



# Analytical Testing Report

## Indalloy 241

**Report Number: R-20180302-009**

Prepared for:

*Quan Sheng*

**Indium Corporation**

1676 Lincoln Avenue

Utica, NY 13503

P.O. #: N/A

March 16, 2018

**NSL Analytical Services, Inc.**  
**NSL Analytical**  
**4450 Cranwood Parkway**  
**Cleveland, Ohio 44128**  
**Phone: 216-438-5200**  
**Fax: 216-438-5050**

**Tests  
Requested:**

- European Directive 2015/863/EU Amending 2011 / 65 / EU Annex II (RoHS; Recasting 2001 / 95 / EC: Cadmium, Lead, Mercury, Hexavalent Chromium, Polybromobiphenyl (PBB), and Polybromodiphenylether (PBDE), (DIBP, DBP, BBP, DEHP) content.
- Antimony, Beryllium and Arsenic Content
- Total Halogen Content
- DnOP, DINP, DIDP, DnHP





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## Project Definition and Scope

European Directive 2015/863/EU Amending 2011 / 65 / EU Annex II (RoHS; Recasting 2001 / 95 / EC:

Cadmium, Lead, Mercury, Hexavalent Chromium, Polybromobiphenyl (PBB), and Polybromodiphenylether (PBDE) content.

Antimony, Beryllium, Arsenic Content, Total Halogen content.

DIBP, DBP, BBP, DEHP, DnOP, DINP, DIDP, DnHP content.

## Sample Identification

The sample was received on March 2<sup>nd</sup>, 2018 and is labeled as indicated below.

Sample Number	Client Label
S-180302-013	Indalloy 241

## Method

With reference to IEC 62321:2008: Chromium (VI) analysis was conducted by UV-Visible Spectroscopy. With reference to IEC 62321-6: 2015: PBB, PBDE analysis was conducted by Gas Chromatography – Mass Spectrometry (GC-MS).

With reference to IEC 62321-4: 2013: Mercury analysis was conducted by Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES).

With reference to IEC 62321-5: 2013: Lead, Cadmium and Chromium analysis was conducted by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).

Antimony, Beryllium and Arsenic analysis was conducted by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).

With reference to IEC62321-3-2: 2013, BS EN 14582, ASTM D 7359: Halogen analysis was conducted by Ion Chromatography and SIE.

With reference to IEC62321-8 and CPSC-CH-C1001-09.3: DIBP, DBP, BBP, DEHP, DnOP, DINP, DIDP, DnHP were analyzed by Gas Chromatography – Mass Spectrometry (GC-MS).

Results, Opinions, and Interpretations

**Table 1: RoHS Results**

Test Item	Results (mg/kg)	Detection Limit (mg/kg)	Reference Limit (mg/kg)
	Sample # S-180302-013		
Lead (Pb)	140	5	1000
Cadmium	ND	5	100
Chromium	ND	5	
Hexavalent Chromium (Cr(VI))	ND <sup>2</sup>	1	1000
Mercury (Hg)	ND	5	1000
<b>Sum of PBBs</b>	ND <sup>3</sup>	300	1000
Monobromobiphenyl	ND <sup>3</sup>	100	-
Dibromobiphenyl	ND <sup>3</sup>	100	-
Tribromobiphenyl	ND <sup>3</sup>	10	-
Tetrabromobiphenyl	ND <sup>3</sup>	10	-
Pentabromobiphenyl	ND <sup>3</sup>	10	-
Hexabromobiphenyl	ND <sup>3</sup>	10	-
Heptabromobiphenyl	ND <sup>3</sup>	10	-
Octabromobiphenyl	ND <sup>3</sup>	10	-
Nonabromobiphenyl	ND <sup>3</sup>	10	-
Decabromobiphenyl	ND <sup>3</sup>	10	-
<b>Sum of PBDEs</b>	ND <sup>3</sup>	300	1000
Monobromodiphenyl ether	ND <sup>3</sup>	100	-
Dibromodiphenyl ether	ND <sup>3</sup>	10	-
Tribromodiphenyl ether	ND <sup>3</sup>	10	-
Tetrabromodiphenyl ether	ND <sup>3</sup>	10	-
Pentabromodiphenyl ether	ND <sup>3</sup>	10	-
Hexabromodiphenyl ether	ND <sup>3</sup>	10	-
Heptabromodiphenyl ether	ND <sup>3</sup>	10	-
Octabromodiphenyl ether	ND <sup>3</sup>	10	-
Nonabromodiphenyl ether	ND <sup>3</sup>	50	-
Decabromodiphenyl ether	ND <sup>3</sup>	100	-

**Note:** ND = Not Detected

**Note:** mg/kg = ppm

**Note:** ND<sup>2</sup> = Total Chromium analysis by ICP-MS was not detected in the submitted samples. Therefore, Hexavalent Chromium determination by UV-Visible spectroscopy was not performed.

**Note:** ND<sup>3</sup> = Total Bromine by Ion Chromatography was determined to be < 250 ppm, therefore PBB and PBDE analysis by Gas Chromatography – Mass Spectrometry was not performed.

**Table 2: Antimony, Beryllium and Arsenic Content**

Test Item	Results (mg/kg)	Detection Limit (mg/kg)
	Sample # S-180302-013	
Antimony (Sb)	110	5
Beryllium (Be)	ND	5
Arsenic (As)	ND	5

**Table 3: Halogen Content**

Test Item	Results (mg/kg)	Detection Limit (mg/kg)
	Sample # S-180302-013	
Chlorine (Cl)	ND	10
Bromine (Br)	ND	10
Fluorine (F)	ND	10
Iodine (I)	ND	10

**Table 4: Phthalates Results**

Test Item	Results (mg/kg)	Detection Limit (mg/kg)	Reference Limit (mg/kg)
	Sample # S-180302-013		
DIBP	ND	100	
DBP	ND	100	1000
BBP	ND	100	1000
DEHP	ND	200	1000
DnOP	ND	100	1000
DINP	ND	500	1000
DIDP	ND	500	1000
DnHP	ND	100	

Note: ND = Not Detected      Note: mg/kg = ppm

If you have any questions regarding these results, please contact us.

Report Prepared By: Roxanne Skinner



Carm D'Agostino-Technical Services  
cdagostino@nslanalytical.com

Process Flow – Analytical Methods for Chemical Analysis

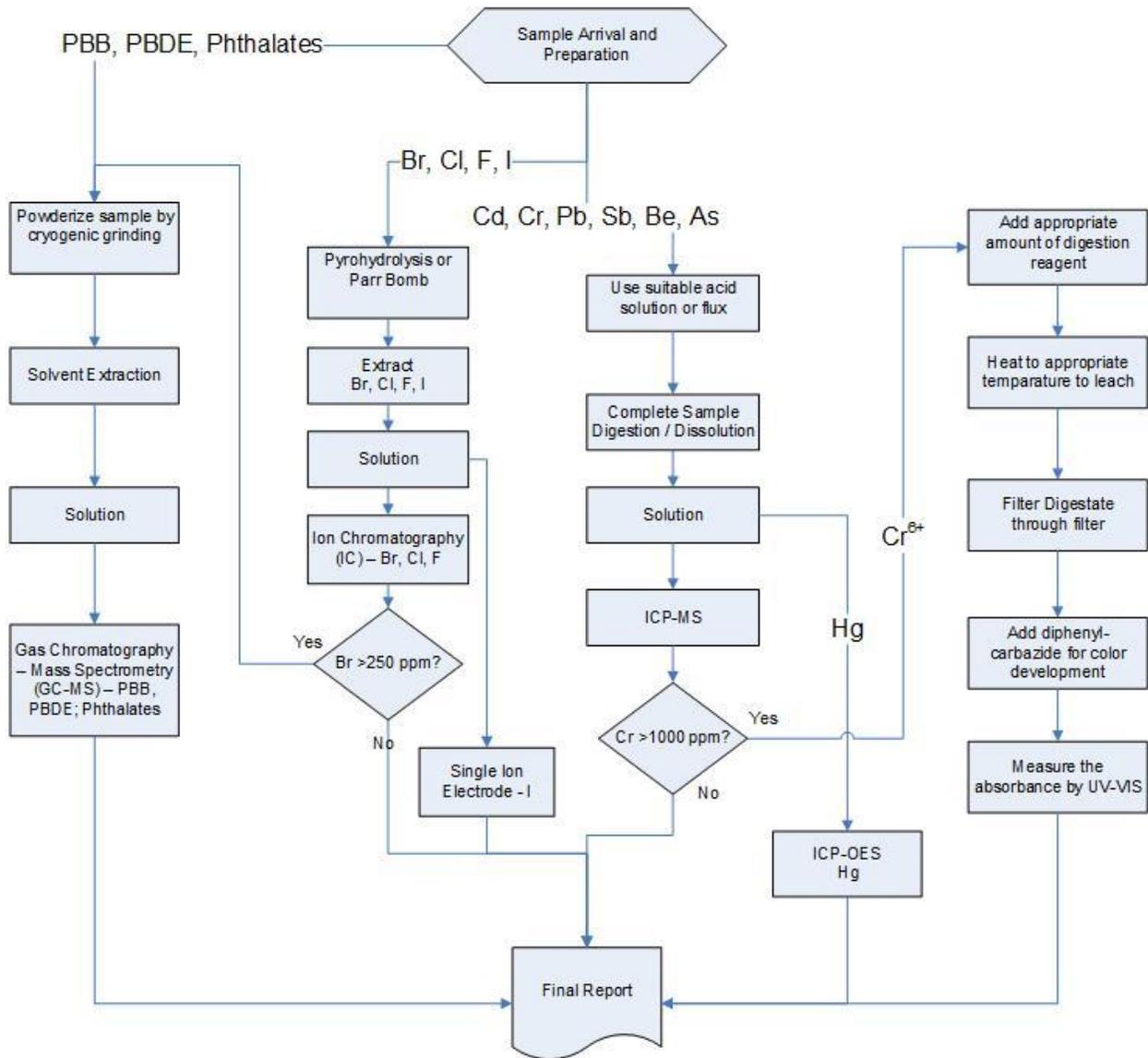


Photo: Sample # S-180302-013

**Indium - SERVICE REQUEST FORM**  
**Restricted Substance Testing for E&E Products** CONTRACT REVIEW

Request Service:  5 days; Rush Service:  2 day;  3 day 1630 1/2018 16/22

Client Requesting NSL Service

Company Name: **INDIUM CORPORATION OF AMERICA**

Invoice: Address: 1676 Lincoln Ave. Report: Address:  Same as billing address  
P. O. Box 269 UICA, New York 13503 Contact Name:  
Contact Name: **Quan Sheng** Telephone:  
Telephone: 315-853-4900 ext. 7663 Email:  Ready for testing  
Email: **qsheng@indium.com**

Sample Information

Sample Description: **Indalloy 241** PO #: **SP19543** Location: **BFD**  
Color: Sample/Style No:  
Special Instructions: **Powder Composition: Sn95.5/Ag3.8/Cu0.7** Contain BE: **No**  
Photo of material not the jar.  
Re-test Sample: \_\_\_\_\_ If yes, provide previous report number:

NSL Service(s) Required: Please check appropriate line(s) below:  
**[Analyze the submitted sample(s) per NSL Quote #108243 Revision 2]**

**RoHS: Full Package IEC 62321**  **Phthalates: DEHP, DBP, DINP, DIDP, DNOP, BBP, DIBP, DnHP**  
 Cadmium (Cd)  HBCD  
 Lead (Pb)  High Concentration  XRF Testing (please list substances)  
 Low Concentration  PFOS/PFOA  
 Mercury (Hg) Packaging Test:  TPCH (packaging): Pb, Cd, Hg, Cr VI  
 PBBs and PBDEs Halogens:  
 Chromium VI (Cr VI)  Chlorine (Cl)  Bromine (Br)  
 Antimony  Beryllium  Arsenic  Iodine (I)  Fluorine (F)  
Other tests (please specify Analyte/Method): \_\_\_\_\_

Photos Required  Flow Chart  Other Reporting Instruction: No result Conclusion on Report Cover Page

NSL Customer Service Representative: \_\_\_\_\_ NSL Sales Contact: \_\_\_\_\_  
NSL Analytical Services Inc. Return Sample Immediately; If return please  
4450 Cranwood Parkway provide shipping account number.  
Cleveland, OH 44128  Destroy/Disard Sample after 90 days  
Phone: 1-216-438-5200  
Fax: 1-216-438-5050

Client Confirmation: We confirm that the above information is complete and understand that the performances of the services described are governed by NSL General Conditions of Service.  
Authorized Signature: Quan Sheng Date: 3/16/2018

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