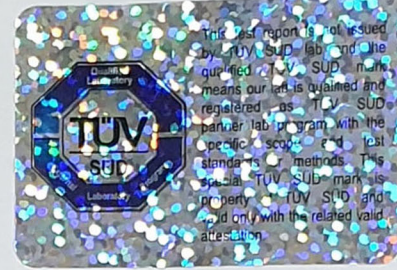




# TEST REPORT



98, Gyoyukwon-ro, Gwacheon-si, Gyeonggi-do, 13810, Korea

TEL 82-2-2164-0011 FAX 82-2-2634-1008

Report No. : TAK-2020-068280

Receipt Date : Apr.27.2020

Customer : Chung Chun Sik

Test Date : May.14.2020

Leader Energy

710ho, Na-Dong(MegaZone), 117 Hwanggeum-Ro, Yangchon-Myeon, Kimpo-Si, Gyeonggi-do, Republic of Korea

Sample : HEAT PIPE WORKING LIQUID

Testing Date : Apr.27.2020 ~ May.14.2020

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 does not guarantee the quality of all products of the customer, and you can confirm the authenticity of the test report online ([www.ktr.or.kr](http://www.ktr.or.kr)) or by using the QR code.
2. This test report shall not be used for public relation, advertisement, lawsuit and any other purposes outside the scope of its defined usage.
3. Only original copy (including certified copy) of the test report is valid – electronic copy (hard and/or soft) is for your reference only.

*Yong-hyeon Lee*

Prepared by Yong-hyeon Lee

Tel : 02-2092-3682

*Yang-Suek Bhang*

Reviewed by Yang-Suek Bhang

Technical Manager

Tel : 1577-0091(ARS ①→④)

May.14.2020

## Korea Testing & Research Institute

President

*Kwon Oh-jung*



QR Code to verify Genuineness



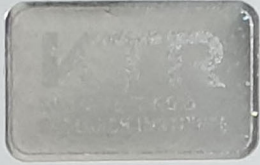
# TEST REPORT

Report No. : TAK-2020-068280

Sample : HEAT PIPE WORKING LIQUID

## TEST RESULT

Test itmes	Unit	Sample	Results	MDL	Test Methods
Pb	mg/kg	-	Not Detected	10	
Cd	mg/kg	-	Not Detected	1	
Cr <sup>6+</sup>	mg/kg	-	Not Detected	8	
Hg	mg/kg	-	Not Detected	1	
Total-PBBs	mg/kg	-	Not Detected	-	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Tetra-BB	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Penta-BB	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Hexa-BB	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Hepta-BB	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Octa-BB	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Nona-BB	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Deca-BB	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Total-PBDEs	mg/kg	-	Not Detected	-	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Mono-BDE	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Di-BDE	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Tri-BDE	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Tetra-BDE	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Penta-BDE	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Hexa-BDE	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Hepta-BDE	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Octa-BDE	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Nona-BDE	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
Deca-BDE	mg/kg	-	Not Detected	10	IEC 62321-6 Ed. 1.0 : 2015(Apply Correspondingly)
DEHP	mg/kg	-	Not Detected	50	IEC 62321-8 Ed. 1.0 : 2017(Apply Correspondingly)
BBP	mg/kg	-	Not Detected	50	IEC 62321-8 Ed. 1.0 : 2017(Apply Correspondingly)
DBP	mg/kg	-	Not Detected	50	IEC 62321-8 Ed. 1.0 : 2017(Apply Correspondingly)
DIBP	mg/kg	-	Not Detected	50	IEC 62321-8 Ed. 1.0 : 2017(Apply Correspondingly)



# TEST REPORT

Report No. : TAK-2020-068280

Sample : HEAT PIPE WORKING LIQUID

## TEST RESULT

Test itmes	Unit	Sample	Results	MDL	Test Methods
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Notes : mg/kg = ppm (parts per million)

N.D = Not detected( <MDL)

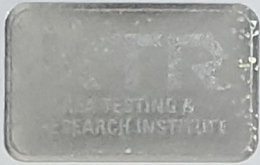
MDL = Method detection limit

\* DIBP : Di-isobutyl phthalate

DBP : Di-n-butyl phthalate

BBP : Butyl benzyl phthalate

DEHP : Di(ethylhexyl) phthalate



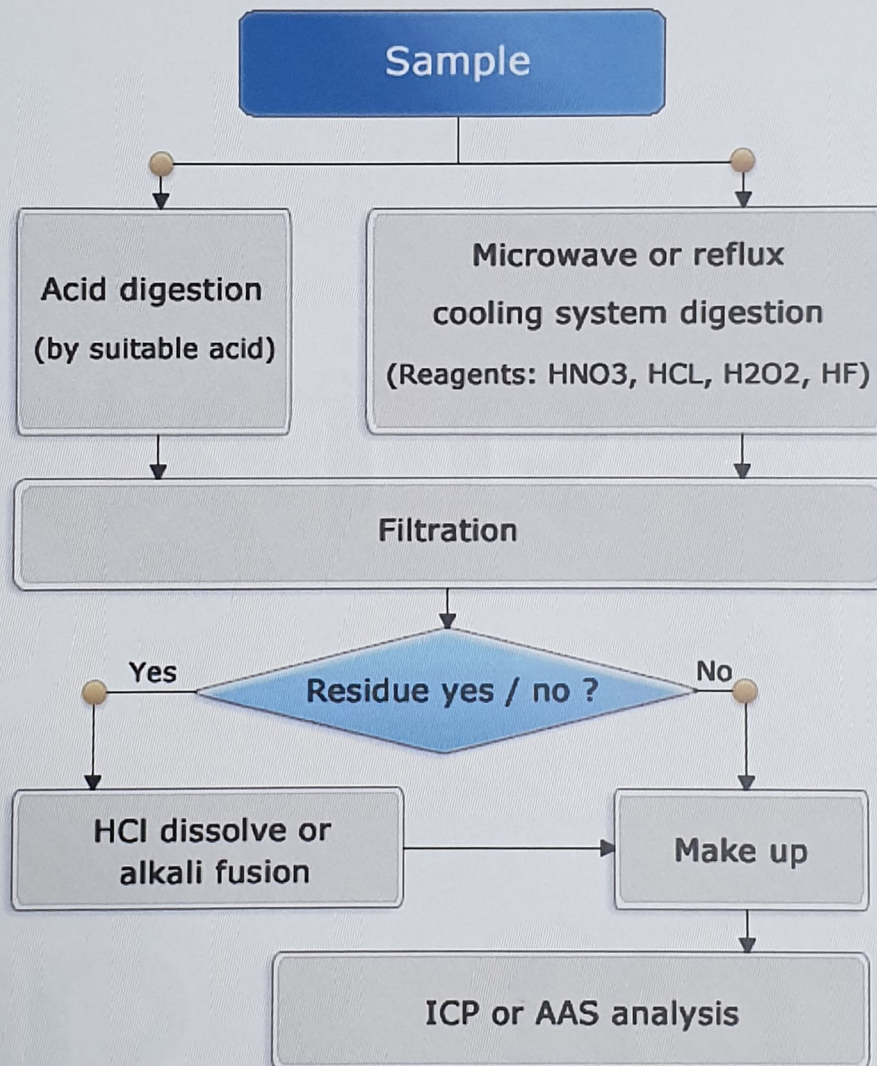
# TEST REPORT

Report No. : TAK-2020-068280

Sample : HEAT PIPE WORKING LIQUID

Pb, Cd, Hg : Tested by yoo ji yeoun(Tel : 02-2092-3797)

## Flow Chart of heavy metals analysis





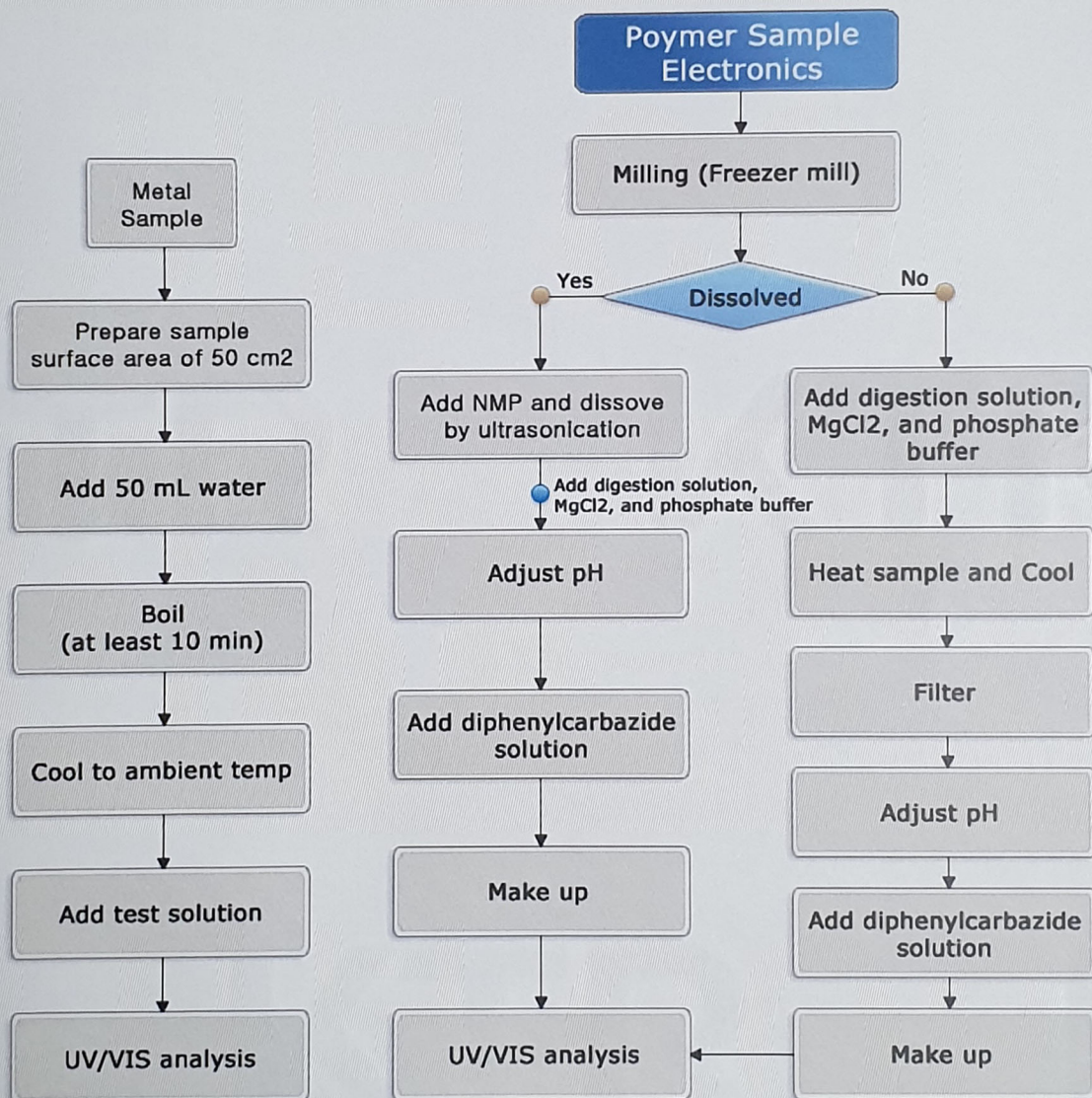
# TEST REPORT

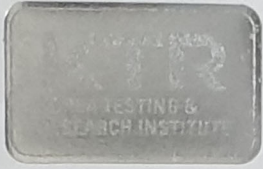
Report No. : TAK-2020-068280

Sample : HEAT PIPE WORKING LIQUID

Cr<sup>6+</sup> : Tested by yoo ji yeoun(Tel : 02-2092-3797)

## Flow Chart of Cr<sup>6+</sup> analysis





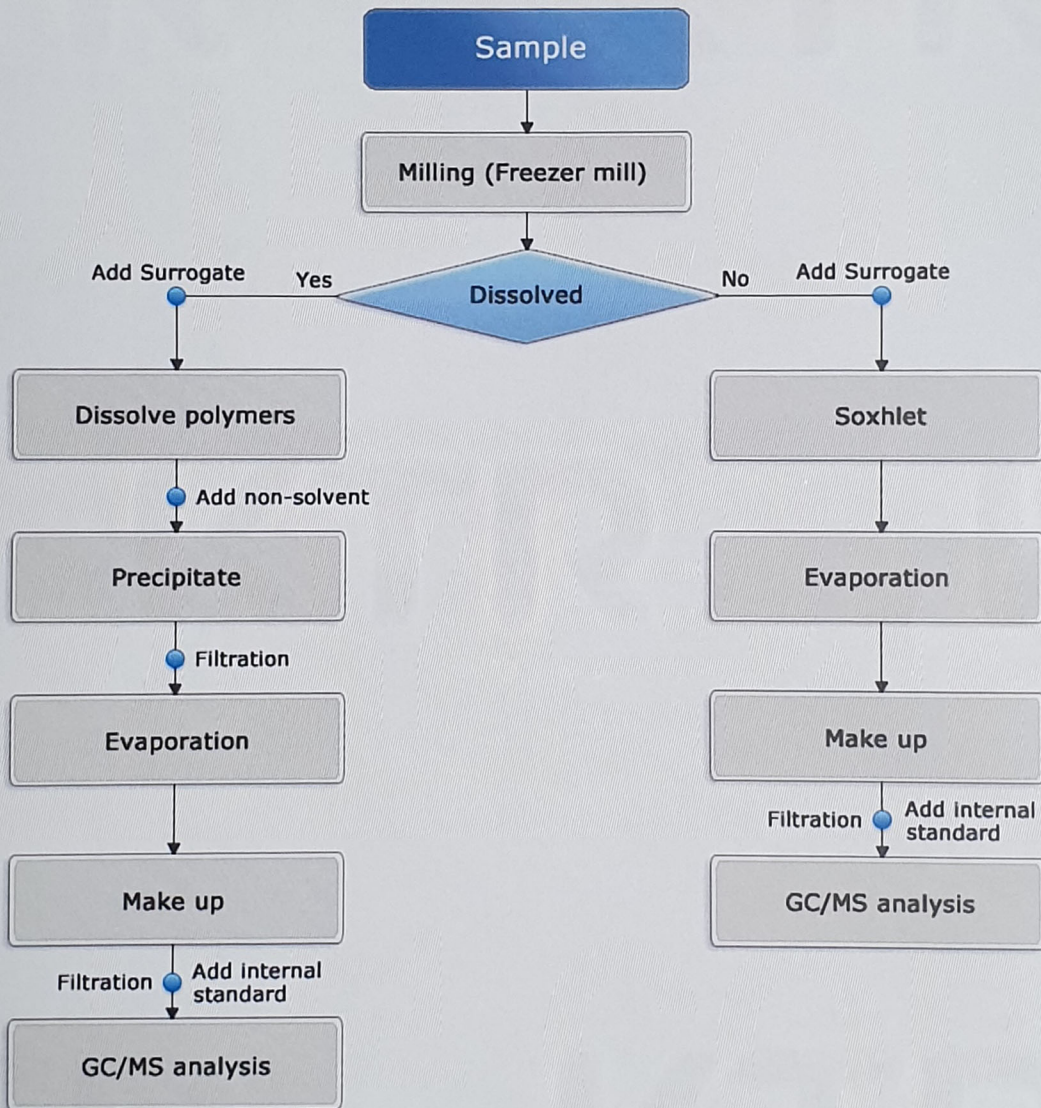
# TEST REPORT

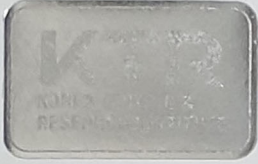
Report No. : TAK-2020-068280

Sample : HEAT PIPE WORKING LIQUID

PBBs, PBDEs : Tested by Yong-hyeon Lee(Tel : 02-2092-3682)

## Flow Chart of PBBs and PBDEs analysis





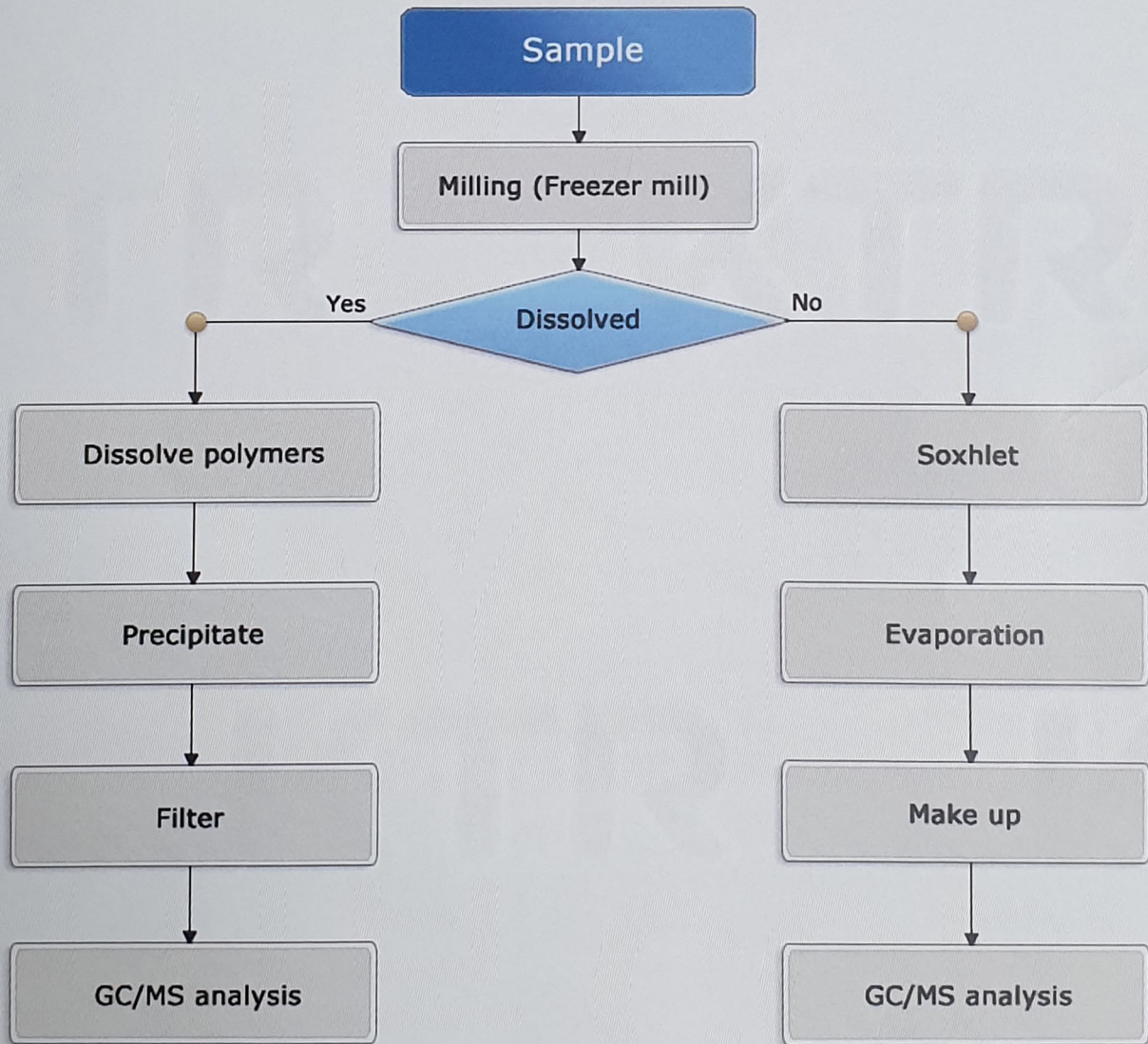
# TEST REPORT

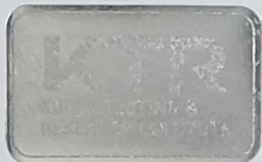
Report No. : TAK-2020-068280

Sample : HEAT PIPE WORKING LIQUID

Phthalates : Tested by Kweon Deok Jun(Tel : 02-2092-3792)

## Flow Chart of Phthalates analysis





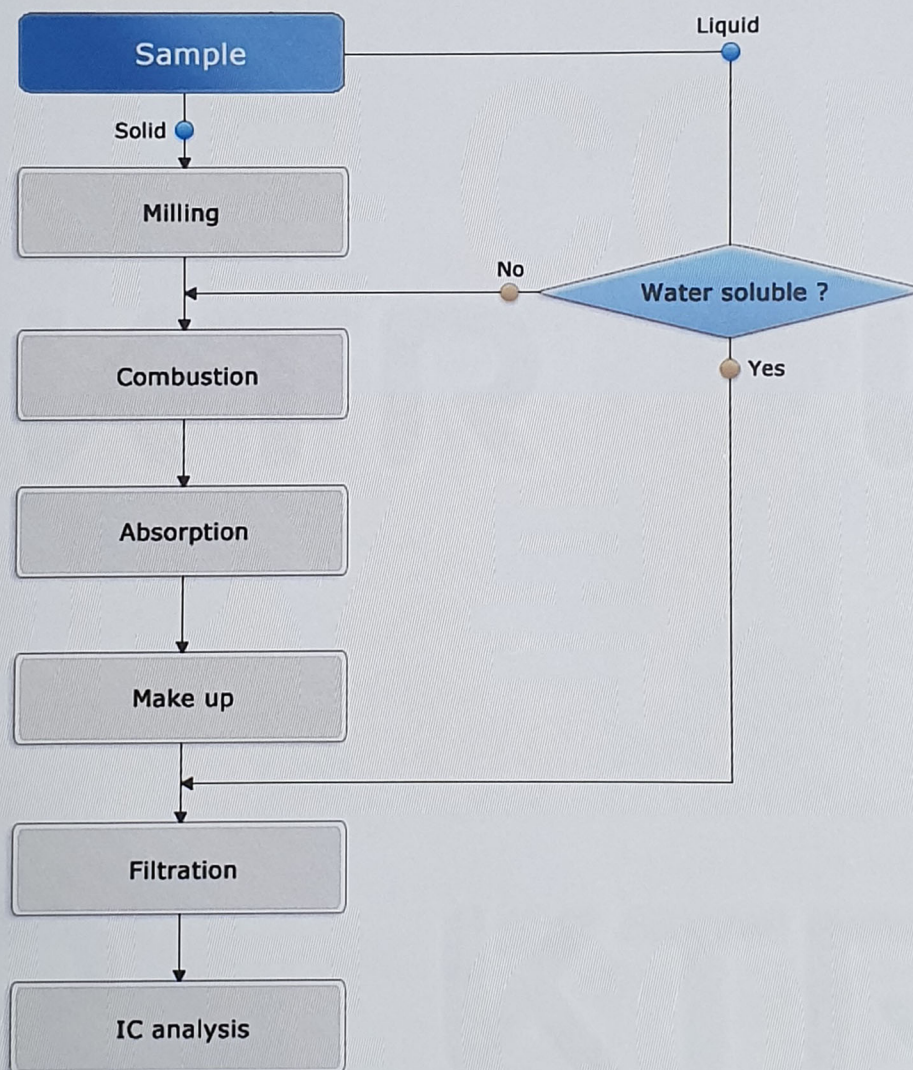
# TEST REPORT

Report No. : TAK-2020-068280

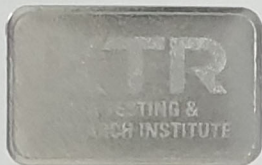
Sample : HEAT PIPE WORKING LIQUID

F, Cl, Br, I : Tested by Kweon Deok Jun(Tel : 02-2092-3792)

## Flow Chart of Halogen analysis







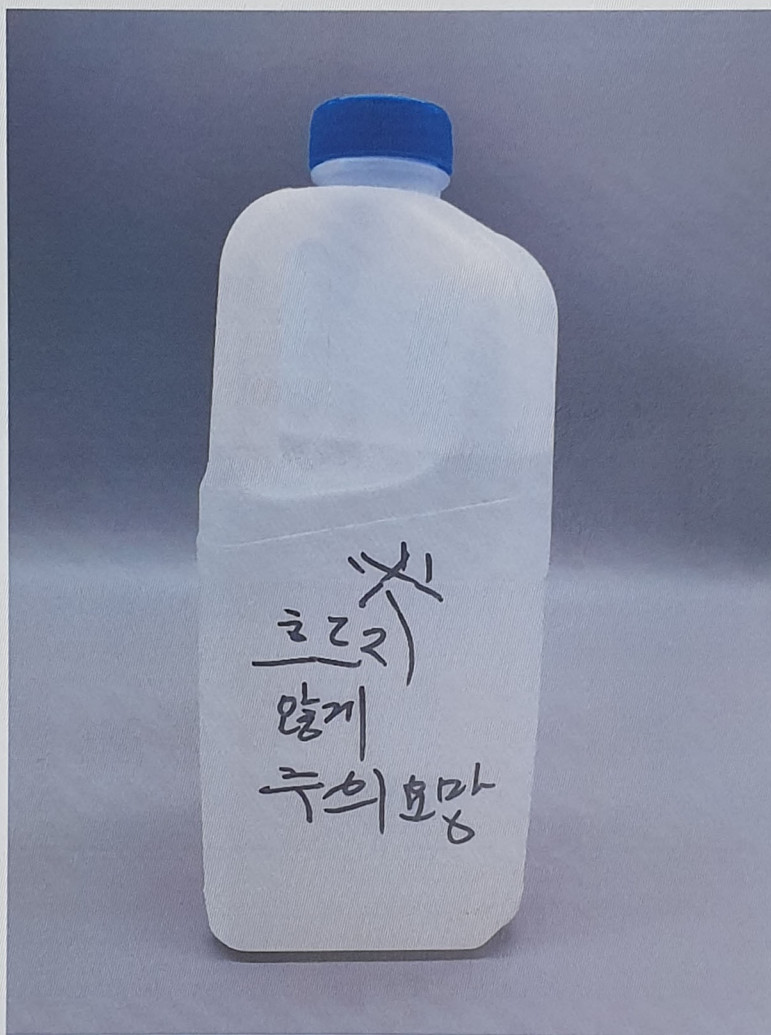
# TEST REPORT

Report No. : TAK-2020-068280

Sample : HEAT PIPE WORKING LIQUID

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## Sample



- End of Report -