<tbody>
<tr>
<td>D-3</td>
<td>05/08/2018</td>
<td>Industrial Hygiene Request</td>
<td>Deleted Paragraph 3.2.5 out of the &quot;Radiological Controls&quot; section of the procedure. Edited &quot;CAUTION&quot; statement in regard to grammar usage within it. Modified the &quot;Records&quot; section to reference data and attachments being entered into the Site Wide Industrial Hygiene Database. Added a &quot;Figure&quot; to the procedure to denote the screw in which to adjust if the instrument is not reading the correct parameter that it is required to denote.</td>
</tr>
<tr>
<td>D-2</td>
<td>10/10/2017</td>
<td>Industrial Hygiene Request</td>
<td>Modified &quot;Radiological and Contamination Control&quot; section to current standard. Modified Notes within procedure in addition to Tables and Attachments.</td>
</tr>
<tr>
<td>D-0</td>
<td>03/29/2016</td>
<td>Periodic review comment incorporation</td>
<td>Clarified the accuracy range of the meter. Added requirement to contact IH if performed w/o a Work Package. Updated terminology associated with “out of cal” meter.</td>
</tr>
<tr>
<td>C-1</td>
<td>07/24/2014</td>
<td>Safety request</td>
<td>Changed to ROUTINE.</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for use of the Sper Scientific light meter (model 840021) in support of field monitoring performed in accordance with TF-OPS-IHT-007 and an applicable industrial hygiene sampling plan.

1.2 Scope

This procedure involves the functional checks associated with the Sper Scientific light meter.

2.0 INFORMATION

2.1 Terms and Definitions

Foot-candle (fc).-A unit of measurement defined as the intensity of light on a 1 ft² surface 1 foot away from a candle

2.2 General Information

The Sper light meter (model 840021) specifications and operating range:

- Accuracy: ± 5% of the reading plus 4 digits [e.g., a 15.0 fc reading could actually lie within range of 15.0 fc ± 0.80 fc (5% x 15 = 0.75, 0.75 + 4 digits = 0.79)]
- Temperature range: 32-122°F
- Relative humidity: < 80 %
- Power supply: 9 volt alkaline battery.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Equipment Safety

**CAUTION** - During adjustment, be sure to use only the terminal Marked “ZERO”. The unmarked terminals are for professional laboratory calibration only. Tampering with the unmarked terminals will result in inaccurate readings and require professional calibration of the meter.

**CAUTION** The lens cap should be kept on the photo sensor at all times except when actually taking a reading.

3.1.1 Avoid range overload.

3.1.2 Avoid storage in areas of high temperature and humidity.

3.1.3 Remove the battery for long term storage.

3.1.4 Never adjust the “FACTORY CALIBRATION” screws when zeroing the meter.

3.2 Radiation and Contamination Control

3.2.1 Planned work in radiological areas must be approved by Radiological Control personnel per the Radiological Risk Screening procedure TFC-ESHQ-RP-RWP-C-01.

3.2.1.1 When performed without a formal work package or approved procedure (i.e., Level 3 or 4 work), this procedure is limited to radiological areas and work activities permitted by a low risk Radiological Work Permit (RWP).

3.2.2 Before conducting sampling or monitoring, contact the responsible Radiological Control personnel for the facility or area to determine any specific survey or monitoring requirements.

- Pre, during, and post contamination survey requirements
- Any applicable RSP’s for your specific equipment or task
- Alternative survey or monitoring needs to support the radiological release survey process.
3.2  Radiation and Contamination Control (Cont)

3.2.3  Comply with the requirements set forth by the RWP, HPT coverage, Release Survey Plan (RSP), and any other applicable procedures as determined above.

3.2.4  When exiting radiological areas where no HPT coverage was provided, inform the radiological control personnel of the use/history for the equipment being presented (e.g., only sampled air in the Contamination Area, No known history of contamination based on use, etc.) to aid them in properly evaluating the radiological release criteria needed.
4.0 PREREQUISITES

4.1 Performance Documents

The following documents may be needed to perform this procedure:
- Sper Scientific Ltd. “Light Meter (Foot Candles), 840021, Instruction Manual”.
- TFC-ESHQ-S_IH-C-46, “Industrial Hygiene Reporting and Records Management.”
- TFC-ESHQ-RP_RWP-C-03, “ALARA Work Planning.”
- TF-OPS-IHT-007, “Using Direct Reading Instruments.”

4.2 Field Preparation

4.2.1 IF performing without a work package, CONTACT industrial hygiene for requirements.

4.2.2 CHECK the work package for reference to any applicable industrial hygiene sampling plan AND

PERFORM a review of the plan before using this instrument.
5.0 PROCEDURE

5.1 Using the Sper Light Meter

5.1.1 CHECK that the maintenance calibration date on the sticker is current for the light meter.

5.1.2 IF the calibration is past due, RETURN the meter to the equipment custodian with a completed green tag “IH INSTRUMENT SERVICE TAG” (BT-6004-019) indicating it is “Scheduled Maintenance Calibration.”

5.1.3 OBTAIN a blueprint, building map, or diagram of the survey area, OR

PREPARE a sketch illustrating the area layout and the approximate locations of the light sources and employees.

5.1.4 INSERT the sensor plug into the “PROBE INPUT” of the light meter.

5.1.5 TURN on the instrument by pressing the “ON” switch AND CHECK that the low battery indicator icon is not showing in the left corner of the display.

5.1.6 IF the low battery indicator icon is displayed, REPLACE the battery (located on the back) with a 9 volt alkaline battery.

5.1.7 WITH lens cover on, PRESS the “200” fc range button.

5.1.8 IF the display is not reading “00.0,” ZERO the light meter as follows:

5.1.8.1 OPEN the cover on the right hand side of the instrument.

CAUTION

During adjustment, be sure to use only the terminal Marked “ZERO”. The unmarked terminals are for professional laboratory calibration only. Tampering with the unmarked terminals will result in inaccurate readings and require professional calibration of the meter.

NOTE - See Figure 1 Display of D2 Sper Light Meter for reference.

5.1.8.2 USE a small Phillips screw driver AND ADJUST the screw marked “ZERO” until “00.0” is seen in the display (See Figure 1).
5.1 Using the Sper Light Meter (Cont.)

5.1.8.3 CLOSE the cover.

5.1.9 ENSURE meter is in the “200” fc range (see Attachment 1 for typical light levels).

5.1.10 REMOVE the lens cap from the photo sensor AND ALIGN it in the horizontal plane.

NOTE - Range overload is indicated when the number “1” appears on the left side of the display.

5.1.11 IF the meter indicates range overload, SWITCH to the “2000” fc range OR DISCONTINUE use of meter.

NOTE - The meter has an optional stand built into the back of the case to allow for easy viewing of the display if set on a stable surface.

- Fluctuations in the reading are generally due to shadows or changes in light fixture line voltage. Ambient temperature, drafts and ventilation also affect the light output.

5.1.12 WAIT for the meter reading to stabilize AND PRESS the “HOLD” button to freeze the reading in the display.

5.1.13 RECORD the reading in accordance with TFC-ESHQ-S_IH-C-46.

CAUTION
The lens cap should be kept on the photo sensor at all times except when taking a reading.

5.1.14 PLACE the lens cap back on the photo sensor.
5.1 Using the Sper Light Meter (Cont.)

5.1.15 PRIOR to taking the next measurement, PRESS the “HOLD” button to release the meter from the “HOLD” mode.

5.1.16 RECORD the information in accordance with TFC-ESHQ-S_IH-C-46 and submit to the Project Industrial Hygienist for review within two (2) working days.

5.1.17 TURN instrument off by using the “OFF” switch AND ENSURE lens cap is covering the photo sensor.
5.2 Records

Data and attachments are entered into the Site-Wide Industrial Hygiene Database and when reviewed and completed by the Industrial Hygienist, are uploaded to IDMS via an automated interface.

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
Attachment 1 - OSHA Hazwoper Illumination Standards

29 CFR 1910.120 (m) TABLE H-120.1. – MINIMUM ILLUMINATION INTENSITIES IN FOOT CANDLES.

<table>
<thead>
<tr>
<th>Foot-candles</th>
<th>Area or operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas.</td>
</tr>
<tr>
<td>5</td>
<td>General site areas.</td>
</tr>
<tr>
<td>5</td>
<td>Indoors: warehouses, corridors, hallways, and exitways.</td>
</tr>
<tr>
<td>5</td>
<td>Tunnels, shafts, and general underground work areas; (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Mine Safety and Health Administration approved cap lights shall be acceptable for use in the tunnel heading.)</td>
</tr>
<tr>
<td>10</td>
<td>General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms.</td>
</tr>
<tr>
<td>30</td>
<td>First aid stations, infirmaries, and offices.</td>
</tr>
</tbody>
</table>
Figure 1 Display of D2 Sper Light Meter

1. DISPLAY
2. ON BUTTON
3. OFF BUTTON
4. HOLD BUTTON
5. 200 RANGE BUTTON
6. 2000 RANGE BUTTON
7. ZERO SETTING TERMINAL
8. SENSOR INPUT SOCKET
9. STAND
10. BATTERY COMPARTMENT
11. PHOTO SENSOR
12. SENSOR PLUG