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415-873 Rep. of KOREA

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Report No. : TAK-000761

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 Vulcanization Accelerator [KUMAC D]

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-000761

Sample : Rubber Vulcanization Accelerator [KUMAC D]

### 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) |

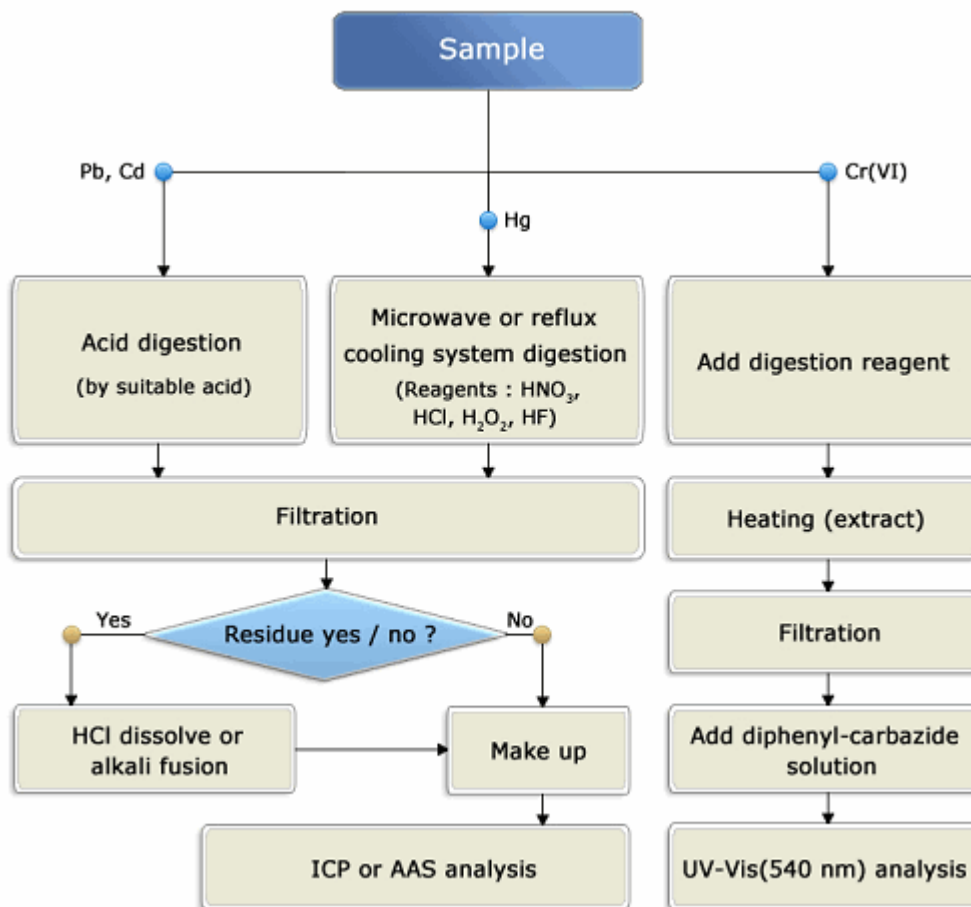
Notes : mg/kg = ppm (parts per million)  
N.D. = Not detected (<MDL)  
MDL = Method detection limit

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Sample : Rubber Vulcanization Accelerator [KUMAC D]

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

### Flow chart of heavy metals analysis



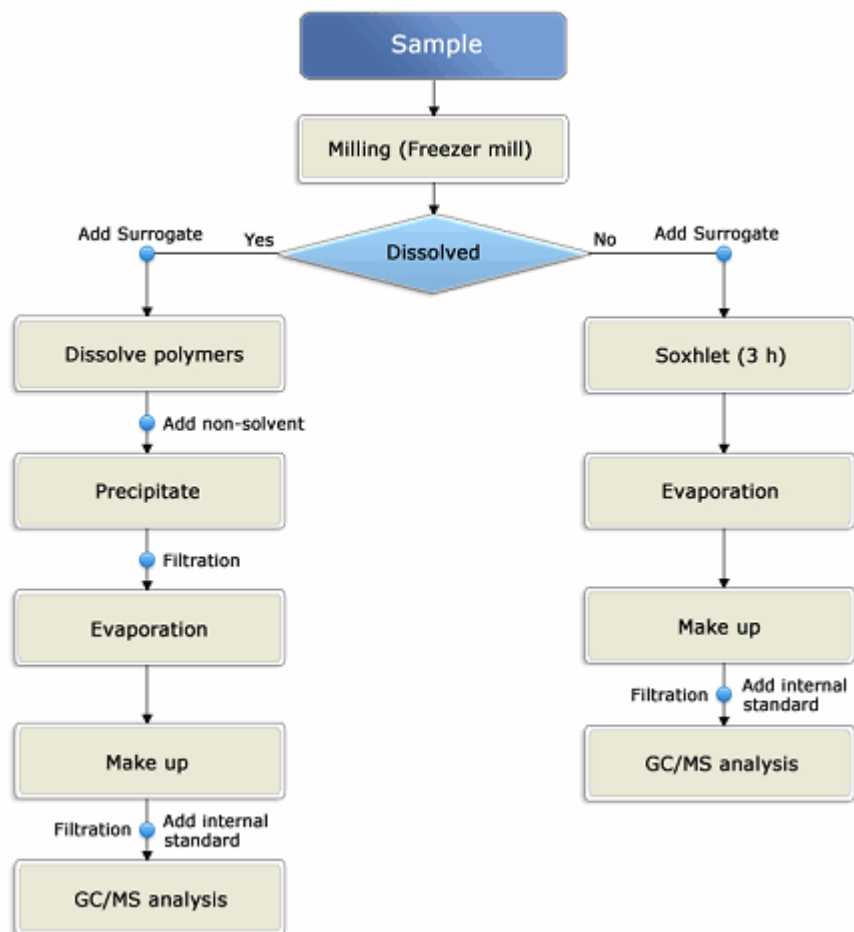
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PBBs, PBDEs : Tested by Yoo Seungkyun (Tel : 031-999-3131)

### Flow chart of PBBs and PBDEs analysis



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## Sample



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