

Job Ref. C&P/2023-05-23-026

#### DYNACRAFT INDUSTRIES SDN. BHD.

NO. 255-A, BLOCK D, PHASE II, BAYAN LEPAS INDUSTRIAL ZONE, 11900 PENANG, MALAYSIA.

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

SAMPLE DESCRIPTION : PRE-PLATED LEADFRAME EFTECT64T (STANDARD/MICRO NIPdAu & ADVNACED MICRO/RT

PPF NiPdAuAq)

SAMPLE RECEIVED : 23-May-2023

TESTING PERIOD : 23-May-2023 to 12-June-2023

TEST REQUESTED : Selected test(s) as requested by customer

TEST METHOD : -PLEASE REFER TO NEXT PAGE(S)-

TEST RESULTS : -PLEASE REFER TO NEXT PAGE(S)-

CONCLUSION : Based on the performed tests on submitted sample(s), the result(s) of Cadmium (Cd), Lead (Pb),

Mercury (Hg), Hexavalent Chromium (CrVI), Polybrominated biphenyl, PBB, Polybrominated diphenyl ether, PBDE, Dibutyl phthalate (DBP), Benzyl butyl phthalate (BBP), Di(2-ethylhexyl) phthalate (DEHP), Diisobutyl phthalate (DIBP) complies/comply with the limits as set by RoHS

Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 1 of 14

10871-



Job Ref. C&P/2023-05-23-026

**TEST RESULTS:** 

**Test Part Description** 

Sample Description: -PLEASE REFER TO PAGE 1-

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Parameter(s):	Unit	Test Method	Result	MDL	Limit
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5:2013.Analysis performed by ICP-OES.(Decision rule:refer Appendix, category 3)	N.D.	2	Max 100
Lead (Pb)	mg/kg	With reference to IEC 62321-5:2013.Analysis performed by ICP-OES.(Decision rule:refer Appendix, category 3)	N.D.	2	Max 1000
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+A1:2017.Analysis performed by ICP-OES.(Decision rule:refer Appendix, category 3)	N.D.	2	Max 1000
Hexavalent Chromium (CrVI)	μg/cm²	With reference to IEC 62321-7-1:2015.Analysis performed by Colorimetric Method using UV-Vis. (Decision rule:Refer Appendix category 2)	N.D.	0.10	-
Sum of PBBs	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	Max 1000
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Dibromobiphenyl	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Tribromobiphenyl	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Pentabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Hexabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Heptabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Octabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER

IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 2 of 14



Job Ref. C&P/2023-05-23-026

**TEST RESULTS:** 

**Test Part Description** 

Sample Description: -PLEASE REFER TO PAGE 1-

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Parameter(s):	Unit	Test Method	Result	MDL	Limit
Nonabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Decabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)		5	-
Sum of PBDEs	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	Max 1000
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015. Analysis performed by GC-MS.(Decision rule: refer to Appendix, category 3)	N.D.	5	-

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 3 of 14



Job Ref. C&P/2023-05-23-026

Note: (a) mg/kg = ppm; ug/kg = ppb (0.01 mg/kg = 10 ug/kg); 0.1wt% = 1000ppm

(b) N.D. = Not Detected

(c) MDL = Method Detection Limit

(d) - = Not regulated

- (e) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
- (f) a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 μg/cm². The sample coating is considered to contain CrVI.
  - b. The sample is negative for CrVI if CrVI is N.D. (concentration less than  $0.10~\mu g/cm^2$ ). The coating is considered a non-CrVI based coating.
  - c. The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive unavoidable coating variations may influence the determination.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER

IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 4 of 14



Job Ref. C&P/2023-05-23-026

**TEST RESULTS:** 

**Test Part Description** 

Sample Description: -PLEASE REFER TO PAGE 1-

Optional: RoHS Directive 2011/65/EU, priority substances

Test Parameter(s):	Unit	Test Method	Result	MDL
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α-HBCDD, β-HBCDD, γ-HBCDD) (CAS No.: 25637-99-4, 3194-55-6(134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	In-house method, SGS-TM-RSTS-O-012, with reference to IEC 62321-6:2015. Analysis was performed by GCMS	N.D.	5

Note: (a) Reference Information: Directive 2011/65/EU recasting RoHS directive 2002/95/EC: Hexabromocyclododecane (HBCDD), Bis (2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) are considered as a priority for risk evaluation and substance restriction.

(b) N.D. = Not Detected

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 5 of 14



Job Ref. C&P/2023-05-23-026

**TEST RESULTS:** 

**Test Part Description** 

Sample Description: -PLEASE REFER TO PAGE 1-

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Parameter(s):	Unit	Test Method	Result	MDL	Limit
Dibutyl phthalate (DBP) (CAS No. 84-74-2)	mg/kg	With reference to IEC 62321-8:2017. Analysis performed by GC-MS.(Decision rule:refer Appendix, category 3)	N.D.	50	Max 1000
Benzyl butyl phthalate (BBP) (CAS No. 85-68-7)	mg/kg	With reference to IEC 62321-8:2017.Analysis performed by GC-MS.(Decision rule:refer Appendix, category 3)	N.D.	50	Max 1000
Di(2-ethylhexyl) phthalate (DEHP) (CAS No. 117-81-7)	mg/kg	With reference to IEC 62321-8:2017.Analysis performed by GC-MS.(Decision rule:refer Appendix, category 3)	N.D.	50	Max 1000
Diisobutyl phthalate (DIBP) (CAS No. 84-69-5)	mg/kg	With reference to IEC 62321-8:2017.Analysis performed by GC-MS.(Decision rule:refer Appendix, category 3)	N.D.	50	Max 1000

Note: (a) mg/kg = ppm; ug/kg = ppb (0.01 mg/kg = 10 ug/kg); 0.1wt% = 1000ppm

(b) N.D. = Not Detected

(c) MDL = Method Detection Limit

(d) - = Not regulated

(e) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.

(f) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

10871-

Page 6 of 14



Job Ref. C&P/2023-05-23-026

#### **TEST RESULTS BY CHEMICAL METHOD:**

**Test Part Description** 

Sample Description: -PLEASE REFER TO PAGE 1-

Test Parameter(s):	Unit	Test Method	Result	MDL
Beryllium (Be)	mg/kg	With reference to EPA Method 3051A, and performed by ICP-OES.	N.D.	2
Antimony (Sb)	mg/kg	With reference to EPA Method 3051A, and performed by ICP-OES.	N.D.	2
Halogen	-	-	-	-
Halogen-Fluorine (F)	mg/kg	With reference to BS EN 14582:2016, analysis performed by IC method for Fluorine content.	N.D.	50
Halogen-Chlorine (CI)	mg/kg	With reference to BS EN 14582:2016, analysis performed by IC method for Chlorine content.	N.D.	50
Halogen-Bromine (Br)	mg/kg	With reference to BS EN 14582:2016, analysis performed by IC method for Bromine content.	N.D.	50
Halogen-lodine (I)	mg/kg	With reference to BS EN 14582:2016, analysis performed by IC method for lodine content.	N.D.	50

Note: (a) mg/kg = ppm; ug/kg = ppb (0.01 mg/kg = 10 ug/kg); 0.1wt% = 1000ppm

(b) N.D. = Not Detected

(c) MDL = Method Detection Limit

(d) Negative = Undetectable / Positive = Detectable

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 7 of 14

10871-



Job Ref. C&P/2023-05-23-026

**TEST RESULTS:** 

**Test Part Description** 

Sample Description: -PLEASE REFER TO PAGE 1-

Test Method: With reference to CEN/TS 15968:2010. Analysis was performed by LC-MS

Test Parameter(s):	Result (%)	Max. Limit (µg/m²) (Textile/Coated material)	Max.Limit(%) (Plastic)	Max. Limit(%) (Substances/ in mixtures)
Perfluorooctanesulfonic acid (PFOS)	N.D.	1	0.1	0.001
Perfluorooctanoic acid (PFOA) (CAS No. 335-67-1)	N.D.	I	1	1
Conclusion	PASS			

Note: (a) N.D. = Not Detected

(b) Detection limit = 1 μg/m² for Textile / Coated Material

= 0.001% for Plastic, substances or mixtures

- (c) Recommended requirement with reference to Commission Regulation (EU) 2019/1021 on Persistent Organic Pollutant.
- (d) PFOS refers to Perfluoroctanesulfonic acid and its derivatives including Perfluoroctanesulfonic acid, Perfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamide, N-Ethylperfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamidoethanol and N-Ethylperfluoroctane sulfonamidoethanol.

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

TAY SIAM PINE

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 8 of 14



No. CPSA/230613954-CB23556 Job Ref. C&P/2023-05-23-026

#### **Appendix**

Category	Decision Rule Statement
1	Based on binary statement with guard band (equal to the expanded measurement uncertainty with a 95% coverage probability, w=U95) in ILAC-G8:09/2019 Clause 4.2.2.
2	According to IEC 62321-7-1 Edition 1.0 2015-09 Section 7: Table 1- Comparison to standard and interpretation of result.
3	Based on binary statement for simple acceptance rule (w=0) in ILAC-G8:09/2019 Clause 4.2.1.
4	Based on non-binary statement with guard band (equal to the expanded measurement uncertainty with a 95% coverage probability, w=U95) in ILAC-G8:09/2019 Clause 4.2.3.
	A. "Pass - the measured value is within (or below / above) the acceptance limit, where the acceptance limit is below / above to the guard band." or "Pass - The measured values were observed in tolerance at the points tested. The specific false accept risk is up to 2.5%.".  B. "Conditional Pass - The measured values were observed in tolerance at the points tested. However, a portion of the expanded measurement uncertainty intervals about one or more measured values exceeded / out of tolerance. When the measured result is close to the tolerance, the specific false accept risk is up to 50%.".
	C. "Conditional Fail - One or more measured values were observed out of tolerance at the points tested. However, a portion of the expanded measurement uncertainty intervals about one or more measured values were in tolerance. When the measured result is close to the tolerance, the specific false reject risk is up to 50%.".  D. "Fail - the measured value is out of (or below / above) the tolerance limit added / subtracted to the guard
	band." or "Fail - One or more measured values were observed out of tolerance at the points tested". The specific false reject risk is up to 2.5%.
5	According to IEC 62321-3-1 Edition 1.0 2013-06 Annex A.3 Interpretation of result.
Remark	When decision rule is not feasible to be used and the uncertainty of the result is available to be provided, the uncertainty range of result will be shown in the report. Otherwise, only result will be shown in the report.

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 9 of 14

REPORTED DATE: 12-June-2023



No. CPSA/230613954-CB23556 REPORTED DATE: 12-June-2023 **TEST REPORT:** 

Job Ref. C&P/2023-05-23-026

**Test Part Description:** 

Sample Description: -PLEASE REFER TO PAGE 1-

# DYNACRAFT INDUSTRIES SDN. BHD. CB23556 20 40 30 50 40 90 90 07 08 06 01 11 02 05 04 05 09 07 08 06 04 03 02 01 05 08 06 001 01 02 05 04 05 09 07 08 06 002 01 05 06 04 05 09 07 08 06 005

SGS authenticate the photo on original report only

SGS (MALAYSIA) SDN BHD

SIGNED FOR AND ON BEHALF OF

TECHNICAL MANAGER IKM No. M/3452/6047/11/12

TAY SIAM PINE

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 10 of 14

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="https://www.sgs.com/en/terms-and-conditions">https://www.sgs.com/en/terms-and-conditions</a> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="https://www.sgs.com/en/terms-and-conditions/ferms-e-document">https://www.sgs.com/en/terms-and-conditions/ferms-e-document</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 7 days (for perishable samples) or 30 days only from date of report.

10871-



No. CPSA/230613954-CB23556 Job Ref. C&P/2023-05-23-026

#### 2. DETERMINATION OF LEAD CONTENT BY IEC 62321-5 2013

REPORTED DATE: 12-June-2023

Sample Receiving and Registration

Sample Preparation

Weigh sample (0.2-0.5g) into digestion vessel

Acid digestion (Hotplate)

"Totally Dissolved"

Filtration

Analyses by ICP

#### 1. DETERMINATION OF CADMIUM CONTENT BY IEC 62321-5 2013

Sample Receiving and Registration

Sample Preparation

Weigh sample (0.2-0.5g) into digestion vessel

Acid digestion (Hotplate)

"Totally Dissolved"

Filtration

Analyses by ICP

#### 3. DETERMINATION OF MERCURY CONTENT BY IEC 62321-42013/AMD12017

Sample Receiving and Registration

Sample Preparation

Weigh sample (0.1-0.5g) into digestion vessel

Acid digestion (Hotplate)

"Totally Dissolved"

Filtration

Analyses by ICP

#### 4. DETERMINATION OF HEXAVALENT CHROMIUM BY IEC 62321-7-1 2015

Sample Receiving and Registration

Sample Preparation

Boiling-water-extraction

Analyses by UV-Spectrophotometer

Test Report

#### 5. DETERMINATION OF PBB/PBDE WITH GC-MS BY IEC 62321-6 2015

Sample Preparation

Weigh sample (0.5-4.0g) into extraction thimble

Soxhlet Extraction with Toluene

Filter through 0.45 um membrane filter

Analyses by GC-MS (with appropriate dilution)

SIGNED FOR AND ON BEHALF OF

SGS (MALAYSIA) SDN BHD SGS 10871-1 TAY SIAM PINE TECHNICAL MANAGER

IKM No. M/3452/6047/11/12 Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 11 of 14



No. CPSA/230613954-CB23556 Job Ref. C&P/2023-05-23-026

#### DETERMINATION OF HBCDD CONTENT

Sample preparation

Weigh sample (0.5 - 4.0g) into extraction thimble

Solvent extraction with Toluene

Filter through 0.45 µm membrane filter

Analysis by GC-MS (with appropriate dilution)

# DETERMINATION OF PHTHALATES WITH GC-MS BY IEC 62321-8:2017

Sample Cutting / Preparation

 $\downarrow$ 

Sample Measurement



Solvent Extraction



Concentrate / Dilute extracted solution



GC-MS analysis



DATA

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 12 of 14

REPORTED DATE: 12-June-2023



No. CPSA/230613954-CB23556 Job Ref. C&P/2023-05-23-026

### MICROWAVE ASSISTED ACID DIGESTION OF ORGANICALLY BASED METRICES BY US EPA 3051A Sample Preparation Weight sample (0.2-0.5g) into digestion vessel Acid digestion "Totally Dissolved" Filtration Analyses by ICP

## DETERMINATION OF HALOGEN CONTENT Sample pre-treatment Weighting and putting sample in cell Combustion / Absorption Dilution to fixed volume Analyses by IC

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

10871-1 TAY SIAM PINE TECHNICAL MANAGER IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

Page 13 of 14

REPORTED DATE: 12-June-2023



No. CPSA/230613954-CB23556 Job Ref. C&P/2023-05-23-026

# DETERMINATION OF PFOS AND PFOA CONTENTS Sample pre-treatment / separation Solvent extraction Concentrate / Dilute extracted solution Sample filtration Analysis performed by LC/MS Data

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

\*\*\* End of test report \*\*\*

Page 14 of 14

REPORTED DATE: 12-June-2023