

1.

	()		FH28-60S-0.5SH(05)			
Code	DJ58	Code				
			07.08.28	憲	炯	在
	031-496-7044	E-mail	heejung@hirose.co.kr	靜	泰	煥
	1261-10			8/28	8/28	8/28

2.

				Data		
		有	無			
Class						
	6가					
	Polybrominated biphenyls (PBBs)					
	Polybrominated diphenylethers (PBDEs)					
Class	Polychlorinated biphenyls (PCBs)					
	Polychlorinated Terphenyls (PCTs)					
	Polychlorinated naphthalences (PCNs)					
	Ozone depleting substances (CFCs,HCFCs, Halons)					
	Short-chain chlorinated paraffins (Alkane 10~13 Carbon chain)					
Class	PVC ()					
	(Other chlorinated flame retardants)					
	(Other brominated flame retardants) (ex, TBBP-A)					

3.

- (O)
- Data : Class (ex : ICP, GC-MS)
- : Class Data (ex : MSDS, Mil Sheet)
- : Class Spec

Data

(Code No) :

() (DJ58)

: 2007 . 08 . 28 .

No	Code	가	CAS-No	(ppm = mg/kg)						
				Cd	Pb	Hg	Cr ⁺⁶	PBBs	PBDEs	
1	FH28-60S-0.5SH(05)	-	HOUSING LCP 2140GM UENO	90967-43-4	N.D	N.D	N.D	N.D	N.D	N.D
			ACTUATOR LCP E6008MR-B SUMITOMO	60088-52-0 65997-17-3 1333-86-4	N.D	N.D	N.D	7	N.D	N.D
			CONTACT C5191R NIKKO METAL	7440-31-5 7723-14-0 7440-50-8	N.D	32	N.D	N.D	-	-
			METAL HOLD DOWN C2680R NIKKO METAL	7440-50-8 7440-66-6	N.D	N.D	N.D	N.D	-	-

[Redacted]

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: () : 2007 . 08 . 28 .

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				()			
				E-mail	cha-jh@hirose.co.kr		
				<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid red; border-radius: 50%; padding: 5px; text-align: center;">惠 静</div> <div style="border: 1px solid red; border-radius: 50%; padding: 5px; text-align: center;">炯 泰</div> <div style="border: 1px solid red; border-radius: 50%; padding: 5px; text-align: center;">在 煥</div> </div>			
				8/28 8/28 8/28			

: FH28-60S-0.5SH(05) : ()
Code No : :
:

	가			가			
	Maker		Type	Maker		Type	
HOUSING	UENO	2140GM	LCP				
ACTUATOR	SUMITOMO	E6008MR-B	LCP				
CONTACT	NIKKO METAL	C5191R					
METAL HOLD DOWN	NIKKO METAL	C2680R					

- 가 Data , (Mil Sheet, MSDS) .
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- Sample 時 , Data,
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TEST REPORT

Applicant : UENO FINE CHEMICALS IND., LTD.
Address : 2-4-8, KORAIBASHI, CHUO-KU, OSAKA, JAPAN

Page: 1 of 3

Report No. ST07R-0491-001

Date: Jun. 05, 2007

Sample Description : The following submitted sample(s) said to be:-

Name/Type of Product : UENO LCP 2140GM
Name of Material : LCP RESIN
Sample ID No. : ST07R-0491-001
ITEM No. : Lot no. : KL205-61004
Manufacturer/Vender : UENO FINE CHEMICALS IND., LTD.

Sample received : May 31, 2007
Testing Date : May 31, 2007 ~ Jun. 05, 2007
Testing Laboratory : Intertek Testing Center
Testing Environment : Temperature : 23 °C Relative Humidity: 50 %

Test Method(s) : Please see the following page(s).

Test Result(s) : Please see the following page(s).

* Note 1 : The test results presented in this report relate only to the object tested.

* Note 2 : This report shall not be reproduced except in full without the written approval of the testing laboratory.

* Note 3 : The item no. is assigned by client and indicated according to their requirement and guarantee letter.

Approved by,

Chris Ko / Senior Researcher

Authorized by,

Bo Park / Lab Manager



TEST REPORT

Report No. ST07R-0491-001

Page: 2 of 3
Date: Jun. 05, 2007

Sample ID No. : ST07R-0491-001
Sample Description : UENO LCP 2140GM

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	0.5	N.D
Lead (Pb)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	5	N.D
Mercury (Hg)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D
Hexavalent Chromium (Cr ⁶⁺)	mg/kg	US EPA 3060A and determined by UV-VIS	1	N.D
Polybrominated Biphenyl (PBBs)				
Monobromobiphenyl	mg/kg	With reference to US EPA 3540C, by solvent extraction and determined by GC/MS	5	N.D
Dibromobiphenyl	mg/kg		5	N.D
Tribromobiphenyl	mg/kg		5	N.D
Tetrabromobiphenyl	mg/kg		5	N.D
Pentabromobiphenyl	mg/kg		5	N.D
Hexabromobiphenyl	mg/kg		5	N.D
Heptabromobiphenyl	mg/kg		5	N.D
Octabromobiphenyl	mg/kg		5	N.D
Nonabromobiphenyl	mg/kg		5	N.D
Decabromobiphenyl	mg/kg		5	N.D
Polybrominated Diphenyl Ether (PBDEs)				
Monobromodiphenyl ether	mg/kg	With reference to US EPA 3540C, by solvent extraction and determined by GC/MS	5	N.D
Dibromodiphenyl ether	mg/kg		5	N.D
Tribromodiphenyl ether	mg/kg		5	N.D
Tetrabromodiphenyl ether	mg/kg		5	N.D
Pentabromodiphenyl ether	mg/kg		5	N.D
Hexabromodiphenyl ether	mg/kg		5	N.D
Heptabromodiphenyl ether	mg/kg		5	N.D
Octabromodiphenyl ether	mg/kg		5	N.D
Nonabromodiphenyl ether	mg/kg		5	N.D
Decabromodiphenyl ether	mg/kg		5	N.D

Notes : mg/kg = ppm = parts per million
< = Less than
N.D = Not detected (<MDL)
MDL = Method detection limit

TEST REPORT

Report No. ST07R-0491-001

Page: 3 of 3
 Date: Jun. 05, 2007

Sample ID No. : ST07R-0491-001
 Sample Description : UENO LCP 2140GM

Test Items	Unit	Test Method	MDL	Results
Bromine (Br)	mg/kg	With reference to EN 14582, by oxygen combustion and determined by IC	20	N.D
Chlorine (Cl)	mg/kg	With reference to EN 14582, by oxygen combustion and determined by IC	20	N.D

Notes : mg/kg = ppm = parts per million
 <= Less than
 N.D = Not detected (<MDL)
 MDL = Method detection limit

* View of sample as received;-



***** End of Report *****

Material Safety Data Sheet

Revised date Oct. 30, 2002

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name : UENO LCP 2140GM
Name of Company : UENO FINE CHEMICALS INDUSTRY,LTD.
Section in Charge : QUALITY ASSURANCE DEPT.
Address : 2-4-8,KORAIBASHI,CHUO-KU OSAKA, 541-8543 JAPAN
Phone No. : 81-6-6203-6193
Fax No. : 81-6-6222-2413
Emergency : UENO INSITUTE FOR CHEMICAL SCIENCE
Emergency Phone No. : 81-795-68-7205

2. COMPOSITION INFORMATION ON INGREDIENTS

Chemical Family : Wholly Aromatic Liquid Crystal Polyester resin
Specification of division : Composition
Ingredients and Composition : Resin 60wt%
Glass Fiber + Mineral 40wt%
Small amount of pigments may contain.
Serial No. in Official Gazette : (7)-2365 (base resin)
CAS-No. : 90967-43-4 (base resin)

3. HAZARDS IDENTIFICATION

Hazards : Not applicable
Harmfulness : Not applicable

4. FIRST-AID TREATMENT

Eye Contact : In the case of molten material , immediately flush and cool with clean water and seek medical attention.
In the case of solid or powder materials, immediately flush with clean water.
Seek medical attention if discomfort and incompatibility persist.
Skin Contact : In the case of molten material , immediately cool with clean water.
Do not forcibly peel off the solidified resin on the skin.
Seek medical attention if burned.
Inhalation : If nausea is caused by gas from the molten materials , remove immediately to fresh air.
When nausea persists, seek medical attention.
Ingestion : Help to vomit as much as possible . Seek medical attention if discomfort persists.

5. FIRE-FIGHTING MEASURES

Extinguishing Media : Water, Foam fire-extinguishing agent, Powder fire-extinguishing agent, Carbon dioxide gas
Extinguishing Measure : Recommend to use water for extinguishing.
Usual extinguishing measure is applicable.
Specific Harm : Incomplete combustion of the material may cause carbon mono-oxide , phenol and other toxic gases.

Protect of Extinguisher : Protective equipment such as gas mask should be worn.

6. ACCIDENTAL RELEASE MEASURES

Precautions of human : Clean up by broom or vacuum-cleaner to avoid slipping and tumbling by spilt pellets.

Precautions of environment: Follow the "Manual for preventing release of resin pellets " to avoid ingestion by marine organism and birds.

7. HANDLING AND STORAGE

HANDLING : Avoid to inhale emitted gas during molding.
Do not directly touch heated resin.

STORAGE : Do not store in high temperature and high humidity conditions, and avoid sunlight.
Stored away from fire and sources of heat.

8. EXPOSURE CONTROL /PERSONAL PROTECTION

Facility measures : In case of using molten material during molding , establish suitable local ventilation.
In case of using dust, use an airtight container with dust explosion proof.
Establish bodywash and eyewash equipments.

Protection

Eye protection : Wear safety glasses or goggles.

Body protection : In case of handling molten material during molding , wear heatproof gloves and long sleeve clothes in order to prevent thermal burns.

Respiratory protection : Wear dustproof mask.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Solid (pellet)

Melting Point : 330°C

Boiling Point : Not applicable

Vapor pressure : Not applicable

Specific Gravity : 1.74

Solubility in water : Insoluble

Flash Point : No data

Ignition Point : >540°C

Explosion Limit : Not applicable

Flammability : Flammable but self-extinguishing as keeping away from flame.

Ignitivity : Nonspontaneous ignition
Nonreactive with water

Oxidativity : None

Self-reactivity·explosively : None

Dust explosively : No data

10. STABILITY AND REACTIVITY

Stability·Reactivity : Stable and nonreactive on general handling and storage conditions.

11. TOXICOLOGICAL INFORMATION

Corrosive Property	: Unknown
Irritant Property	: Vapor generated during drying and molding may cause irritation to eyes and skins.
Acute Toxicity	: Unknown
Subacute Toxicity	: Unknown
Chronic Toxicity, Long-term toxicity	: Unknown
Carcinogenicity	: Unknown
Mutagenicity	: Unknown
Reproductive toxicity	: Unknown
Teratogenicity	: Unknown
Others	
Harmfulness of glass fibers	: Glass fibers of more than 5 μm may cause itching . Skin irritation might form on occasion.

12. ECOLOGICAL INFORMATION

Biodegradability	: Unknown
Bioaccumulation	: Unknown
Fish Toxicity	: Unknown

13. DISPOSAL CONSIDERATIONS

This materials is classified as industrial waste and waste plastics based on "Law for treatment and cleaning of waste".

In case of disposal, ask approved industrial waste disposal agency or commission local governments in accordance with waste disposal law.

In case of burnout, use well-controlled incinerator and treat them in accordance with waste disposal law ,air pollution control law, and water pollution control law.

14. TRANSPORT INFORMATION

UN class and UN number	: Not applicable
Notice	: Avoid rough handling and contact with water in order to prevent break of bags. Stack without drop and damage, and make sure to provide preventing load collapse.

15. REGULATORY INFORMATION

Disposal Regulation	: Law for treatment and cleaning disposal waste.
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16. OTHER INFORMATION

Ueno Fine Chemicals Industry, LTD. do not assume any liability whatsoever for the accuracy or completeness of the information contained herein, although stated information is prepared based on the documents, information and data that can be obtained as far as possible.

This material safety data sheet is prepared for general use. Adequate safety and environmental countermeasures for actual uses and applications should be provided in case of unusual use.

TEST REPORT

Client: Hirose Electric Co., Ltd.

Report No.: 33910396-01M- 007 1/2
Date Issued: 07/Nov/2006
Date Tested: 06/Nov/2006
Sample Receiving Date : 26/Oct/2006

Subject: Analysis for RoHS/ELV Directive

Authorized by Yoshiharu Namekawa
Manager of Central Research Laboratory
NIHON ENVIRONMENTAL SERVICES CO., LTD.
2-1-13, Sachiura, Kanazawa-ku, Yokohama-shi,
Kanagawa-ken, JAPAN
TEL +81-45 (780) 3831
Tested by Kouta Kumao

RESULTS ARE REPORTED AS FOLLOWS

Sample Name	E6008MR BLACK Sumitomo Chemical			
Test Item	Results	Quantitation Limit	Unit	Test Method
Cadmium	N.D.	1	ppm	With reference to EPA Method 3052 (Microwave digestion - ICP-MS method)
Lead	N.D.	10	ppm	With reference to EPA Method 3052 (Microwave digestion - ICP-MS method)
Mercury	N.D.	1	ppm	With reference to EPA Method 3052 (Microwave digestion - ICP-MS method)
Total Chromium	7	1	ppm	With reference to EPA Method 3052 (Microwave digestion - ICP-MS method)
(End of report)				

Instruments: ICP-MS; Agilent Technologies, Agilent 7500c

Note: Sample for Cadmium and Lead is totally dissolved.
N.D. = Not Detected (Less than Quantitation Limit)

Green Partner

The results relate only to the items tested.

TEST REPORT

Client: Hirose Electric Co., Ltd.

Report No.: 33910396-01M- 007 2/2

Date Issued: 07/Nov/2006

Date Tested: 06/Nov/2006

Sample Receiving Date : 26/Oct/2006

Subject : Analysis for RoHS/ELV Directive

Authorized by Yoshiharu Namegawa

Manager of Central Research Laboratory
NIHON ENVIRONMENTAL SERVICES CO., LTD.

2-1-13, Sachiura, Kanagawa-ku, Yokohama-shi,
Kanagawa-ken, JAPAN
TEL. +81-45 (780) 3831

Tested by Kouta Kumao

RESULTS ARE REPORTED AS FOLLOWS

Sample Name	B6008MR BLACK Sumitomo Chemical			
Test Item	Results	Quantitation Limit	Unit	Test Method
Polybrominated biphenyls(PBBs)	N.D.	10	ppm	Solvent extraction-GC/MS method
Monobrominated biphenyls	N.D.	10	ppm	Solvent extraction-GC/MS method
Dibrominated biphenyls	N.D.	10	ppm	Solvent extraction-GC/MS method
Tribrominated biphenyls	N.D.	10	ppm	Solvent extraction-GC/MS method
Tetrabrominated biphenyls	N.D.	10	ppm	Solvent extraction-GC/MS method
Pentabrominated biphenyls	N.D.	10	ppm	Solvent extraction-GC/MS method
Hexabrominated biphenyls	N.D.	10	ppm	Solvent extraction-GC/MS method
Heptabrominated biphenyls	N.D.	10	ppm	Solvent extraction-GC/MS method
Octabrominated biphenyls	N.D.	10	ppm	Solvent extraction-GC/MS method
Nonabrominated biphenyls	N.D.	10	ppm	Solvent extraction-GC/MS method
Decabrominated biphenyl	N.D.	10	ppm	Solvent extraction-GC/MS method
Polybrominated diphenyl ethers(PBDEs)	N.D.	10	ppm	Solvent extraction-GC/MS method
Monobrominated diphenyl ethers	N.D.	10	ppm	Solvent extraction-GC/MS method
Dibrominated diphenyl ethers	N.D.	10	ppm	Solvent extraction-GC/MS method
Tribrominated diphenyl ethers	N.D.	10	ppm	Solvent extraction-GC/MS method
Tetrabrominated diphenyl ethers	N.D.	10	ppm	Solvent extraction-GC/MS method
Pentabrominated diphenyl ethers	N.D.	10	ppm	Solvent extraction-GC/MS method
Hexabrominated diphenyl ethers	N.D.	10	ppm	Solvent extraction-GC/MS method
Heptabrominated diphenyl ethers	N.D.	10	ppm	Solvent extraction-GC/MS method
Octabrominated diphenyl ethers	N.D.	10	ppm	Solvent extraction-GC/MS method
Nonabrominated diphenyl ethers	N.D.	10	ppm	Solvent extraction-GC/MS method
Decabrominated diphenyl ether	N.D.	10	ppm	Solvent extraction-GC/MS method
(End of report)				
Instruments: GC/MS; PerkinElmer, Clarus500 GCMS				
Note: N.D. = Not Detected (Less than Quantitation Limit) PBBs & PBDEs presents total amount of all Brominated diphenyl ethers.				

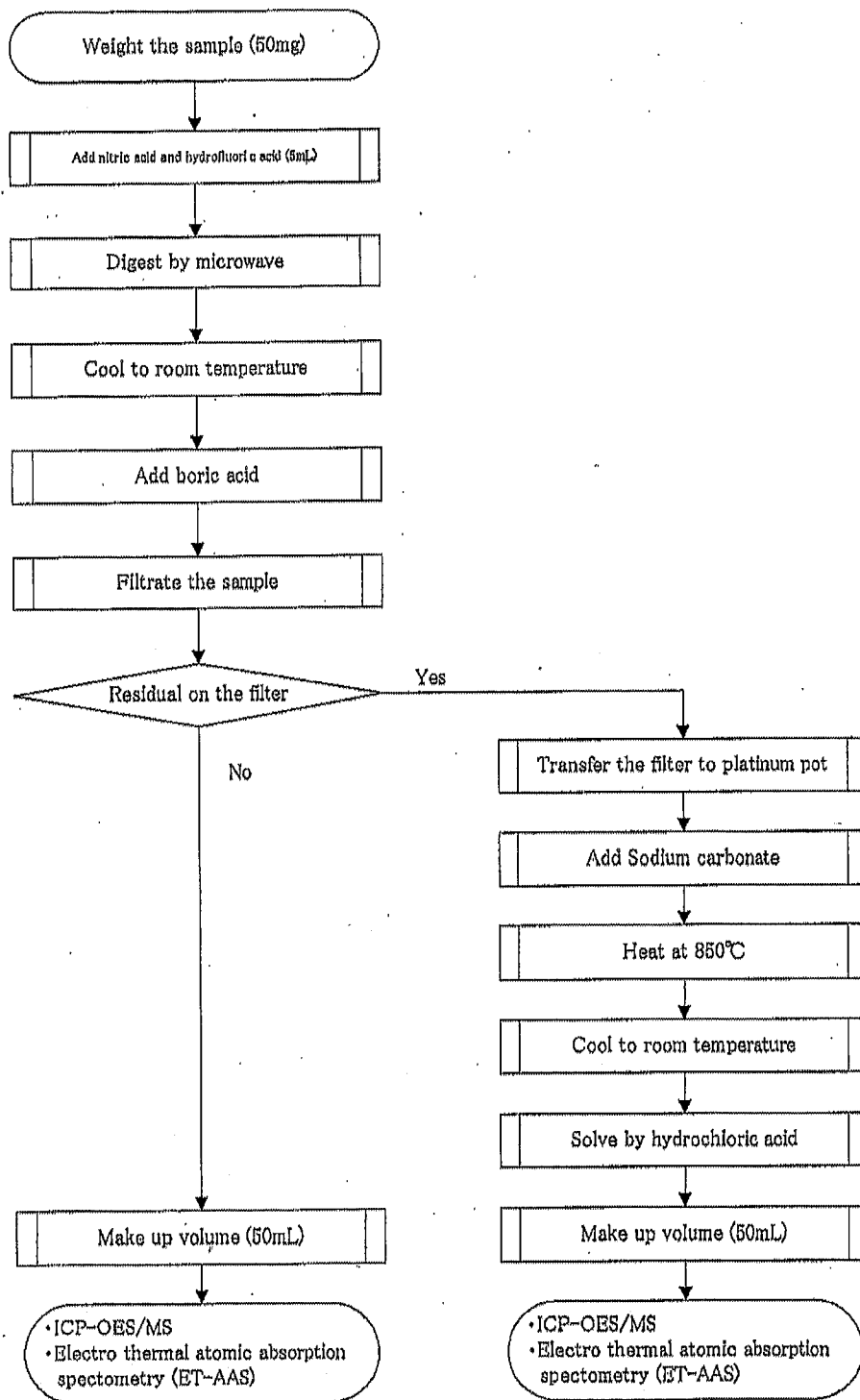
The results relate only to the items tested.

Measurement flowchart of Cadmium and Lead in plastics

NIHON ENVIRONMENTAL SERVICES CO., LTD.

2-1-13, Sachiura, Kanazawa-ku,
Yokohama-shi Kanagawa-ken, JAPAN

TEL +81-45 (780) 3831



※The result is the total of filtered sample and it's resid ual.

4

MATERIAL SAFETY DATA SHEET**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

Product name SUMIKASUPER LCP (with GF)
 Available grade E4008 MR, E4008 MR-B, E6006 MR, E6006 MR-B, E6006LHF B, E6006LHF Z, E6006LHF B Z, E6006L MR, E6006L MR-B, E6007LHF Z, E6007LHF B Z, E6008 MR, E6008 MR-B, E6010 MR

Chemical name Aromatic polyester resin
 General use Electronic parts
 Manufacturer **Sumitomo Chemical Co., Ltd.**
 ELECTRONIC MATERIALS DIV.
 27-1, Shinkawa 2-chome, Chuo-ku, Tokyo
 104-8260 Japan
 TEL +81-3-5543-5845
 FAX +81-3-5543-5939

Emergency Contact **Sumitomo Chemical Co., Ltd.**
 ELECTRONIC MATERIALS DIV.
 TEL +81-3-5543-5845
 FAX +81-3-5543-5939

2. COMPOSITION / INFORMATION ON INGREDIENTS

Components	CAS No.	wt. %	OSHA PEL	ACGIH TLV
Aromatic polyester resin	60088-52-0	45-75%	N/E	N/E
Glass fiber	65997-17-3	25-55%	N/E	N/E
Carbon black *	1333-86-4	<1%	3.5 mg/m ³	3.5 mg/m ³

(N/E Not Established)

*Black Grades contain carbon black.

3. HAZARDS IDENTIFICATION**Emergency overview**

White ~ yellowish white or black pellet and the properties of this material have not been fully investigated. Avoid contact with skin and eyes. Avoid release to the environment.

Potential Health Effects

Inhalation Not known.
 Eye contact Not known. May cause scratch the surface of eyes.
 Skin contact Not known. Prolonged or repeated contact may cause skin irritation.
 Ingestion Not known.
 Chronic/ Carcinogenicity Not known.
 Carbon black is listed by IARC as Group 2B (possibly carcinogenic to humans), and not listed by NTP or OSHA as a carcinogen.

4

4. FIRST AID MEASURES

First aid Procedures

Inhalation

If exposed to excessive levels of gases that may be formed at elevated temperatures, remove to fresh air. Give the victim rest. Get immediate medical attention. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Never give anything by mouth to an unconscious person.

Eye contact

Rinse immediately with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Remove contact lenses if easily. Get medical attention if irritation develops or persists.

Skin contact

For hot material, immediately immerse or flush the affected area with large amounts of cold water to dissipate heat. Cover with clean cotton or gauze and get medical attention immediately. Get medical attention if irritation develops or persists.

Ingestion

Immediately induce vomiting and rinse mouth with plenty of water. Get medical attention. Never give anything by mouth and induce vomiting in unconscious or confused persons.

Medical treatment

Symptomatic treatment is advised.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Use carbon dioxide or dry chemical for small fires, universal foam or water spray for large fires.

Hazardous combustion products

May generate CO or HF when heated to burning.

Fire-fighting instructions

Wear self-contained breathing apparatus. Dike area to prevent runoff from entering sewer or water sources. Evacuate personnel to a safe area. Keep personnel removed and upwind of fire.

Special protective equipment for fire-fighters

Wear self-contained breathing apparatus. Wear suitable protective clothing. See also Section 8.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

For personal protection (see section 8) when cleaning spill.

Environmental precautions

Avoid runoff into storm sewers and ditches, which lead to waterways.

4

Methods for cleaning up

In case of spill, vacuum or sweep up material and place in a disposal container immediately. Reduce airborne dust and prevent scattering by moistening with water. Scrub contaminated area with detergent and water. Dispose of as waste following local regulations.

7. HANDLING AND STORAGE

Handling

Use with adequate personal protections. Avoid contact with eyes and skin. Avoid inhaling gases from heated material. Wash thoroughly after handling. Keep away from all ignition sources. Ground and bond containers when transferring material.

Storage

Store in a cool, well-ventilated place away from sources of heat, sources of ignition and direct sunlight. Keep container tightly closed in a well-ventilated place. Keep only in the original container.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure limits

OSHA PEL (2003)

Carbon black 3.5 mg/m³

Particles Not Otherwise Specified [PNOS]

5 mg/m³ (Respirable fraction)15 mg/m³ (Total dust)

ACGIH TLV (2003)

Carbon black 3.5 mg/m³

Particles Not Otherwise Specified [PNOS]

3 mg/m³ (respirable particles)10 mg/m³ (inhalable particles)

Engineering controls

Use local ventilation at places where vapour can be released into the workplace air. Always clean protective equipment and workplace. Keep container tightly closed.

Personal protective equipment

Respiratory protection

A respirator is recommended for prolonged handling or exposure.

Hand protection

Wear chemical resistant gloves.

Eye protection

Wear safety goggles or equivalent eye protection.

Skin protection

Wear appropriate protective clothing to avoid skin contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

White ~ yellowish white or black pellet

Odor

Odorless

Physical state

Solid

pH

Not applicable.

4

Boiling point	Not applicable.
Melting point	Not available.
Flash point	Not available.
Explosive properties	Not available.
Oxidising properties	Not available.
Vapor pressure	Not available.
Relative density	ca.1.4-1.9
Solubility in water	Insoluble
Solubility in other solvents	Not available.
Partition coefficient (octanol / water)	Not available.
Viscosity	Not available.
Vapor density	Not available.
Decomposing point	>500°C

10. STABILITY AND REACTIVITY

Conditions to avoid	Direct sunlight, source of heat, open flames, sparks and high temperature
Materials to avoid	No information available.
Hazardous decomposition products	May generate CO or HF when heated to burning.
Hazardous polymerization	Will not occur.

11. TOXICOLOGICAL INFORMATION

No toxicological data are available on the material as such. The following data are applicable to "Aromatic polyester resin" listed below.

[Aromatic polyester resin]

Eye effects	Mildly irritating. (rabbits)
Skin effects	Non-irritating. (rabbits)

12. ECOLOGICAL INFORMATION

No data available.

13. DISPOSAL CONSIDERATIONS

Waste must be disposed in accordance with federal, state and local environmental control regulations. Empty containers must be handled with care due to material residue.

14. TRANSPORT INFORMATION (not meant to be all-inclusive)

UN Class	Not classified.
UN number	None

4

15. REGULATORY INFORMATION (not meant to be all-inclusive)

U.S.A All components are listed on TSCA Inventory.

Europe Union All components are listed on EINECS.

16. OTHER INFORMATION

MSDS Status Newly prepared.

This information only concerns the above-mentioned product and does not need to be valid if used with other(s) or in any process. The information is, to our best present knowledge, correct and complete and is given in good faith but without warranty. It remains the user's own responsibility to make sure that the information is appropriate and complete for his special use of this product.

(This is the last page of this MSDS.)



Intertek Testing Center

7th Fl., Ace Techno Tower V,
#197-22, Guro 3-dong, Guro-gu,
Seoul, 152-766 Korea
Tel : 02-2109-1260, Fax : 02-2109-1258

TEST REPORT

Applicant : HIROSE KOREA CO., LTD.
Address : 1261-10, Jeongwang-dong,
Sihung-city, Kyunggi-do, Korea

Page: 1 of 2

Report No. ST07R-0661-003

Date: Jun. 27, 2007

Sample Description : The following submitted sample(s) said to be:-

Name/Type of Product : C5191R
Sample ID No. : ST07R-0661-003
Manufacturer/Vender : NIKKO METAL
Name of Buyer : SAMSUNG, LG

Sample received : Jun. 22, 2007
Testing Date : Jun. 22, 2007 ~ Jun. 27, 2007
Testing Laboratory : Intertek Testing Center
Testing Environment : Temperature : 23 °C Relative Humidity: 50 %

Test Method(s) : Please see the following page(s).
Test Result(s) : Please see the following page(s).

* Note 1 : The test results presented in this report relate only to the object tested.

* Note 2 : This report shall not be reproduced except in full without the written approval of the testing laboratory.

Approved by,

Chris Ko / Senior Researcher

Authorized by,

Bo Park / Lab Manager

Intertek Testing Center

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TEST REPORT

Report No. ST07R-0661-003

Page: 2 of 2
 Date: Jun. 27, 2007

Sample ID No. : ST07R-0661-003
 Sample Description : C5191R

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	0.5	N.D
Lead (Pb)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	5	32
Mercury (Hg)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D
Hexavalent Chromium (Cr ⁶⁺)	mg/kg	US EPA 3060A and determined by UV-VIS	1	N.D

Notes : mg/kg = ppm = parts per million
 < = Less than
 N.D = Not detected (<MDL)
 MDL = Method detection limit

* View of sample as received;-



***** End of Report *****

To. HIROSE ELECTRIC CO., LTD.

MATERIAL SAFETY DATA SHEET

MSDS FILE No. (KURAMI WORKS) : 05-1113

(based on Form OSHA-174)

IDENTITY (AS Used on Label and List)

Product Class : Tin Plated Phosphor Bronze Strip
 Trade Name : JIS H3110 C5191R(SM)
 CAS No. : Copper: 7440-50-8, Tin: 7440-31-5, Phosphor: 7723-14-0
 Chemical Composition

	Content(wt-%)	CAS No.
Tin(Sn)	5.5~7.0	7440-31-5
Phosphor(P)	0.03~0.35	7723-14-0
Copper(Cu)	Balance	7440-50-8
Sn+P+Cu	99.5≤	-

Section I

Manufacturer's Name NIKKO METAL MANUFACTURING CO., LTD. KURAMI WORKS	Date Prepared January 27th, 2005
Address 3 Kurami Samukawa-cho Kouza-gun Kanagawa prefecture 253-0101 JAPAN	Signature of Person in Charge <i>Tetsuo Maki</i> MAKI, Tetsuo Senior Technical Supervisor, Quality Assurance
	Signature of Person Responsible <i>Hiroaki Watanabe</i> WATANABE, Hiroaki Manager, Quality Assurance Section
Telephone Number for Information (Quality Assurance) +81-467-75-7285	
Facsimile Number for Information (Quality Assurance) +81-467-74-6971	

Section II Hazardous Ingredients / Identity Information

Hazardous Components (Specific Chemical Identity : Names OSHA Pel ACGIH TLV)

Nothing for ordinary service condition

Section III Physical / Chemical Characteristics

Boiling Point 2630 deg. centi.	Specific Gravity (H2O = 1) 8.83
Vapor Pressure (mmHg) N/A	Melting Point 1045 deg. centi. for C5191 Phosphor Bronze 232 deg. centi. for Plated Tin
Vapor Density (Air = 1) N/A	Evaporation Rate (Butyl Acetate = 1) N/A
Solubility in Water N/A	
Appearance and Odor Shiny Silver (solid) : Odor - None	

Section IV Fire and Explosion Hazard Data

Flash Point (Method Used) N/A	Flammable Limits N/A	LEL N/A	UEL N/A
Extinguishing Media N/A (stable , nonflammable substance)			
Special Fire Fighting Procedures Not specified			
Unusual Fire and Explosion Hazards Metal products do not present fire or explosion hazards under normal conditions.			

TEST REPORT

Client: Hirose Electric Co., Ltd.

Report No.: 33911132-01M- 003 1/1
 Date Issued: 17/Nov/2006
 Date Tested: 16/Nov/2006
 Sample Receiving Date : 10/Nov/2006

Subject: Analysis for RoHS/ELV Directive

Authorized by Yoshiharu Namagawa
 Manager of Central Research Laboratory
 NIHON ENVIRONMENTAL SERVICES CO., LTD.
 2-1-13, Sachiura, Karazawa-ku, Yokohama-shi,
 Kanagawa-ken, JAPAN
 TEL +81-45 (780) 3831
 Tested by Kouta Kumao

RESULTS ARE REPORTED AS FOLLOWS

Sample Name	C2680 Nippon Mining & Metals			
Test Item	Results	Quantitation Limit	Unit	Test Method
Cadmium	N.D.	1	ppm	With reference to EPA Method 3052 (Microwave digestion - ICP-MS method)
Lead	N.D.	10	ppm	With reference to EPA Method 3052 (Microwave digestion - ICP-MS method)
Mercury	N.D.	1	ppm	With reference to EPA Method 3052 (Microwave digestion - ICP-MS method)
Total Chromium	N.D.	1	ppm	With reference to EPA Method 3052 (Microwave digestion - ICP-MS method)
(End of report)				

Instruments: ICP-MS; Agilent Technologies, Agilent 7500c

Note:
 N.D. = Not Detected (Less than Quantitation Limit)

The results relate only to the items tested.

To. HIROSE ELECTRIC CO., LTD.

MATERIAL SAFETY DATA SHEET

MSDS FILE No. (KURAMI WORKS) : 05-1111

(based on Form OSHA-174)

IDENTITY (AS Used on Label and List)

Product Class : Brass Strip
Trade Name : JIS H3100 C2680R
CAS No. : Copper: 7440-50-8, Zinc: 7440-66-6

Chemical Composition

Table with 3 columns: Component, Content (wt-%), CAS No. Rows include Copper (Cu) and Zinc (Zn).

Section I

Manufacturer's Name: NIKKO METAL MANUFACTURING CO., LTD. KURAMI WORKS. Date Prepared: January 27th, 2005. Address: 3 Kurami Samukawa-cho, Kouza-gun Kanagawa prefecture, 253-0101 JAPAN. Signatures of MAKI, Tetsuo and WATANABE, Hiroaki.

Section II Hazardous Ingredients / Identity Information

Hazardous Components (Specific Chemical Identity : Names OSHA PeI ACGIH TLV

Nothing for ordinary service condition

Section III Physical / Chemical Characteristics

Table with 2 columns: Property and Value. Rows include Boiling Point (2630 deg. centi.), Specific Gravity (8.47), Vapor Pressure (N/A), Melting Point (930 deg. centi. for C2680 Brass), Vapor Density (N/A), Evaporation Rate (N/A), Solubility in Water (N/A), and Appearance and Odor (Shiny Gold (solid) : Odor - None).

Section IV Fire and Explosion Hazard Data

Flash Point (Method Used) : N/A. Flammable Limits : N/A. LEL : N/A. UEL : N/A. Extinguishing Media : N/A (stable , nonflammable substance). Special Fire Fighting Procedures : Not specified. Unusual Fire and Explosion Hazards : Metal products do not present fire or explosion hazards under normal conditions.

Section V Reactivity Data			
Stability	Unstable		Conditions to Avoid
	Stable	X	
Incompatibility (Materials to Avoid)			
Nothing			
Hazardous Decomposition or Byproducts			
Nothing			
Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	
Section VI Health Hazard Data			
Route(s) of Entry :	Inhalation ?	Skin ?	Ingestion ?
	N/A	N/A	N/A
Health Hazardous (Acute and Chronic)			
N/A			
Carcinogenicity :	NTP ?	IARC Monographs ?	OSHA Regulated ?
	N/A	N/A	N/A
Signs and Symptoms of Exposure			
N/A			
Medical Conditions			
Generally Aggravated by Exposure			
N/A			
Emergency and First Aid Procedures			
N/A			
Section VII Precautions for State Handling and Use			
Steps to Be Taken in Case Material Is Released or Spilled			
N/A			
Waste Disposal Method			
Collect scrap for remelting.			
Precautions to Be Taken in Handling and storing			
<u>For Handling</u>			
<ul style="list-style-type: none"> -Put safety gloves on to protect your hands from edges of coils which might cut your hands. -Wear safety glasses when metal powders or chips are expected to be generated in the work. -Put safety shoes on when handling heavy coils. 			
<u>For Storing</u>			
<ul style="list-style-type: none"> -The environment of stocking area should be free from acid, alkali, chloride, sulfide and other corrosive chemicals to prevent from rusting or corrosion. 			
Other Precautions			
No special requirements			
Section VIII Control Measures			
Respiratory Protection (Specify Type)			
Wearing a mask be recommended in the work such as abrasion and buffing which generates metal powders or chips.			
Ventilation	Local Exhaust	Special	
	None	None	
	Mechanical (General)	Other	
	None	None	
Protective Gloves			
Put safety gloves on to protect your hands from edges of coils which might cut your hands.			
Eye Protection			
Wear safety glasses when metal powder is expected to be generated in the work.			
Other Protective Clothing or Equipment			
Put safety shoes on when handling heavy coils.			
Work / Hygienic Practices			
None			
Influence to environments			
Fish on toxicity : TLm 48 hr. on CuSO4			
Salmogardeneri : 0.038 ~ 0.8 ppm			