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**Release:**  
**Approved By: Lanny Huynh**  
**Title: CHEMIST**

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## BALAZS™ TEST RESULTS

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If you have any questions regarding the results, please call Tiffany Wilkus at (510) 624-4048

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### **I. Background and Summary:**

A set of films with masks was sent, identified as Films and Masks, were submitted for analysis to determine the concentrations of elemental contaminants, polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs), and phthalates present per the European RoHS directive.

### **II. Analysis Techniques:**

**RoHS Parameters:** Analyses for metals were conducted following the guidelines set out in IEC 62321, Ed. 1, Revision 111/54/CDV, "Procedures for the Determination of Levels of Six Regulated Substances in Electrotechnical Products".

Trace elements were analyzed by ICP-MS in accordance with the documents EN1122, ICS 83.080.01, Method "A" "Plastics - Determination of cadmium - Wet decomposition method", and lead by EPA 3050B "Acid Digestion of Sediments, Sludges and Soils".

Organobromines (polybrominated biphenyls & polybrominated diphenyl ethers) and phthalates were evaluated by GC-MS with the appropriate preparation technique.

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**III. Summary of Results:**

**A) RoHS Evaluation:** In these films and masks, none of the parameters tested were detected at concentrations in excess of those permitted under the RoHS directive. The permitted concentrations are listed below.

Cadmium	100 ppmw (0.01% by weight)
Mercury	1,000 ppmw (0.1% by weight)
Lead	1,000 ppmw (0.1% by weight)
Hexavalent Chromium	1,000 ppmw (0.1% by weight)
PBBs, PBDEs	1,000 ppmw (0.1% by weight)
DEHP	1,000 ppmw (0.1% by weight)
DBP	1,000 ppmw (0.1% by weight)
BBP	1,000 ppmw (0.1% by weight)
DIBP	1,000 ppmw (0.1% by weight)

Sample: 1213390 [FILMS]

Site ID: KM AG, MK AR, MK Triple A, BJ  
 AR

Component	Detection Limit	Result Value	Units
<b>G0342-N-R GC/MS Analysis for Organic Bromine Compounds (IEC 62321 Edition 1 111/116/FDIS)</b>			
Polybrominated biphenyl (PBB) / 1	10	*	ppm
Polybrominated diphenyl ether (PBDE) / 1	10	*	ppm
<b>G0344-N-R RoHS ICP Elemental Analysis for Cd, Pb, and Hg</b>			
Cadmium (Cd) / 1	1	*	ppm
Lead (Pb) / 1	1	*	ppm
Mercury (Hg) / 1	30	*	ppm
<b>G0345-N-R Hexavalent Chromium by UV-VIS (EC Method)</b>			
Hexavalent chromium (Cr+6) / 1	1	*	ppm
<b>G0315-N-R GC/MS Analysis for Phthalates (DEHP, BBP, DBP and DIBP)</b>			
Di(2-ethylhexyl)phthalate (DEHP)	10	*	ppm
Dibutyl phthalate (DBP)	10	*	ppm
Benzyl butyl phthalate (BBP)	10	*	ppm
Diisobutyl phthalate (DIBP)	10	*	ppm

\* = Analysis revealed that the analyte was not found at or about the detection limit

Sample: 1213391 [MASKS]

Site ID: KM AG, MK AR, MK Triple A, BJ  
 AR

Component	Detection Limit	Result Value	Units
<b>G0342-N-R GC/MS Analysis for Organic Bromine Compounds (IEC 62321 Edition 1 111/116/FDIS)</b>			
Polybrominated biphenyl (PBB) / 1	10	*	ppm
Polybrominated diphenyl ether (PBDE) / 1	10	*	ppm
<b>G0344-N-R RoHS ICP Elemental Analysis for Cd, Pb, and Hg</b>			
Cadmium (Cd) / 1	1	*	ppm
Lead (Pb) / 1	1	*	ppm
Mercury (Hg) / 1	30	*	ppm
<b>G0345-N-R Hexavalent Chromium by UV-VIS (EC Method)</b>			
Hexavalent chromium (Cr+6) / 1	1	*	ppm
<b>G0315-N-R GC/MS Analysis for Phthalates (DEHP, BBP, DBP and DIBP)</b>			
Di(2-ethylhexyl)phthalate (DEHP)	10	*	ppm
Dibutyl phthalate (DBP)	10	*	ppm
Benzyl butyl phthalate (BBP)	10	*	ppm
Diisobutyl phthalate (DIBP)	10	*	ppm

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