



Attachment H

**DEPARTMENT OF HEALTH & HUMAN SERVICES**

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National Institute for Occupational  
Safety and Health (NIOSH)

1095 Willowdale Road

**Public Health Service**

Centers for Disease Control  
and Prevention (CDC)

Morgantown, WV 26505-2888

{**FIRST NAME**} {**LAST NAME**}

{**ADDRESS**}

{**CITY**}, {**STATE**} {**ZIP CODE**}

{**TODAY=S DATE**}

Dear Ms. / Mr. {**LAST NAME**}:

Thank you for participating in the medical testing conducted by the National Institute for Occupational Safety and Health (NIOSH) at Umicore Thin Film Products in Providence, Rhode Island on {**TestDate**}. Enclosed are the results of your blood tests. The results of your inflammation tests were {**InflamInterp**}. The result of your indium test was {**MetalInterp**}.

The actual values from your tests are enclosed with this letter. You should provide this information to your personal physician, so that it may be added to your medical records. Any abnormal test results should not be considered a diagnosis of disease; that determination can only be made by your personal physician following a complete medical evaluation. It is important to note that these blood tests were conducted as part of a research study. Information about many of these tests is limited, particularly in terms of what is expected in someone who works with indium compounds. Below you will find additional details about each test.

**Explanation of Test Results**

**Inflammation Tests**

The purpose of these blood tests is to measure the levels in the blood of markers of general and lung-specific inflammation.

IL-6, IL-8, TNF, and YKL-40 can be elevated with inflammation in the lungs or inflammation in other organs of the body. YKL-40 can be elevated in a rare lung disease called pulmonary alveolar proteinosis, as well as in other diseases. Pulmonary alveolar proteinosis has occurred in some people who worked with indium compounds including indium-tin oxide.

KL-6 and surfactant protein D (SP-D) can be elevated with inflammation in the lungs. KL-6 and SP-D have been found to be elevated in some people who worked with indium compounds including indium-tin oxide. They can also be elevated in other lung diseases.

The enclosed report entitled "Report of Blood Test Findings" gives the values from your inflammation tests under the heading "Inflammatory Markers." [INFLAM OPTIONS]

### **Metal Test**

The purpose of this blood test is to measure the level of indium in the blood.

Indium is not common in outdoor air, soil, food, or water. The main source of exposure is the workplace. Indium is thought to enter the bloodstream mainly from inhalation. Many different indium compounds can contribute to elevated indium levels in the blood. Some of these compounds, such as indium-tin oxide, appear to be more toxic than others. The indium blood test that is available does not tell us which indium compounds a person has been exposed to.

Indium has been found to be elevated in the blood of some people who worked with indium compounds and developed lung disease. A Japanese study reported that an indium level in the blood of 3 micrograms per liter (mcg/L) or greater is a risk factor for lung disease. However, not everyone with elevated indium levels has developed lung disease. We do not know why some people with elevated indium levels develop lung disease and others do not. It may be due to the types of indium compounds a person was exposed to, individual susceptibility, or other factors. We do not know the long-term health effects of elevated indium levels in the blood.

We used an indium test that is more sensitive than the one used at Umicore in the past. With the old indium test, the lowest level of indium that could be detected was 5 mcg/L and levels below 11 mcg/L were often not reported. The test we used can detect indium when it is present in the blood at levels at least as low as 0.1 mcg/L. Since the new test is more sensitive for indium, it is possible that a person could have had a

“normal” result with the old test and now has an “elevated” result with the new test, even if the amount of indium in the blood did not change between the two tests.

The enclosed report entitled "Report of Blood Test Findings" gives the value from your indium test under the heading “Metal.” [INDIUM OPTIONS]

Again, thank you for your participation in this survey. Moving forward, we plan to examine these blood test results in relation to the results of the other medical testing and the air testing that we have conducted at Umicore. By looking at the results on a group level, we may be able to learn more about the possible health effects of working with the materials used at Umicore Thin Film Products. We will share any findings with Umicore and its employees as they become available.

If you have questions about your results, please feel free to contact our office at 1-800-232-2114.

Sincerely,

Kristin J. Cummings, MD, MPH  
Medical Officer  
Field Studies Branch  
Division of Respiratory Disease Studies



## PARAGRAPH #1 OPTIONS

{*TestDate*} = date test performed

{*InflamInterp*}=

- (1) within normal limits.
- (2) abnormal.
- (3) not interpretable.

{*MetalInterp*}=

- (1) within normal limits.
- (2) abnormal.
- (3) not interpretable.

## **EXPLANATION OF TEST RESULTS OPTIONS**

### **[INFLAM OPTIONS]**

- (1) All of your inflammation tests were within normal limits.
- (2) One or more of your inflammation tests was abnormally elevated. This may indicate inflammation in your lungs or possibly other organs.
- (3) Unfortunately, one or more of your inflammation tests was not interpretable.

### **[INDIUM OPTIONS]**

- (1) Your indium level in the blood was below 0.1 mcg/L, which is the lowest level the laboratory can reliably measure.
- (2) Your indium level in the blood was between 0.1 mcg/L and 3.0 mcg/L, which is elevated. We do not know the short-term or long-term health effects of an indium level in this range.
- (3) Your indium level in the blood was 3.0 mcg/L or greater, which is elevated. In Japanese studies of people who worked with indium compounds, an indium level in the blood of 3 mcg/L or greater was a risk factor for lung disease.
- (4) Unfortunately, your indium test was not interpretable.

## Report of Blood Test Findings

Centers for Disease Control and Prevention  
National Institute for Occupational Safety and Health  
1095 Willowdale Road  
Morgantown, WV 26505

Participant Name

Test Date

### Inflammatory Markers

<u>Marker</u>	<u>Value</u>	<u>Reference Range</u>	<u>Interpretation</u>
IL-6		3-12.5 pg/ml	
IL-8		<31 pg/ml	
TNF		<16 pg/ml	
YKL-40		25-93 ng/ml (female) 24-125 ng/ml (male)	
KL-6		201-4020 U/ml	
Surfactant protein D (SP-D)		0-200 ng/ml	

### Metal

<u>Metal</u>	<u>Value</u>	<u>Reference Range</u>	<u>Interpretation</u>
Indium		<0.1 mcg/L	