

Date:

16 Dec, 2022

Applicant: MAYFIELD HEIGHTS, OH

MATERION CORPORATION 6070 PARKLAND BLVD MAYFIELD HEIGHTS,

OH 44124

Sample Description:

One (1) piece of submitted sample said to be : Item Name : Au

Tests Conducted:

As requested by the applicant, for details refer to attached page(s).

Conclusion:

Tested SampleStandardResultSubmitted SampleRestriction of the use of certain hazardous substance in electrical and electronicPass

equipment (RoHS Directive 2011/65/EU and (EU) 2015/863)

Prepared And Checked By: For Intertek Testing Services Wuxi Ltd.

Peter Chen General Manager SERVICES NUMBER OF THE CONTROL OF T

Tage 10117



SHAH01527193 **Test Report** Number:

Tests Conducted

1. RoHS Chemical Test

(A) Test Result Summary:

Cadmium (Cd) Content (mg/kg) Lead (Pb) Content (mg/kg) Mercury (Hg) Content (mg/kg) ND Chromium (VI)(Cr ⁵⁺) Result (By Boiling Water Extraction on Megative Metal) (µg/cm ²) Polybrominated Biphenyls (PBBs) Content (mg/kg) Monobromobiphenyl (MonoBB) Dibromobiphenyl (DiBB) Tribromobiphenyl (TetraBB) Pentabromobiphenyl (PentaBB) Hexabromobiphenyl (PentaBB) ND Hetabromobiphenyl (HexaBB) Hoboromobiphenyl (HexaBB) ND Octabromobiphenyl (NonaBB) ND ND Nonabromobiphenyl (NonaBB) ND Nonabromobiphenyl (DecaBB) ND Nonabromobiphenyl (DecaBB) ND Decabromobiphenyl (Ber (MonoBDE) Dibromodiphenyl Ether (MonoBDE) Tribromodiphenyl Ether (TriBDE) Tetrabromodiphenyl Ether (PentaBDE) ND Pentabromodiphenyl Ether (PentaBDE) ND Pentabromodiphenyl Ether (PentaBDE) ND Pentabromodiphenyl Ether (HexaBDE) ND Octabromodiphenyl Ether (HexaBDE) ND Dibromodiphenyl Ether (NonaBDE) ND Pentabromodiphenyl Ether (NonaBDE) ND Pentabromodiphenyl Ether (PentaBDE) ND Pentabromodiphenyl Ether (NonaBDE) ND ND Octabromodiphenyl Ether (NonaBDE) ND Decabromodiphenyl Ether (NonaBDE) ND ND ND ND ND ND ND ND ND N	(A) Test Result Summary: Testing Item	Result
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Decabromodiphenyl Ether (DecaBDE) Phthalates Content (mg/kg) Bis(2-ethylhexyl)phthalate (DEHP) Butyl benzyl phthalate (BBP) Dibutyl phthalate (DBP) ND	Octabromodiphenyl Ether (OctaBDE)	ND
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Butyl benzyl phthalate (BBP) Dibutyl phthalate (DBP) ND	Phthalates Content (mg/kg)	
Dibutyl phthalate (DBP) ND	Bis(2-ethylhexyl)phthalate (DEHP)	ND
	Butyl benzyl phthalate (BBP)	ND
Dijsohutyl phthalate (DIRP)	Dibutyl phthalate (DBP)	ND
billiobatty printing (bib)	Diisobutyl phthalate (DIBP)	ND

mg/kg = milligram per kilogram

ND = Not detected

Negative = A negative test result indicated the absorbance value of testing sample solution for Cr(VI) testing is less than the absorbance value of the 0.10 µ g/cm² equivalent comparison standard solution, the Cr(VI) concentration is below the limit of quantification, then the sample is considered to be negative for Cr(VI).

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Tests Conducted

(B) RoHS Requirement:

(E) Horie Hoquitorian	
Restricted Substances	Limits
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr ⁶⁺)	0.1% (1000 mg/kg)
Polybrominated Biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000 mg/kg)
Phthalates (DEHP, BBP, DBP, DIBP)	0.1% (1000 mg/kg)

The above limits were quoted from 2011/65/EU and (EU) 2015/863 for homogeneous material.

(C) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) Content	With reference to IEC 62321-5 Edition 1.0:2013, by acid digestion until the tested sample was totally dissolved and determined by ICP - OES	2 mg/kg
Lead (Pb) Content	With reference to IEC 62321-5 Edition 1.0:2013, by acid digestion until the tested sample was totally dissolved and determined by ICP - OES	2 mg/kg
Mercury (Hg) Content	With reference to IEC 62321-4 Edition 1.1:2017, by acid digestion until the tested sample was totally dissolved and determined by ICP - OES	2 mg/kg
Chromium (VI) (Cr ⁶⁺) Content	With reference to IEC 62321-7-1 Edition 1.0:2015, by boiling water extraction and determined by UV-VIS Spectrophotometer.	Positive(>0.13 μg/cm²) / Negative(<0.10 μg/cm²) / Inconclusive(0.10 μg/cm² 0.13 μg/cm²)
Polybrominated Biphenyls (PBBs)& Polybrominated Diphenyl Ethers (PBDEs) Content	With reference to IEC 62321-6 Edition 1.0:2015, by solvent extraction and determined by GC/MS and further HPLC confirmation when necessary	5 mg/kg
Phthalates (DEHP, BBP, DBP, DIBP) Content	With reference to IEC 62321-8 Edition 1.0:2017,by solvent extraction and determined by GC/MS	50 mg/kg

Date Sample Received: 08 Dec, 2022

Testing Period: 08 Dec, 2022 To 16 Dec, 2022

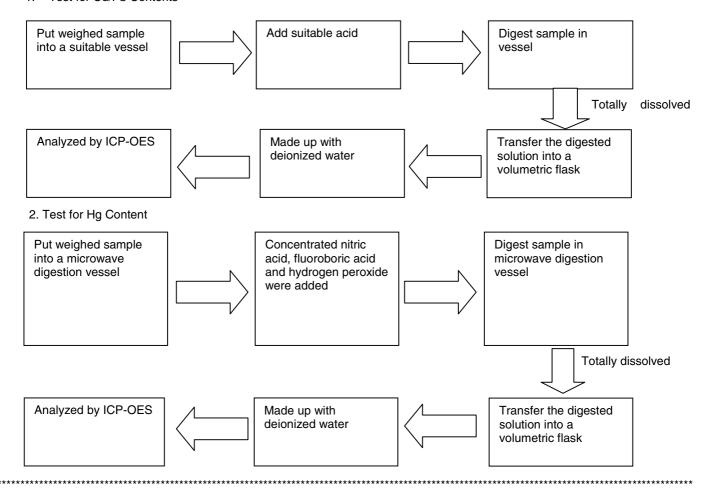
(N)



Tests Conducted

(D) Measurement Flowchart:

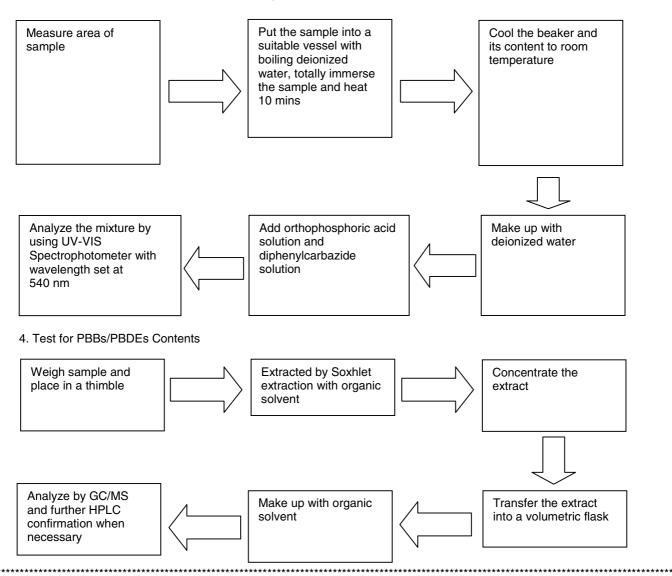
1. Test for Cd/Pb Contents





Tests Conducted

3. Test for Chromium (VI) (Cr⁶⁺) Content (Boiling Water Extraction)





SHAH01527193 **Test Report** Number: **Tests Conducted** 5. Test for Phthalate Contents Weigh sample and Extracted by Soxhlet Concentrate the extraction with organic place in a thimble extract solvent

Analyze by GC/MS

Make up with organic solvent

Transfer the extract into a volumetric flask





Test Report SHAH01527193 Number:

Tests Conducted

Halogen Content

I. Testing Result

Testing Item	Result (ppm)
Fluorine (F) content	ND
Chlorine (CI) content	ND
Bromine (Br) content	ND
lodine (I) content	ND

Remark: ppm = Parts per million = mg/kg

ND = Not Detected

II. Testing Method

Testing Item	Testing Method	Reporting Limit
THAIRMAN (F. C.) BY I) CONTANT	With reference to EN 14582:2016 by combustion in a calorimetric bomb and determined by ion chromatography	50 ppm

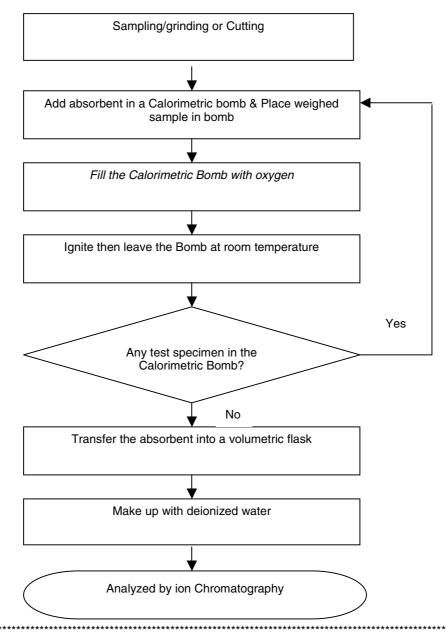
Date Sample Received: 08 Dec, 2022 Testing Period: 08 Dec, 2022 To 16 Dec, 2022



Tests Conducted (III) Measurement flowchart:

Test for Halogen content

Reference method: EN 14582: 2016





Tests Conducted

3. Perfluorooctane Sulfonates (PFOS) and Perfluorooctanoic Acid (PFOA)

With Reference To EPA 3550C, By solvent extraction and followed by Liquid Chromatography – Mass Spectrometry (LC-MS) analysis.

Test Item
Perfluoroctanesulfonic Acid (PFOS)
Perfluoroctane Acid (PFOA)
ND
ND

Remark: ND = Not Detected (Less than detection limit)

Detection Limit = 1 ppm

Date Sample Received: 08 Dec, 2022 Testing Period: 08 Dec, 2022 To 16 Dec, 2022

4. Perfluorooctane Sulfonates (PFOS) and Perfluorooctanoic Acid (PFOA)

With Reference To CEN/TS 15968, By solvent extraction and followed by Liquid Chromatography – Mass Spectrometry (LC-MS) analysis.

Test Item Result in ppm
Perfluoroctanesulfonic Acid (PFOS) ND

Perfluoroctane Acid (PFOA) ND

Remark: ND = Not Detected (Less than detection limit)
Detection Limit = 0.025 ppm

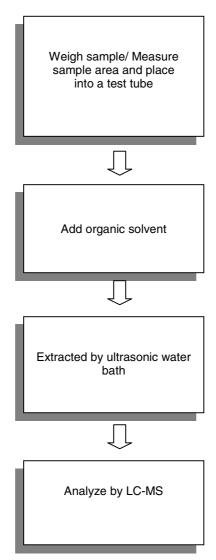
Date Sample Received: 08 Dec, 2022

Testing Period: 08 Dec, 2022 To 16 Dec, 2022



Tests Conducted Measurement flowchart:

Test for Perfluorooctane Sulfonates(PFOS) and Perfluorooctanoic Acid (PFOA) content:



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Tests Conducted

5. Phthalate Content Test

With Reference To EN14372, By Gas Chromatography-Mass Spectrometry (GC-MS) Analysis.

Tested Compound	Result (In ppm)
Di-Iso-Decyl Phthalate (DIDP)	ND
Di-N-Hexyl Phthalate (DNHP)	ND
Bis(2-methoxyethyl)phthalate (DMEP)	ND
Bis(2-methoxyethyl)phthalate (BMEP)	ND
Di-isopentylphthalate (DIPP)	ND
D-pentyl iso-pentylphthalate (NPIPP)	ND
Dipentyl phthalate (DNPP)	ND

With Reference To IEC 62321-8:2017, By Gas Chromatography-Mass Spectrometry (GC-MS) Analysis.

Tested Compound Result (In ppm)

Di-Iso-Nonyl Phthalate (DINP)
Di-N-Octyl Phthalate (DNOP)
ND

Detection Limit = 50 ppm ND = Not Detected ppm = parts per million = mg/kg

Date Sample Received: 08 Dec, 2022

Testing Period: 08 Dec, 2022 To 16 Dec, 2022

6. Total Antimony(Sb), Beryllium(Be) Content

With Reference To US EPA 3052, Acid Digestion Method Was Used And total Antimony(Sb), Beryllium(Be) content were determined by Inductively Coupled Argon Plasma Spectrometry.

Result (ppm)
Antimony(Sb)

Beryllium(Be)

Result (ppm)

ND

Remark: ppm = parts per million = mg/kg

Detection Limit= 2 ppm ND=Not Detected

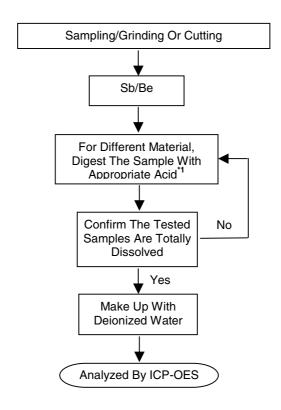
Date Sample Received: 08 Dec. 2022

Testing Period: 08 Dec, 2022 To 16 Dec, 2022



Tests Conducted

Measurement Flowchart:



Remarks:

*1: List Of Appropriate Acid:

<u>Material</u>	Acid Added For Digestion
Polymers	HNO ₃ ,HCL,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO ₃ ,HCL,HF
Electronics	HNO ₃ ,HCL,H ₂ O ₂ ,HBF ₄



Tests Conducted

7. HBCDD Content

(I)Test result summary:

Testing Item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = Parts per million = mg/kg

ND = Not Detected

(II) Test Method:

Testing Item	Testing Method	Reporting Limit
	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm

Date Sample Received: 08 Dec, 2022

Testing Period: 08 Dec, 2022 To 16 Dec, 2022

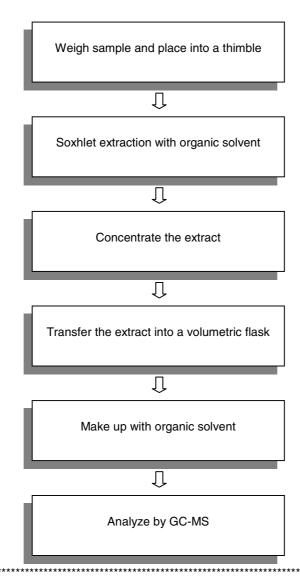
(N)



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

8. TBBPA-bis and TBBPA

(I) Test result summary:

Testing Item	Result (ppm)
TBBPA (Tetrabromobisphenol A)	ND

Remarks: ppm = Parts per million = mg/kg

ND = Not Detected

(II) Test method:

Testing Item	Testing Method	Reporting Limit
I I RRPA (Letranromonishneno) A)	With reference to USEPA 3540C, by solvent extraction and determined by HPLC	10 ppm

Date Sample Received: 08 Dec, 2022

Testing Period: 08 Dec, 2022 To 16 Dec, 2022

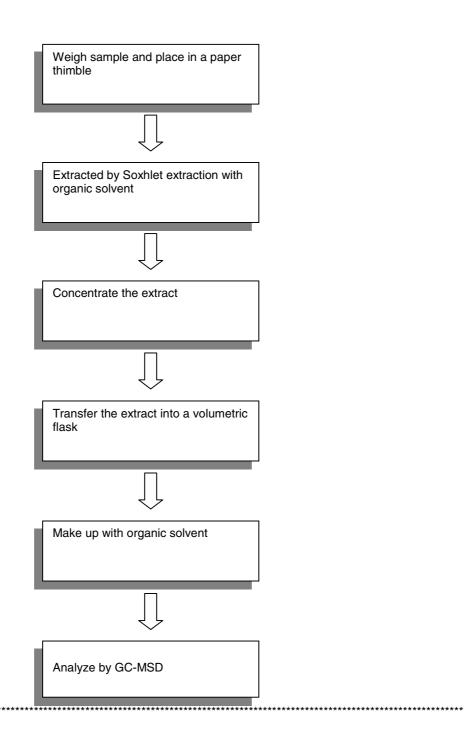
(N)



Tests Conducted

Measurement flowchart

Test for TBBPA content:





Tests Conducted



End Of Report

The statements of conformity reported have considered the decision rule agreed, namely that Intertek have taken account of measurement uncertainty as calculated by Intertek, and applied according to ILAC-G8/09:2019 (Non-binary acceptance based on guard band w = U) except designation from the customer, regulation or test specification. This decision rule only applies to the numeric test results.

The sample(s) and sample information hereto are provided by the client who shall be solely responsible for the authenticity and integrity thereof. The results shown in this report relate only to the sample(s) received and tested. It is not intended to be a recommendation for any particular course of action. Intertek does not accept a duty

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