LGA QualiTest GmbH
Ecological Product Testing

Certified according to DIN EN ISO 9001/14001

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Test report

QUOP 5791302

Client:

IMEX CO., LTD
1630-8 Mitsu-takatsu
Okayama-shi
Okayama-ken 709-2124
Japan

Date of commission: July 24, 2009

Samples received: July 16, 2009 (MG-Toner)

Nature of commission: Material examinations of the toner sample
MG-Toner (Monochrome)

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1 Nature of commission

LGA QualiTest GmbH was commissioned to conduct material tests on a black toner sample according to the requirements of the LGA certificate "Tested for contaminants", product group – reprocessed toner modules. The tested parameters comprise volatile organic compounds in total (TVOC), heavy metals: cobalt, nickel and tin-organic compounds.

2 Description of the sample

The sample (toner powder) was packed in a glass bottle and delivered on July 16, 2009.

Sample name	MG-Toner (Monochrome)

3 Examination methods

3.1 Benzene, Styrene, TVOC (total volatile organic compounds) and volatile CMR compounds (carcinogenic, mutagenic, reproduction-toxic substances)

The sample was analyzed by means of thermoextraction and subsequent thermodesorption GC/MS.
Volatile CMR compounds are classified as carcinogenic, mutagenic or reproduction-toxic pursuant to category 1 and 2 according to
- TRGS 905 German Technical Rules for Hazardous Substances
- Annex VI of the EC GHS-ordinance 1272/2008

3.2 Heavy metals "Cobalt, Nickel"

Digestion with microwave following determination with inductively coupled plasma spectrometry (ICP).

3.3 Tin-organic compounds

Extraction with methanol (method A)
Extraction of the sample with methanol, derivatisation with sodium tetraethyl borate.
The quantification is based on capillary gas chromatography (GC).
Extraction with artificial sweat solution (method B)
Extraction of the sample with artificial sweat solution, derivatisation with sodium tetraethyl borate.
The quantification is based on capillary gas chromatography (GC).

Tin-organic compounds: n-butyl tin, di-n-butyl tin, tri-n-butyl tin, tetra-n-butyl tin, n-octyl tin, di-n-octyl tin and tri-cyclohexyl tin.

4 Results of the examination

The limit values as evaluated are in accordance with the certification criteria of the LGA certificate "Tested for contaminants" for reprocessed toner modules (toner powder).

Values that are exceeding the threshold limits are printed in bold letters.

No.	Parameter	Unit	Limiting value		Material examination	
					MG-Toner (Monochrome)	
1.	**Volatile organic compounds:**					
1.1	**TVOC**	mg/kg	< 300 [1)]		43	
1.2	**Benzene**	mg/kg	< 0.35		< 0.3	
1.3	**Styrene**	mg/kg	< 40 [1)]		3.1	
1.4	**volatile CMR substances (Cat. 1+2)**	mg/kg	< 1		each < 0.3	
2.	**Heavy metals:**					
2.1	**Cobalt**	mg/kg	< 25		15	
2.2	**Nickel**	mg/kg	< 70		26	
3.	**Tin-organic compounds:**		**A** [2)]	**B** [2)]	**A**	**B**
3.1	**Total of tin-organic compounds**	mg/kg	< 5	< 0.5	< 0.005	not
3.2	**Sum of dibutyltin (DBT) and tributyltin (TBT)**	mg/kg	< 0.5	< 0.05	< 0.005	necessary
4.	**Azo dyes (only for color toner, mixed sample)**	mg/kg	< 30		not applicable	

[1)] Exceeding the limits of both TVOC and styrene value is permissible if the requirements (target values) of the emission test are fulfilled.

[2)] Method A is valid when extracted using methanol. If the determined value is exceeding the set limit, method B is authoritative (extraction using artificial sweat solution, DIN EN ISO 105 E04).

5 Evaluation

The prerequisite in order to award the "LGA-tested for contaminants" certificate for reprocessed toner modules is a passed material examination for benzene and volatile CMR substances, a material examination for TVOC and styrene (exceeding the limits of the TVOC and styrene values are permissible) and a passed emission test in the test chamber as well as a signed monitoring contract.

The results of the emission test in the test chamber – calculated as emission rates – are decisive for awarding the certificate. It is possible to issue a certificate if specified LGA emission rates are in compliance with fixed upper limits even if individual values of the material examination are slightly exceeded. The higher the exceedance in the scope of the material test the lower the likelihood that the emission requirements of the certificate will be adhered to.

The toner powder "MG-Toner" fulfills the material requirements of the "LGA-tested for contaminants" certificate for benzene, styrene, TVOC, other volatile CMR substances, cobalt, nickel and tin-organic compounds.

Nuremberg, August 11, 2009

LGA QualiTest GmbH
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Ökologische Produktprüfung

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Attachment to Report QUOP 5791302

Thermoextraction Compounds	CAS #	MG-Toner (Monochrome) Amount	Units	LGA Limit value mg/kg
benzene	71-43-2	< 0.3	mg/kg	**< 0.35**
ethylbenzene	100-41-4	4.7	mg/kg	
xylenes	106-42-3	8.5	mg/kg	
styrene	100-42-5	3.1	mg/kg	**< 40**
n-butanol	71-36-3	1.9	mg/kg	
2-ethyl-1-hexanol	104-76-7	1.3	mg/kg	
phenol	108-95-2	0.6	mg/kg	
2,6-di-tert-butyl-p-cresol (SVOC) [3)]	128-37-0	2.7	mg/kg	
n-octanal	124-13-0	0.4	mg/kg	
n-nonanal	124-19-6	0.9	mg/kg	
n-decanal	112-31-2	0.9	mg/kg	
butanone	78-93-3	0.9	mg/kg	
2-phenylpropene	98-83-9	0.9	mg/kg	
aniline	62-53-3	0.5	mg/kg	
benzaldehyde	100-52-7	6.6	mg/kg	
acetophenone	98-86-2	4.4	mg/kg	
dipropylenglycoldimethylether	--	5.0	mg/kg	
stilbene (SVOC)	588-59-0	1.6	mg/kg	
1,3-diphenyl propane (SVOC)	1081-75-0	11	mg/kg	
phenyl tetraline (SVOC)	--	62	mg/kg	
diphenyl cyclobutane (SVOC)	--	19	mg/kg	
not identified compounds	--	2.7	mg/kg	
not identified compounds (SVOC)	--	47	mg/kg	
TVOC [4)] (the sum of all detected substances, having retention times between n-hexane and n-hexadecane) LGA-tested for contaminants	--	43	mg/kg	**< 300**
TVOC (the sum of all detected compounds)	--	187	mg/kg	--

[3)] SVOC = semi volatile organic compounds
[4)] TVOC = total volatile organic compounds