



Analytical Testing Report

Indalloy 171 with NC-SMQ75

Report Number: R-20200429-060

Prepared for:

Cliff Talbot

Indium Corporation

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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



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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 and Sulfur content.

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

PFOA, PFOS content.

Sample Identification

The sample was received on April 29th, 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) Sample # S-200429-107	Detection Limit (mg/kg)	Reference Limit (mg/kg)
Lead (Pb)	852000	5	1000
Cadmium	ND	5	100
Chromium	ND	5	
Hexavalent Chromium (Cr(VI))	ND ²	1	1000
Mercury (Hg)	ND	5	1000
Sum of PBBs	ND ³	300	1000
Monobromobiphenyl	ND ³	100	-
Dibromobiphenyl	ND ³	100	-
Tribromobiphenyl	ND ³	10	-
Tetrabromobiphenyl	ND ³	10	-
Pentabromobiphenyl	ND ³	10	-
Hexabromobiphenyl	ND ³	10	-
Heptabromobiphenyl	ND ³	10	-
Octabromobiphenyl	ND ³	10	-
Nonabromobiphenyl	ND ³	10	-
Decabromobiphenyl	ND ³	10	-
Sum of PBDEs	ND ³	300	1000
Monobromodiphenyl ether	ND ³	100	-
Dibromodiphenyl ether	ND ³	10	-
Tribromodiphenyl ether	ND ³	10	-
Tetrabromodiphenyl ether	ND ³	10	-
Pentabromodiphenyl ether	ND ³	10	-
Hexabromodiphenyl ether	ND ³	10	-
Heptabromodiphenyl ether	ND ³	10	-
Octabromodiphenyl ether	ND ³	10	-
Nonabromodiphenyl ether	ND ³	50	-
Decabromodiphenyl ether	ND ³	100	-

Note: ND = Not Detected

Note: mg/kg = ppm

Note: ND² = 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: ND³ = 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 ⁴	ND = <20
PFOS	ND ⁵	ND = <150

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

Note: ND⁴ = Total F by Ion Chromatography was determined to be < 10 ppm, therefore PFOA was determined by calculation to be <20 ppm

Note: ND⁵ = 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



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Process Flow – Analytical Methods for Chemical Analysis

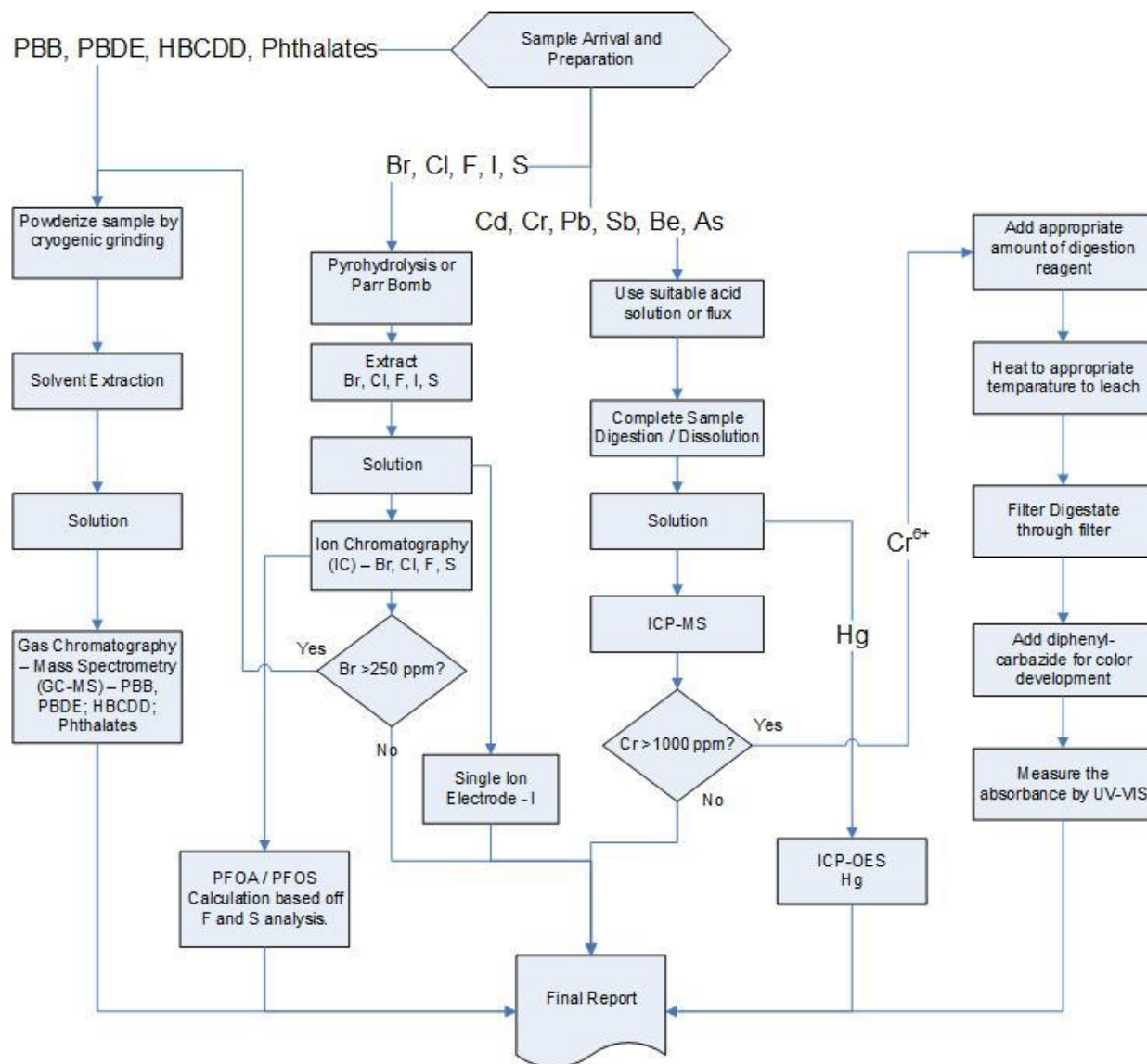


Photo: Sample # S-200429-107

APR 29 10:13

Indium – SERVICE REQUEST FORM

Restricted Substance Testing for E&E Products

CONTRACT REVIEW
my 4/29/20

Client Requesting NSL Service

Request Service: ☒ 5 days; Rush Service: ☐ 2 days; ☐ 3 days

Company Name: **INDIUM CORPORATION**

Invoice: Address: 1676 Lincoln Ave.
P. O. Box 269
Utica, New York 13503

Contact Name: Cliff Talbot
Telephone: 315-853-4900 ext. 7415
Email: ctalbot@indium.com

Report: Address: ☒ Same as billing address
Contact Name:
Telephone:
Email:

☒ Ready for testing

Sample Information

Sample Description: **Indalloy 171 with NC-SMQ75** PO #: **EP21471** Location: **ECD**

Color: **Contain Phthalates: No**

Special Instructions: **Powder Composition: Pb95/Sn5** **Contain Bromine: 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 Number: **NSLQ4281-03: line 1, 3**)

☒ RoHS: Full Package IEC 62321 ☒ Phthalates: DEHP, DBP, DINP, DIDP, DNOP, BBP, DIBP, DnHP

☐ Cadmium (Cd) ☒ HBCDD

☒ 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 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. ☐ Return Sample Immediately; if returned please provide shipping account number.

4450 Cranwood Parkway ☒ Destroy/Discard Sample after 90 days

Cleveland, OH 44128

Phone: 1-216-438-5200

Fax: 1-216-438-5050

Indalloy 171 with NC-SMQ75

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

Customer: Indium Corporation of America

Request: R-20200429-060

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