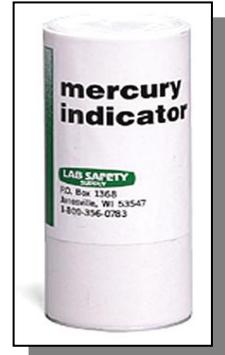


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## IH 75135

# Mercury Spills- Area Clearance Testing

**1.0 Purpose/Scope** This procedure documents the BNL building re-occupancy testing procedure and clearance criteria for spills of elemental mercury in indoor locations. It is used after cleanup with HEPA filtration and/or mercury adsorbents. When used in conjunction with SHSD IH75530 for the Jerome 431X direct reading mercury analyzer and the application of mercury indicating powder, field testers can achieve accurate results to release an area for re-occupancy by building occupants.



This procedure is not intended for use in measuring employee exposure levels during routine or emergency situations. Use SHSD Procedure IH75140 for quantifying employee exposure levels and determining compliance with occupational exposure limits.

This procedure is not intended to measure the environmental consequences of releases or determine the status of environmental compliance release of the area.

**2.0 Responsibilities** This procedure will be implemented through the SHSD Industrial Hygiene Group, SHSD, EPD and RCD Facility Support Groups, or other BNL organization that qualify their personnel as per this SOP. Only persons who thoroughly understand this procedure and are competent to operate the detection equipment should conduct this testing.

### 3.0 Definitions

**Direct Reading Meter or Instrument:** An electronic meter with a sensor that detects mercury. The meter presents a real-time (instantaneous) display in concentration of the chemical sensed by the detector. An indicator tube, specific for mercury, and calibrated sampling pump can also serve as a direct reading instrument.

**Indicating Powder:** A commercial powder containing cuprous iodide, such as J.T.Baker Product Number 4509-01, that indicates the presence of droplets of mercury as a color change in the powder.

**Spill:** An unplanned release of mercury into the work environment.

### 4.0 Prerequisites

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4.1 Prior to testing, the detection equipment must meet the requirements of its BNL method and manufacturer recommendations.

4.2 **Hazard Assessment of area:**

- The task of using a direct reading meter in itself does not pose significant employee health risks. But by its very nature, this SOP may be performed in areas with mercury contamination. Do not perform sampling until a competent individual has assessed the hazards of the area.
- Handling the indicator powder is hazardous and protective equipment must be used.

4.3 **Personal Protective Equipment:** Appropriate personal protective equipment to protect the person collecting the sample and handling the indicator powder and working around spilled mercury are:

- **Hand:** Use disposable gloves. Exam-style, splash gloves are acceptable. Acceptable elastomers are: Nitrile, PVC, and Natural Rubber. Remove and dispose of the gloves immediately after spreading the powder. Don a second pair of gloves to further handle equipment.
- **Body:** If contact of the body with contaminated surfaces is anticipated, a disposable suit should be used. Acceptable CPC materials include: Tyvek®, KleenGuard®, and cotton. Disposable garments must be discarded as mercury waste if contact with contamination has occurred. If personal clothing items become contaminated, they must be surrendered for BNL cleaning or disposal.
- **Foot:** If contact of the feet is anticipated with contaminated surfaces, disposable shoe coverings, boots or booties should be used. Acceptable CPC material include: Tyvek®, KleenGuard®, and rubber. If personal shoes become contaminated, they must be surrendered for BNL cleaning or disposal.
- **Respiratory:** Under normal use, respiratory protection is not required. If mercury, in the area exceed (as indicated by the direct reading meter) or are likely to exceed the OSHA or ACGIH standards, respirators are required. A half face or full face APR or PAPR respirator with mercury cartridge or an air line respirator may be used up to the assigned protection factor listed in the BNL's Respiratory Protection Selection and Issuance SOPs.
- **Eye:** Safety Glasses with side shields are required in all laboratories, construction, and general industry work areas. If exposure is above the Occupational Exposure Limit (PEL/TLV), vapor-proof goggles or full-face respirator must be used.

4.4 **Work Planning:** All requirements of work permits and work planning system reviews must be met in performing this procedure.

4.5 **Environmental Impact and Waste Disposal:** Direct Reading meters do not have adverse impact on the environment or create waste for disposal. Indicator powders

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are considered hazardous waste and must be handled, transported and disposed of in accordance with BNL Environmental Protection Division (EPD) requirements.

## 5.0 Precautions

Verify the testing personnel will not be exposed to hazardous airborne levels of the mercury by testing the highest probability source first. Test all sources in a manner that does not place the tester's breathing zone in vicinity with a suspected spill source, i.e. approach with meter in front of the employee. Move slowly to allow the meter to respond to mercury vapors. Use appropriate respiratory protection if indicated by the airborne vapor levels. The appropriate respiratory protection equipment used must be approved by the RCD Facility Support Group or SHSD IH Group.

## 6.0 Procedure

### Equipment:

- Appropriate PPE as determined in Step 4.3.
- Mercury Indicator powder, J. T. Baker Product Number 4509-01, or equivalent.
- Jerome Mercury Meter 431X, or equivalent.

6.1 Observe that the clean up of the spill follows an approved procedure and that appropriate PPE and exposure monitoring is conducted. After appropriate abatement, clearance testing may be initiated.

6.2 **Airborne Vapor test:** Using a direct reading meter, sample at a height of one (1) inch (2.54 cm) above the entire surface of the spill area. If no concentration above **0.010 mg/m<sup>3</sup>** is detected, the surface "passes" the *Airborne Vapor* test.

6.3 **Visual Inspection** of spill area: Visually examine surfaces and crevices for droplets of mercury (shiny, silvery droplets) by using a flashlight or lamp at an oblique angle. If none are observed, proceed to *Indicator Powder* testing. If droplets are observed, instruct the appropriate personnel to repeat the approved clean-up procedure.

6.4 If the *Airborne Vapor* test and the *Visual Inspection* are successfully passed, the area not immediately involved in the spill may be released for limited re-occupancy. Place barriers, such as warning tape, to prevent access to areas where the indicator powder will be spread. Barrier indicators should state: "Caution" and Mercury Spill Area, Do not Enter".

6.5 **Indicator Powder test:** Spread the indicator powder in a thin film over the entire surface of the spill area and extend at least six inches beyond areas cleaned on all sides.

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- Be sure to spread powder into cracks and crevices and low spots. Minimize dust generation when spreading the powder.
- If furniture is involved, first test the area with the furniture in its typical location.
- If a cabinet or desk is in the affected area, (if needed), remove the lower cabinet drawers to access the space behind cabinet kickboards, if appropriate.
- Allow the indicator powder to set on the surfaces. Strong positives response (change to black) may occur as soon as 5 minutes.
- After **24 hours**, if no color change is seen in the powder (i.e. change from white to pink, orange, or black in any part of the powder), the surface “passes” the Indicator powder test.
- For vertical surfaces suspected of contamination, mix the powder with water and “paint” on surfaces.
- If items were sitting on a contaminated surface, after performing the above steps, move the items onto plastic and retest the area under their original location to determine if any mercury had spread under the item.

#### Summary of Test Criteria

Sample Media	BNL Passing Criteria
Air	<0.01 mg/m <sup>3</sup> (as an instantaneous reading)
Indicator Powder	No color change (does NOT change from white to pink, orange, or black)

Note: The OSHA Ceiling is 0.1 mg/m<sup>3</sup> and it must be met also

- 6.6 After the test, have the indicator powder removed from surfaces with a mercury designated HEPA vacuum by the appropriate personnel. After clean up of the indicator powder, the area may be released for re-occupancy. Handle the powder residue in the vacuum cleaner as per instructions by the EWMSD.
- 6.7 If the area fails either the *Indicator Powder* test or the *Airborne Vapor* test, have the appropriate personnel repeat the approved clean-up procedure. Then repeat the *Airborne Vapor* and *Indicator Powder* tests.
- 6.8 **Documentation:** Record the test results on the *BNL Mercury Spill Clearance Test Record* (Attachment 9.1) or an equivalent.

## 7.0 Implementation & Training

- 7.1 Only persons who thoroughly understand this procedure and have demonstrated competency to the satisfaction of their supervision should conduct this testing. Use Attachment 9.3 *Qualification Record and Job Performance Record* (or an equivalent method) to record the qualification of staff. A Challenge Exam may be used. Qualification should be verified on a 3-year basis.
- 7.2 Persons should be qualified to use the direct reading Meter via IH75100 and the meter operator Aid.

The only official copy is on-line at the SHSD IH Group website.  
 Before using a printed copy, verify that it is current by checking the document issue date on the website.

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7.3 Only persons who thoroughly understand the hazards of mercury and have completed Hazard Communication or Laboratory Standard training should conduct this testing.

## 8.0 References

8.1 JT Baker Instrument Manual.

## 9.0 Attachments:

- 9.1 *Mercury Spill Clearance Test Record*
- 9.2 MSDS of J. T. Baker Indicator Powder
- 9.3 Qualification Record and Job Performance Record
- 9.4 SHSD Environmental Evaluation of Mercury Spill- Area Clearance Testing

## 10.0 Procedure Documentation

ISM Review - Hazard Categorization	<input type="checkbox"/> High	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Low/Skill of the craft
Validation:	<input type="checkbox"/> Formal Walkthrough	<input checked="" type="checkbox"/> Desk Top Review	<input type="checkbox"/> SME Review

Rev	Revision History
0	New Procedure; Prepared By: R. Selvey 03/08/02, Reviewed By: J. Peters 03/12/02, Approved By: R. Selvey SHSD IH Group Leader 03/21/02
1	Revise format to Section 7 Implementation and Training. SME Reviewer/Date: R. Selvey, 08/26/04
2	Added JPM (Attachment 9.3). Changed text regarding color of indicator powder change and 24 hour test period as per JT Baker Instrument Manual. SME Reviewer/Date: R. Selvey, 09/08/04
3	Changes to Section 6.6 and 6.7 based on workers comments in training class. Add more info on type of vacuum cleaner and location to spread powder. Section 6.9 had text added for clarity on the clearance criteria. SME Reviewer/Date: R. Selvey 08/24/05
4	Updated link in Section 4.5. Updated format of Attachment 9.1. Added Attachment 9.4. SME Reviewer/Date: R. Selvey 02/09/09
5	Revised format of header and Section 10. Major review of content. Changes to text in Section 6 and 7. Reviewer: N. Bernholc 03/04/14.

The only official copy is on-line at the SHSD IH Group website.  
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<b>BROOKHAVEN NATIONAL LABORATORY</b> Safety & Health Services Division -- Industrial Hygiene Group	NUMBER: <h2 style="text-align: center; margin: 0;">IH75135 Attachment 9.1</h2>
SUBJECT: <h1 style="text-align: center; margin: 0;">Mercury Spill Clearance Testing Record</h1>	

DATE:	SURVEYOR(S):
-------	--------------

I. AREA INFORMATION		
DEPT:	BLDG:	ROOM:
Description of Spill and Area:		

II. AIRBORNE VAPOR SURVEY INFORMATION <span style="float: right;">Passing Criteria &lt;0.010 mg/m<sup>3</sup></span>		
INSTRUMENT:	MODEL:	SERIAL#:
FACTORY CALIBRATION DATE:	PRE-CAL: BY:	POST CAL: BY:
TIME	LOCATION	MERCURY READING mg/m <sup>3</sup>

III. INDICATOR POWDER TEST <span style="float: right;">Passing Criteria = no color change</span>
Spread powder over entire spill area, wait <b>12 hours</b> , observe color
<input type="checkbox"/> No color change detected (passing) <span style="margin-left: 100px;"><input type="checkbox"/> Color Change detected (from white to orange)</span>
Comments:

V. CONCLUSIONS & RECOMMENDATIONS	
<input type="checkbox"/> Area Passed Tests	<input type="checkbox"/> Test Failed
Comments:	
Area Release for Re-occupancy by: Name:	Date:
IH75135 Attachment 9.1 Rev: 2/09/09 <span style="float: right;">Return completed form to: IH Lab, Building 120</span>	

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.  
222 Red School Lane  
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151  
CHEMTREC: 1-800-424-9300

National Response in Canada  
CANUTEC: 613-996-6666

Outside U.S. and Canada  
Chemtrec: 703-527-3887

**NOTE:** CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# Mercury Indicator

MSDS Number: Z6056 --- Effective Date: 05/17/01

## 1. Product Identification

**Synonyms:** None

**CAS No.:** Not applicable to mixtures.

**Molecular Weight:** Not applicable to mixtures.

**Chemical Formula:** Proprietary Mixture

**Product Codes:** 4509

## 2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
------------	--------	---------	-----------

Cuprous Iodide	7681-65-4	1 - 50%	Yes
----------------	-----------	---------	-----

Sulfur	7704-34-9	1 - 50%	Yes
--------	-----------	---------	-----

Starch	9005-25-8	1 - 50%	Yes
--------	-----------	---------	-----

Silica, Amorphous	7631-86-9	1 - 50%	Yes
-------------------	-----------	---------	-----

Specific CAS No. for Silica, Amorphous is 112945-52-5 (Amorphous fumed silica)

## 3. Hazards Identification

### Emergency Overview

**WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. DUST MAY FORM FLAMMABLE OR EXPLOSIVE MIXTURE WITH AIR.**

**J.T. Baker SAF-T-DATA<sup>(tm)</sup>** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate

Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight

Contact Rating: 1 - Slight

Lab Protective Equip: GOGGLES; LAB COAT  
Storage Color Code: Orange (General Storage)

---

### **Potential Health Effects**

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Amorphous fumed silica does not contain crystalline silica.

**Inhalation:** May cause dryness and irritation to mucous membranes, nose, and throat. Symptoms may include coughing, sore throat, dyspnea, wheezing, and non-specific chest illnesses.

**Ingestion:** Major hazard is that of the copper iodide component, of which only trace amounts are moderately toxic. Symptoms may include burning pain in the mouth, esophagus, and stomach. Symptoms of copper poisoning include hemorrhagic gastritis, nausea, vomiting, abdominal pain, metallic taste, and diarrhea.

Ingestion of very large amounts of sulfur may cause sore throat, nausea, headache, and possibly unconsciousness in severe cases. May be converted into hydrogen sulfide in the intestine.

**Skin Contact:** Causes irritation to skin. Symptoms include redness, itching, and pain.

**Eye Contact:** Causes irritation, redness, and pain.

**Chronic Exposure:** Prolonged overexposure to sulfur dust can produce possible skin sensitization and permanent eye damage (clouding of the lens and chronic irritation). Prolonged inhalation can cause irritation of mucous membranes.

Chronic iodide overdoses have produced iodism. Headache, fever, sneezing, salivation, and skin rashes may occur. Prolonged or repeated exposure to dusts of copper salts may cause discoloration of the skin or hair, ulceration and perforation of the nasal septum, runny nose, metallic taste, and atrophic changes and irritation of the mucous membranes.

**Aggravation of Pre-existing Conditions:** Sensitive individuals can experience skin irritation from repeated exposure to sulfur dust. Allergenic responses can occur.

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## **4. First Aid Measures**

**Inhalation:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:** Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

**Skin Contact:** Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

**Eye Contact:** Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

## **5. Fire Fighting Measures**

### **Fire:**

Flash point: 207C (405F) OC

Autoignition temperature: 232C (450F)

(Listed values are for sulfur.)

Slight fire hazard when exposed to heat or flame. As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source. Contact with strong oxidizers may cause fire.

**Explosion:** Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

**Fire Extinguishing Media:** For fires involving sulfur, extinguish with dry chemical, sand, water spray, fog, or standard foam. If water is used, apply from as far a distance as possible. Use water spray to blanket fire, cool fire exposed containers, and to flush non-ignited spills or vapors away from fire. Solid streams of water should not be used because of possibility of dispersing dust clouds of sulfur in air.

**Special Information:** In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

## 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

---

## 7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, corrosion-proof, ventilated area away from moisture, sources of heat or ignition, combustibles and oxidizers. Protect against physical damage. Avoid dust formation and control ignition sources. Employ grounding, venting and explosion relief provisions in accord with accepted engineering practices in any process capable of generating dust and/or static electricity. Empty only into inert or non-flammable atmosphere. Emptying contents into a non-inert atmosphere where flammable vapors may be present could cause a flash fire or explosion due to electrostatic discharge. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product. Do Not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

---

## 8. Exposure Controls/Personal Protection

### Airborne Exposure Limits:

- OSHA Permissible Exposure Limit (PEL) -

Cuprous Iodide: 1 mg/m<sup>3</sup> (TWA) for copper dusts & mists as Cu

Amorphous Fumed Silica (nuisance dust): 15 mg/m<sup>3</sup> (total dust, TWA),  
5mg/m<sup>3</sup> (respirable fraction, TWA)

Starch: 15 mg/m<sup>3</sup> (total dust, TWA),

5 mg/m<sup>3</sup> (respirable fraction, TWA)

- ACGIH Threshold Limit Value (TLV) -

Cuprous Iodide: 1 mg/m<sup>3</sup> (TWA) for copper dusts & mists as Cu

Amorphous Fumed Silica ( dust containing no asbestos and < 1% crystalline silica for particulates not otherwise classified): 10 mg/m<sup>3</sup> (total dust, TWA)

3 mg/m<sup>3</sup> (respirable fraction, TWA)

Starch: 10 mg/m<sup>3</sup> (TWA), A4-not classifiable as human carcinogen

**Ventilation System:** A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):** If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

**Skin Protection:** Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

**Eye Protection:** Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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## 9. Physical and Chemical Properties

**Appearance:** White to yellow solid.  
**Odor:** No information found.  
**Solubility:** Negligible.  
**Specific Gravity:** No information found.  
**pH:** No information found.  
**% Volatiles by volume @ 21C (70F):** 0  
**Boiling Point:** No information found.  
**Melting Point:** No information found.  
**Vapor Density (Air=1):** Not applicable.  
**Vapor Pressure (mm Hg):** No information found.  
**Evaporation Rate (BuAc=1):** No information found.

## 10. Stability and Reactivity

**Stability:** Stable under ordinary conditions of use and storage.  
**Hazardous Decomposition Products:** Burning may release hydrogen iodide or iodine vapors and oxides of sulfur and carbon.  
**Hazardous Polymerization:** Will not occur.  
**Incompatibilities:** For Sulfur: chlorates, nitrates and other oxidizing agents. Halogens, carbides, zinc, tin, alkali metals, phosphorus, ammonia, ammonium nitrate, charcoal and many other substances.  
 For Cuprous Iodide: can explode when mixed with potassium or nitromethane. Copper salts promote the decomposition of hydrazine and sodium hypobromite; many form dangerous, explosive, acetylides.  
 For Amorphous Silica: hydrogen fluoride, fluorine, xenon hexafluoride, oxygen difluoride, and chlorine trifluoride. Substance can explode when wet and heated with magnesium.

**Conditions to Avoid:** Heat, flame, ignition sources, dusting and incompatibles.

## 11. Toxicological Information

**Toxicological Data:** For amorphous fumed silica: oral rat LD50: 3160 mg/kg. Investigated as a tumorigen and mutagen.  
**Carcinogenicity:** IARC category for silica, amorphous (7631-86-9) applies to silicas that may contain crystalline silica. The silica in this product is synthetic and does not contain crystalline silica.

-----\Cancer Lists\-----

---NTP Carcinogen---

Ingredient	Known	Anticipated	IARC Category
Cuprous Iodide (7681-65-4)	No	No	None
Sulfur (7704-34-9)	No	No	None
Starch (9005-25-8)	No	No	None
Silica, Amorphous (7631-86-9)	No	No	3

## 12. Ecological Information

**Environmental Fate:** No information found.  
**Environmental Toxicity:** No information found.

### 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

### 14. Transport Information

Not regulated.

### 15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----

Ingredient	TSCA	EC	Japan	Australia
Cuprous Iodide (7681-65-4)	Yes	Yes	Yes	Yes
Sulfur (7704-34-9)	Yes	Yes	No	Yes
Starch (9005-25-8)	Yes	Yes	No	Yes
Silica, Amorphous (7631-86-9)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----

--Canada--

Ingredient	Korea	DSL	NDSL	Phil.
Cuprous Iodide (7681-65-4)	Yes	Yes	No	Yes
Sulfur (7704-34-9)	Yes	Yes	No	Yes
Starch (9005-25-8)	Yes	Yes	No	Yes
Silica, Amorphous (7631-86-9)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----

-SARA 302- -----SARA 313-----

Ingredient	RQ	TPQ	List	Chemical Catg.
Cuprous Iodide (7681-65-4)	No	No	No	Copper compo
Sulfur (7704-34-9)	No	No	No	No
Starch (9005-25-8)	No	No	No	No
Silica, Amorphous (7631-86-9)	No	No	No	No

-----\Federal, State & International Regulations - Part 2\-----

-RCRA- -TSCA-

Ingredient	CERCLA	261.33	8(d)

-----	-----	-----	-----
Cuprous Iodide (7681-65-4)	No	No	No
Sulfur (7704-34-9)	No	No	No
Starch (9005-25-8)	No	No	No
Silica, Amorphous (7631-86-9)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No  
 SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No  
 Reactivity: No (Mixture / Solid)

**Australian Hazchem Code:** No information found.

**Poison Schedule:** S7

**WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: 2 Flammability: 1 Reactivity: 0

**Label Hazard Warning:** WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. DUST MAY FORM FLAMMABLE OR EXPLOSIVE MIXTURE WITH AIR.

**Label Precautions:**

Avoid contact with eyes, skin and clothing.

Avoid breathing dust.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Keep away from heat, sparks and flame.

Avoid dust cloud in presence of an ignition source.

**Label First Aid:** In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In all cases, get medical attention.

**Product Use:** Laboratory Reagent.

**Revision Information:** No changes.

**Disclaimer:**

\*\*\*\*\*

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\*\*\*\*\*

**Prepared by:** Environmental Health & Safety

Phone Number: (314) 654-1600 (U.S.A.)



# IH75135 Attachment 9.3 HP-IHP-75135

Environmental, Safety, Health & Quality Directorate  
SHSD Industrial Hygiene

## Mercury Spill- Area Clearance Testing Job Performance Measure (JPM) Completion Certificate

Candidate's Name	Life Number:
------------------	--------------

### Practical Skill Evaluation: Demonstration of Evaluation Methodology

Criteria	Qualifying Performance Standard	Unsat.	Recov.	Satisf.
<b>1. Hazard Analysis</b>	Understands the need to perform a hazard analysis of the area and potential exposure to the self as sampler and workers in the area.			
<b>2. Personal Protective Equipment</b>	Understands the need to be aware of the potential surface contamination, airborne levels of contaminants, radiological hazards, noise hazards, etc. Knows how to determine the need for PPE.			
<b>3. Sampling Equipment</b>	Knows where equipment needed for the procedure is located and how to properly sign it out.			
<b>6. Operating Parameters</b>	Knows the theory to establish operating parameters (safety envelope) for the equipment.			
<b>7. Documentation</b>	Demonstrates correctly filling out IH monitoring forms.			

### IH Procedure Details - Practical Skill Evaluation: Demonstration of Methodology

Criteria	Qualifying Performance Standard	Unsat.	Recov.	Satisf.
<b>1. Spreading of indicator powder</b>	Demonstrates placing a thin film of powder on spill surfaces. Correct technique and areas			
<b>2. Observation of mercury presence</b>	Knows the proper waiting period. Knows the color change that indicates the presence of mercury.			
<b>3. Airborne vapor testing</b>	Is qualified on procedure 75530 Jerome 431X <ul style="list-style-type: none"> <li>▪ Turning the Meter On and Off</li> <li>▪ Calibration of the Meter</li> <li>▪ Clearing Stored data</li> <li>▪ Operation of taking a reading</li> <li>▪ Downloading stored data</li> <li>▪ Clearing data after downloading</li> </ul>			

I accept the responsibility for performing this task as demonstrated within this JPM and the corresponding SOP.

Candidate Signature:	Date:
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I certify the candidate has satisfactorily performed each of the above listed steps and is capable of performing the task unsupervised.

Evaluator Signature:	Date:
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**SHSD Environmental Evaluation  
Of Mercury Spill- Area Clearance Testing**

<p><b>Operation Description:</b> In the event of a mercury spill at BNL, the IH Group has prepared a plan for testing the spill area to determine if the area can be re-occupied. The IH procedure calls for spreading a “Mercury Indicator” which is a dry powder mixture of Cuprous Iodide, Sulfur, Starch, and Silica. In the presence of mercury, the indicators changes color.</p>	
<p><b>Frequency of Operation:</b> 0-1 times per year</p>	
<p><b>Environmental impact:</b></p> <p>At end of the test, the “Mercury Indicator” is vacuumed by the Plant Engineering staff who are abating the incident. The powder disposal is via EPD along with the collected mercury and adsorbents by Plant Engineering. The spill clean up procedure is documented in IHG SOP 75135.</p>	
<p><b>Waste Disposal:</b></p> <p>Indicating powder disposal is via EPD.</p> <p>Used PPE is disposed of through EPD instruction.</p>	