



# Analytical Testing Report

Indalloy 171 with NC-SMQ75

**Report Number: R-20200429-060**

Prepared for:

*Cliff Talbot*

**Indium Corporation**

1676 Lincoln Avenue

Utica, NY 13503

P.O. #: NA

May 14, 2020

**NSL Analytical Services, Inc.**  
**NSL Analytical**  
**4450 Cranwood Parkway**  
**Cleveland, Ohio 44128**  
**Phone: 216-438-5200**  
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**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 and Sulfur Content
- HBCDD, DnOP, DINP, DIDP, DnHP
- PFOA, PFOS





**Contents**

Project Definition and Scope ..... 3

Sample Identification ..... 3

Method ..... 3

    Table 1: RoHS Results ..... 4

    Table 2: Antimony, Beryllium and Arsenic Content ..... 5

    Table 3: Halogen and Sulfur Content ..... 5

    Table 4: Phthalates Results ..... 5

    Table 5: HBCDD Results ..... 6

    Table 6: PFOA and PFOS Content ..... 6

Process Flow – Analytical Methods for Chemical Analysis ..... 7

    Photo: Sample # S-200429-107 ..... 8

## 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 and Sulfur content.

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

PFOA, PFOS content.

## Sample Identification

The sample was received on April 29<sup>th</sup>, 2020 and is labeled as indicated below.

Sample Number	Client Label
S-200429-107	Indalloy 171 with NC-SMQ75

## Method

With reference to IEC 62321-7-2: 2017: 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 and Sulfur 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).

HBCDD analysis was conducted by Gas Chromatography-Mass Spectrometry (GC-MS).

PFOA and PFOS attained by calculation from Fluoride and Sulfur analysis.

**Table 1: RoHS Results**

Test Item	Results (mg/kg)	Detection Limit (mg/kg)	Reference Limit (mg/kg)
	Sample # S-200429-107		
Lead (Pb)	852000	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-200429-107	
Antimony (Sb)	21	5
Beryllium (Be)	ND	5
Arsenic (As)	ND	5

**Table 3: Halogen and Sulfur Content**

Test Item	Results (mg/kg)	Detection Limit (mg/kg)
	Sample # S-200429-107	
Chlorine (Cl)	ND	10
Bromine (Br)	ND	10
Fluorine (F)	ND	10
Iodine (I)	ND	10
Sulfur (S)	ND	10

**Table 4: Phthalates Results**

Test Item	Results (mg/kg)	Detection Limit (mg/kg)	Reference Limit (mg/kg)
	Sample # S-200429-107		
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	

**Table 5: HBCDD Results**

Test Item	Results (mg/kg)	Detection Limit (mg/kg)	Reference Limit (mg/kg)
	Sample # S- 200429-107		
HBCDD	ND	100	

**Table 6: PFOA and PFOS Content**

Test Item	Results (mg/kg)	Detection Limit (mg/kg)
	Sample # S- 200429-107	
PFOA	ND <sup>4</sup>	ND = <20
PFOS	ND <sup>5</sup>	ND = <150

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

Note: ND<sup>4</sup> = Total F by Ion Chromatography was determined to be < 10 ppm, therefore PFOA was determined by calculation to be <20 ppm

Note: ND<sup>5</sup> = Total F by Ion Chromatography was determined to be < 10 ppm and total S by Ion Chromatography was determined to be <10ppm, therefore PFOS was determined by calculation to be <150 ppm

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

Report Prepared By: Jonathan Crandall



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

### Process Flow - Analytical Methods for Chemical Analysis

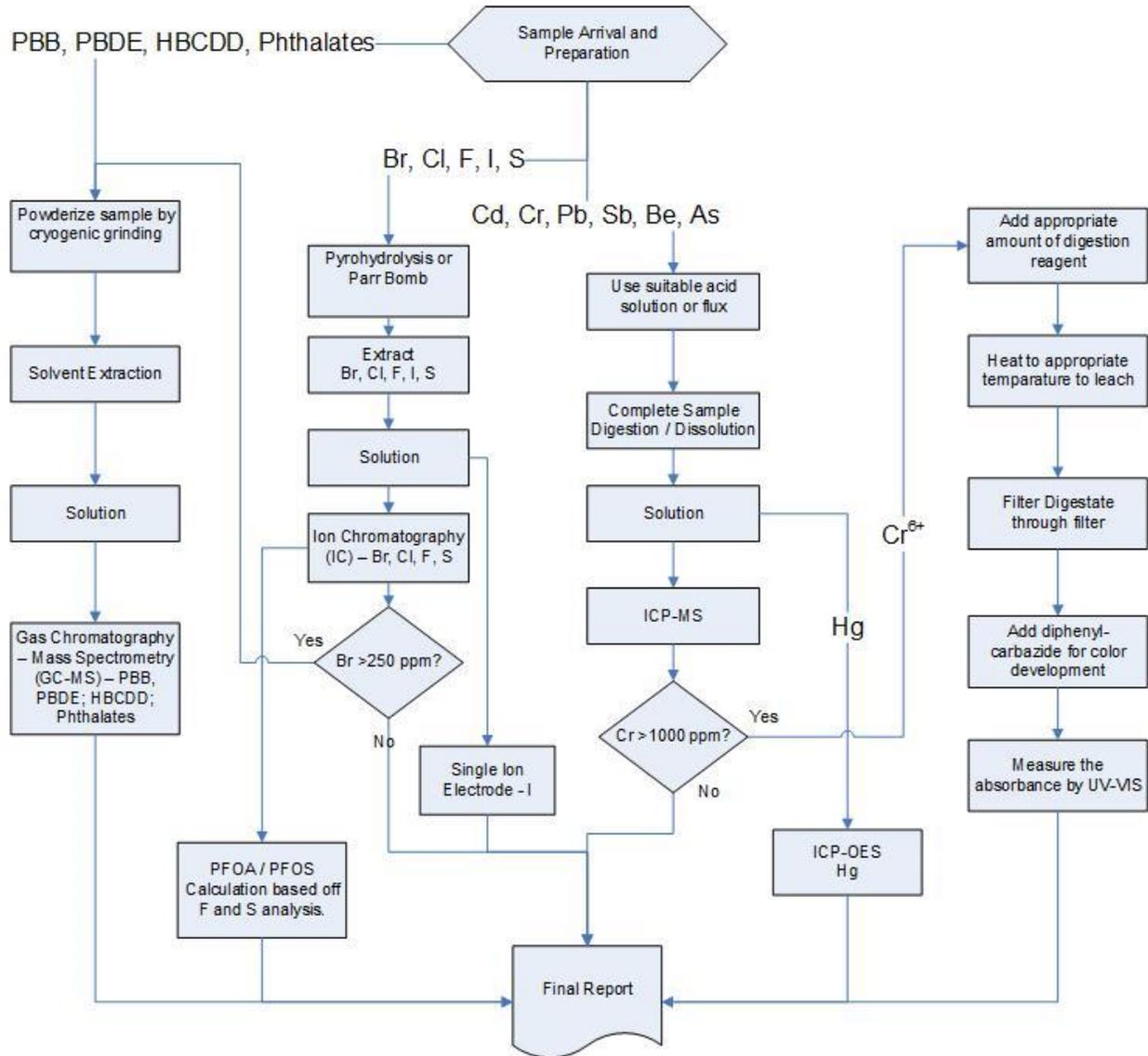


Photo: Sample # S-200429-107

APR 29 10:13

**Indium – SERVICE REQUEST FORM**

**Restricted Substance Testing for E&E Products** CONTRACT REVIEW

Client Requesting NSL Service

Request Service:  5 days; Rush Service: \_\_\_ 2 days; \_\_\_ 3 days

Company Name: **INDIUM CORPORATION**

Invoice: Address: 1676 Lincoln Ave. Report: Address:  Same as billing address  
P. O. Box 269  
Utica, New York 13503  
Contact Name: Cliff Talbot  
Telephone: 315-853-4900 ext. 7415  
Email: ctalbot@indium.com

my 4/29/20  
502 9167  
R-060

Ready for testing

**Sample Information**

Sample Description: **Indalloy 171 with NC-SMQ75** PO #: **EP21471** Location: **ECD**  
Color: \_\_\_\_\_  
Special Instructions: **Powder Composition: Pb95/Sn5** Contain Phthalates: **No**  
Photo of material not in the jar. Contain Bromine: **No**

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 Number: NSLQ4281-03: line 1, 3)**

<input checked="" type="checkbox"/> RoHS: Full Package IEC 62321	<input checked="" type="checkbox"/> Phthalates: DEHP, DBP, DINP, DIDP, DNOP, BBP, DIBP, DnHP
<input type="checkbox"/> Cadmium (Cd)	<input checked="" type="checkbox"/> HBCDD
<input checked="" type="checkbox"/> Lead (Pb) <input checked="" type="checkbox"/> High Concentration	<input type="checkbox"/> XRF Testing (please list substances)
<input type="checkbox"/> Low Concentration	<input checked="" type="checkbox"/> PFOS/PFOA
<input type="checkbox"/> Mercury (Hg)	Packaging Test: ___ TPCH (packaging): Pb, Cd, Hg, Cr VI
<input type="checkbox"/> PBBs and PBDEs	Halogens:
<input type="checkbox"/> Chromium VI (Cr VI)	<input checked="" type="checkbox"/> Chlorine (Cl) <input checked="" type="checkbox"/> Bromine (Br)
<input checked="" type="checkbox"/> Antimony <input checked="" type="checkbox"/> Beryllium <input checked="" type="checkbox"/> Arsenic	<input checked="" type="checkbox"/> Iodine (I) <input checked="" type="checkbox"/> Fluorine (F)

Other tests (please specify Analysis/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.  
4450 Cranwood Parkway  
Cleveland, OH 44128  
Phone: 1-216-438-5200  
Fax: 1-216-438-5050

\_ Return Sample Immediately; if returned please provide shipping account number.  
 Destroy/Discard Sample after 90 days

Sample #: **S-200429-107**

Customer: Indium Corporation of America

Request: R-20200429-060

Lab Areas: WCP, AC, ICP, MS, ORG

... information is complete and understand that the