

**Test Report**

No. 6126125-02\_rev01

Date: 18/MAY/2022

Page 1 of 5

Globalfoundries Dresden  
 Module One LLC & Co. KG  
 Ms. Hermanns  
 Wilschdorfer Landstrasse 101  
 01109 Dresden  
 GERMANY



**The following samples were submitted and identified by/on behalf of the client as**

SGS Job file : 6126125  
 Order date : 17/MAR/2022  
 Order number : 813003903482  
 Sample receiving date : 21/MAR/2022  
 Sampling : by client or by a third party acting at the client's direction  
 Condition of the samples : appropriate for testing  
 Testing period : 21/MAR/2022 – 06/MAY/2022  
 control analysis: 10/MAY/2022-18/MAY/2022  
 Analytical scope : according to client's requirements

Sample No.	Sample designation	Sample material
220295895	Fab 1 300mm die patterned wafer, Tech Node 40nm	Wafer

Test requested : In accordance with the RoHS Directive 2011/65/EU and subsequent amendments

Test Method(s) : (1) Determination of Cadmium by ICP-OES, acc. IEC 62321-5:2013-06  
 (2) Determination of Lead by ICP-OES, acc. IEC 62321-5:2013-06  
 (3) Determination of Mercury by CV-AAS, acc. IEC 62321-4:2013-06  
 (4) Determination of Chromium by ICP-OES, acc. IEC 62321-5:2013-06  
 (5) Determination of Chromium (VI) acc. IEC 62321:  
 A) (metal samples) Determination after extraction with hot water and derivatization with 1,5-diphenyl-carbazide based on IEC 62321-7-1:2015-09 (metal samples), ion chromatography  
 B) (non-metallic samples) Testing acc. IEC 62321-7-2:2017-03,  
 deviation: measurement via ion chromatography acc. DIN EN ISO 10304-1:2009-07  
*Remark: Due to its highly reactive nature the concentration of Cr(VI) in a corrosion-protection changes drastically with time and storage conditions. The results obtained by IEC 62321-7-1:2015 can therefore only give an indication of the presence/absence of Cr(VI) within the limitations of the method at the time of testing.*  
 (6) Determination of PBB/PBDE by GC/MS, acc. IEC 62321-6:2015-06  
*Remark: Please note that acc. to IEC the testing of metals for PBB/PBDE is gratuitous*  
 (7) Determination of Phthalates by GC/MS acc. IEC 62321-8:2017-03  
 GC-MS after extraction with THF (Tetrahydrofurane)  
 (cooperation with SGS Asia)

Test Result(s) : Please refer to next page(s)

## Test Report

No. 6126125-02\_rev01

Date: 18/MAY/2022

Page 2 of 5

Globalfoundries Dresden  
 Module One LLC & Co. KG  
 Wilschdorfer Landstrasse 101  
 01109 Dresden  
 GERMANY

Conclusion : Based on the performed tests on submitted sample(s), the test results of Lead, Mercury, Cadmium, hexavalent Chromium, Polybrominated Biphenyls (PBB) and Polybrominated Diphenyl Ethers (PBDE) **comply with** the limits as set by RoHS Directive 2011/65/EU, Annex 2 and subsequent amendments.

Based on the performed tests on submitted sample(s), the test results of Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP), and Diisobutyl phthalate (DIBP) **comply with** the limits as set by Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

This report cancels and supersedes the report no. 6126125-02 dated 06/MAY/2022 issued by SGS INSTITUT FRESENIUS GmbH. We corrected the result of Chromium (Cr) after control analysis.

Signed for and on behalf of

**SGS INSTITUT FRESENIUS GmbH**

i.V.

Wera Leonhard / sba-tp  
 Projektleiterin / Project Manager  
 Connectivity & Products (C&P)  
 Tel. +49 (0)6128 / 744 - 186

i.A.

Dr. Stefan Graß  
 Customer Service Consultant  
 Connectivity & Products (C&P)  
 Tel. +49 (0)6128 / 744 - 280

## Test Report

No. 6126125-02\_rev01

Date: 18/MAY/2022

Page 3 of 5

Globalfoundries Dresden  
 Module One LLC & Co. KG  
 Wilschdorfer Landstrasse 101  
 01109 Dresden  
 GERMANY

### Test results by chemical method (Unit: mg/kg)

Sample No.	Method (refer to)	220295895	RL	RoHS Limit
Test Item(s):				
Cadmium (Cd)	(1)	n.d.	1	100
Lead (Pb)	(2)	n.d.	10	1000
Mercury (Hg)	(3)	n.d.	0,5	1000
Chromium, total (Cr)	(4)	n.d.	10	1000 (Limit for Cr(VI))
Chromium, hexavalent (Cr(VI))	(5 B)	n.d.	1	1000
<b>Sum of PBDEs</b>	(6)	-	-	1000 (Sum of polybrominated diphenylethers)
Monobromodiphenyl ether		n.d.	50	
Dibromodiphenyl ether		n.d.	50	
Tribromodiphenyl ether		n.d.	50	
Tetrabromodiphenyl ether		n.d.	50	
Pentabromodiphenyl ether		n.d.	50	
Hexabromodiphenyl ether		n.d.	50	
Heptabromodiphenyl ether		n.d.	50	
Octabromodiphenyl ether		n.d.	50	
Nonabromodiphenyl ether		n.d.	50	
Decabromodiphenyl ether		n.d.	50	
<b>Sum of PBBs</b>		-	-	
Monobromobiphenyl		n.d.	50	
Dibromobiphenyl		n.d.	50	
Tribromobiphenyl		n.d.	50	
Tetrabromobiphenyl		n.d.	50	
Hexabromobiphenyl		n.d.	50	
Pentabromobiphenyl		n.d.	50	
Heptabromobiphenyl		n.d.	50	
Octabromobiphenyl		n.d.	50	
Nonabromobiphenyl		n.d.	50	
Decabromobiphenyl		n.d.	50	
<b>Phthalates</b>	(7)			
Bis(2-ethylhexyl) phthalate (DEHP) (117-81-7)		n.d.	100	1000 <sup>#</sup>
Butyl benzyl phthalate (BBP) (85-68-7)		n.d.	100	1000 <sup>#</sup>
Dibutyl phthalate (DBP) (84-74-2)		n.d.	100	1000 <sup>#</sup>
Diisobutyl phthalate (DIBP) (84-69-5)		n.d.	100	1000 <sup>#</sup>

Note : mg/kg = ppm

n.d.= not detected

RL = Report Limit

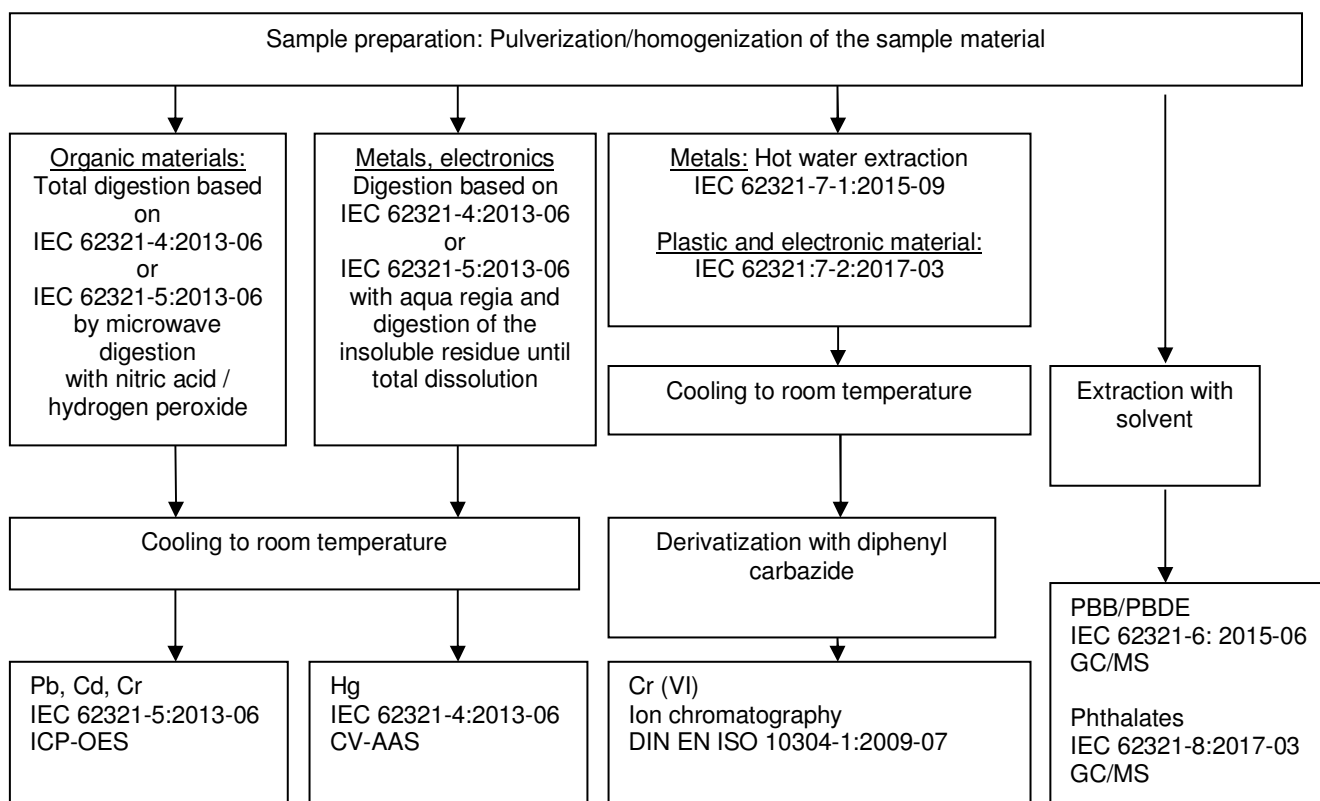
n.a.= not analyzed

\*\* = elevated reporting limit due to matrix interferences

<sup>#</sup> = limit acc. dir. 2015/863 (EU), valid from 22/JUL/2019

Globalfoundries Dresden  
 Module One LLC & Co. KG  
 Wilschdorfer Landstrasse 101  
 01109 Dresden  
 GERMANY

**Flow Chart for the working flow of the performed analysis**



## Test Report

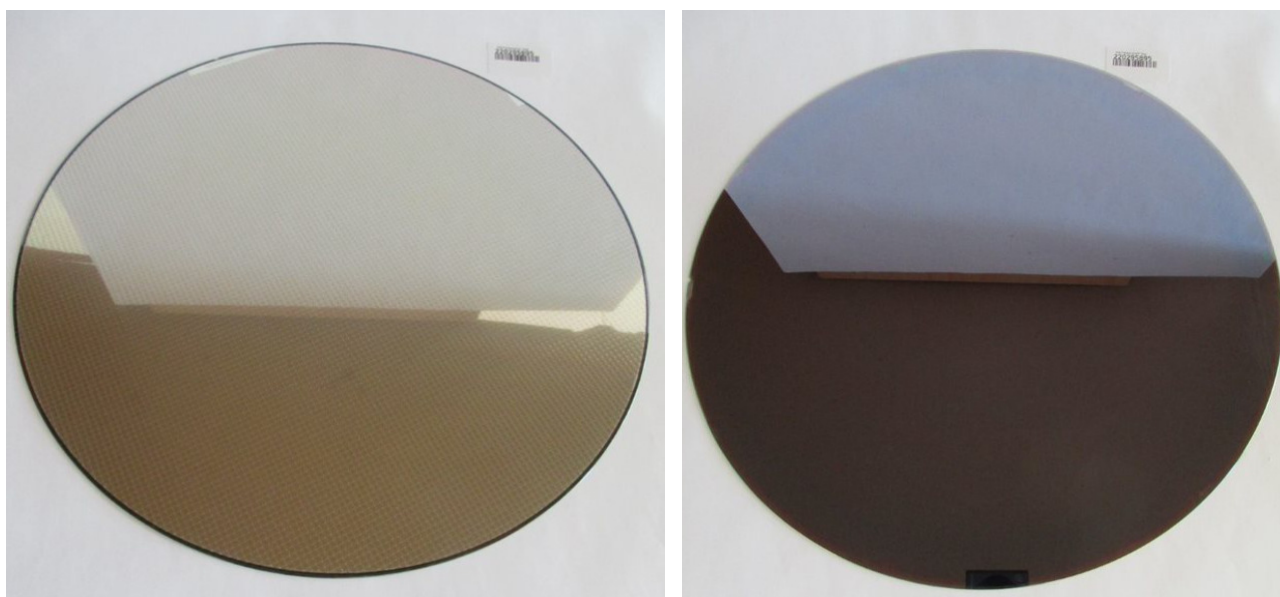
No. 6126125-02\_rev01

Date: 18/MAY/2022

Page 5 of 5

Globalfoundries Dresden  
Module One LLC & Co. KG  
Wilschdorfer Landstrasse 101  
01109 Dresden  
GERMANY

## Sample Photo(s)



\*\*\*End of Report\*\*\*

The test results refer exclusively to the examined test items and the date of the test under the test specifications. Written acknowledgement for publication and duplication of our analytical reports for promotional purpose, as well as fractional use for other purposes are mandatory. Numbers following „<“ represent limits of quantification. Determination of parameters marked with \* was performed with a cooperation partner.

This document is issued by the Company subject to its General Conditions of Service ([www.sgsgroup.de/agb](http://www.sgsgroup.de/agb)). Attention is drawn to the limitations of liability, indemnification and jurisdictional issues established therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instructions, if any. The Company's sole responsibility is to its client and this document does not exonerate parties to a transaction from exercising all their rights and under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Note: The sample(s) to which the findings recorded herein (the "findings") relate was (were) probably drawn and / or provided by the client or by a third party acting at the client's direction. In this case the findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

We would like to point out that measurement uncertainties are not taken into account for conclusions. On request, we can provide measurement uncertainties and take them into account for conclusions upon consultation.