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415-873 Rep. of KOREA

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Report No. : TAK-000769

Receipt Date : Jan.24.2014

Customer : Chan Koo,Park except 1

Test Date : Feb.03.2014

KUMHO PETRO CHEMICAL CO.,LTD

227, Yeosusandan 2-ro, Yeosu-si, Jeollanam-do, Korea

Sample : Rubber Antioxidant [KUMANOX SP]

Testing Date : Jan.27.2014 ~ Feb.03.2014

Testing Environment : Temperature (20 ± 5) °C, Relative humidity (40 ± 20) %

Test method : Refer to following pages

Test result : Refer to following pages

Attachment : Flow chart and Sample pictures

USAGE : QUALITY CONTROL

NOTE : 1. The test results on this test report are only limited to the samples and sample names provided by the customer and KTR do not guarantee the quality of all products of the customer.  
2. This test report shall not be used for public relation, advertisement, lawsuit and any other purposes outside the scope of its defined usage.

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Feb.03.2014

## Korea Testing & Research Institute

President

*Choi Hyeonk'*



전자문서본(Electronic Copy)

Report No : TAK-000769

Sample : Rubber Antioxidant [KUMANOX SP]

### TEST RESULT

Test Items	Unit	Sample	Results	MDL	Test Methods
Pb	mg/kg	-	Not Detected	5	IEC 62321-5 Ed.1.0b : 2013 (AAS)
Cd	mg/kg	-	Not Detected	0.5	IEC 62321-5 Ed.1.0b : 2013 (AAS)
Hg	mg/kg	-	Not Detected	0.5	IEC 62321-4 Ed.1.0b : 2013 (AAS)
Cr(VI)	mg/kg	-	Not Detected	0.5	IEC 62321 Ed.1.0b : 2008 (UV/Vis)
Total-PBBs	mg/kg	-	Not Detected	-	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Mono-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Di-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Tri-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Tetra-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Penta-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Hexa-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Hepta-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Octa-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Nona-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Deca-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Total-PBDEs	mg/kg	-	Not Detected	-	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Mono-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Di-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Tri-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Tetra-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Penta-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Hexa-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Hepta-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Octa-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Nona-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Deca-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)

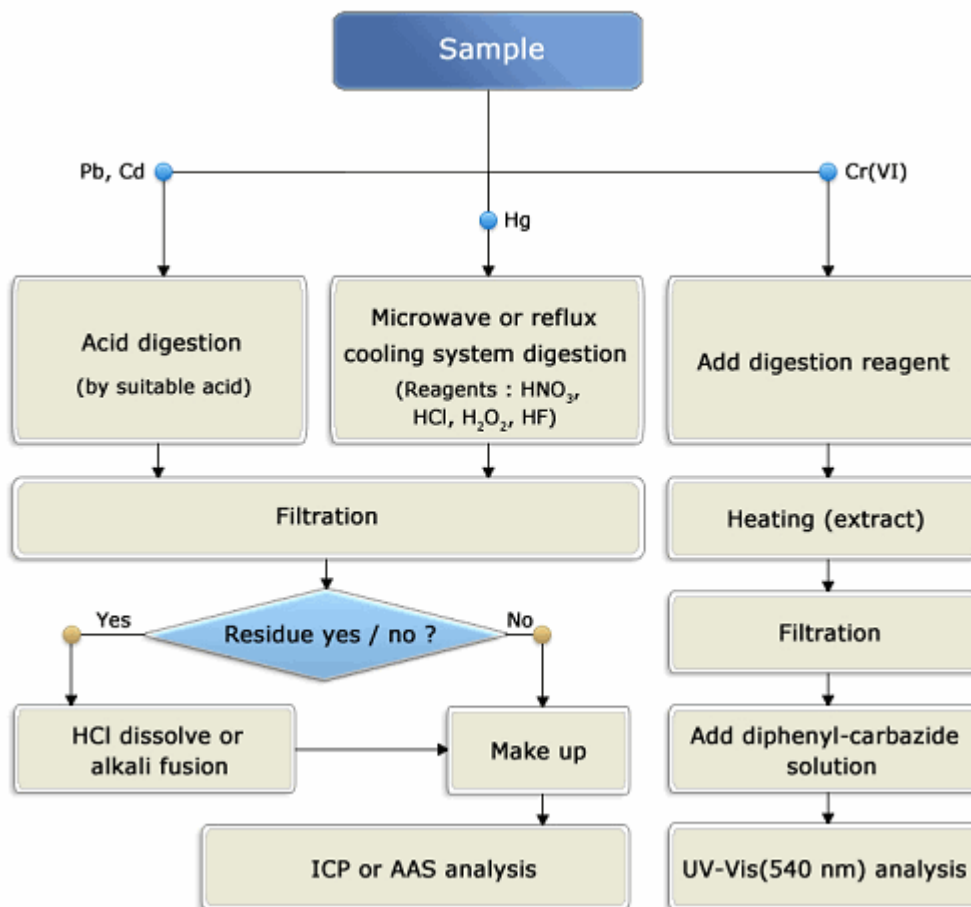
Notes : mg/kg = ppm (parts per million)  
N.D. = Not detected (<MDL)  
MDL = Method detection limit

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Sample : Rubber Antioxidant [KUMANOX SP]

Pb, Cd, Hg, Cr(VI) : Tested by Hong Chang-ki (Tel : 031-999-3114)

### Flow chart of heavy metals analysis

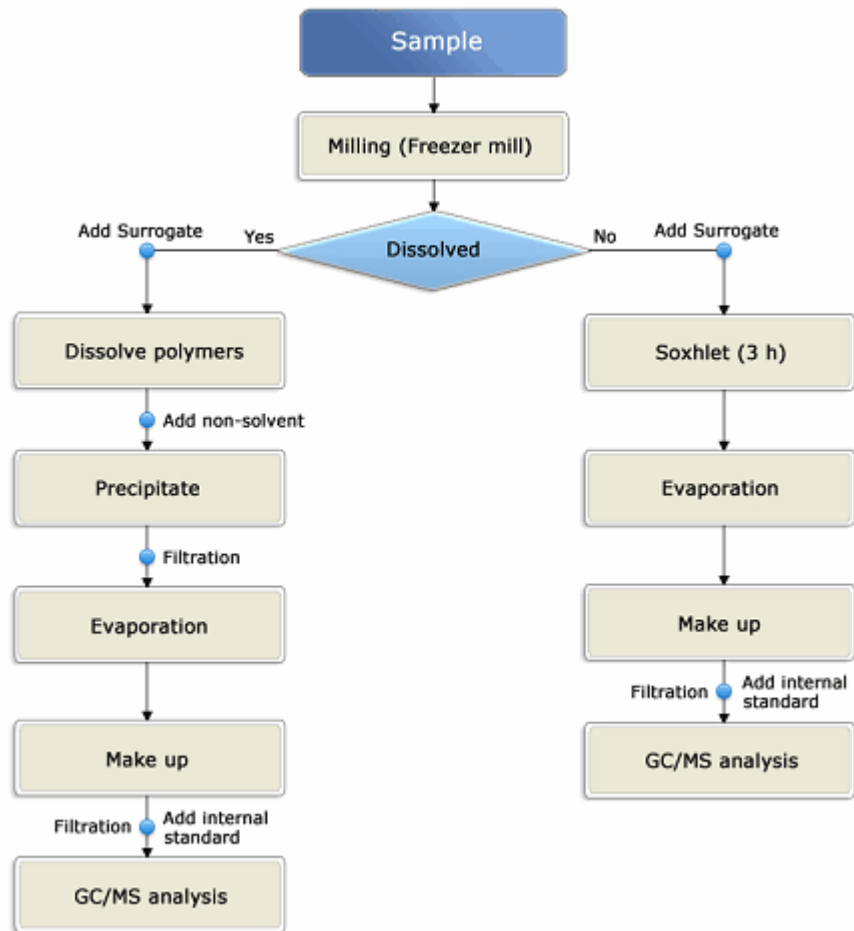


Report No : TAK-000769

Sample : Rubber Antioxidant [KUMANOX SP]

PBBs, PBDEs : Tested by Yoo Seungkyun (Tel : 031-999-3131)

### Flow chart of PBBs and PBDEs analysis



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Sample : Rubber Antioxidant [KUMANOX SP]

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## Sample



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