

Test Report

No. : KA/2020/42002

Date : 2020/05/14

Page : 1 of 6

NITTO DENKO CORPORATION

919, FUKE-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

The following sample(s) was/were submitted and identified by/on behalf of the applicant as :

Sample Submitted By : NITTO DENKO CORPORATION
 Sample Description : MOLDING COMPOUND FOR OPTICAL SEMICONDUCTOR
 Style/Item No. : NT-8500 SERIES
 Sample Receiving Date : 2020/04/28
 Testing Period : 2020/04/28 to 2020/05/04

Test Requested : As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs contents in the submitted sample.

Test Result(s) : Please refer to next page(s).

Ray Chang
 Ray Chang Ph.D. / Manager
 Signed for and on behalf of
 SGS Taiwan Limited
 Chemical Laboratory-Kaohsiung



PIN CODE: 03DC8DE4

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NITTO DENKO CORPORATION
919, FUKU-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

Test Result(s)

PART NAME No.1 : WHITE MOLDING COMPOUND FOR OPTICAL SEMICONDUCTOR

Test Item(s)	Unit	Method	MDL	Result No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	n.d.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-OES.	2	n.d.
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321-7-2:2017 and performed by UV-VIS.	8	n.d.
Sum of PBBs	mg/kg	With reference to IEC 62321-6:2015 and performed by GC/MS.	-	n.d.
Monobromobiphenyl			5	n.d.
Dibromobiphenyl			5	n.d.
Tribromobiphenyl			5	n.d.
Tetrabromobiphenyl			5	n.d.
Pentabromobiphenyl			5	n.d.
Hexabromobiphenyl			5	n.d.
Heptabromobiphenyl			5	n.d.
Octabromobiphenyl			5	n.d.
Nonabromobiphenyl			5	n.d.
Decabromobiphenyl			5	n.d.
Sum of PBDEs	mg/kg	With reference to IEC 62321-6:2015 and performed by GC/MS.	-	n.d.
Monobromodiphenyl ether			5	n.d.
Dibromodiphenyl ether			5	n.d.
Tribromodiphenyl ether			5	n.d.
Tetrabromodiphenyl ether			5	n.d.
Pentabromodiphenyl ether			5	n.d.
Hexabromodiphenyl ether			5	n.d.
Heptabromodiphenyl ether			5	n.d.
Octabromodiphenyl ether			5	n.d.
Nonabromodiphenyl ether			5	n.d.
Decabromodiphenyl ether			5	n.d.

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NITTO DENKO CORPORATION

919, FUKU-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated

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Test Report

No. : KA/2020/42002

Date : 2020/05/14

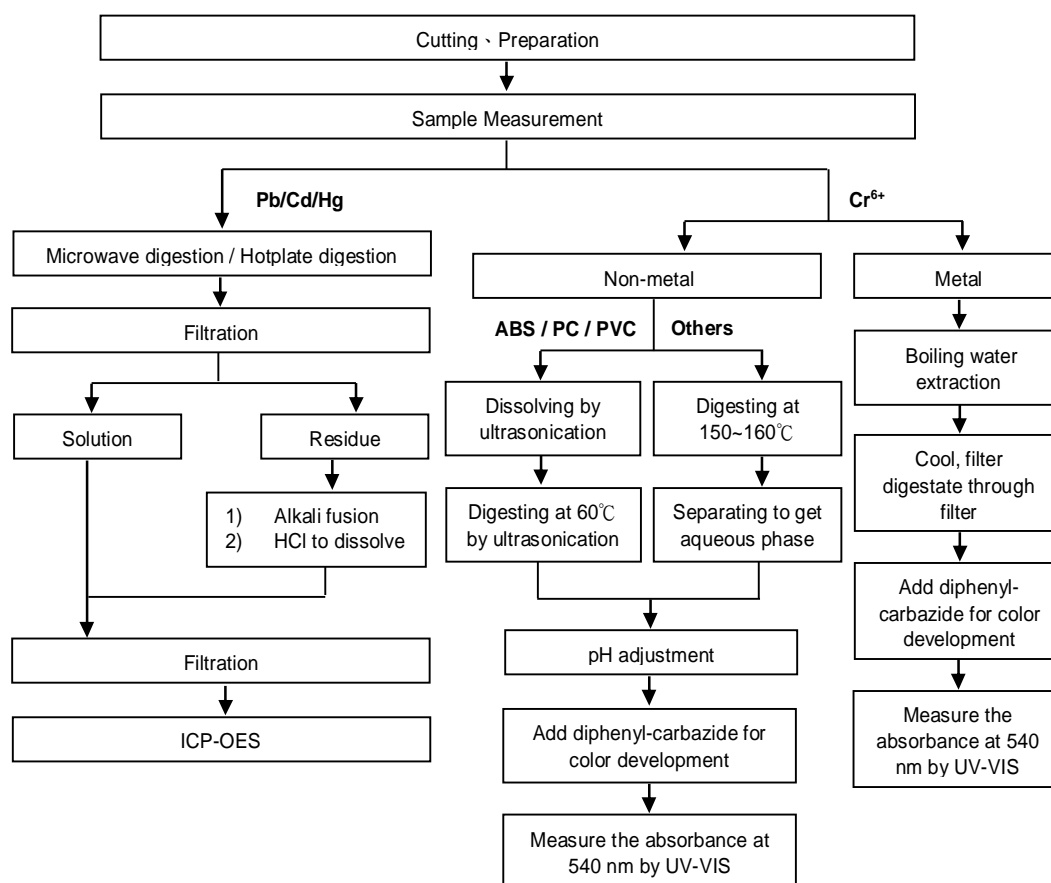
Page : 4 of 6

NITTO DENKO CORPORATION

919, FUKE-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)



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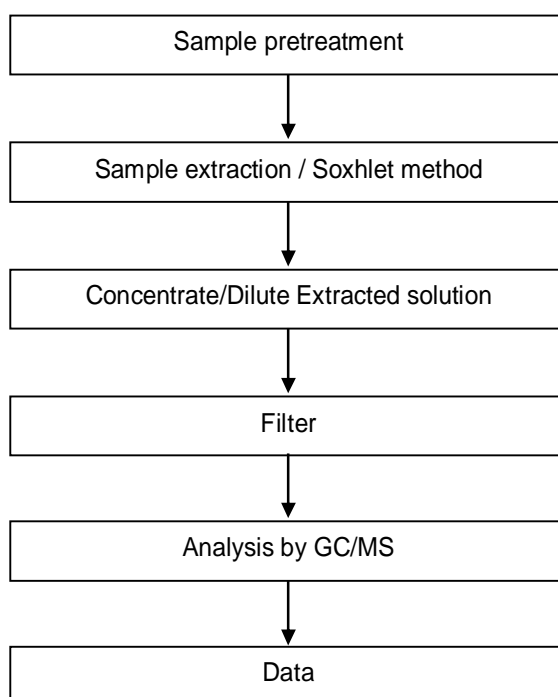
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NITTO DENKO CORPORATION

919, FUKE-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

PBB/PBDE analytical FLOW CHART



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No. : KA/2020/42002

Date : 2020/05/14

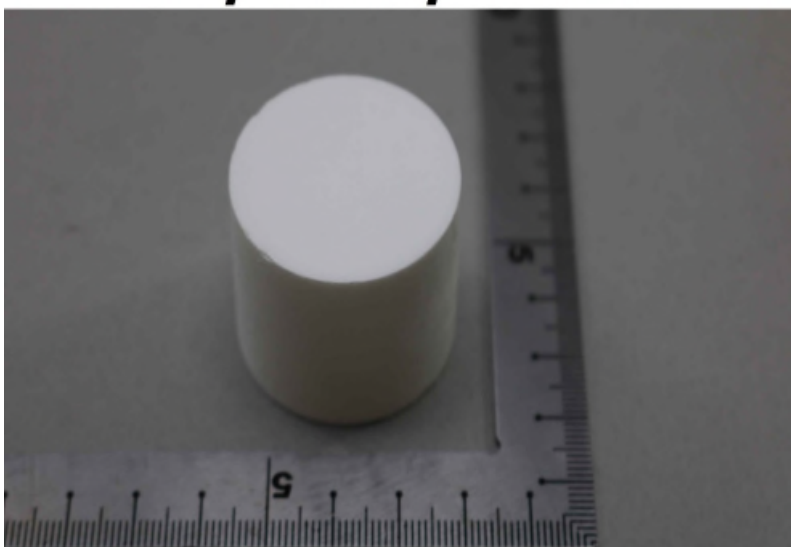
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NITTO DENKO CORPORATION

919, FUKE-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

* The tested sample / part is marked by an arrow if it's shown on the photo. *

KA/2020/42002



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Test Report

No. : KA/2020/51062

Date : 2020/05/14

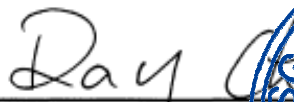
Page: 1 of 4


NITTO DENKO CORPORATION
919, FUKU-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

The following sample(s) was/were submitted and identified by/on behalf of the client as :

Sample Submitted By : NITTO DENKO CORPORATION
Sample Description : MOLDING COMPOUND FOR OPTICAL SEMICONDUCTOR
Style/Item No. : NT-8500 SERIES
Sample Receiving Date : 2020/05/11
Testing Period : 2020/05/11 to 2020/05/12

Test Requested : As specified by client, to test Halogen-Fluorine, Chlorine, Bromine, Iodine in the submitted sample(s).
Test Result(s) : Please refer to next page(s).


Ray Chang Ph.D. / Manager
Signed for and on behalf of
SGS Taiwan Limited
Chemical Laboratory-Kaohsiung




PIN CODE: 36AD61D9

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No. : KA/2020/51062

Date : 2020/05/14

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NITTO DENKO CORPORATION
919, FUKE-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

Test Result(s)

PART NAME NO.1 : WHITE MOLDING COMPOUND FOR OPTICAL SEMICONDUCTOR

Test Item (s)	Unit	Method	MDL	Result
				No.1
Halogen				
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	602
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.

Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit

Test Report

No. : KA/2020/51062

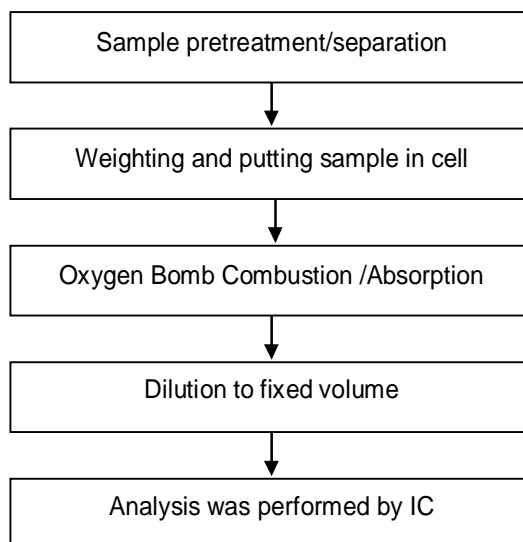
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NITTO DENKO CORPORATION

919, FUKU-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

Analytical flow chart of Halogen



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Test Report

No. : KA/2020/51062

Date : 2020/05/14

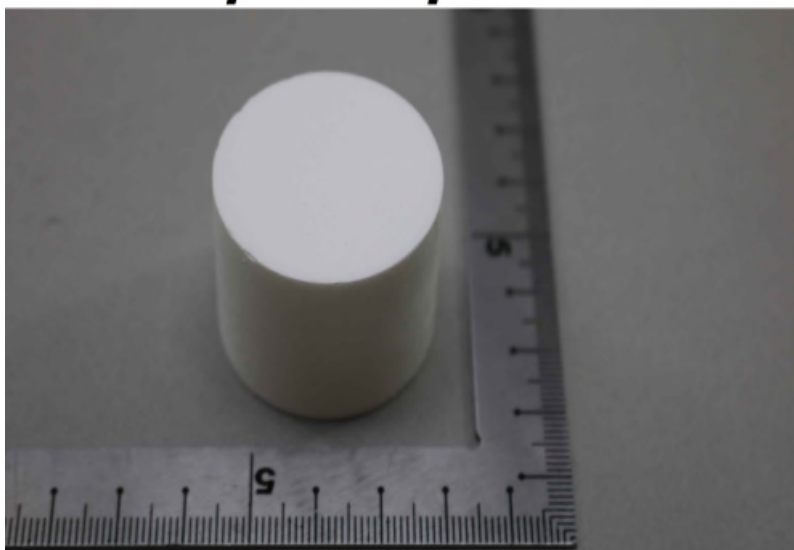
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NITTO DENKO CORPORATION

919, FUKE-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

* The tested sample / part is marked by an arrow if it's shown on the photo. *

KA/2020/51062



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Test Report

No. : KA/2020/42018

Date : 2020/05/14

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NITTO DENKO CORPORATION

919, FUKE-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

The following sample(s) was/were submitted and identified by/on behalf of the client as :

Sample Submitted By : NITTO DENKO CORPORATION
 Sample Description : MOLDING COMPOUND FOR OPTICAL SEMICONDUCTOR
 Style/Item No. : NT-8500 SERIES
 Sample Receiving Date : 2020/04/28
 Testing Period : 2020/04/28 to 2020/05/04

Test Result(s) : Please refer to next page(s).

Ray Chang
 Ray Chang Ph.D. / Manager
 Signed for and on behalf of
 SGS Taiwan Limited
 Chemical Laboratory-Kaohsiung



PIN CODE: F93D26C3

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Test Report

No. : KA/2020/42018

Date : 2020/05/14

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NITTO DENKO CORPORATION

919, FUKU-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

Test Result(s)

PART NAME NO.1 : WHITE MOLDING COMPOUND FOR OPTICAL SEMICONDUCTOR

Test Item (s)	Unit	Method	MDL	Result
				No.1
Antimony (Sb)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	n.d.

Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected

Test Report

No. : KA/2020/42018

Date : 2020/05/14

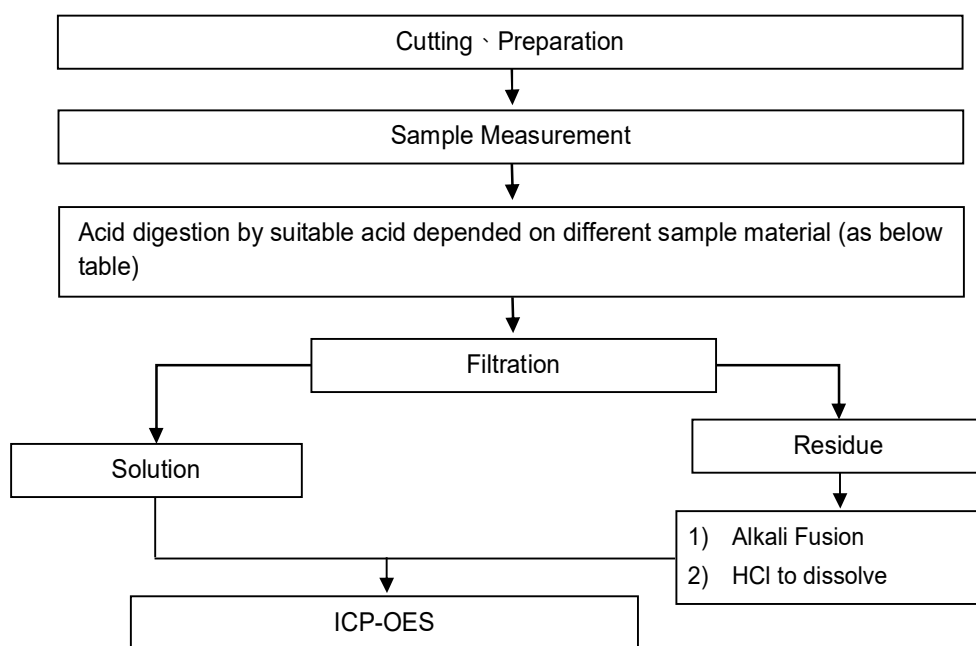
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NITTO DENKO CORPORATION

919, FUKU-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

Flow Chart of digestion for the elements analysis performed by ICP-OES

These samples were dissolved totally by pre-conditioning method according to below flow chart.



Steel, copper, aluminum, solder	Aqua regia, HNO ₃ , HCl, HF, H ₂ O ₂
Glass	HNO ₃ /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO ₃
Plastic	H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCl
Others	Any acid to total digestion

Test Report

No. : KA/2020/42018

Date : 2020/05/14

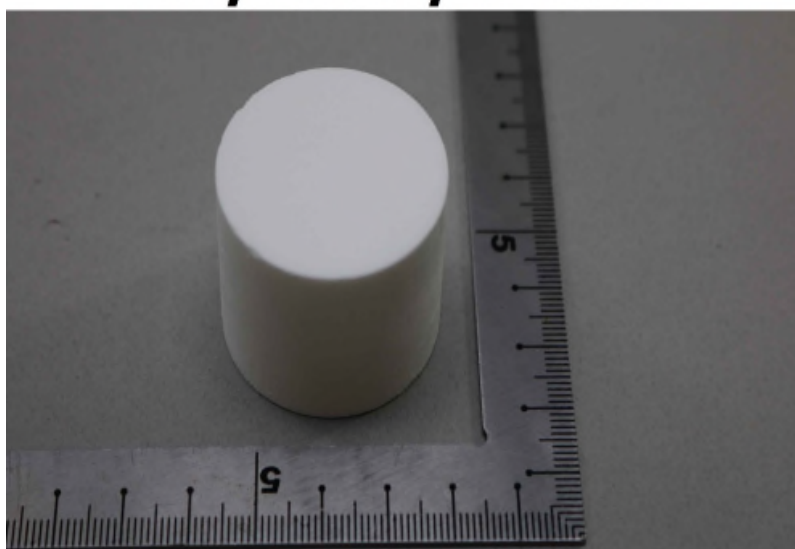
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NITTO DENKO CORPORATION

919, FUKU-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

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KA/2020/42018



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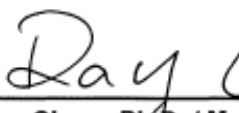
NITTO DENKO CORPORATION


919, FUKE-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

The following sample(s) was/were submitted and identified by/on behalf of the client as :

Sample Submitted By : NITTO DENKO CORPORATION
Sample Description : MOLDING COMPOUND FOR OPTICAL SEMICONDUCTOR
Style/Item No. : NT-8500 SERIES
Sample Receiving Date : 2020/04/28
Testing Period : 2020/04/28 to 2020/05/04

Test Result(s) : Please refer to next page(s).


Ray Chang Ph.D. / Manager
Signed for and on behalf of
SGS Taiwan Limited
Chemical Laboratory-Kaohsiung



PIN CODE: 5AEC83AA

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NITTO DENKO CORPORATION

919, FUKU-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

Test Result(s)

PART NAME NO.1 : WHITE MOLDING COMPOUND FOR OPTICAL SEMICONDUCTOR

Test Item (s)	Unit	Method	MDL	Result
				No.1
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α -HBCDD, β -HBCDD, γ -HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	With reference to IEC 62321: 2008. Analysis was performed by GC/MS.	5	n.d.

Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit

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No. : KA/2020/42026

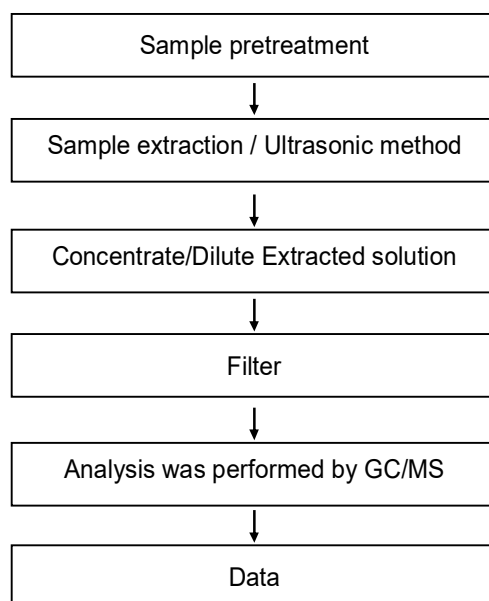
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NITTO DENKO CORPORATION

919, FUKE-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

HBCDD analytical flow chart



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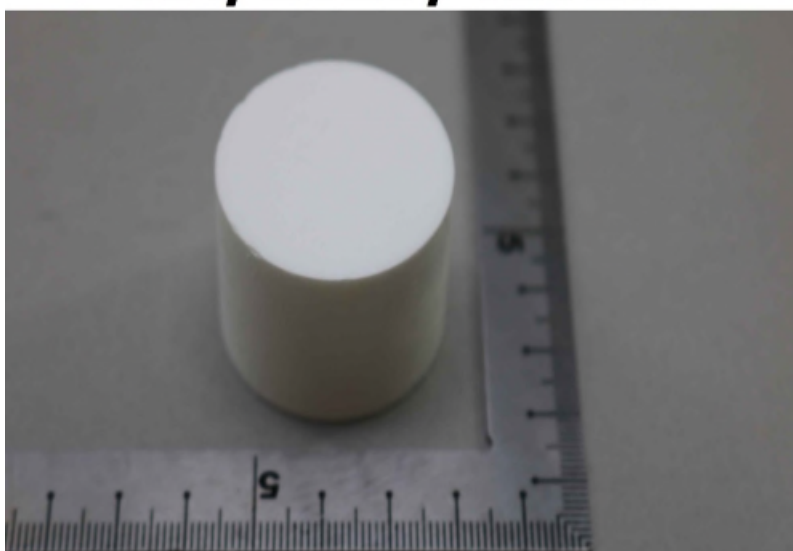
Page: 4 of 4

NITTO DENKO CORPORATION

919, FUKE-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

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KA/2020/42026



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Test Report

No. : KA/2020/42034

Date : 2020/05/14

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NITTO DENKO CORPORATION


919, FUKU-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

The following sample(s) was/were submitted and identified by/on behalf of the client as :

Sample Submitted By : NITTO DENKO CORPORATION
 Sample Description : MOLDING COMPOUND FOR OPTICAL SEMICONDUCTOR
 Style/Item No. : NT-8500 SERIES
 Sample Receiving Date : 2020/04/28
 Testing Period : 2020/04/28 to 2020/05/04

Test Requested : (1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine DBP, BBP, DEHP, DIBP contents in the submitted sample(s).
 (2) Please refer to next pages for the other item(s).
 Test Result(s) : Please refer to next page(s).

Ray Chang
 Ray Chang Ph.D. / Manager
 Signed for and on behalf of
 SGS Taiwan Limited
 Chemical Laboratory-Kaohsiung




PIN CODE: 6C0789EE

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NITTO DENKO CORPORATION

919, FUKU-CHO, KAMEYAMA, MIE, 519-0193, JAPAN

Test Result(s)

PART NAME NO.1 : WHITE MOLDING COMPOUND FOR OPTICAL SEMICONDUCTOR

Test Item (s)	Unit	Method	MDL	Result No.1
Phthalates				
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n.d.
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n.d.
DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	mg/kg		50	n.d.
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0; 68515-48-0)	mg/kg		50	n.d.
DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg		50	n.d.
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	n.d.

Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit

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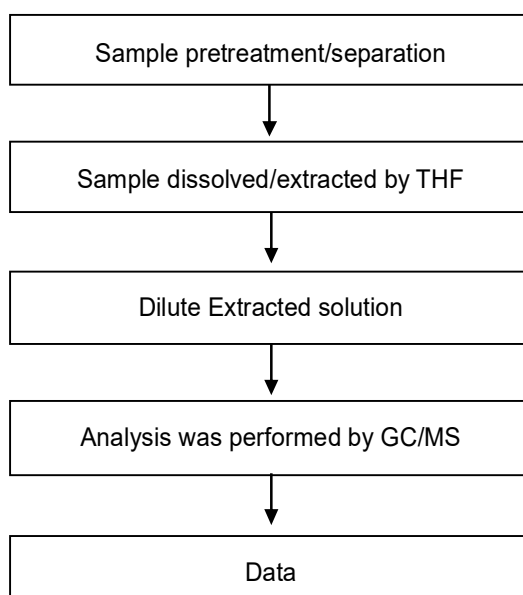
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Analytical flow chart of phthalate content

【Test method: IEC 62321-8】



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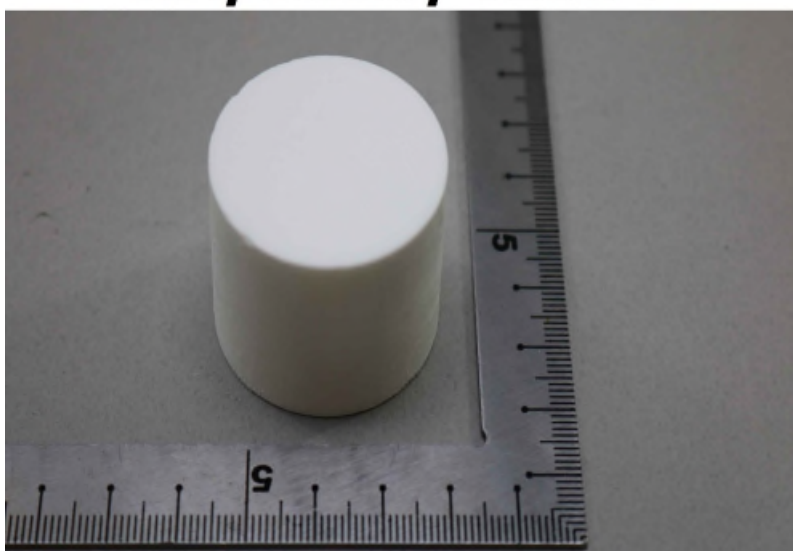
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* The tested sample / part is marked by an arrow if it's shown on the photo. *

KA/2020/42034



** End of Report **

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