

# CHEMICAL ANALYSIS TEST REPORT

Customer Company : TSEC CORPORATION  
Customer Address : No.85, Guangfu N. Rd., Houkou Township, Hsinchu County 30351,  
Taiwan, R.O.C.  
Laboratory Address : No.10-1, Lixing 1st Rd., Hsinchu City 30078, Taiwan (R.O.C.)  
Sample Name : TOPCon Halfcut solar Cell  
Model Name : NA  
Date Received : 2024/10/23  
Date Tested : 2024/10/24~ 2024/11/04  
Report Issue Date : 2024/11/05

## TESTING LABORATORY IS APPROVED BY:

IECQ Certificate of Approval No.: IECQ-L DEKRA 16.0002 For Independent Test  
Laboratory According to ISO/IEC 17025

ISO 9001 certificate is approved by TUV CERT certification body of TUV NORD Cert GmbH

## WE HEREBY CERTIFY THAT:

The test(s) shown in the attachment were conducted according to the indicating procedures. We assume full responsibility for the accuracy and completeness of these tests and vouch for the qualifications of all personnel performing them.

	Name	Signature	Date
Test Engineer	Xiaohu Chen	<i>Xiaohu Chen</i>	Nov 05, 2024
Manager	Wenston Lin	<i>Wenston Lin</i>	Nov 05, 2024

## **NOTE :**

1. This report will be invalid if reproduced in part or altered in any way.
2. This report refers only to the specimen(s) submitted to test, and is invalid if used otherwise.
3. This report is ONLY valid with the examination seal and signature of this institute.
4. The tested specimen(s) will only be preserved for thirty days from the date issued, if not collected by the applicant.





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## 1. GENERAL INFORMATION

### 1.1 DESCRIPTION OF SAMPLE

Sample Name : TOPCon Halfcut solar Cell

Model Name : NA

## 2. CHEMICAL ANALYSIS TEST

### 2.1 TEST CONDITION AND RESULT

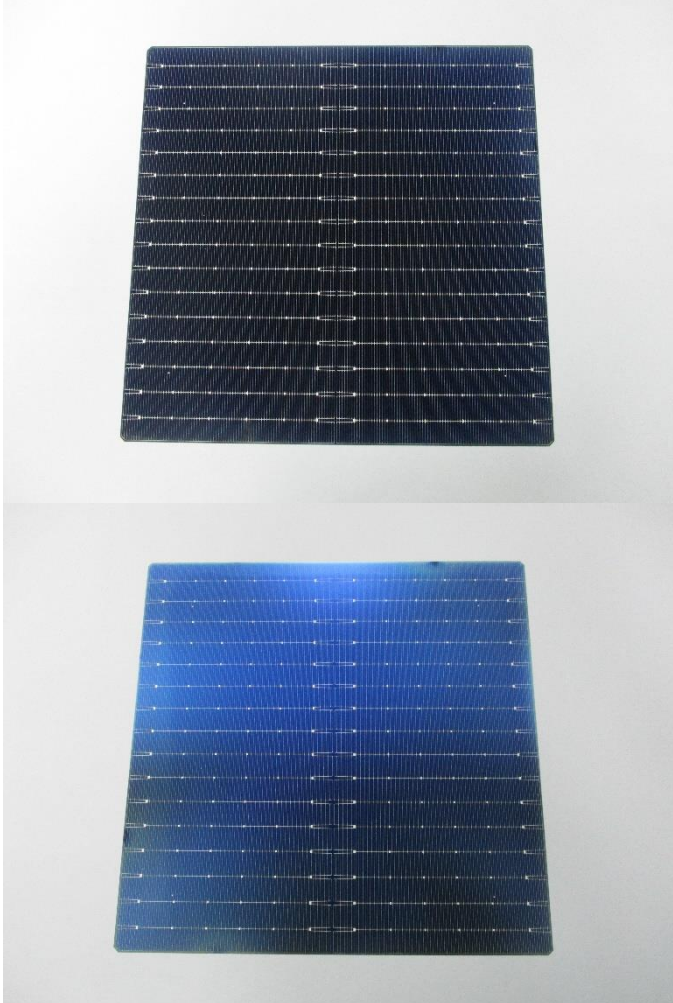
Description of test part : TOPCon Halfcut solar Cell					
Test Item(s)	Method	Instrument	Unit	MDL	Result
Pb	IEC	ICP-OES	mg/kg	2	83.2
Cd	62321-5:2013			2	N.D.
Hg	IEC 62321-4:2013	ICP-OES	mg/kg	2	N.D.
Cr <sup>6+</sup>	IEC 62321-7-2:2017	UV-VIS	mg/kg	2	N.D.
Monobromobiphenyl	IEC 62321-6:2015	GC-MS	mg/kg	5	N.D.
Dibromobiphenyl				5	N.D.
Tribromobiphenyl				5	N.D.
Tetrabromobiphenyl				5	N.D.
Pentabromobiphenyl				5	N.D.
Hexabromobiphenyl				5	N.D.
Heptabromobiphenyl				5	N.D.
Octabromobiphenyl				5	N.D.
Nonabromobiphenyl				5	N.D.
Decabromobiphenyl				5	N.D.
<b>The above-mentioned total of (PBBs)</b>				---	---
Monobromodiphenyl ether	IEC 62321-6:2015	GC-MS	mg/kg	5	N.D.
Dibromodiphenyl ether				5	N.D.
Tribromodiphenyl ether				5	N.D.
Tetrabromodiphenyl ether				5	N.D.
Pentabromodiphenyl ether				5	N.D.
Hexabromodiphenyl ether				5	N.D.
Heptabromodiphenyl ether				5	N.D.
Octabromodiphenyl ether				5	N.D.
Nonabromodiphenyl ether				5	N.D.
Decabromodiphenyl ether				5	N.D.
<b>The above-mentioned total of (PBDEs)</b>				---	---

Description of test part : TOPCon Halfcut solar Cell					
Test Item(s)	Method	Instrument	Unit	MDL	Result
DEHP (CAS NO. 117-81-7)	IEC 62321-8:2017	GC/MS	mg/kg	10	N.D.
DBP (CAS NO. 84-74-2)				10	N.D.
BBP (CAS NO. 85-68-7)				10	N.D.
DIBP (CAS NO. 84-69-5)				10	N.D.

**Note :**

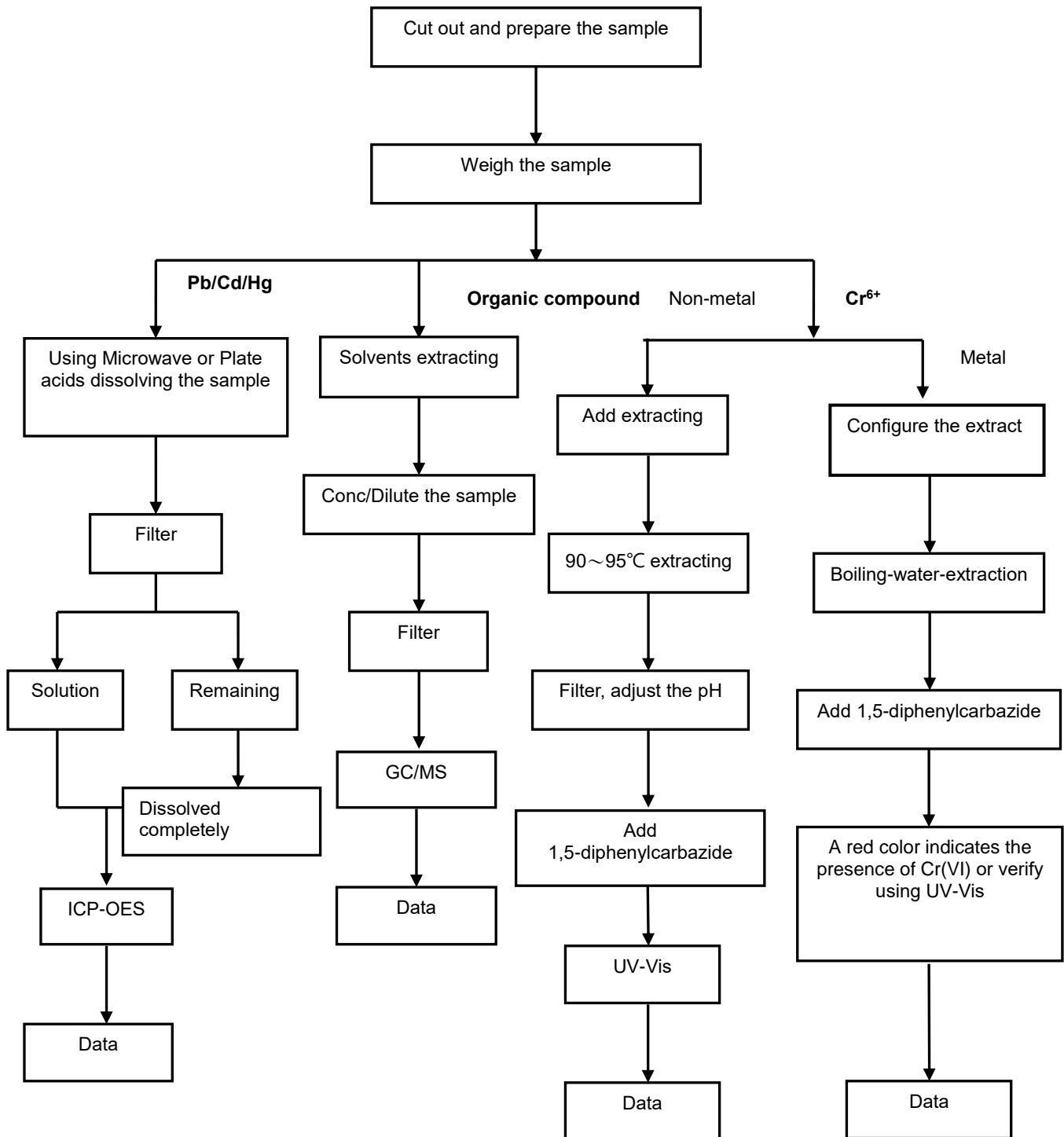
1. MDL = Method Detection Limit.
2. mg/kg = ppm.
3. N.D. = Not Detected. (The result is below the MDL.)
4. ICP-OES = Inductively Coupled Plasma-Optical Emission Spectrometer.
5. UV-VIS = Ultraviolet-Visible Spectrophotometer.
6. GC-MS = Gas Chromatograph-Mass Spectrometer.
7. "---" Show that there is not specification value.

## 2.2 PHOTO OF SAMPLE

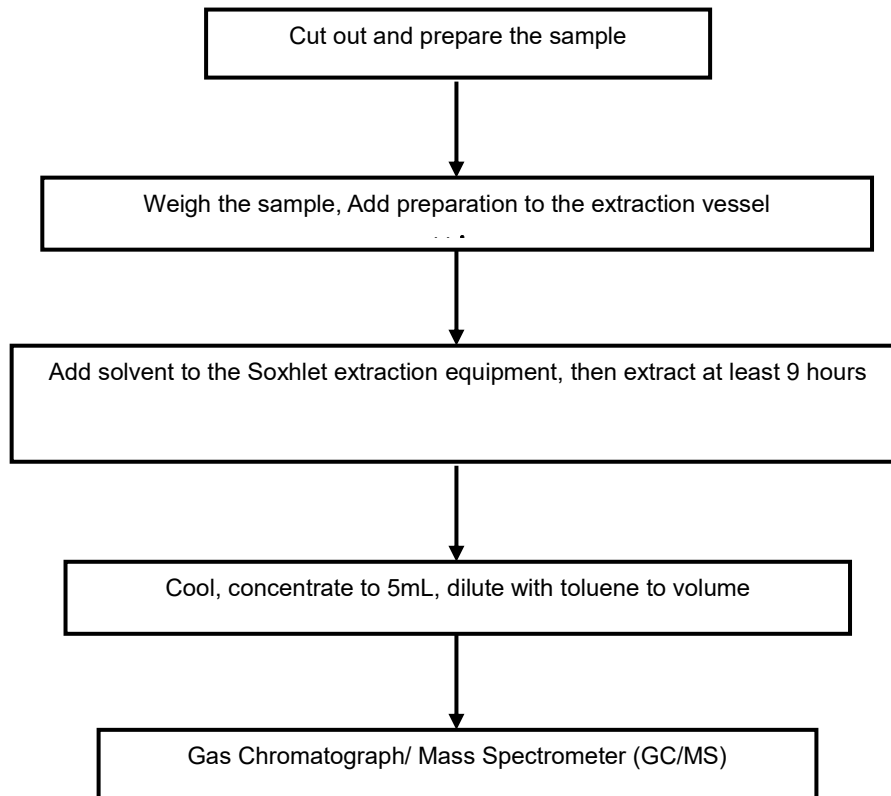
Sample NO.	Description of test part	Photo
NO.1	TOPCon Halfcut solar Cell	

## 2.3 MEASUREMENT FLOW CHART

### Measurement Flowchart of Pb/Cd/Hg/Cr<sup>6+</sup>/ PBBs/PBDEs



### Measurement Flowchart of DEHP/BBP/DBP/DIBP



-----End of Report-----