

# TEST REPORT

Technical Report: (8714)337-0050

December 05, 2014

Date Received: December 03, 2014

Page 1 of 5

## EXCELERTHINGS

7/729(A), MANNUTHY P.O, THRISSUR-680651, KERALA, INDIA

CONTACT PERSON: Mr. C.P.AUGUIN

Sample Description: ELECTRA FILL (EARTHING COMPOUND)  
Sample received in good condition

Part:	/	Quantity:	/
Technical Data:	/	Special Process:	/
Homogenous Parts:	/	Style No.	/
Color:	SILK GREY	PO No.:	/
Component:	/	Batch No.:	/
Model No.:	/	Product End Use:	/
Age Grade:	/	Retest No.:	/
Vendor:	/	Buying Agent:	/
Manufacturer:	EXCELERTHINGS	Country of Origin:	/
Buyer:	/	Country of Destination:	/
Test Period:	December 03, 2014 to December 05, 2014		

### SUMMARY OF TEST RESULTS

TEST REQUESTED	CONCLUSION	REMARK
European Council Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS)	PASS	See Results

#### Note:

1. The test has been conducted as per vendor's request.

#### REMARK

If there are questions or concerns on this report, please contact:

Phone# 080-40701600/645

Email : [rs1.bvcpbl@in.bureauveritas.com](mailto:rs1.bvcpbl@in.bureauveritas.com)

**BUREAU VERITAS CONSUMER PRODUCTS SERVICES (INDIA) PVT. LTD.**  
**AUTHORIZED SIGNATORIES**



**S. Anbukumar**  
Deputy Manager - Analytical Lab

APPROVED BY



**VS. Sudalaimuthu**  
Lab Manager - Analytical Services

FOR ANY TECHNICAL ISSUES:

PLEASE CONTACT: SUDALAIMUTHU V.S

E. MAIL: [sudalaimuthu.vs@in.bureauveritas.com](mailto:sudalaimuthu.vs@in.bureauveritas.com)

PHONE NO: 080-40701645

FOR ANY INVOICING MATTER: MR.S.JAGADISH

E. MAIL: [S.Jagdish@in.bureauveritas.com](mailto:S.Jagdish@in.bureauveritas.com)

PHONE NO: 080-40701621

C/N: (8714)337-0050 KK/VP/RP

**Photo of the Submitted Sample**



## TEST RESULT

**European Council Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS)**

**Test Method** : With reference to EN 62321: 2009, Clause 8,9 & 10

Test Item(s)	Item / Component Description(s)
A	ELECTRA FILL (EARTHING COMPOUND)

-	Result				
Parameter	Lead (Pb)	Cadmium (Cd)	Mercury (Hg)	Chromium (Cr VI)	Conclusion
Unit	mg/kg	mg/kg	mg/kg	mg/kg	-
Test Item(s)	-	-	-	-	-
A	ND	ND	ND	ND	PASS

Note / Key :

BL = Below limit

NR = Not requested

% = percent

Detection Limit: See Appendix.

OL = Over limit

mg/kg = milligram(s) per kilogram = ppm = part(s) per million

10000 mg/kg = 1 %

M = Marginal

NA = Not applicable

Remark :

- Result(s) may be different to the actual content based on various factors including, but not limit to, sample size, thickness, area, non-uniformity composition, surface flatness.
- When the result(s) is (are) marginal, it is recommended to further perform related wet chemistry method for confirmation. See interpretation of result(s) in Appendix.
- Only selected example(s) is (are) indicated on the photograph(s) in Comment.

Comment :

## TEST RESULT

### Flame Retardants Content - European Council Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS)

**Test Method** : With reference to EN 62321: 2009, Annex A

Test Item(s)	Item / Component Description(s)		
A	ELECTRA FILL (EARTHING COMPOUND)		
See Analytes (Parameter) and their corresponding Maximum Allowable Limit (Req.) in Result Table	Type I	Metallic material	
	Type II	Glass or ceramic material	
	Type III	Other non-metallic material except Type II	
-	Unit	Req.	Result
Test Item(s)	-	-	A
Type	-	III	III
Parameter	-	-	-
PBBs	mg/kg	1000	N.D
MonoBB	mg/kg	-	N.D
DiBB	mg/kg	-	N.D
TriBB	mg/kg	-	N.D
TetraBB	mg/kg	-	N.D
PentaBB	mg/kg	-	N.D
HexaBB	mg/kg	-	N.D
HeptaBB	mg/kg	-	N.D
OctaBB	mg/kg	-	N.D
NonaBB	mg/kg	-	N.D
DecaBB	mg/kg	-	N.D
PBDEs	mg/kg	1000	N.D
MonoBDE	mg/kg	-	N.D
DiBDE	mg/kg	-	N.D
TriBDE	mg/kg	-	N.D
TetraBDE	mg/kg	-	N.D
PentaBDE	mg/kg	-	N.D
HexaBDE	mg/kg	-	N.D
HeptaBDE	mg/kg	-	N.D
OctaBDE	mg/kg	-	N.D
NonaBDE	mg/kg	-	N.D
DecaBDE	mg/kg	-	N.D
<b>Conclusion</b>	-	-	<b>PASS</b>

Note / Key :

ND = Not detected

NR = Not requested

% = percent

Detection Limit (mg/kg) :

For Type I - Each (Pb, Cd & Hg) : 2.0

For Type II - Each (Pb, Cd, Hg & Cr VI) : 2.0

For Type III - Metal, Polymers & Electronics - Each (Pb, Cd, Hg & Cr VI) : 2.0; Each (PBBs & PBDEs) : 50;

Others - Each (Pb, Cd & Hg) : 2.0; Cr VI : 3.0; Each (PBBs & PBDEs) : 50

Remark :

- The list of analytes is summarized in table of Appendix.

## APPENDIX

<b>List of Analytes and their Corresponding Detection Limit and Maximum Allowable Limit [ Preliminary Screening Assessment for European Council Directive 2011/65/EU ] :</b>			
No.	Name of Analytes	Detection Limit (mg/kg)	Maximum Allowable Limit (mg/kg)
		Wet Chemistry	
1	Lead (Pb)	10	1000
2	Cadmium (Cd)	10	100
3	Mercury (Hg)	10	1000
4	Chromium (Cr)	NA	NA
5	Chromium VI (Cr VI)	10	1000
6	Bromine (Br)	NA	NA
NA = Not applicable			

<b>Interpretation of Result(s) [ Preliminary Screening Assessment for European Council Directive 2011/65/EU ] :</b>			
Element	Non-metal	Metal	Composite material
Lead (Pb)	$BL \leq (700 - 3\sigma) < X < (1300 + 3\sigma) \leq OL$	$BL \leq (700 - 3\sigma) < X < (1300 + 3\sigma) \leq OL$	$BL \leq (500 - 3\sigma) < X < (1500 + 3\sigma) \leq OL$
Cadmium (Cd)	$BL \leq (70 - 3\sigma) < X < (130 + 3\sigma) \leq OL$	$BL \leq (70 - 3\sigma) < X < (130 + 3\sigma) \leq OL$	$BL < X < (150 + 3\sigma) \leq OL$
Mercury (Hg)	$BL \leq (700 - 3\sigma) < X < (1300 + 3\sigma) \leq OL$	$BL \leq (700 - 3\sigma) < X < (1300 + 3\sigma) \leq OL$	$BL \leq (500 - 3\sigma) < X < (1500 + 3\sigma) \leq OL$
Chromium (Cr)	$BL \leq (700 - 3\sigma) < X$	$BL \leq (700 - 3\sigma) < X$	$BL \leq (500 - 3\sigma) < X$
Bromine (Br)	$BL \leq (300 - 3\sigma) < X$	-	$BL \leq (250 - 3\sigma) < X$
<p>X = Region considers as marginal result  3σ = Repeatability of XRF analyser at action level</p>			

List of Analytes and their Corresponding Test Methods		European Council Directive 2011/65/EU ] :
No.	Name of Analytes	Test Method(s)
1	Polybromobiphenyls (PBBs) - Bromobiphenyl (MonoBB) - Dibromobiphenyl (DiBB) - Tribromobiphenyl (TriBB) - Tetrabromobiphenyl (TetraBB) - Pentabromobiphenyl (PentaBB) - Hexabromobiphenyl (HexaBB) - Heptabromobiphenyl (HeptaBB) - Octabromobiphenyl (OctaBB) - Nonabromobiphenyl (NonaBB) - Decabromobiphenyl (DecaBB)	With reference to EN 62321: 2009, Annex A.
2	Polybromodiphenyl ethers (PBDEs) - Bromodiphenyl ether (MonoBDE) - Dibromodiphenyl ether (DiBDE) - Tribromodiphenyl ether (TriBDE) - Tetrabromodiphenyl ether (TetraBDE) - Pentabromodiphenyl ether (PentaBDE) - Hexabromodiphenyl ether (HexaBDE) - Heptabromodiphenyl ether (HeptaBDE) - Octabromodiphenyl ether (OctaBDE) - Nonabromodiphenyl ether (NonaBDE) - Decabromodiphenyl ether (DecaBDE)	
[a] The principle of this method was evaluated and supported by two studies organized by IEC TC 111 WG3. These studies were focused on detecting the presence of Cr VI in the corrosion protection coatings on metallic samples.		

**END OF REPORT**



# KERALA ENVIRO INFRASTRUCTURE LTD. LABORATORY

Inside FACT-CD Campus, Ambalamedu, Kochi - 682 303

Ph: 0484-2120196, 3117937, E-mail: keillaboratory@gmail.com

CIN: U24129KL2005PLC017973

• NABL Accredited as per ISO/IEC 17025:2005

• Approved by Kerala State Pollution Control Board: 'A' Grade

## CERTIFICATE OF ANALYSIS

Report No: KEIL/QA/CS/012

Date: 18.04.2015

Client Name	Sample Code	U1/J3
M/s.Excelerthings 7/729(A), Mannuthy.P.O. Thrissur-680 651 Kerala	Sample Name	Earth Enhancing Compound
	Sample Appearance	Grey coloured powder
	Sample Received on	07.04.2015
	Analysis Commenced on	08.04.2015
	Analysis completed on	17.04.2015

### Heavy Metals

Test Methods: Leaching Procedure (TCLP Method-1311-USEPA-1992), AAS for Total Cadmium, Lead Spectrophotometer for Hexavalent Chromium

Sample Code	Unit	Cadmium	Lead	Chromium
U1/J3	mg/kg	BDL	22	BDL
Limit of Detection	mg/kg	0.03	0.5	0.1
RoHS Limit, Max	mg/kg	100	1000	1000

### pH & Total Sulphur as $SO_4^{2-}$

Test Methods: USEPA M-9041 & 9045 for pH, IS: 14685 -1999 for sulphur

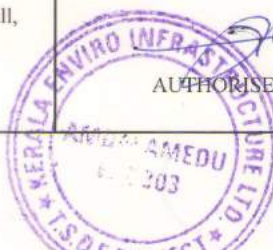
Sample Code	Unit	pH	Total Sulphur as $SO_4^{2-}$
U1/F9	-	8.30	1.22
RoHS Limit, Max	%	---	2.00

Abbreviation: "mg/kg" denotes milligram per kilogram

"BDL" denotes Below Detection Limit

Remarks: The test results are within the limits of Directive 2011/65/EU (RoHS2)

Remarks: *Sample is submitted by customer.	This certificate shall not be reproduced except in full, without the written approval of the laboratory	FOR AND ON BEHALF OF KERALA ENVIRO INFRASTRUCTURE LTD - LABORATORY  AUTHORISED SIGNATORY
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### CERTIFICATE OF ANALYSIS

Report No: KEIL/QA/CS/011

Date: 18.04.2015

Client Name	Sample Code	U1/F9
M/s. Excelerthings	Sample Name	Earth Enhancing Compound
7/729(A), Mannuthy.P.O.	Sample Appearance	Light brown coloured powder
Thrissur-680 651	Sample Received on	07.04.2015
Kerala	Analysis Commenced on	08.04.2015
	Analysis completed on	17.04.2015

#### Heavy Metals

Test Methods: Leaching Procedure (TCLP Method-1311-USEPA-1992), AAS for Total Cadmium, Lead Spectrophotometer for Hexavalent Chromium

Sample Code	Unit	Cadmium	Lead	Chromium
U1/F9	mg/kg	0.3	15.6	BDL
Limit of Detection	mg/kg	0.03	0.5	0.1
RoHS Limit, Max	mg/kg	100	1000	1000

#### pH & Total Sulphur as $\text{SO}_4^{2-}$

Test Methods: USEPA M-9041 & 9045 for pH, IS: 14685 -1999 for sulphur

Sample Code	Unit	pH	Total Sulphur as $\text{SO}_4^{2-}$
U1/F9	-	8.60	1.76
RoHS Limit, Max	%	---	2.00

Abbreviation: "mg/kg" denotes milligram per kilogram  
"BDL" denotes Below Detection Limit

Remarks: The test results are within the limits of Directive 2011/65/EU (RoHS2)

Remarks: *Sample is submitted by customer.	This certificate shall not be reproduced except in full without the written approval of the laboratory.	FOR AND ON BEHALF OF KERALA ENVIRO INFRASTRUCTURE LTD - LABORATORY  AUTHORISED SIGNATORY
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राष्ट्रीय प्रौद्योगिकी संस्थान कलिकट  
**National Institute of Technology Calicut**

एन.आई.टी. कॉपस (पी.ओ.), कलिकट, केरल-673 601, भारत • NIT Campus (P.O.), Calicut, Kerala-673 601, India

Phone: 0495 2286100, 2286101

Fax: 0495 2287250

website: www.nite.ac.in

**DEPARTMENT OF ELECTRICAL ENGINEERING**

EED/SA/earth/61/B

24/03/2010

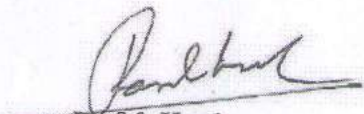
To  
M/s Excel Earthings  
TC - 13 / 1155 ,Mannuthy P O  
Thrissur Dt.


Dear Sir,

Sub: Test Report of Earthing station using Excel Earthing compound  
Ref: Your letter no. nil dated 8-12- 2008

This is to certify that the excel earthing compound treatment of soil results in appreciable reduction of earth resistance and the decrease in the earth resistance is constant over the year. Detailed test report no EED/SA/earth/61/A dated 24/03/2010 is enclosed.



  
Prof & Head

  
Professor & Head  
Dept. of Electrical Engineering  
National Institute of Technology Calicut  
NIT Campus P.O.  
Calicut -673601 - Kerala





DEPARTMENT OF ELECTRICAL ENGINEERING  
National Institute of Technology Calicut  
NIT Campus P. O., Calicut, 673601, Kerala, India  
Ph: 0495-2286300 (HOD), 2286301 (office)

EED/SA/earth/61/A

24/03/2010

**TEST REPORT Sheet1/3**

Name of item/equipment	Earthing Stations using 'Excel Earthing Compound'
Make/model	Earthing Stations made by M/s. Excel Earthings, Trichur
Client	M/s. Excel Earthings, TC - 13 / 1155 Mannuthy P O Thrissur, Kerala
User dept. & reference	M/s. Excel Earthings, TC - 13 / 1155 Mannuthy P O Thrissur, Kerala- Letter dated 08/12/08
Type of Testing	Earth resistance measurement as per IS 3043 in line with client's instructions
<b>Tests conducted and results</b>	
Period of tests	January 2009 to March 2010
Details of item	Earthing Station using 'Excel Earthing Compound'
Sl no. of the item	Nil
Testing standard/parameters	Earth resistance measurement in earthing station using excel earthing compound as per IS 3043 in line with client's instructions

**OBJECTIVES OF THE TEST:**

1. Studies on the effectiveness of soil treatment by 'Excel Earthing Compound' with regard to reduction in earth resistance and durability of the effect.
2. Comparison of earth resistance between earthing stations using charcoal and 'excel earthing compound'.

**FIELD STUDIES:**

A location in the campus of National Institute of Technology Calicut, where the soil resistivity is 400 ohm-meters was chosen for conducting the field studies. In this location, two numbers of earth pits were made as per IS 3043:1987. One earth pit with 'Excel Earthing Compound' and the other with charcoal used as the backfill. The earth resistance values were monitored over a period of one year for both the earth stations.

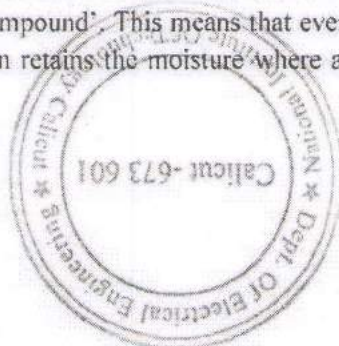
**EXCEL EARTHING COMPOUND:**

'Excel Earthing Compound' is a product of M/s Excel Earthings, Thrissur-Kerala. It is manufactured from a composition of minerals and materials to obtain highly conductive, moisture absorbing and retaining characteristics providing continuous resistance against corrosion.

**ANALYSIS OF THE RESULT:**

One year is taken as the test period to cover all the seasons. During the period under test (year 2009) summer is from March to May and Monsoon is from June to August.

- 1 The earth resistance value of earth station treated with 'Excel Earthing Compound' decreased by approximately 96% of its initial value whereas the earth resistance value of Earth station treated with 'Charcoal' decreased only by 84% of its initial value over the period of one year.
- 2 During summer, there was increase of earth resistance in the earthing station treated with charcoal. While approximately 10% reduction in the earth resistance was observed for the earthing station treated with 'Excel Earthing Compound'. This means that even during the summer months, 'Excel Earthing Compound' suspension retains the moisture whereas 'charcoal' treated earthing system dries up.





**EXPERIMENTAL SETUP:**

In the location, two numbers of earth pits are made as per IS 3043:1987. Plate electrodes are placed at the centre of each pit with details shown below. 50kg of Charcoal is mixed with water (in the volume ratio 1:1.5) to make slurry and is used to fill the space around the ground electrode in one earth pit. 50kg of 'Excel Earthing Compound' supplied by M/s Excel Earthings is mixed with water (in the volume ratio 1:3 as instructed by the client) and this slurry is used to fill the surrounding volume of the ground electrode in the second pit. Common salt is not added in any of the pits as it is corrosive and soluble. After the installation no water is applied to both the pits during the test period of one year except rain water. 6mm thick CI plate is used as the pits are of experimental.

The values of earth resistances were measured regularly and monthly average values were computed and shown below. The earth resistance values were monitored over a period of one year for both the earth stations.

**MATERIALS USED FOR EARTHING STATIONS:**

Earthing station using Charcoal	Earthing station using Excel Earthing Compound
<ul style="list-style-type: none"> <li>• Cast Iron Earth Plate : 60 cm x 60 cm x 6mm</li> <li>• Copper wire 8 SWG - 10 feet</li> <li>• G.I Pipe : B - Class ( 1.5 inch x 8 feet)</li> <li>• G I Nut &amp; bolts and washers ( 2 inch length with 6mm. dia.) : 3 Nos</li> <li>• Charcoal : 50 kg. and water in the volume ratio 1:1.5 to make slurry</li> </ul>	<ul style="list-style-type: none"> <li>• Cast Iron Earth Plate : 60 cm x 60 cm x 6mm</li> <li>• Copper wire 8 SWG - 10 feet</li> <li>• G.I Pipe : B - Class ( 1.5 inch x 8 feet)</li> <li>• G I Nut &amp; bolts and washers ( 2 inch length with 6mm. dia.) : 3 Nos</li> <li>• 'Excel Earthing Compound': 50 kg. and water in the volume ratio 1:3 to make slurry</li> </ul>

**INSTRUMENTS USED:**

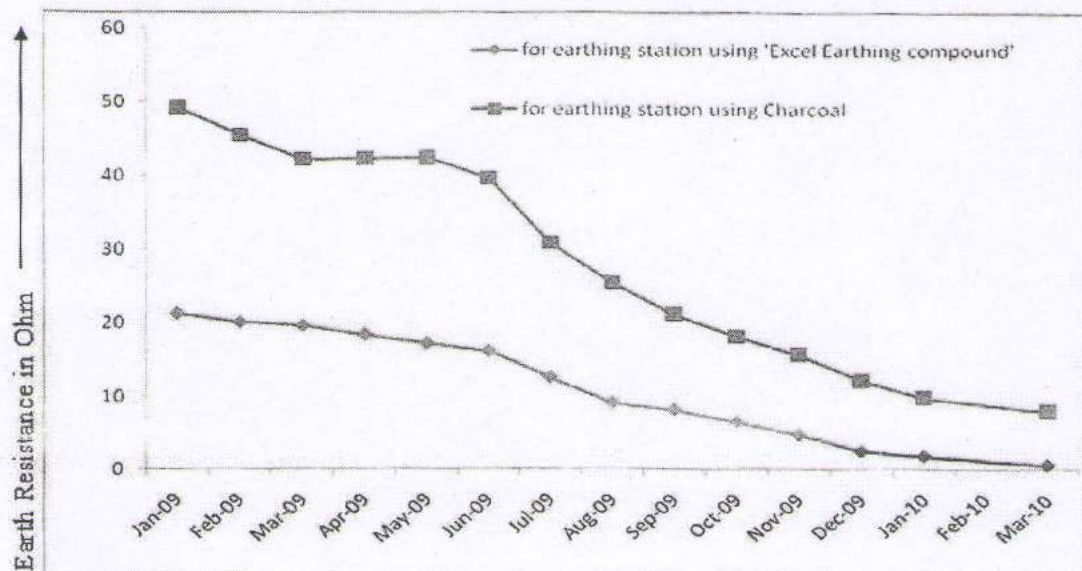
- |  |   |
|--|---|
| 1) Magneto Generator type EARTH TESTER<br>Model: CIE /222(M). , Accuracy $\pm 5\%$ | 2) Digital Earth Tester DET 20<br>Make : Motwane , Accuracy $\pm 1.5\%$ |
|--|---|

**EARTH RESISTANCE MEASUREMENT:**

The values of earth resistances were measured regularly and monthly average values were computed and shown below. Values are recorded with necessary correction factors of the instruments.

Sl no.	Measurement	Resistance measured in earthing using	
		'Excel Earthing Compound'	'Charcoal'
1	January 2009	21.3 $\Omega$	49.2 $\Omega$
2	February 2009	20.1 $\Omega$	45.5 $\Omega$
3	March 2009	19.6 $\Omega$	42.2 $\Omega$
4	April 2009	18.4 $\Omega$	42.3 $\Omega$
5	May 2009	17.2 $\Omega$	42.4 $\Omega$
6	Jun 2009	16.2 $\Omega$	39.6 $\Omega$
7	July 2009	12.6 $\Omega$	30.8 $\Omega$
8	August 2009	9.2 $\Omega$	25.4 $\Omega$
9	September 2009	8.3 $\Omega$	21.1 $\Omega$
10	October 2009	6.6 $\Omega$	18.1 $\Omega$
11	November 2009	4.9 $\Omega$	15.7 $\Omega$
12	December 2009	2.6 $\Omega$	12.2 $\Omega$
13	January 2010	1.9 $\Omega$	9.8 $\Omega$
14	March 2010	0.7 $\Omega$	8 $\Omega$



**VARIATION OF EARTH RESISTANCE:****SHEET RESISTANCE OF EXCEL EARTHING COMPOUND AND CHARCOAL:**

The samples were made slurry using double distilled water and casted to sheet form (of thickness 3 mm) and dried at room temperature for 24 hours

Sheet resistance of Excel Earthing compound :  $2.89 \times 10^6 \Omega$

Sheet resistance of Charcoal :  $52.5 \times 10^6 \Omega$

The pH value of 'Excel Earthing Compound' slurry is of the order 8.

**CONCLUSION:**

The excel earthing compound treatment of soil results in appreciable reduction of earth resistance over the test period of one year and the decrease in the earth resistance is almost constant.

Soil dries up in summer months producing cracks in the fillings and thereby increasing the resistance. After the raining season, these cracks will be filled with water, increasing the moisture content and thereby decreasing the earth resistance. 'Excel Earthing Compound' will retain the moisture irrespective of seasonal variations while charcoal gets dried up.

'Excel Earthing Compound' suspension forms an electrolyte which is basic in nature. Therefore it does not corrode iron or zinc. In the context of present day practice of using cast iron and galvanized steel as material for grounding, this property is especially important.

Measurements & testing: TKS

24.03.2010





Dr Ashok S  
Faculty I/C of Testing

*(Signature)*  
Professor & Head  
Dept. of Electrical Engineering  
National Institute of Technology Calicut  
NIT Campus P.O.  
Calicut - 673601 - Kerala



Certificate No. T-1849

Industry Services

<b>Prüfbericht - Nr.:</b> <i>Test Report No.:</i>		<b>IND/BLR/CH/2013/04621</b>		<b>Seite 1 von 3</b> <i>Page 1 of 3</i>	
<b>Auftraggeber:</b> <i>Client:</i>		<b>Excel Earthings</b> 7/729 (A), Mannuthy, Thrissur - 680 651 .Kerala, India			
<b>Gegenstand der Prüfung:</b> <i>Test item:</i>		Earthing compound (backfill for earth electrode surroundings in the soil)			
<b>Bezeichnung:</b> <i>Identification:</i>		-		<b>Serien-Nr.:</b> <i>Serial No./Document</i> Email dated 14.10.2013 <i>Submitted:</i>	
<b>Wareneingangs-Nr.:</b> <i>Receipt No.:</i>		11102013		<b>Eingangsdatum:</b> <i>Date of receipt:</i> 11.10.2013	
Order No.:		180301		<i>Test Period:</i> 15.10.2013-17.10.2013	
<b>Prüfört:</b> <i>Testing location:</i>		TÜV Rheinland India Pvt Ltd, Plot No.17B, Electronic City, Phase 2, East Wing, Hosur Road, Bangalore - 560 100, Karnataka, India.			
<b>Prüfgrundlage:</b> <i>Test specification:</i>		Customer's requirement : Restriction of the use of Hazardous Substances Directive (RoHS-2), 2011/65/EU, Amended directive updated to date.			
<b>Prüfergebnis:</b> <i>Test Result:</i>		<b>PASS</b>			
<b>Prüflaboratorium/ Testing Laboratory:</b>					
<b>zusammengestellt/ compiled by:</b>			<b>kontrolliert/ checked by:</b>		
 18.10.2013      Rajesh Jain Technical Head, Material Testing Laboratories, Industry Services			 18.10.2013      Nagendra Hebbar Head, Material Testing Laboratories, Industry Services		
<b>Datum</b> <i>Date</i>	<b>Name</b> <i>Name</i>	<b>Unterschrift</b> <i>Signature</i>	<b>Datum</b> <i>Date</i>	<b>Name</b> <i>Name</i>	<b>Unterschrift</b> <i>Signature</i>
<b>Sonstiges/ Other Aspects:</b>					
<b>Abkürzungen:</b> ok / P = entspricht Prüfgrundlage fail / F = entspricht nicht Prüfgrundlage n.a. / N = nicht anwendbar			<b>Abbreviations:</b> ok / P = passed fail / F = failed n.a. / N = not applicable		
<p><b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b></p> <p><i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products. Sampling not done by TÜVRI. Test item submitted by client</i></p>					





Certificate No. T-1849

Industry Services

**Prüfbericht - Nr.:**  
**Test Report No.:**
**IND/BLR/CH/2013/04621**
**Seite 2 von 3**  
**Page 2 of 3**
**TEST RESULTS**

Heavy Metals:

Test Methods: IEC 62321 Ed.,1, 2008, ICP-OES for Total Cadmium, Lead, Mercury, Chromium IEC 62321 Ed.,1, 2008, Spectrophotometer for Hexavalent Chromium					
Sample No.	Unit	Total Cadmium	Hexavalent Chromium	Total Mercury	Total Lead
Sample 001	mg/kg	ND	ND	ND	ND
RoHS Limit, Max.	mg/kg	100	1000	1000	1000

Limit of Detection : Total Cadmium, Lead, Mercury, Hexavalent Chromium : 1 mg/kg  
 Abbreviation : "mg/kg" denotes milligram per kilogram  
 "ND" denotes not detected  
 Sample 001: Test Sample

PBB's and PBDE's:

Test Methods: IEC 62321 Ed.,1, 2008, GC-MS for PBB's and PBDE's		
Flame Retardants		Results, mg/kg
PBBs	Bromobiphenyl	ND
	Dibromobiphenyl	ND
	Tribromobiphenyl	ND
	Tetrabromobiphenyl	ND
	Pentabromobiphenyl	ND
	Hexabromobiphenyl	ND
	Heptabromobiphenyl	ND
	Octabromobiphenyl	ND
	Nonabromobiphenyl	ND
	Decabromobiphenyl	ND
	Sum of PBB's	< 2.5
	RoHS Limit, Sum of PBB's	1000
PBDEs	Bromodiphenylether	ND
	Dibromodiphenylether	ND
	Tribromodiphenylether	ND
	Tetrabromodiphenylether	ND
	Pentabromodiphenylether	ND
	Hexabromodiphenylether	ND
	Heptabromodiphenylether	ND
	Octabromodiphenylether	ND
	Nonabromodiphenylether	ND
	Decabromodiphenyl ether	ND
	Sum of PBDE's	< 2.5
	RoHS Limit, Sum of PBDE's	1000

Limit of Detection : PBB's & PBDE's – 0.25 mg/kg Each  
 Abbreviation : "mg/kg" denotes milligram per kilogram, "ND" denotes not detected

Remarks: The test sample listed above has been verified to comply with the requirements of employed directive 2011/65/EU (RoHS2) (Earlier 2002/95/EC, RoHS Directive)



Certificate No. T-1849

Industry Services

**Prüfbericht - Nr.:**  
*Test Report No.:*

**IND/BLR/CH/2013/04621**

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Test item Photograph:



---- End of Report ----



CENTRE FOR MATERIALS FOR ELECTRONICS TECHNOLOGY (C-MET)  
SHORNUR ROAD, ATHANI (PO), THRISSUR - 680 771.

Fax: 0487-201347  
Phone: 0487-201157

### TEST REPORT

Test report No.:	Customer Ref.: Nil
Name of the Customer: M/s. Excel Earthings Thrissur	Date of receipt of sample: 04.01.2010
Code:	Date of completion of testing: 15.01.2010
Batch No.	Date of reporting: 15.01.2010

Packing  
Sample identification/description:

### TEST RESULTS

Summary of results: (for details see enclosed sheets)


Total number of samples: 2

Sheet resistance of

1. Excel Earthing compound :  $2.89 \times 10^6 \Omega^*$
2. Charcoal :  $52.5 \times 10^6 \Omega^*$

\* The samples were made slurry using double distilled water and casted to sheet form and dried at Room temperature for 24 hrs. The resistance was measured by two probe method.

Seema B  
Analyst / Engineer.

  
Authorized signatory

Subject to terms and conditions in overleaf.