

設計驗證
工程課
2025 -10- 02
發行
鈺緯科技開發股份有限公司

承認書

SPECIFICATION FOR APPROVAL

SUPPLIER(廠商) : 苏州星徽纳米新材料有限公司

KG P/N(IVY料號) : 3MD695LG010 (M3520)

SUPPLIER P/N(供應商料號) : /

REVISION(版本) : A/0

設計驗證
工程課
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KG APPROVAL CENTER（KG批准部門）

R&D DEPARTMENT研發部				
承認組(資料部分)				R&D(機構尺寸)
有害物質檢測報告確認狀況	☐ OK ☐ NG			

SUPPLIER APPROVAL CENTER(廠商批准需加蓋公章)

APPROVAL BY 核准(簽署)	CHECKED BY 審核(簽署)	PREPARED BY 製作
苏溪	杨孝福	蓝伟松

ISSUE DATE（發行日期）：2025.9.6

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8	RoHS/HF 有害物質檢測清單	,	
9	物質安全資料表/SGS	,	
10	有害物质不使用证明	,	
11	产品图片	,	

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廠商地址(SUPPLIER ADDRESS)：苏州市常熟市尚湖镇练塘大道299号9号厂房

聯絡電話(LIAISON PHONE): 18260131286

聯系人(LIAISON PERSON): 杨孝福

郵件地址(E-MAIL ADDRESS): QA@mc-star.com.cn

料号： 3MD695LG010 日期： 2025.9.6

Revision History

版本	變更內容	變更者	日期	備註

REV	DATE	DESCRIPTION	DRAFT	APPROVED
0	2025-04-27	INITIAL RELEASE	Laslie Chen	
A	2025-09-04	PRODUCTION RELEASE	Laslie Chen	Ferris

設計驗證
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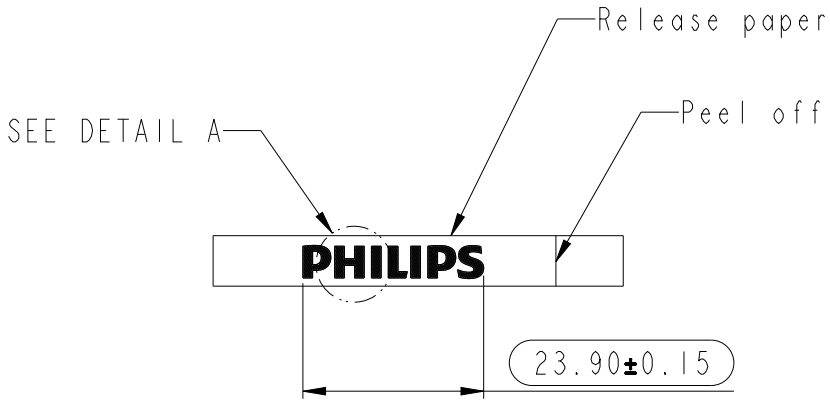
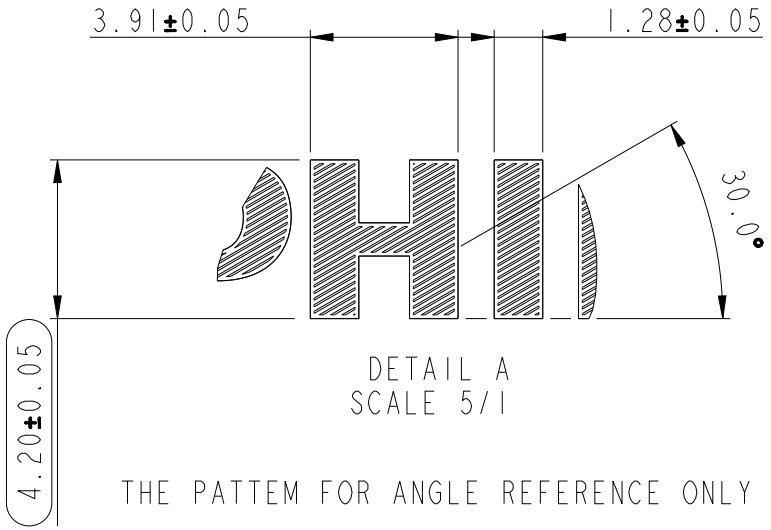
發行
[illegible]科技開發股份有限公司





DETAIL A
SCALE 5/1

THE PATTEM FOR ANGLE REFERENCE ONLY

NOTE:
1. MATERIAL:
   ELECTROMED FIOL STICKER, T=0.08±0.05.
2. COLOR: SILVER CHROME.
3. FINISH: 30 DEGREE PATTERN.
4. ADHESIVE ON BACK SIDE.
5. PET FILM ON FRONT SIDE.
6. RoHS COMPLIANT.

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN MM.
TOLERANCES:

.X = ± 0.5
.XX = ± 0.30
.XXX = ± 0.150
ANGLE = ± 1.0°

INTERPRET DIM AND TOL
PER ASME Y14.5-2009

THIRD ANGLE PROJECTION

MATERIAL: Note	FINISH: Note	DIVA Laboratories. Ltd.
DRAWN BY: Laslie Chen 2025-03-23		PART NAME: NAME PLATE
CHECKED BY: Ferris Tsai 2025-09-04		PART NUMBER: 3MD695LG010 (M3520) / MFG. PART NUMBER: NA
APPROVED BY: Laslie Chen 2025-09-04		MODEL NAME: VM15 / SIZE: A4 / SCALE: 1/1 / SHEET: 1 OF 1 / REV: A
FILE NAME: 027_216_LOGO_PHILIPS_BEZEL	APPROVED NO.:	

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華碩電腦股份有限公司
ASUSTek COMPUTER INC.
樣品檢驗報告 SAMPLE INSPECTION REPORT

★FAI全尺寸量測：1pcs
★Critical dimension：3pcs
★CPK：32pcs
V16.7 (MB BU 機構一部 游文鼎)

Project name：	NAME PLATE
Part name：	3MD695LG010
Measurement Date：	2025/9/6

3MD695LG010_logo_philips_bezel.pdf

Inspection Tool：
C:游標卡尺 P:PIN GAUGE T:厚薄規 H:高度規 CMM:三次元量測儀 M:工具顯微鏡 CD:色差計 H:硬度計 PP:拉壓力計 L:雷射測距儀 MM:分離卡 AC:準直儀 DI:千分錶 SG:牙規 BG:塊規 GRT:瞄合機 LO:目視檢查 PT:投影機 S:特製檢具

★★★填寫"藍字"的項目★★★

★尺寸編號(頁面-編號)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
★尺寸類別	外型大長	外型大寬	外型總高																					
備註(如：量測基準說明，非必填)																								
★Inspection Tool(參考表格右上方代號)																								
★單位 (unit)	mm	mm	mm																					
★規格/設計中心值/期望中心值	23.900	4.200	0.080																					
★上公差	0.150	0.050	0.050																					
(負公差須加上負號)★下公差	-0.150	-0.050	-0.050																					
最終規格	23.900	4.200	0.080																					
最終上公差	0.150	0.050	0.050																					
最終下公差	-0.150	-0.050	-0.050																					
最終尺寸上限	24.050	4.250	0.130																					
最終尺寸下限	23.750	4.150	0.030																					
幾何公差(Y/N)	N	N	N																					
取樣數 (sampling number)	32	32	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
平均值 (Average) or 平均數	23.895	4.199	0.090																					
最大值(Max.)	23.919	4.206	0.107																					
最小值(Min.)	23.855	4.175	0.080																					
標準差 (Standard Deviation)	0.015	0.007	0.007																					
3*標準差 (3*Sigma)	0.044	0.020	0.020																					
預估量產最大值(Max.)	23.939	4.219	0.109																					
預估量產最小值(Min.)	23.850	4.179	0.070																					
Ca(又稱C_a) (< 0.25)	0.034	0.024	0.191																					
Cp (> 1.33)	3.379	2.467	2.543																					
Cpk (> 1.33)	3.264	2.408	2.057																					
預估良率	100.00%	100.00%	100.00%																					
PASS / Need to improve / FAIL	PASS	PASS	PASS																					
1	23.905	4.205	0.085																					
2	23.904	4.202	0.083																					
3	23.905	4.203	0.084																					
4	23.906	4.204	0.085																					
5	23.908	4.206	0.088																					
6	23.903	4.203	0.083																					
7	23.9	4.202	0.088																					
8	23.9	4.198	0.088																					
9	23.903	4.201	0.089																					
10	23.9	4.198	0.096																					
11	23.899	4.199	0.092																					
12	23.903	4.205	0.091																					
13	23.905	4.203	0.093																					
14	23.897	4.195	0.083																					
15	23.892	4.195	0.088																					
16	23.888	4.201	0.081																					
17	23.907	4.203	0.095																					
18	23.9	4.201	0.088																					
19	23.891	4.199	0.097																					
20	23.884	4.198	0.096																					
21	23.877	4.197	0.092																					
22	23.911	4.201	0.099																					
23	23.895	4.196	0.083																					
24	23.885	4.193	0.091																					
25	23.876	4.206	0.088																					
26	23.866	4.186	0.081																					
27	23.915	4.205	0.103																					
28	23.89	4.191	0.096																					
29	23.879	4.187	0.085																					
30	23.868	4.198	0.08																					
31	23.855	4.175	0.088																					
32	23.919	4.206	0.107																					
Action (填寫 ok/修改規格/修模....等，不可空白)	OK	OK	OK																					

提交前確認事項：

☐1.量測報告上面的Project name、Part name、Measurement Date 、第7~第19欄位，是否已填入清楚

☐2. 是否逐一確認判定結果為PASS or FAIL

☐3.所有尺寸的"Action"欄位是否已填寫對該尺寸的處置動作，其影響並註明清楚

苏州星徽纳米新材料有限公司

First article inspection

客户		DIVA			产品名称		NAME PLATE			检验日期		2025.9.6	
机种名					产品料号		3MD695LG010			检验人员		李敖	
序号	测量工具	标准尺寸	公差		上限	下限	数据记录					判定	备注
			上公差	下公差			1	2	3	4	5		
1	二次元	23.90	0.15	0.15	24.05	23.75	23.758	23.759	23.762	23.776	23.789	OK	
2	二次元	4.20	0.05	0.05	4.25	4.15	4.203	4.206	4.214	4.218	4.223	OK	
3	卡尺	0.08	0.05	0.05	0.13	0.03	0.08	0.09	0.08	0.08	0.08	OK	
4													
5													
6													
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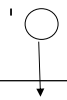
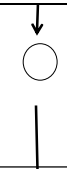
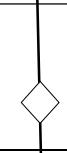
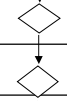
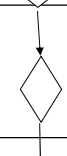
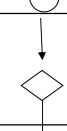
19													
20													
21													
22													

品名	NAME PLATE	全工程QC工程表	文件编号	编制部门	编制	审核	承认
料号	3MD695LG010		XH-DIVA-RD-0001	品管部	工程部	朱宁	苏溪

序号	流程图	工艺	管控项目							检具/工具	责任者
			工序	执行文件	标准	频度	方法	执行文件	异常处理		
1		S01：进料、库存	包装	采购定单、送货单、领料单	不可破损	每次购入、入库、领料	目视、测量	填各种材料检验报告、供应商出货报告、库存表、送货单	退回	目视	卓雯婷
			数量		不可短装						
			规格		不可错误						
			材质		镍标-银灰						
2		S02：进料检验	外观	板材进料检验标准	点缺陷≤0.2,划伤宽度≤0.05,没有脏污,无裂纹,颜色透明	抽查AQL0.4	目视、测量	进料检验记录	退回、报废	点规、台灯、黑白背景	卓雯婷
			规格		T=0.08					直尺	
3		S03：印刷， 烘烤	油墨	印刷SOP	参照印刷SOP	开始时	目视，测量	调墨记录，烘烤记录，印刷工艺点检表	调整，重工，报废	电子秤，调墨杯，烘箱，印刷机，色卡，网版，色差仪，钟表	王磊
			烘烤温度		/						
			烘烤时间		/						
			静止时间		/						
			套位		十字架套位						
			刮胶		85度						
			网目		/						
			颜色		参照样品						
4		S04：印刷首件检验	颜色	印刷QC作业指导书、检验标准、百格测试SOP	参照样品（或根据客户要求用色差仪打色差）	生产前	目视、测量	首件检验记录	调整、重工、报废	色差仪、二次元，3M610胶带、点规、样品	杨孝福
			图案		与样品、图纸一致						
			百格		达到3B以上要求						
			外观		溢墨、断线、偏位、重影，异物，脏污、气泡，脏点≤0.2，锯齿H≤0.1，漏光≤0.1						
			尺寸		依据图纸管控						
5		S05：印刷， 检验	图案	印刷QC作业指导书、印刷检验标准、百格测试SOP	与样品、图纸一致	首件：生产前 30分钟/次，每机台抽检10张产品	目视、测量	制程巡检记录	调整、重工、报废	二次元，3M600胶带、点规、样品,万用表	杨孝福
			颜色		参照样品（或根据客户要求用色差仪打色差）						
			百格测试		达到3B以上要求						
			外观		溢墨、断线、偏位、重影，异物，脏污、气泡，						
6		S6：覆膜和覆膜检验	保护膜型号	覆膜SOP	/	全数	目视	覆膜记录表	调整、重工、报废	覆膜机、刀片	杨孝福
			速度		80r/min						
			外观要求		平整、完整、无毛屑、无气泡						
7		S7：切割	打孔	CAD图纸、切割机SOP、产品模切SOP、CNC检验标准	不可偏位	每批	目视、测量	切割记录	调整、重工、报废	二次元，点规，卡尺	高齐/陈军
			刀具		/						
			尺寸		依图纸管控						
			外观		过切、切割偏位、划伤宽度≤0.05、无刀痕、过切	全数					
8		S8：CNC首件检验	尺寸	图纸、检验标准	按图纸公差要求	生产前	目视、测量	首件检验记录	调整、重工、报废	二次元，点规，卡尺	杨孝福
			外观		漏切、过切、切割偏位、划伤宽度≤0.05、无刀痕、白边、过切						
9		S9：切割检验	尺寸	图纸、模切检验标准	按图纸公差要求	2H/次	目视、测量	制程巡检记录	调整、重工、报废	二次元，点规，卡尺	杨孝福
			外观		过切、切割偏位、划伤宽度≤0.05、无刀痕、过切						
10		S10：包装	半成品检验	《包装规范》包装作业SOP、包装机SOP	毛屑、溢胶、平整、气泡、重影、断线、偏位、无刀痕、过切、划伤宽度≤0.05、脏点≤0.2、锯齿H≤0.1、漏光≤0.1、无色差、毛屑、	全数	目视	成品生产检查表、包装日报表，包装工艺点检表	重工	无尘布、酒精、黑白背景、灯光	牛秋
			背胶		/						
			包装		50PCS/包PE袋105*70(MM) 进行包装						
11		S11：成品检验	外观	成品检验标准、抽样表、可靠性测试作业指导书	重影，断线、脏污、溢墨、掉墨、气泡、溢胶，无刀痕、过切，脏点≤0.2，锯齿H≤0.1，漏光≤0.1，毛屑、背胶不溢胶、无褶皱、平整，图案正确	AQL0.4	目视、测量	成品检验记录、可靠性测试报告	退回、重工、报废	点规、二次元、灯光、黑白背景	杨孝福
			尺寸		依据图面管控					2次元	
12		S12：入库	标签、数量	仓库管理规范	状态标识正确无误，	全数	目视	入库记录、库存记录	退回、重工、报废	温湿度计	卓雯婷
			储存		温度，湿度						
13		S13：OQC检验	标签	客户要求、OQC检验SOP、图纸、抽样表、可靠性测试作业指导书	标识正确无误，	全数	目视、测量	OQC出货检验检验记录	退回、重工、报废	点规、台灯、黑白背景	杨孝福
			外观		重影，断线、脏污、溢墨、掉墨、气泡、溢胶，无刀痕、过切，脏点≤0.2，锯齿H≤0.1，漏光≤0.1，毛屑、背胶不溢胶、无褶皱、平整，图案正确	AQL0.4					
			尺寸		依图纸管控					二次元	
14		S14：出货	包装外观	发货作业SOP	不可破损	全数	目视	发货通知单、送货单	重新发货	货车、推车	卓雯婷
			数量		无误						
			型号、料号		不可发错料						

表示记号：	检查（数）	检查（质）	作业	出货							
	□	◇	○	▽							

试 验 报 告 书

客户	材料	品名	测试时间	试验项目	实验室温度/湿度
NIVA	镍	NAME PLATE	2025-09-06	耐护手霜测试	25℃ /45%

一、 测试目的：

样品承认：表面涂层耐化妆品测试

二、 测试条件：

1.测试样品
2.无尘布
3.护手霜
4.恒温恒湿箱

三、测试方法：

1.取適量的護手霜(模擬一般使用者情境人手塗上護手霜使用相關產品)，均勻塗抹於手指後，再塗抹於待測物的表面.(塗抹區域約80mm*80mm若區域不足之待測樣品則無此限定)
2.再放入Chamber中，設定所需溫溼度與時間70℃；90%RH
3.測試完24小時後，再將Chamber設定Temperature:25℃，50%RH，Test Time:2小時，使測試物達到恆溫.
4.將測試物從Chamber取出後，先以不會傷害測試物表面的方式擦拭後(例如清潔劑、溶劑或布等)，才確認表面狀況

四、测试结果图片如下：

五、

测试前	测试中	测试后
		

判定依据	样品实测值			审核
				杨孝福
无涂层脱落	S1	S2	S3	制作
	OK	OK	OK	杨芳

试 验 报 告 书

客户	材料	品名	测试时间	试验项目	实验室温度/湿度
NIVA	镍	NAME PLATE	2025-09-06	酒精测试	25℃ /45%

一、 测试目的：

表面涂层耐酒精测试

二、 测试条件：

1. 测试样品
2. 纱布
3. 酒精
4. 耐磨测试仪
5. 测试专用砝码

三、测试方法：

1. 找一平面待测物,將待测物以平均力量,固定於測試儀器的平台上, 務必確實固定
2. 先準備一塊 45*45 mm 大小, 1.5 mm 厚的紗布.
3. 將紗布固定於挾具上的銅柱, 並且紗布前端要冒出挾具約 5mm 左右. (八層紗布)
加法碼於挾具上套頭, 使測試挾具達到荷重 500g.(含固定架本體重量)
4. 加入適量的藥用酒精(95%)於紗布上.
5. 以 2 秒一個來回的速度, 連續不間斷做來回 80 次測試

四、测试结果

无涂层脱落

测试前



测试中



测试后



判定依据	样品实测值			审核
				杨孝福
无涂层脱落	S1	S2	S3	制作
	OK	OK	OK	杨芳

试 验 报 告 书

客户	材料	品名	测试时间	试验项目	实验室温度/湿度
NIVA	镍	NAME PLATE	2025-09-06	冷热冲击测试	25℃ /45%

一、 测试目的：

产品外观测试

二、 测试条件：

1. 测试样品
2. 冷热冲击机

三、测试方法：

1. -40℃±2℃,48H。60℃±2℃， 48H。
2. 试验后被测产品放置在室温2H。
4. 检查外观:表面无裂纹，外观无异常。

四、测试结果

测试前



测试中



测试后



判定依据	样品实测值			审核
				杨孝福
无涂层脱落	S1	S2	S3	制作
	OK	OK	OK	杨芳

试 验 报 告 书

客户	材料	品名	测试时间	试验项目	实验室温度/湿度
NIVA	镍	NAME PLATE	2025-09-06	高温高湿测试	25℃ /45%

一、 测试目的：

产品外观测试

二、 测试条件：

1. 测试样品
2. 恒温恒湿箱

三、测试方法：

1. 60℃±2℃,20±3%RH,5H。60℃±2℃,95±3%RH,24H。
2. 试验后被测产品放置在室温2H。
4. 检查外观:表面无裂纹，外观无异常。

四、测试结果

测试前



测试中



测试后



判定依据	样品实测值			审核
				杨孝福
无涂层脱落	S1	S2	S3	制作
	OK	OK	OK	杨芳

RoHS/HF 有害物質檢測清單

DIVA料號 / 物品規格名稱: NAME PLATE　　料号： 3MD695LG010　　日期: 2025.9.6

組成成份		製造商	材質	材質型號	有害物質檢測數據表																		檢測機構 / 地區	檢測報告編號	報告日期
序號	產品名稱				RoHS										鹵素		其它								
					Pb	Hg	Cd	Cr^{6+}	PBB	PBDE	DIBP	BBP	DBP	DEHP	Br	Cl	F	I	Be	Bi	Sb				
1	背胶	3M		3M SP7533	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND										SGS	SHAEC24025767201	2024.11.18
															ND	201	ND	ND						SGS	SHAEC24025767203	2024.11.18
2	挪威镍	格伦科镍厂股份公司		镍	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			SGS	ETR25104685	2025.2.5
3																										
4																										
5																										
6																										
7																										

表單版次: A0

備註：

Test Report

No.: SHAEC24025767201 **Date:** Nov 18, 2024

Client Name: 3M CHINA LIMITED

Client Address: 222 TIANLIN ROAD, SHANGHAI

Sample Name: 3M SP7533

The above sample(s) and information were provided by the client.

SGS Job No.: SHP24-036098

Sample Receiving Date: Nov 12, 2024

Testing Period: Nov 12, 2024 ~ Nov 18, 2024

Test Requested: Select test(s) as requested by the client.

Test Method(s): Please refer to next page(s).

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

Test Requirement	Conclusion
EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU - Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)	Pass

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Jenny Lan
Approved Signatory

scan to see the report
E83E55E1

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Test Result(s):

Test Part Description：

SN ID	Sample No.	SGS Sample ID	Description
SN1	A1	SHA24-0257672-0001.C001	White liquid

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%
(2) MDL = Method Detection Limit
(3) ND = Not Detected (< MDL)
(4) "-" = Not Regulated

EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU - Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)

Test Method: With reference to IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017, IEC 62321-6:2015 and IEC 62321-8:2017, analysis was performed by ICP-OES/AAS, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A1
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Cadmium (Cd)	100	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Polybromobiphenyl (PBB)	1000	mg/kg	-	ND
Monobrominated biphenyl (MonoBB)	-	mg/kg	5	ND
Dibrominated biphenyl (DiBB)	-	mg/kg	5	ND
Tribrominated biphenyl (TriBB)	-	mg/kg	5	ND
Tetrabrominated biphenyl (TetraBB)	-	mg/kg	5	ND
Pentabrominated biphenyl (PentaBB)	-	mg/kg	5	ND
Hexabrominated biphenyl (HexaBB)	-	mg/kg	5	ND
Heptabrominated biphenyl (HeptaBB)	-	mg/kg	5	ND
Octabrominated biphenyl (OctaBB)	-	mg/kg	5	ND
Nonabrominated biphenyl (NonaBB)	-	mg/kg	5	ND
Decabrominated biphenyl (DecaBB)	-	mg/kg	5	ND
Polybromodiphenyl ether(PBDE)	1000	mg/kg	-	ND
Monobrominated diphenyl ether (MonoBDE)	-	mg/kg	5	ND
Dibrominated diphenyl ether (DiBDE)	-	mg/kg	5	ND
Tribrominated diphenyl ether (TriBDE)	-	mg/kg	5	ND
Tetrabrominated diphenyl ether (TetraBDE)	-	mg/kg	5	ND
Pentabrominated diphenyl ether (PentaBDE)	-	mg/kg	5	ND
Hexabrominated diphenyl ether (HexaBDE)	-	mg/kg	5	ND
Heptabrominated diphenyl ether (HeptaBDE)	-	mg/kg	5	ND

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Test Item(s)	Limit	Unit(s)	MDL	A1
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND
Bis(2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND
Diisobutyl phthalate (DIBP)	1000	mg/kg	50	ND

Notes:

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.

(2) IEC 62321 series is equivalent to EN 62321 series.

(3) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (*w*=0) stated in ILAC-G8:09/2019.

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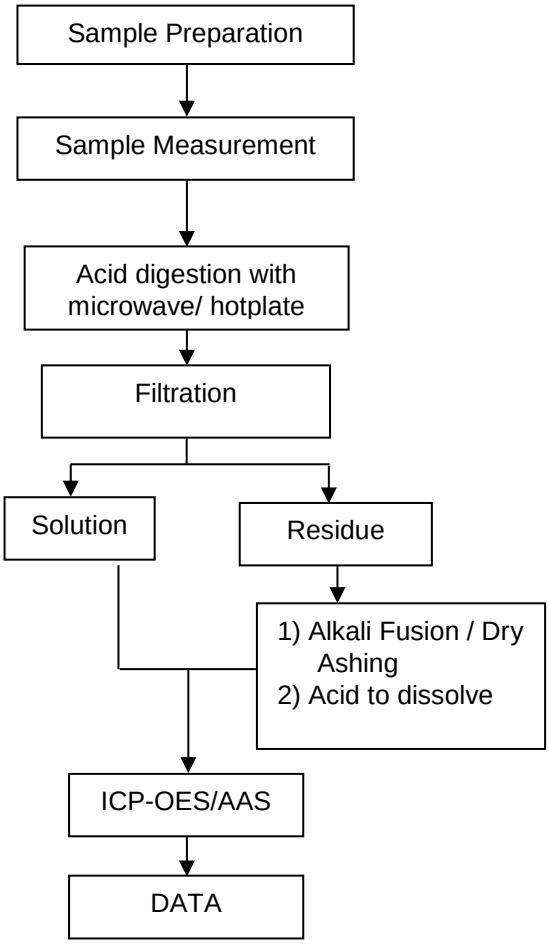
Elements Testing Flow Chart

These samples were dissolved totally by pre-conditioning method according to below flow chart.



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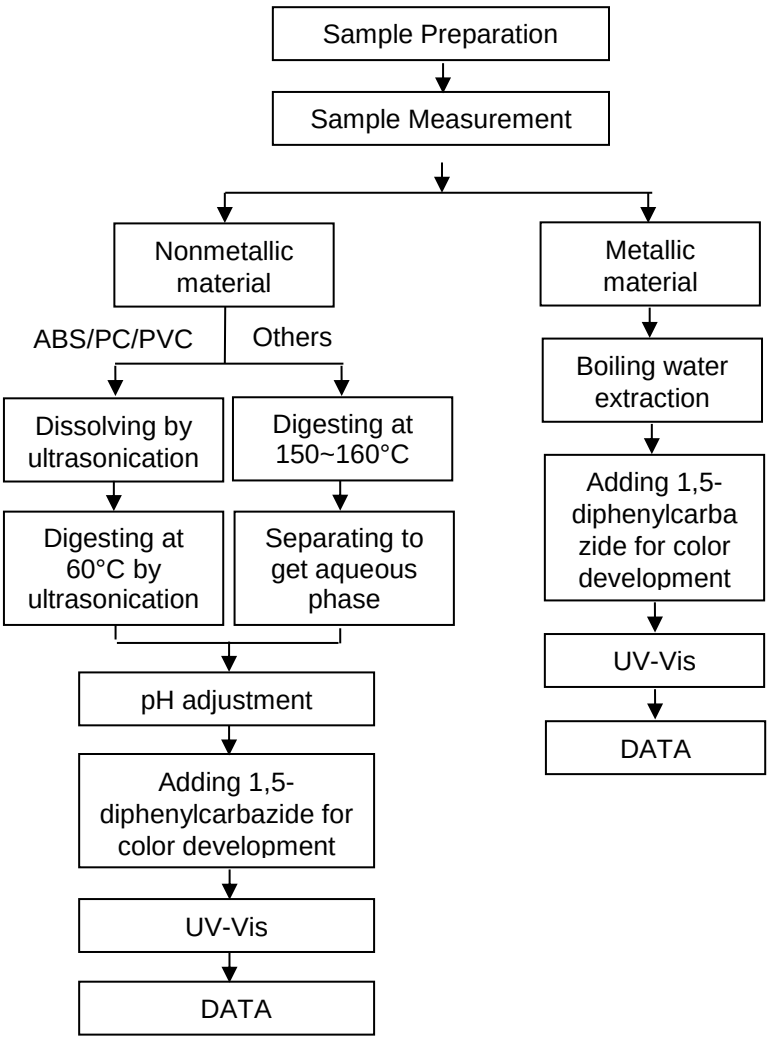
Hexavalent Chromium (Cr(VI)) Testing Flow Chart



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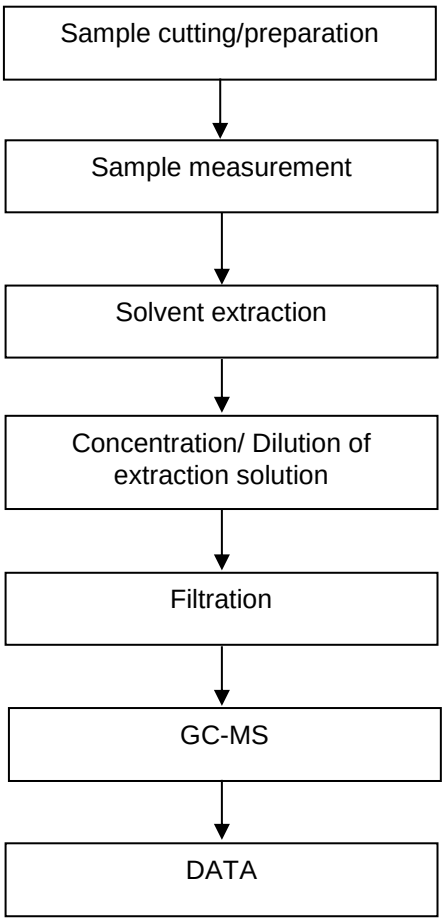
PBB/PBDE Testing Flow Chart



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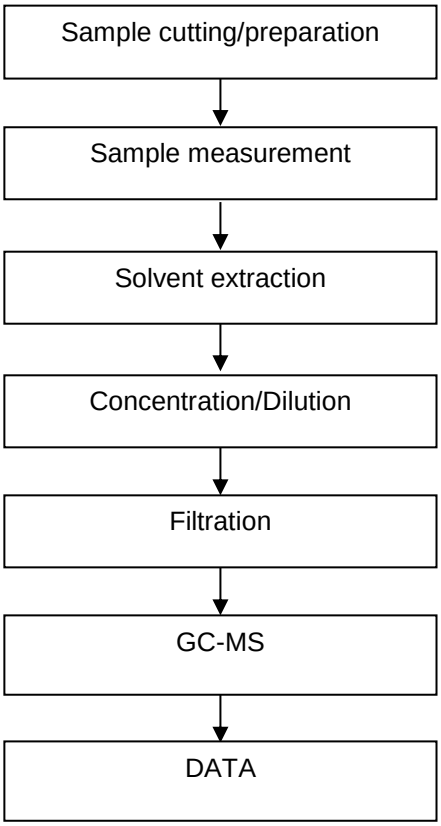
Phthalates Testing Flow Chart



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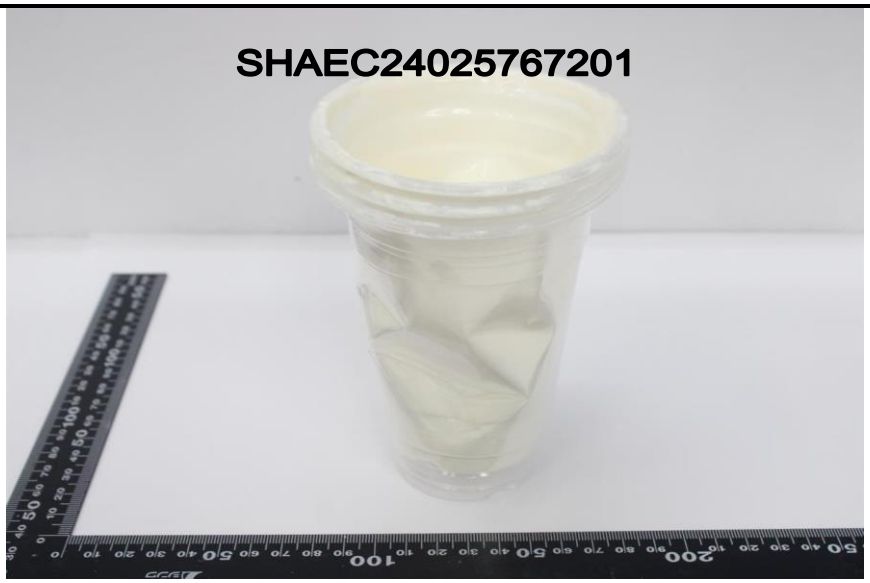
Sample Photo:



SHA24-0257672-0001.C001

SGS authenticate the photo on original report only

*** End of Report ***

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Test Report

No.: SHAEC24025767203 **Date:** Nov 18, 2024

Client Name: 3M CHINA LIMITED

Client Address: 222 TIANLIN ROAD, SHANGHAI

Sample Name: 3M SP7533

The above sample(s) and information were provided by the client.

SGS Job No.: SHP24-036098

Sample Receiving Date: Nov 12, 2024

Testing Period: Nov 12, 2024 ~ Nov 18, 2024

Test Requested: Select test(s) as requested by the client.

Test Method(s): Please refer to next page(s).

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

Test Requirement	Conclusion
Halogen	See Results

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Jenny Lan
Approved Signatory

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Test Result(s):

Test Part Description：

SN ID	Sample No.	SGS Sample ID	Description
SN1	A1	SHA24-0257672-0001.C001	White liquid

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%
(2) MDL = Method Detection Limit
(3) ND = Not Detected (< MDL)
(4) "-" = Not Regulated

Halogen

Test Method: With reference to EN 14582:2016, analysis was performed by IC.

Test Item(s)	Unit(s)	MDL	A1
Fluorine(F)	mg/kg	20	ND
Chlorine(Cl)	mg/kg	50	201
Bromine(Br)	mg/kg	50	ND
Iodine(I)	mg/kg	50	ND

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (*w*=0) stated in ILAC-G8:09/2019.

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. Testing Center-Chemical Laboratory.

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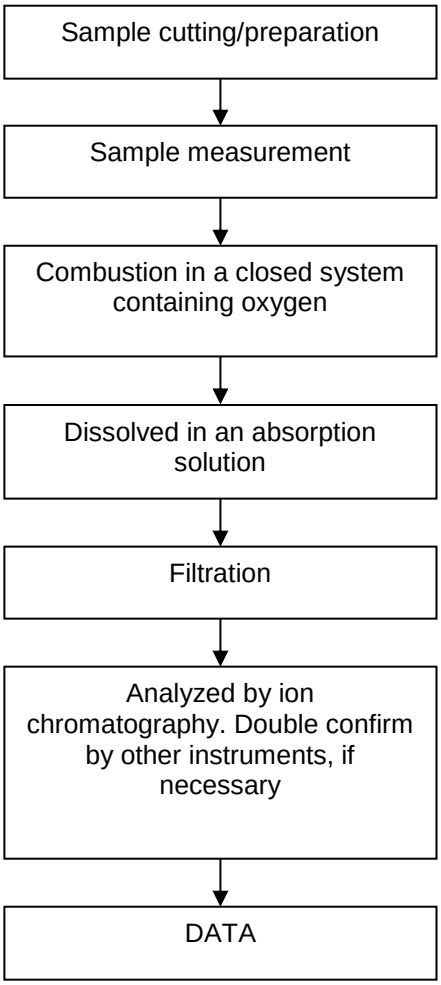
ATTACHMENTS

Halogen Testing Flow Chart



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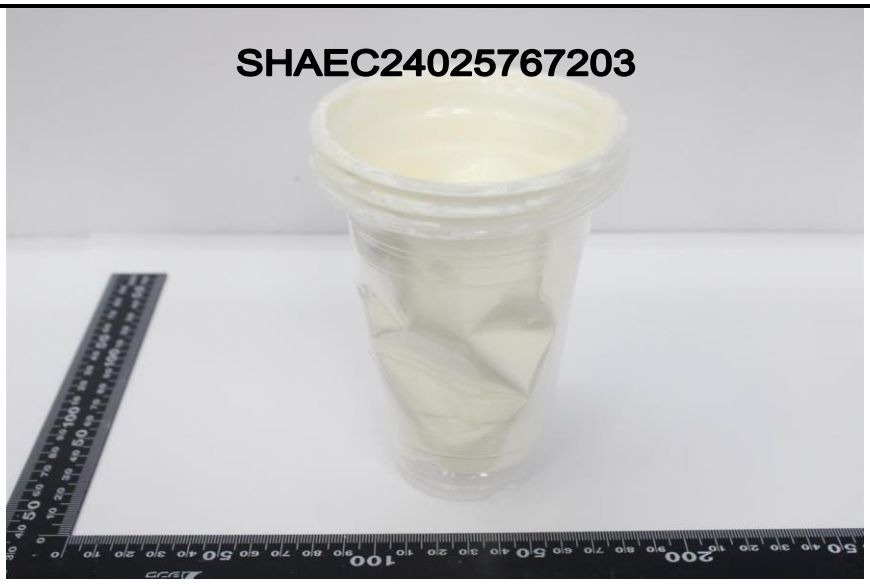
Sample Photo:



SHA24-0257672-0001.C001

SGS authenticate the photo on original report only

*** End of Report ***

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Test Report

No.: ETR25104685 Date: 05-Feb-2025

GLENCORE NIKKELVERK AS
VESTERVEIEN 31, 4606 KRISTIANSAND, NORWAY

The following sample(s) was/were submitted and identified by the applicant as:

Sample Submitted By	:	GLENCORE NIKKELVERK AS
Sample Name	:	YEAR SAMPLE 2024, NICKEL METAL A-GRADE UNCUT, 4X4, 2X2 AND 1X1 CUT CATHODES
Buyer/Order No.	:	4500817119

==========

Sample Receiving Date	:	16-Jan-2025
Testing Period	:	16-Jan-2025 to 05-Feb-2025

Test Requested	:	(1)	As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).
		(2)	Please refer to next pages for the other item(s).
Test Results	:		Please refer to following pages.
Conclusion	:	(1)	Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Troy Chang / Department Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

PIN CODE: 6B5B6C82

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Test Part Description

No.1 : SILVER COLORED METAL

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Cadmium (Cd)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	100
Lead (Pb)		mg/kg	2	n.d.	1000
Mercury (Hg)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Hexavalent Chromium Cr(VI) (#2)	With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.	µg/cm²	0.1	n.d.	-
Monobromobiphenyl	With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Dibromobiphenyl		mg/kg	5	n.d.	-
Tribromobiphenyl		mg/kg	5	n.d.	-
Tetrabromobiphenyl		mg/kg	5	n.d.	-
Pentabromobiphenyl		mg/kg	5	n.d.	-
Hexabromobiphenyl		mg/kg	5	n.d.	-
Heptabromobiphenyl		mg/kg	5	n.d.	-
Octabromobiphenyl		mg/kg	5	n.d.	-
Nonabromobiphenyl		mg/kg	5	n.d.	-
Decabromobiphenyl		mg/kg	5	n.d.	-
Sum of PBBs		mg/kg	-	n.d.	1000
Monobromodiphenyl ether		mg/kg	5	n.d.	-
Dibromodiphenyl ether		mg/kg	5	n.d.	-
Tribromodiphenyl ether		mg/kg	5	n.d.	-
Tetrabromodiphenyl ether		mg/kg	5	n.d.	-
Pentabromodiphenyl ether		mg/kg	5	n.d.	-
Hexabromodiphenyl ether		mg/kg	5	n.d.	-
Heptabromodiphenyl ether		mg/kg	5	n.d.	-
Octabromodiphenyl ether		mg/kg	5	n.d.	-
Nonabromodiphenyl ether		mg/kg	5	n.d.	-
Decabromodiphenyl ether		mg/kg	5	n.d.	-
Sum of PBDEs		mg/kg	-	n.d.	1000

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Test Item(s)	Method	Unit	MDL	Result No.1	Limit
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Dibutyl phthalate (DBP)		mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP)		mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP)		mg/kg	50	n.d.	1000
Diisodecyl phthalate (DIDP) (CAS No.: 26761-40-0, 68515-49-1)		mg/kg	50	n.d.	-
Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0)		mg/kg	50	n.d.	-
Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0)		mg/kg	50	n.d.	-
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	With reference to IEC 62321: 2008, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Chlorine (Cl) (CAS No.: 22537-15-1)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Bromine (Br) (CAS No.: 10097-32-2)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Iodine (I) (CAS No.: 14362-44-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Polyvinyl chloride (PVC)	With reference to ASTM E1252: 2021, analysis was performed by FT-IR and Flame Test.	**	-	Negative	-
Beryllium (Be) (CAS No.: 7440-41-7)	With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Bismuth (Bi) (CAS No.: 7440-69-9)	With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Antimony (Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-

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Note :

1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. "-" = Not Regulated
5. **= Qualitative analysis (No Unit)
6. Negative = Undetectable ; Positive = Detectable
7. (#2) =
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI).
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.
8. Unless otherwise stated , the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.

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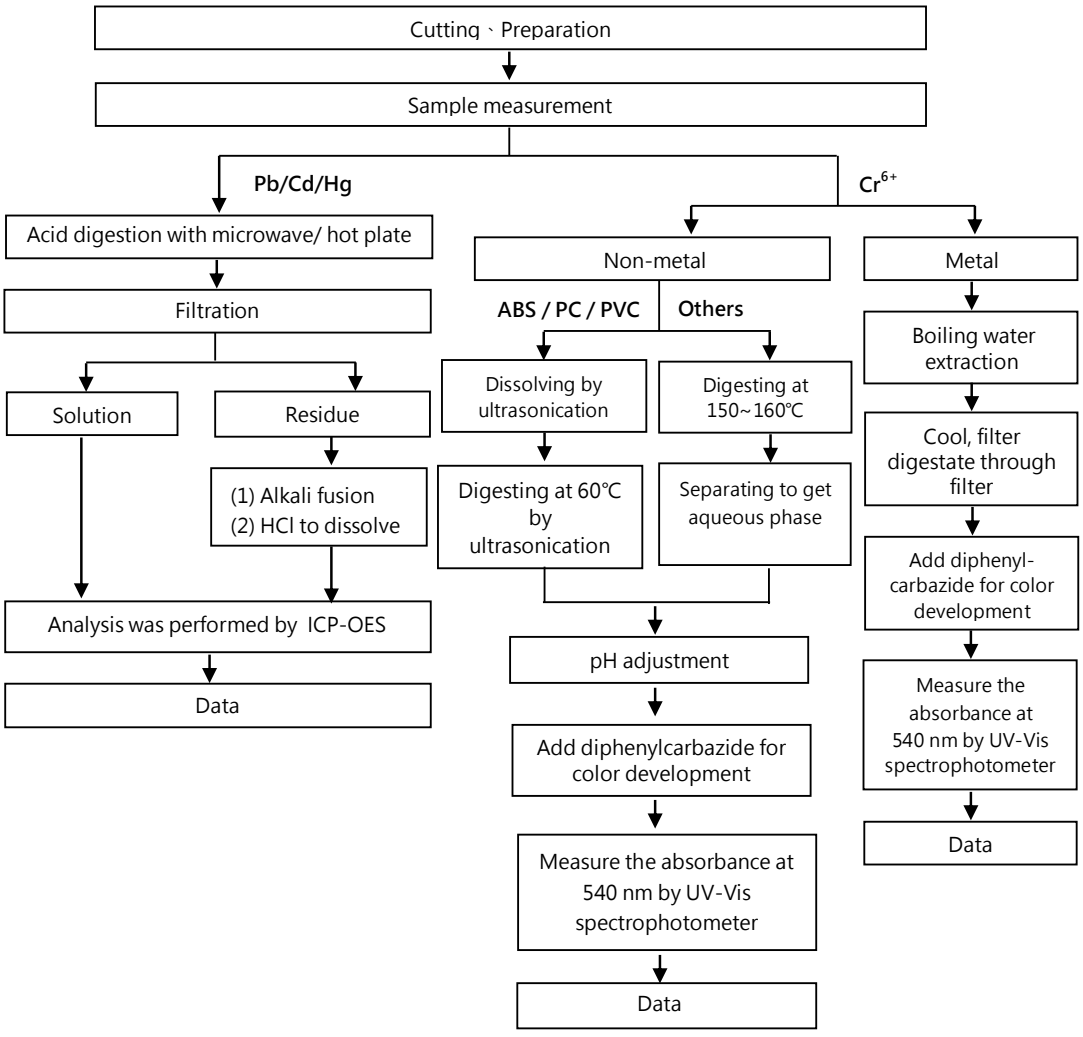
Analytical flow chart of heavy metal

These samples were dissolved totally by pre-conditioning method according to below flow chart.

(Cr^{6+} test method excluded)



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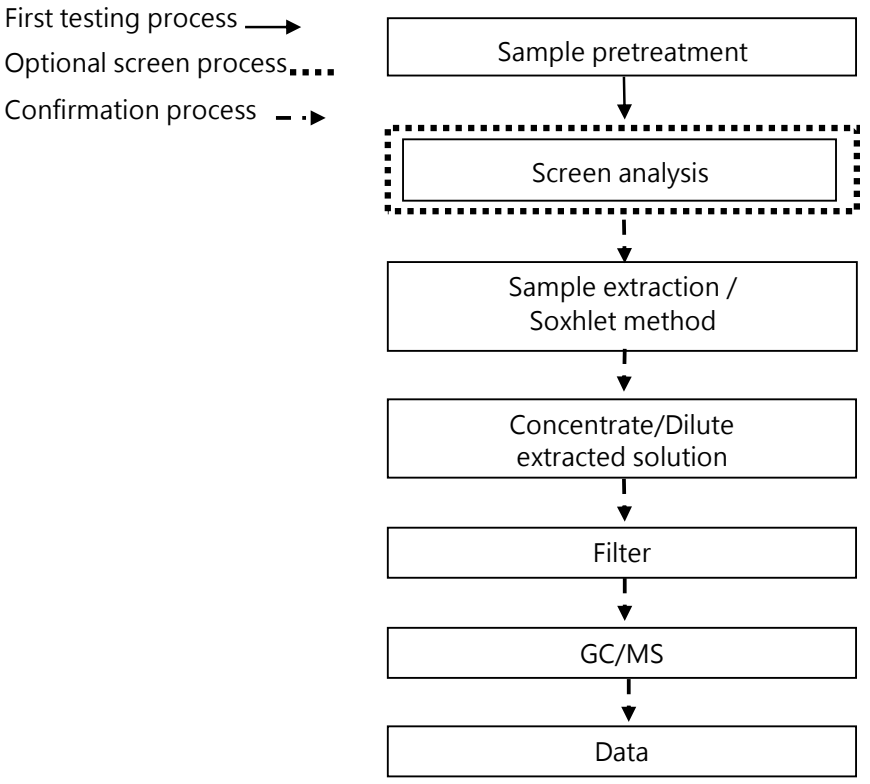
Analytical flow chart – PBBs / PBDEs



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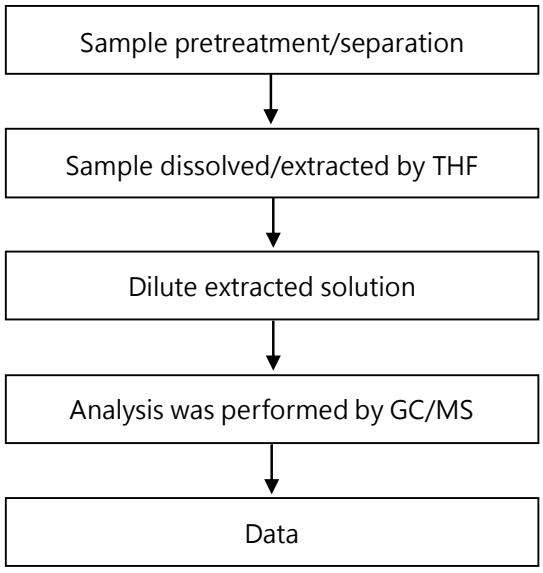
Analytical flow chart - Phthalate

【Test method: IEC 62321-8】



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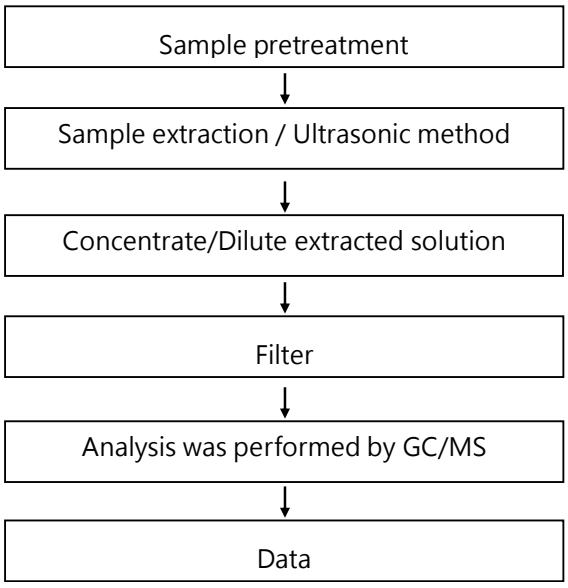
Analytical flow chart - HBCDD



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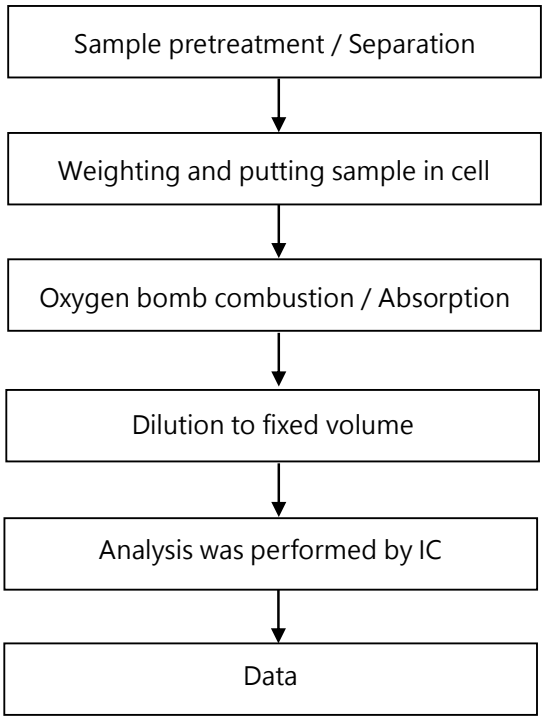
Analytical flow chart - Halogen



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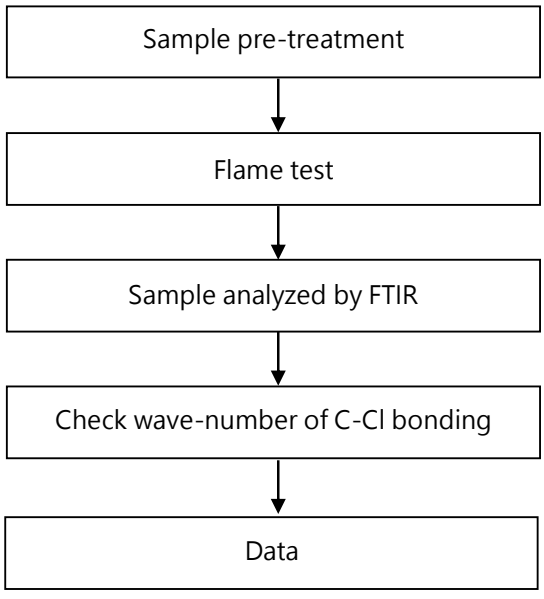
Analysis flow chart - PVC



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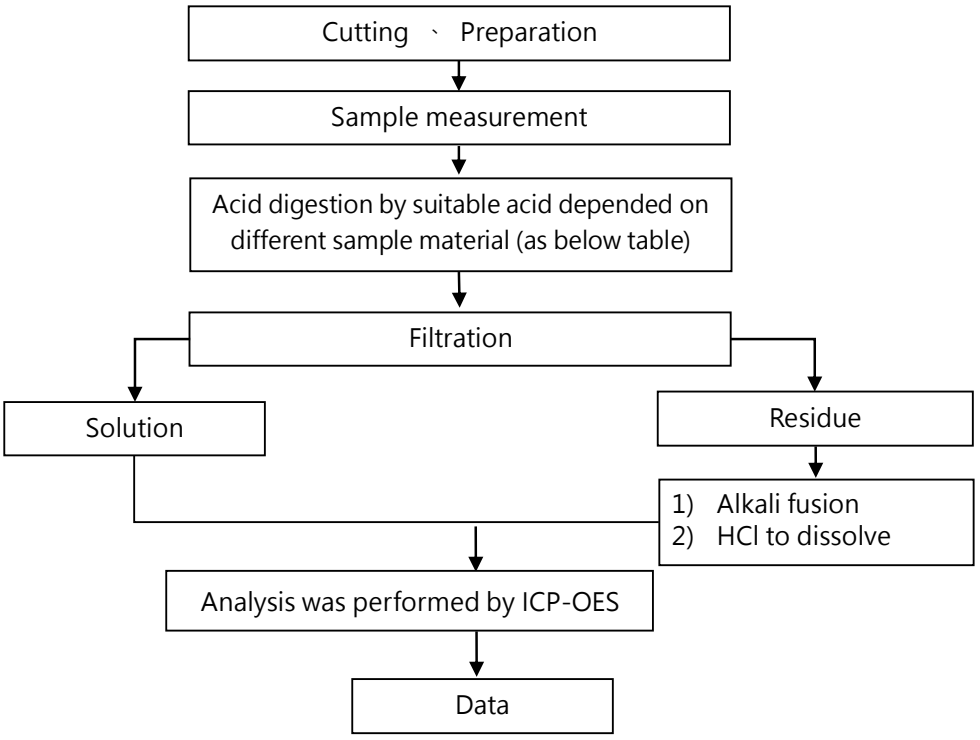
GLENCORE NIKKELVERK AS
VESTERVEIEN 31, 4606 KRISTIANSAND, NORWAY

Flow chart of digestion for the elements analysis performed by ICP-OES

These samples were dissolved totally by pre-conditioning method according to below flow chart.



Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Added appropriate reagent to total digestion

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* The tested sample / part is marked by an arrow if it's shown on the photo. *

ETR25104685



** End of Report **

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Test Report

No.: ETR24602573 Date: 28-Jun-2024

VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

The following sample(s) was/were submitted and identified by the applicant as:

Sample Submitted By : VALE CANADA LIMITED
Sample Name : VALE Long Harbour Nickel Plate Rounds

==========

Sample Receiving Date : 14-Jun-2024
Testing Period : 14-Jun-2024 to 28-Jun-2024

Test Requested :
(1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).
(2) As specified by client, the sample(s) was/were tested for 5 PBTs with reference to Regulation of Persistent, Bioaccumulative, Toxic (PBT) Chemicals under Toxic Substances Control Act (TSCA) Section 6(h). Please refer to result table for testing item(s).
(3) Please refer to next pages for the other item(s).

Test Results : Please refer to following pages.

Conclusion :
(1) Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.
(2) Based on the performed tests on submitted sample(s), the test result(s) comply with the limits as set by Persistent, Bioaccumulative, Toxic (PBT) Chemicals under Toxic Substances Control Act (TSCA) Section 6(h).

Troy Chang / Department Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

PIN CODE: B0C49A04

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VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Test Part Description

No.1 : SILVER COLORED METAL

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result No.1	Limit
Cadmium (Cd)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	100
Lead (Pb)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Mercury (Hg)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Hexavalent Chromium Cr(VI) (#2)	With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.	μg/cm²	0.1	n.d.	-
Monobromobiphenyl	With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Dibromobiphenyl		mg/kg	5	n.d.	-
Tribromobiphenyl		mg/kg	5	n.d.	-
Tetrabromobiphenyl		mg/kg	5	n.d.	-
Pentabromobiphenyl		mg/kg	5	n.d.	-
Hexabromobiphenyl		mg/kg	5	n.d.	-
Heptabromobiphenyl		mg/kg	5	n.d.	-
Octabromobiphenyl		mg/kg	5	n.d.	-
Nonabromobiphenyl		mg/kg	5	n.d.	-
Decabromobiphenyl		mg/kg	5	n.d.	-
Sum of PBBs		mg/kg	-	n.d.	1000
Monobromodiphenyl ether		mg/kg	5	n.d.	-
Dibromodiphenyl ether		mg/kg	5	n.d.	-
Tribromodiphenyl ether		mg/kg	5	n.d.	-
Tetrabromodiphenyl ether		mg/kg	5	n.d.	-
Pentabromodiphenyl ether		mg/kg	5	n.d.	-
Hexabromodiphenyl ether		mg/kg	5	n.d.	-
Heptabromodiphenyl ether		mg/kg	5	n.d.	-
Octabromodiphenyl ether		mg/kg	5	n.d.	-
Nonabromodiphenyl ether		mg/kg	5	n.d.	-
Decabromodiphenyl ether		mg/kg	5	n.d.	-
Sum of PBDEs		mg/kg	-	n.d.	1000

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VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Dibutyl phthalate (DBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisodecyl phthalate (DIDP) (CAS No.: 26761-40-0, 68515-49-1)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	With reference to IEC 62321-9: 2021, analysis was performed by GC/MS.	mg/kg	20	n.d.	-
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Chlorine (Cl) (CAS No.: 22537-15-1)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Bromine (Br) (CAS No.: 10097-32-2)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Iodine (I) (CAS No.: 14362-44-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Short Chain Chlorinated Paraffins(C10-C13) (SCCP) (CAS No.: 85535-84-8)	With reference to ISO 18219-1: 2021, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Polyvinyl chloride (PVC)	With reference to ASTM E1252: 2021, analysis was performed by FT-IR and Flame Test.	**	-	Negative	-

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VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Test Item(s)	Method	Unit	MDL	Result No.1	Limit
Asbestos					
Actinolite (CAS No.: 77536-66-4)	With reference to EPA 600/R-93/116: 1993, analysis was performed by Stereo Microscope (SM), Dispersion Staining Polarized Light Microscope (DS-PLM) and X-ray Diffraction Spectrometer (XRD).	-	-	Negative	-
Amosite (CAS No.: 12172-73-5)		-	-	Negative	-
Anthophyllite (CAS No.: 77536-67-5)		-	-	Negative	-
Chrysotile (CAS No.: 12001-29-5)		-	-	Negative	-
Crocidolite (CAS No.: 12001-28-4)		-	-	Negative	-
Tremolite (CAS No.: 77536-68-6)		-	-	Negative	-
Arsenic (As) (CAS No.: 7440-38-2)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Beryllium (Be) (CAS No.: 7440-41-7)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Antimony (Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Decabromodiphenyl ether (DecaBDE) (CAS No.: 1163-19-5)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	Prohibited / N/A(*3)
Phenol, isopropylated, phosphate (3:1) (PIP 3:1) (CAS No.: 68937-41-7)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	Prohibited / N/A(*1)
2,4,6-Tris(tert-butyl)phenol (2,4,6-TTBP) (CAS No.: 732-26-3)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	3000 / N/A(*2)
Pentachlorothiophenol (PCTP) (CAS No.: 133-49-3)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	10000
Hexachlorobutadiene (HCBD) (CAS No.: 87-68-3)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	Prohibited
Tetrabromobisphenol A (TBBP-A) (CAS No.: 79-94-7)	With reference to RSTS-E&E-121, analysis was performed by LC/MS.	mg/kg	10	n.d.	-
Medium Chain Chlorinated Paraffins(C14-C17) (MCCP) (CAS No.: 85535-85-9)	With reference to ISO 18219-2: 2021, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Perfluorooctane sulfonates and its salts (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-ethylperfluoro-1-octanesulfonamide (EtFOSA) (CAS No.: 4151-50-2)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

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VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
N-Methyl-Perfluoroctanesulfonamide (N-Me-FOSA) (CAS No.: 31506-32-8)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-Ethyl-Perfluoroctanesulfonamidoethanol (N-Et-FOSE alcohol) (CAS No.: 1691-99-2)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-Methyl-Perfluoroctanesulfonamidoethanol (N-Me-FOSE alcohol) (CAS No.: 24448-09-7)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoroctanesulfonamide and its salts (PFOSA and its salts) (CAS No.: 754-91-6 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorooctanoic acid and its salts (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Methyl perfluorooctanoate (Me-PFOA) (CAS No.: 376-27-2)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Ethyl perfluorooctanoate (Et-PFOA) (CAS No.: 3108-24-5)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluoro-1-iodooctane (PFOI) (CAS No.: 507-63-1)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
3-Perfluoroheptyl propanoic acid (7:3 FTCA) (CAS No.: 812-70-4)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorodecanesulfonic acid and its salts (8:2 FTS and its salts) (CAS No.: 39108-34-4 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluoro-1-decanol (8:2 FTOH) (CAS No.: 678-39-7)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyl acrylate (8:2 FTA) (CAS No.: 27905-45-9)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-

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200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
1H,1H,2H,2H-Perfluorodecyl methacrylate (8:2 FTMA) (CAS No.: 1996-88-9)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2H,2H-Perfluorodecane acid and its salts (H2PFDA and its salts) (CAS No.: 27854-31-5 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorodecyl iodide (8_2 FTI) (CAS No.: 2043-53-0)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyltriethoxysilane (8:2 FTSi(OC2H5)3) (CAS No.: 101947-16-4)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2H,2H,3H,3H-Perfluoroundecanoic Acid and its salts (4HPFUnA and its salts) (CAS No.: 34598-33-9 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H-Heptadecafluoro-1-decene (PFDE) (CAS No.: 21652-58-4)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Bis(1H,1H,2H,2H-Perfluorodecyl)phosphate and its salts (8_2diPAP and its salts) (CAS No.: 678-41-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

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200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Note :

1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. "-" = Not Regulated
5. **= Qualitative analysis (No Unit)
6. Negative = Undetectable ; Positive = Detectable
7. Testing range of asbestos qualitative analysis is from less than 0.1% to 100%. The judgment criterion: asbestos fibers being found is shown as "Positive"; asbestos fibers not being found is shown as "Negative".
8. (#2) =
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI).
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.
9. Unless otherwise stated , the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.
10. Detail explanation of the regulation is available at the following link.
    https://www.ecfr.gov/current/title-40/chapter-I/subchapter-R/part-751?toc=1
11. N/A(*1) : The submitted sample is exempted from the regulated scope if it is anyone of the following :
    - Hydraulic fluids for aviation or military
    - Lubricants and grease
    - New and replacement parts for motor and aerospace vehicles
    - Manufacture of cyanoacrylate adhesives in closed systems
    - Specialized engine air filters for locomotive and marine applications
    - Plastic for recycling from PIP (3:1)-containing products or articles
    - Finished products or articles made of plastic recycled from PIP (3:1)-containing products or articles
    - Processing and distribution in commerce of PIP (3:1)-containing articles, before October 31, 2024
12. N/A(*2) : The submitted sample is exempted from the regulated scope if it is not oil and lubricant additives.
13. N/A(*3) : The submitted sample is exempted from the regulated scope if it is anyone of the following :
    Exempts processing and distribution for recycling of DecaBDE-containing plastic from products or articles and DecaBDE-containing products or articles made from such recycled plastic.

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200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

PFAS Remark：

The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.)

Group Name	Substance Name	CAS No.
PFOS, its salts & derivatives	Perfluorooctane sulfonates (PFOS)	1763-23-1
	Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
	Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH_4)	29081-56-9
	Perfluorooctane sulfonate diethanolamine salt (PFOS-$NH(OH)_2$)	70225-14-8
	Perfluorooctanesulfonic acid,tetraethylammonium salt (PFOS-$N(C_2H_5)_4$)	56773-42-3
	N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonate (PFOS-DDA)	251099-16-8
	TetrabutylAmmonium perfluorooctanesulfonate (PFOS-$N(C_4H_9)_4$)	111873-33-7
	Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
	Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
	Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0
	Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctanesulfonate	71463-74-6
PFOSA, its salts	Perfluorooctanesulfonamide (PFOSA)	754-91-6
	Perfluorooctanesulfonamide lithium salt (1:1) (PFOSA-Li)	76752-79-9
	Perfluorooctanesulfonamide Sodium salt (1:1) (PFOSA-Na)	76752-78-8
	Perfluorooctanesulfonamide Potassium salt (1:1) (PFOSA-K)	76752-70-0
	Perfluorooctanesulfonamide Ammonium salt (1:1) (PFOSA-NH_4)	76752-72-2

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VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Group Name	Substance Name	CAS No.
PFOA, its salts & derivatives	Perfluorooctanoic acid (PFOA)	335-67-1
	Sodium perfluorooctanoate (PFOA-Na)	335-95-5
	Potassium perfluorooctanoate (PFOA-K)	2395-00-8
	Silver perfluorooctanote (PFOA-Ag)	335-93-3
	Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	Lithium perfluorooctanoate (PFOA-Li)	17125-58-5
	Cobalt perfluorooctanoate (PFOA-Co)	35965-01-6
PFOA, its salts & derivatives	Cesium perfluorooctanoate (PFOA-Cs)	17125-60-9
	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, chromium(3+) (PFOA-$Cr(3^+)$)	68141-02-6
	Pentadecafluorooctanoic acid--piperazine (2/1)PFOA-$NH(C_4H_{10}N)$	423-52-9
	Pentadecafluorooctanoate (anion)	45285-51-6
	Perfluorooctanoic Anhydride	33496-48-9
8:2 FTS, its salts	1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	39108-34-4
	1H,1H,2H,2H-Perfluorodencane sulfonate acid Potassium salt (8:2 FTS-K)	438237-73-1
	1H,1H,2H,2H-Perfluorodencane sulfonate acid Ammonium salt (8:2 FTS-NH_4)	149724-40-3
	1H,1H,2H,2H-Perfluorodencane sulfonate acid Sodium salt (8:2 FTS-Na)	27619-96-1
H2PFDA, its salts	2H,2H-Perfluorodecane acid (H2PFDA)	27854-31-5
	Tetrabutylphosphonium 2H,2H-Perfluorodecanoate	882489-14-7
4HPFUnA, its salts	2H,2H,3H,3H-Perfluoroundecanoic Acid (4HPFUnA)	34598-33-9
	Potassium 2H,2H,3H,3H-Perfluoroundecanoate (H4PFUnA-K)	83310-58-1
8:2diPAP, its salts	Bis(1H,1H,2H,2H-Perfluorodecyl)phosphate (8:2diPAP)	678-41-1
	Sodium bis(1H,1H,2H,2H-perfluorodecyl)phosphate (8:2diPAP-Na)	114519-85-6

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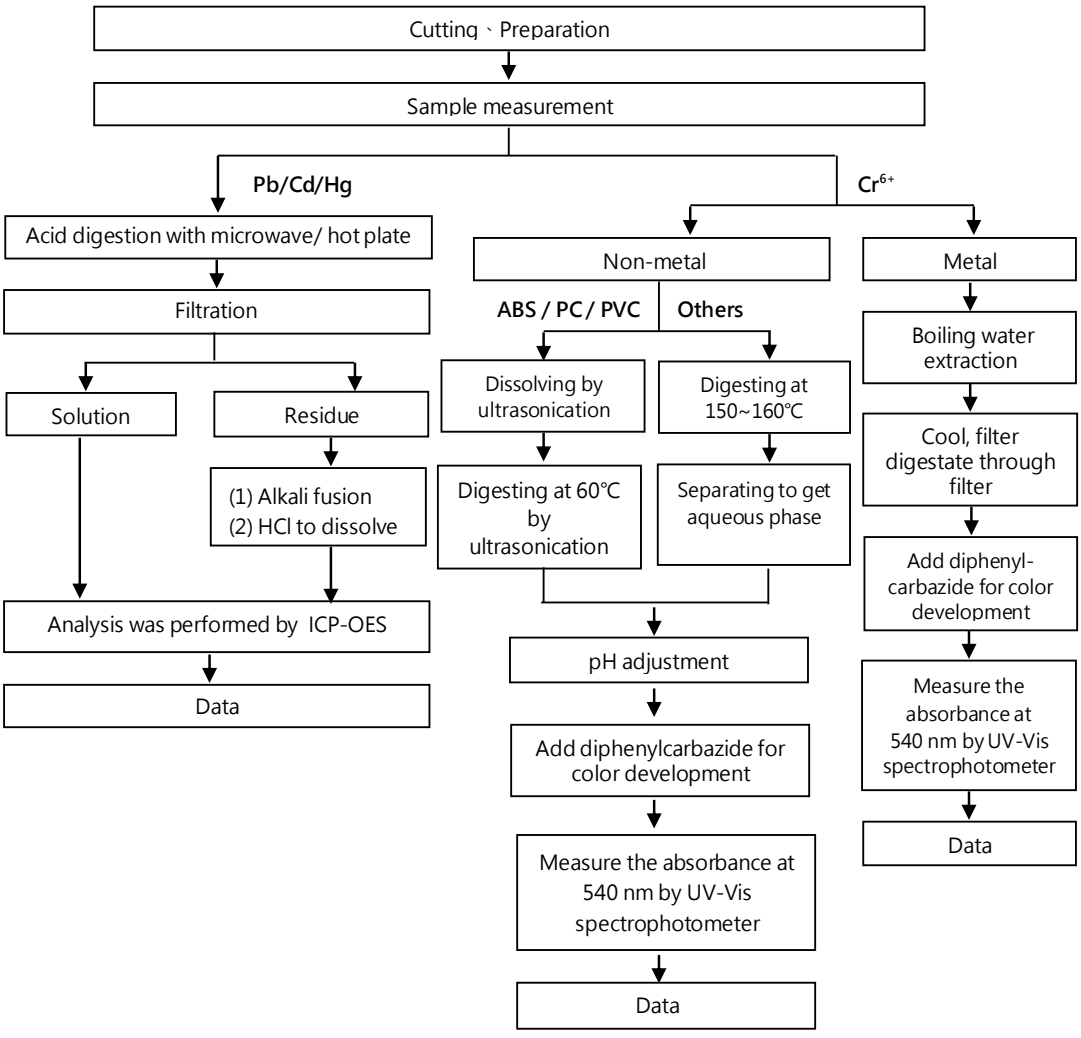
VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analytical flow chart of heavy metal

These samples were dissolved totally by pre-conditioning method according to below flow chart.

(Cr^{6+} test method excluded)



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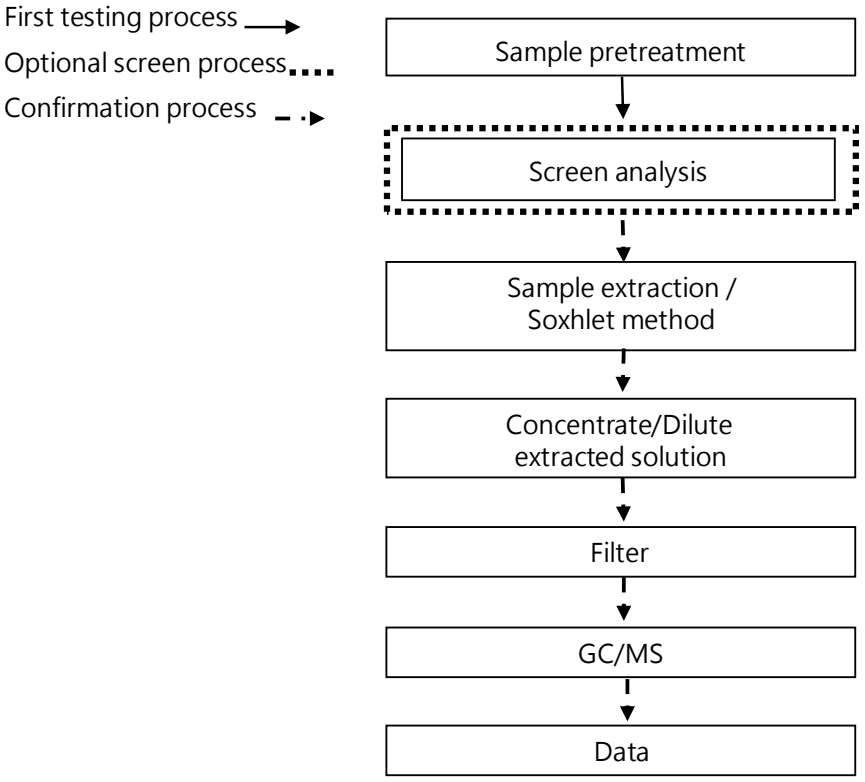
VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analytical flow chart – PBBs / PBDEs



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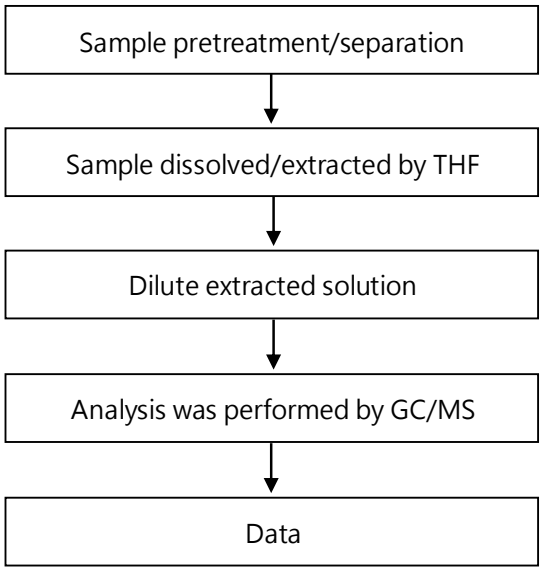
VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analytical flow chart - Phthalate

【Test method: IEC 62321-8】



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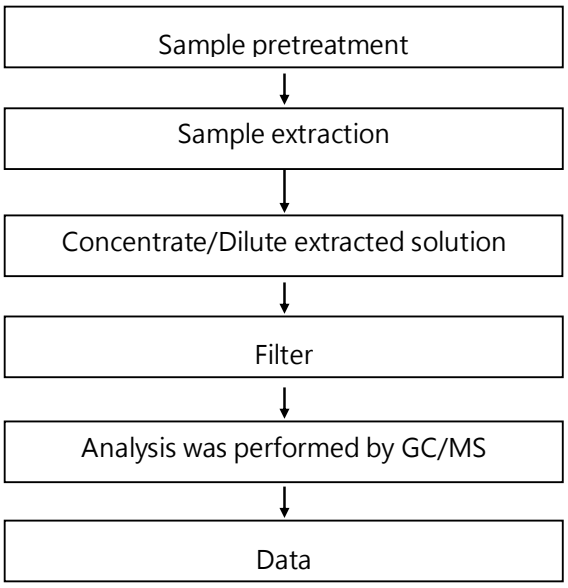
VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analytical flow chart - HBCDD



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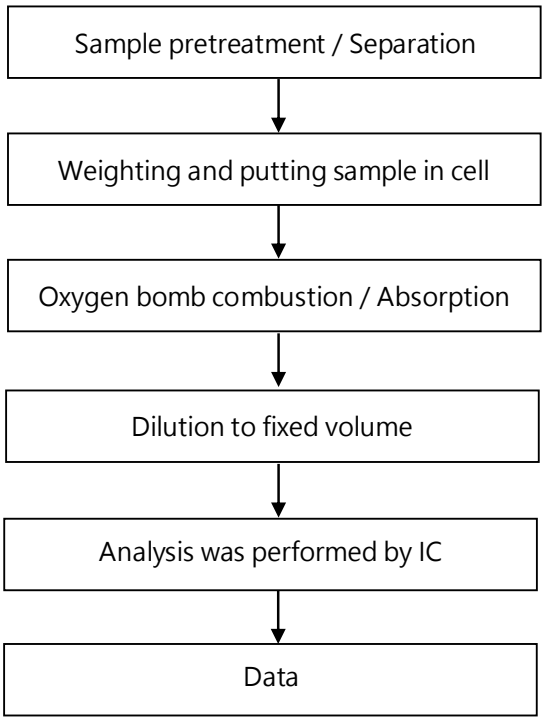
VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analytical flow chart - Halogen



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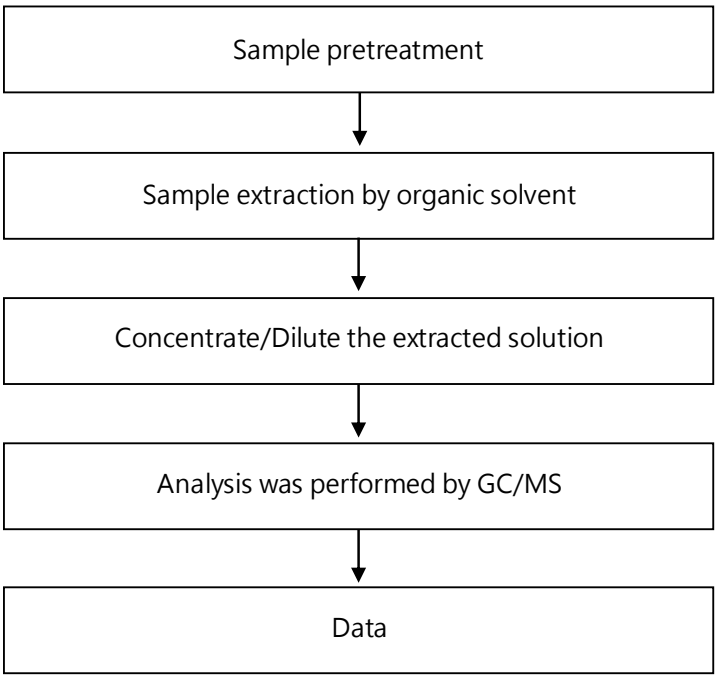
VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analytical flow chart

* Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT



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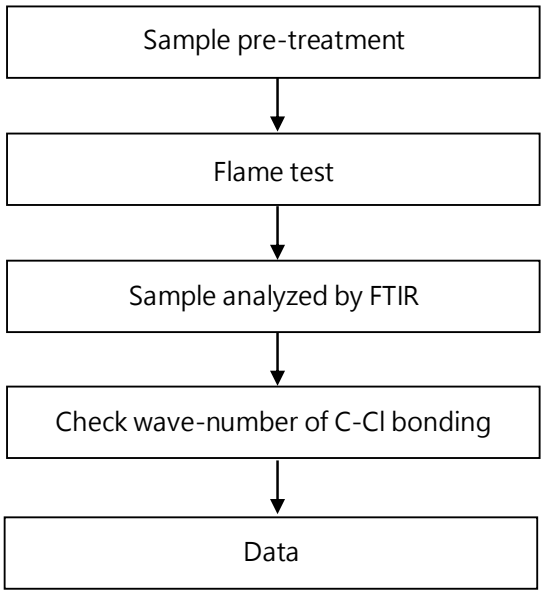
VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analysis flow chart - PVC



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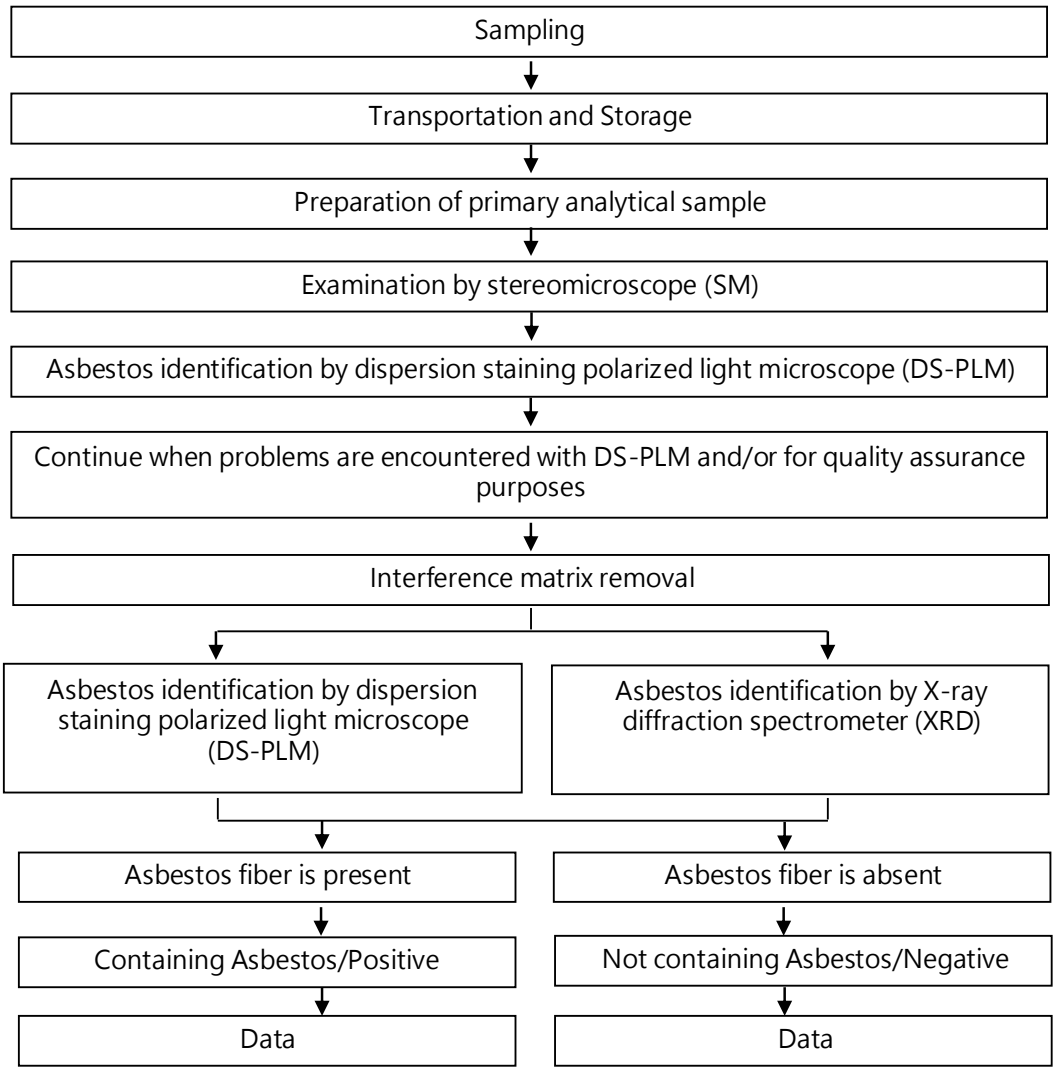
VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analysis flow chart for determination of Asbestos

【Reference method: EPA 600/R-93/116】



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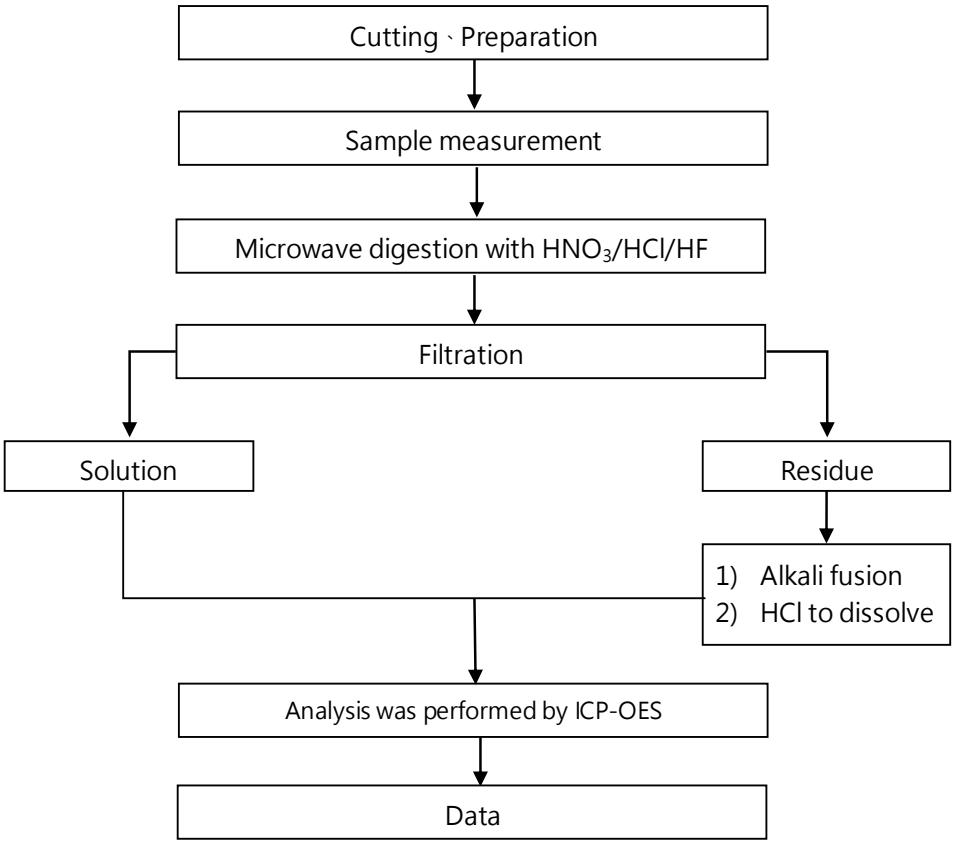
VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analytical flow chart of elements (Heavy metal included)

These samples were dissolved totally by pre-conditioning method according to below flow chart.

【Reference method：US EPA 3051A、US EPA 3052】



* US EPA 3051A method does not add HF.

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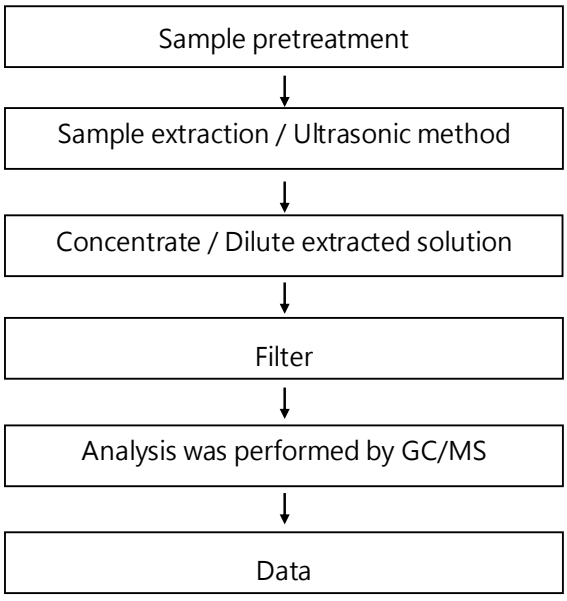
VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analytical flow chart - Persistent, Bioaccumulative, Toxic (PBTs)



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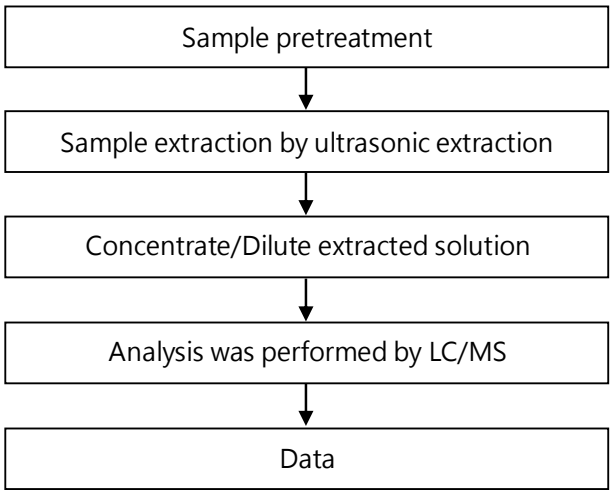
VALE CANADA LIMITED
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analytical flow chart - TBBP-A



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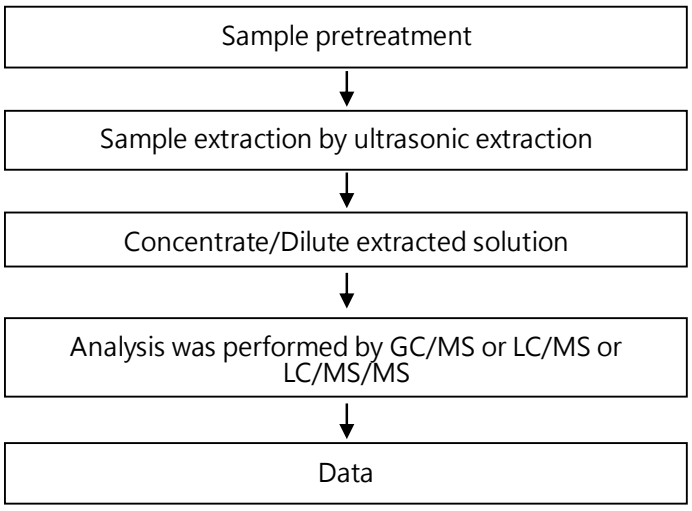
200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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200 BAY STREET, ROYAL BANK PLAZA, SUITE 1600, SOUTH TOWER, P.O. BOX 70, TORONTO, ONTARIO, M5J 2K2, CANADA

*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

ETR24602573



** End of Report **

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1 产品及企业标识

1.1 产品名称

中文名称：3M SP-7533 丝网印刷胶

英文名称：3M™ Screen Printable Adhesive SP7533

其他鉴别方法

产品编号

62-4533-7530-5　　62-4533-7535-4　　JS-3000-4678-1

1.2 推荐用途和限制用途

推荐用途

丝网印刷胶

1.3 供应商信息

供应商： 3M Japan Limited
产品部： 工业胶粘剂及胶带产品部
地址： 6-7-29, Kita-Shinagawa, Shinagawa-ku, Tokyo 141-8684, Japan
电话： 021-22105335
传真： 021-22105036
电子邮件： Tox.cn@mmm.com
网址： www.3m.com.cn

1.4 应急电话

国家化学事故应急咨询专线： 0532-83889090 (24h)

2 危险性概述

紧急情况概述

液体，轻微丙烯酸气味，白色
怀疑致癌。

2.1 物质或混合物的分类
致癌性：类别2。

2.2 标签要素
图形符号
健康危险|

象形图



警示词
警告

危险性说明
H351 怀疑致癌。

防范说明

【预防措施】
P280E 戴防护手套。

【事故响应】
无特殊要求。

【安全储存】
无特殊要求。

【废弃处置】
P501 本品/容器的处置应当遵从当地/上级区域/国家/国际适用的法规。

物理和化学危险
没有已知的GHS危险分类，请查看第9或第10章节获取更多的信息。

健康危害
怀疑致癌。

环境危害
没有已知的GHS危险分类，请查看第12章节获取更多的信息。

2.3 其他危险

未知。

3 成分/组成信息

该产品为混合物.

成分	**CAS号：**	**%重量比**
醋酸乙烯和丙烯酸酯的共聚物	商业机密	40 - 70
水	7732-18-5	15 - 40
异丙醇	67-63-0	< 0.3
乙酸乙烯酯	108-05-4	< 0.2
壬基酚聚氧乙烯醚	9016-45-9	< 0.1

4 急救措施

4.1 急救措施

吸入：
将患者转移到空气新鲜处。如果感觉不适，就医。

皮肤接触：
用肥皂水和水清洗。如果有担心，就医。

眼睛接触：
立即用大量水冲洗。如带隐形眼镜并可方便地取出，则取出隐形眼镜。继续冲洗。如果征兆/症状持续，就医。

如果食入：
漱口。如果感觉不适，就医。

4.2 重要的症状和影响，包括急性的和迟发的
详见第十一章毒理学资料

4.3 建议保护救援人员并特别向医生发出警告
物理和健康的危害、呼吸防护、通风和个人防护装备信息请参考SDS其它章节。

4.4 及时的医疗护理和特殊的治疗的指示
不适用

5 消防措施

5.1 适用的灭火剂
此物质不会燃烧。

5.2 物质或混合物引发的特殊危险性
本产品中没有固有的（危险）。

有害分解产物或副产物

物质	条件
一氧化碳	燃烧过程中
二氧化碳	燃烧过程中

5.3 保护消防人员特殊的防护装备

无异常火灾和爆炸危害。

6 泄漏应急处理

6.1 作业人员防护措施、防护装备和应急处置程序

撤离现场。 用新鲜空气通风工作场所。
如果大量的溢出，或在密闭空间中溢出，根据良好的工业卫生措施，采用机械通风措施驱散和排放蒸汽。
有关物理和健康危险、呼吸防护、通风和个体防护设备的信息请参考本安全技术说明书其他章节。

6.2 环境保护措施

避免释放到环境中。 如果大量溢出，下水道进口盖上并筑防护堤，以防溢出物流入下水道或水体环境中。

6.3 泄露化学品的收容、清除方法及所使用的处置材料

将溢出物收集于容器内。
从溢出物边缘向内进行清理，用膨润土，蛭石，或市售无机吸收材料覆盖。在充分吸收后混合，直至干燥。
记住,添加吸附物质并不能消除物理,健康或环境危害 收集尽可能多的溢出物。
置于有关当局批准用于运输的密闭容器。 用清洗剂和水清理残余物。 密封容器。
尽快废弃处理收集起来的物质。

6.4 次生灾害的预防措施

不适用。

7 操作处置与储存

7.1 安全处置注意事项

仅作工业或专业之用。 在阅读并了解所有安全预防措施之前，切勿操作。
避免吸入粉尘/烟气/气体/烟雾/蒸气/喷雾。 避免接触眼睛、皮肤或衣服。
使用本产品时不得进食、饮水或吸烟。 操作后彻底清洗。
远离活性金属（如铝，锌等）以避免形成具有爆炸危险的氢气。
使用所需的个人防护装备（如手套，呼吸器等...）。

7.2 安全储存的条件，包括不相容的物质

远离热源储存。 远离酸储存。 请远离强碱存储。

8 接触控制/个体防护

8.1 控制参数

职业接触限值

如果第3章节成分/组成信息中有化学物质未出现在下表中，即表示该物质无职业接触限值。

成分	CAS号：	（机构）	限制类型	附加注释
乙酸乙烯酯	108-05-4	中国OELs	TWA(8 hrs):10 mg/m3;STEL(15 mins):15 mg/m3	
乙酸乙烯酯	108-05-4	ACGIH	TWA:10 ppm;STEL:15 ppm	A3：对动物致癌
乙酸乙烯酯	108-05-4	CMRG	TWA:5 ppm	
异丙醇	67-63-0	香港OELs	TWA(8hr):983 mg/m3(400 ppm);STEL(15min):1230 mg/m3(500 ppm)	
异丙醇	67-63-0	中国OELs	TWA(8hr):350 mg/m3;STEL(15min):700 mg/m3	
异丙醇	67-63-0	ACGIH	TWA:200 ppm;STEL:400 ppm	A4：对人类的致癌性尚无法分类

ACGIH ： 美国政府工业卫生学家会议
AIHA ： 美国工业卫生协会

中国OELs ： 中国工作场所有害因素职业接触限值
CMRG ： 化学品厂商推荐标准
香港OELs ： 香港工作环境中化学物质学物质职业接触限值
TWA: 时间加权平均容许浓度
STEL: 短时接触容许浓度
CEIL: 最高容许浓度

生物接触限值

成分	CAS编号	（机构）	测定物	生物标本	采样时间	值	附加注释
异丙醇	67-63-0	ACGIH BEIs	丙酮	尿	ESW	40 mg/l	

ACGIH BEIs ： 美国政府工业卫生师协会(ACGIH)生物接触指数(BEIs)
ESW: 工作周最后一个工作班后

8.2 接触控制

8.2.1 工程控制
使用普通稀释通风和/或局部排气通风设备，以使空气中有害物质(粉尘/烟气/气体/烟雾/蒸汽/喷雾)低于相关的接触限值。如果通风不足，戴呼吸防护设备。

8.2.2 个体防护设备

眼睛/面部防护
不需要。

皮肤/手防护
依据暴露评估结果选择和使用当地相关标准认可的手套和/或防护服，防止皮肤接触。选择应根据使用因素，例如暴露水平，物质或混合物浓度，频率和持续时间，物理挑战，例如极端温度，及其它使用条件。请咨询手套和/或防护服制造商，选择合适匹配的手套和/或防护服。
建议使用以下材质的手套： 丁基橡胶

呼吸防护

需要进行暴露评估来判断是否需要呼吸器。如果需要呼吸器，将其作为完整呼吸防护措施中的一部分。基于暴露评估结果，选择以下型号呼吸器来降低吸入暴露：
可用于有机蒸气和颗粒物过滤的半面罩或全面罩呼吸器

有关特殊设备的适用性，请咨询您的呼吸器生产商。

9 理化特性

9.1 基本理化特性

物理状态：	液体
外观/气味：	轻微丙烯酸气味，白色
嗅觉阈值：	*无资料*
pH值：	7
熔点/凝固点：	*不适用*
沸点/初沸点/沸程：	大约 100 ℃
闪点：	*不适用*
易燃性 （固体、气体）：	
燃烧极限范围（下限）：	*不适用*
燃烧极限范围（上限）：	*不适用*
密度：	1.02 g/ml
相对密度：	1.02 ［*参考标准：*水=1］
水溶解度：	可估量的
溶解度-非水溶：	*无资料*
n-辛醇/水分配系数：	*无资料*
自燃温度：	*不适用*
分解温度：	*无资料*
粘度：	24,000 - 40,000 mPa-s ［@ 20 ℃ ］
分子量	*无资料*
豁免的无水VOC溶剂	<=8 g/l ［*测试方法：*按照美国南海岸空气质量管理局（SCAQMD）标准 443.1计算］

10 稳定性和反应性

10.1 反应性
这种原料在一定条件下可能会与某些试剂反应 - 参见本章节的其他内容。

10.2 化学品稳定性
稳定。

10.3 危险反应的可能性
不会发生有害聚合反应。

10.4 应避免的条件
热

10.5 不相容的物质
强酸
强碱
活性金属

10.6 危险的分解产物

物质	条件
未知	

11 毒理学资料

如果主管当局对某特殊成分进行强制性分类，下面的信息可能与第2章的物质分类不一致。由于某成分浓度低于标签要求阈值，或该成分可能不会产生暴露接触，或者该数据与整个物质不相关，那么该成分的毒理数据可能不会与物质分类或暴露的征兆/症状有关。

11.1 毒理学信息

征兆/症状

根据组分的试验数据和/或信息，本物质可能会产生以下健康效应：

吸入：
呼吸道刺激：征兆/症状可能包括咳嗽、打喷嚏、流鼻涕、头痛、嗓子沙哑、鼻痛、喉咙痛。

皮肤接触：
使用产品时皮肤接触不会导致明显的刺激。

眼睛接触：
在使用产品时眼睛接触不会导致明显的刺激。

食入：
胃肠道刺激：征兆/症状可能包括腹痛、胃不舒服、恶心、呕吐和腹泻。

其他健康影响：

致癌性：
包含一种或多种可能致癌的化学品。

毒理学数据
如果一个成分在第三章节被公开，但是没有出现在下表中，是因为没有可用数据或数据不足以进行分类。

急性毒性

名称	途径	物种	值
产品总体	食入		无数据；计算的急性毒性估计值(ATE)2,000 - 5,000 mg/kg
异丙醇	皮肤	兔子	半数致死剂量(LD50) 12,870 mg/kg
异丙醇	吸入-蒸汽(4 hr)	大鼠	半数致死浓度(LC50) 72.6 mg/l
异丙醇	食入	大鼠	半数致死剂量(LD50) 4,710 mg/kg

乙酸乙烯酯	皮肤	兔子	半数致死剂量(LD50) 2,320 mg/kg
乙酸乙烯酯	吸入-蒸汽 (4 hr)	大鼠	半数致死浓度(LC50) 11.3 mg/l
乙酸乙烯酯	食入	大鼠	半数致死剂量(LD50) 2,920 mg/kg
壬基酚聚氧乙烯醚	皮肤	兔子	半数致死剂量(LD50) 2,091 mg/kg
壬基酚聚氧乙烯醚	食入	大鼠	半数致死剂量(LD50) 1,310 mg/kg

ATE=急性毒性估计值

皮肤腐蚀/刺激

名称	物种	值
异丙醇	多种动物种群	无显著刺激
乙酸乙烯酯	兔子	最小刺激性
壬基酚聚氧乙烯醚	兔子	刺激物

严重眼损伤/眼刺激

名称	物种	值
异丙醇	兔子	严重刺激性
乙酸乙烯酯	兔子	轻度刺激性
壬基酚聚氧乙烯醚	兔子	严重刺激性

皮肤致敏

名称	物种	值
异丙醇	豚鼠	不会致敏
乙酸乙烯酯	豚鼠	存在一些阳性数据，但不足以根据这些数据进行分类。

呼吸过敏

对于该产品组分，没有已知参考数据或当前数据不足以进行分类。

生殖细胞致突变性

名称	途径	值
异丙醇	体外	不会致突变
异丙醇	体外	不会致突变
乙酸乙烯酯	体外	存在一些阳性数据，但不足以根据这些数据进行分类。
乙酸乙烯酯	体外	存在一些阳性数据，但不足以根据这些数据进行分类。

致癌性

名称	途径	物种	值
异丙醇	吸入	大鼠	存在一些阳性数据，但不足以根据这些数据进行分类。
乙酸乙烯酯	食入	多种动物种群	致癌的

乙酸乙烯酯	吸入	大鼠	致癌的

生殖毒性

生殖和/或发育效应：

名称	途径	值	物种	测试结果	暴露时间
异丙醇	食入	存在一些发育毒性的阳性数据，但不足以根据这些数据进行分类。	大鼠	不出现副反应的剂量水平(NOAEL) 400 mg/kg/day	在器官形成过程中
异丙醇	吸入	存在一些发育毒性的阳性数据，但不足以根据这些数据进行分类。	大鼠	出现副反应的最小剂量(LOAEL) 9 mg/l	怀孕期间
乙酸乙烯酯	食入	存在一些女性生殖毒性的阳性数据，但不足以根据这些数据进行分类。	大鼠	不出现副反应的剂量水平(NOAEL) 140 mg/kg/day	2 代
乙酸乙烯酯	食入	存在一些男性生殖毒性的阳性数据，但不足以根据这些数据进行分类。	大鼠	不出现副反应的剂量水平(NOAEL) 140 mg/kg/day	2 代
乙酸乙烯酯	食入	存在一些发育毒性的阳性数据，但不足以根据这些数据进行分类。	大鼠	不出现副反应的剂量水平(NOAEL) 700 mg/kg/day	2 代
乙酸乙烯酯	吸入	存在一些发育毒性的阳性数据，但不足以根据这些数据进行分类。	大鼠	不出现副反应的剂量水平(NOAEL) 0.7 mg/l	在器官形成过程中

靶器官

特异性靶器官系统毒性--一次接触

名称	途径	靶器官	值	物种	测试结果	暴露时间
异丙醇	吸入	中枢神经系统受抑	可能导致困倦或头昏。	人	不出现副反应的剂量水平(NOAEL) 无数据	
异丙醇	吸入	呼吸刺激	存在一些阳性数据，但不足以根据这些数据进行分类。	人	不出现副反应的剂量水平(NOAEL) 无数据	
异丙醇	吸入	听觉系统	存在一些阳性数据，但不足以根据这些数据进行分类。	豚鼠	不出现副反应的剂量水平(NOAEL) 13.4 mg/l	24 hr
异丙醇	食入	中枢神经系统受抑	可能导致困倦或头昏。	人	不出现副反应的剂量水平(NOAEL) 无数据	中毒和/或滥用
乙酸乙烯酯	吸入	呼吸刺激	可能引起呼吸道刺激。	人类和动物	不出现副反应的剂量水平(NOAEL)	

					无数据	
乙酸乙烯酯	吸入	中枢神经系统受抑	存在一些阳性数据，但不足以根据这些数据进行分类。		不出现副反应的剂量水平(NOAEL) 无数据	

特异性靶器官系统毒性-反复接触

名称	途径	靶器官	值	物种	测试结果	暴露时间
异丙醇	吸入	肾和/或膀胱	存在一些阳性数据，但不足以根据这些数据进行分类。	大鼠	不出现副反应的剂量水平(NOAEL) 12.3 mg/l	24 月
异丙醇	吸入	神经系统	所有数据为阴性	大鼠	不出现副反应的剂量水平(NOAEL) 12 mg/l	13 周
异丙醇	食入	肾和/或膀胱	存在一些阳性数据，但不足以根据这些数据进行分类。	大鼠	不出现副反应的剂量水平(NOAEL) 400 mg/kg/day	12 周
乙酸乙烯酯	吸入	呼吸系统	存在一些阳性数据，但不足以根据这些数据进行分类。	多种动物种群	不出现副反应的剂量水平(NOAEL) 0.2 mg/l	104 周
乙酸乙烯酯	吸入	心脏 | 造血系统 | 肝脏 | 肾和/或膀胱	存在一些阳性数据，但不足以根据这些数据进行分类。	大鼠	不出现副反应的剂量水平(NOAEL) 2.1 mg/l	104 周
乙酸乙烯酯	吸入	内分泌系统	存在一些阳性数据，但不足以根据这些数据进行分类。	大鼠	不出现副反应的剂量水平(NOAEL) 0.07 mg/l	120 天
乙酸乙烯酯	吸入	免疫系统	存在一些阳性数据，但不足以根据这些数据进行分类。	多种动物种群	不出现副反应的剂量水平(NOAEL) 3.5 mg/l	3 月
乙酸乙烯酯	吸入	神经系统	存在一些阳性数据，但不足以根据这些数据进行分类。	多种动物种群	不出现副反应的剂量水平(NOAEL) 2.1 mg/l	104 周
乙酸乙烯酯	食入	肝脏	存在一些阳性数据，但不足以根据这些数据进行分类。	大鼠	出现副反应的最小剂量(LOAEL) 684 mg/kg/day	3 月
乙酸乙烯酯	食入	造血系统 | 神经系统 | 肾和/或膀胱	存在一些阳性数据，但不足以根据这些数据进行分类。	大鼠	不出现副反应的剂量水平(NOAEL) 235 mg/kg/day	104 周
乙酸乙烯酯	食入	免疫系统 | 呼吸系统	存在一些阳性数据，但不足以根据这些数据进行分类。	老鼠	不出现副反应的剂量水平(NOAEL) 950 mg/kg/day	3 月
乙酸乙烯酯	食入	心脏	所有数据为阴性	大鼠	不出现副反应的剂量水平(NOAEL) 235	104 周

					mg/kg/day	

化学品吸入性肺炎危险
对于该产品组分，没有已知参考数据或当前数据不足以进行分类。

对于本物质和/或其组分额外的毒理学信息，请联系安全技术说明书首页中列出的地址或电话号码。

12 生态学资料

如果主管当局对某特殊成分进行强制性分类，下面的信息可能与第2部分的物质分类不一致。如有需要，可提供产品分类所需的额外信息。此外，由于某成分浓度低于标签要求阈值，或该组分可能不会产生暴露接触，或者该数据与整个物质不相关，那么本章中可能不会包含环境归宿和环境效应。

12.1 毒性

急性水生危险：
根据GHS分类对水生生物没有急性毒性。

慢性水生危险：
根据GHS分类对水生生物没有慢性毒性。

无产品测试数据

材料	CAS号：	有机体	类型	暴露	测试终点	测试结果
乙酸乙烯酯	108-05-4	饭鱼	试验	96 hr	半数致死浓度	2.4 mg/l
乙酸乙烯酯	108-05-4	水蚤	试验	48 hr	50%效应浓度	9.2 mg/l
乙酸乙烯酯	108-05-4	绿藻	试验	72 hr	50%效应浓度	8.9 mg/l
乙酸乙烯酯	108-05-4	绿藻	试验	72 hr	未观察到效应的浓度	0.2 mg/l
乙酸乙烯酯	108-05-4	水蚤	试验	21 天	未观察到效应的浓度	0.32 mg/l
壬基酚聚氧乙烯醚	9016-45-9	蓝鳃太阳鱼	试验	96 hr	半数致死浓度	1.3 mg/l
壬基酚聚氧乙烯醚	9016-45-9	绿藻	估计值	72 hr	50%效应浓度	1 mg/l
壬基酚聚氧乙烯醚	9016-45-9	水蚤	估计值	48 hr	50%效应浓度	0.148 mg/l
异丙醇	67-63-0	甲壳纲动物	试验	48 hr	50%效应浓度	1,400 mg/l
异丙醇	67-63-0	水藻	试验	24 hr	50%效应浓度	>1,000 mg/l
异丙醇	67-63-0	黑头呆鱼	试验	96 hr	半数致死浓度	6,120 mg/l
异丙醇	67-63-0	水蚤	试验	21 天	未观察到效应的浓度	30 mg/l

12.2 持久性和降解性

材料	CAS号	测试类型	持续时间	研究类型	测试结果	条约草案
乙酸乙烯酯	108-05-4	试验 光分解		光分解的半衰期(空气中)	1.28 天 (半衰期)	其他方法
壬基酚聚氧乙烯醚	9016-45-9	估计值 生物降解	21 天	生化需氧量	0 %重量比	OECD 化学品试验导则301C - 改进的MITI试验
异丙醇	67-63-0	试验 生物降解	14 天	生化需氧量	86 %重量比	OECD 化学品试验导则301C - 改进的MITI试验
乙酸乙烯酯	108-05-4	试验 生物降解	14 天	生化需氧量	90 %重量比	OECD 化学品试验导则301C - 改进的MITI试验

12.3 潜在的生物累积性

材料	CAS号	测试类型	持续时间	研究类型	测试结果	条约草案
乙酸乙烯酯	108-05-4	试验 生物富集		辛醇/水分离系数对数	0.73	其他方法
异丙醇	67-63-0	试验 生物富集		辛醇/水分离系数对数	0.05	其他方法

12.4 土壤中的迁移性
更多详细信息请联系制造商。

12.5 其它不利效应
无资料

13 废弃处置

13.1 处置方法
详见第十一章毒理学资料

在许可的工业废物处置设施中处置废物。
应将用于运输和处理有害化学品（根据适用法规分类为有害的化学物质/混合物/配制品）的空的鼓状桶/桶/容器作为危险废物存储、处理和处置，除非适用于废物的相关法规对其有其它的定义。请咨询各主管机关以确定可用的处理和处置设施。

14 运输信息

当地法规
运输上分类为非危险品

中国运输危险级别：不适用

国际法规
运输上分类为非危险品

UN编号：不适用
联合国正确的运输名称：不适用
运输分类（IMO）：不适用
运输分类（IATA）:不适用
包装类别：不适用
环境危害：

海洋污染物：不是

使用者特别注意事项
不适用。

15 法规信息

该物质或混合物特定安全、健康和环境法律法规

新化学物质环境管理办法
该产品符合中国新物质环境管理办法，所有成分都已列在或被豁免于现有化学物质名录上。

危险化学品安全管理条例
危险化学品目录（2015版） 以下成分被列入

CAS号：	成分	剧毒化学品
108-05-4	乙酸乙烯酯	未列入
67-63-0	异丙醇	未列入
9016-45-9	壬基酚聚氧乙烯醚	未列入

GB18218 危险化学品重大危险源辨识
无成分列入

使用有毒物品作业场所劳动保护条例
高毒物品目录 无成分列入

本安全技术说明书符合下列国家标准：GB/T 17519 化学品安全技术说明书编写指南；GB15258 化学品安全标签编写规定；GB 30000.1-GB30000.29 化学品分类和标签规范；GBZ/T210.1职业卫生标准制定指南第1部分工作场所化学物质职业接触限值；GBZ/T210.2职业卫生标准制定指南第2部分工作场所粉尘职业接触限值；GBZ/T210.3职业卫生标准制定指南第3部分工作场所物理因素职业接触限值；GB6944 危险货物分类和品名编号；GB/T15098 危险货物运输包装类别划分方法；GB12268 危险货物品名表。

更多信息请联系本安全技术说明书第一章节所列的制造商。

16 其他信息

参考
《联合国关于危险货物运输的建议书-规章范本》
联合国《全球化学品统一分类和标签制度》(GHS)

修订信息：
本SDS部分章节更新.请您重新审阅本SDS中的信息.

此安全技术说明书上的信息代表我们现有的数据和在常规条件下处理此产品的最适当的使用方法。但我们不承担由使用该产品所带来的任何损失（除非法律规定）。此信息可能不适用于以下情况：使用者不遵照此安全技术说明书的指导使用此产品，或将此产品与其他材料混合使用。因此，重要的是客户通过测试验证该产品是否满足自己的应用。

3M中国MSDS可在www.3m.com.cn查找。

SAFETY DATA SHEET

GLENCORE IMPORT B.V.

Version #: 08
Issue date: 10-March-2011
Revision date: 28-February-2023
Supersedes date: 25-November-2021

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Name of the substance	Nickel
Trade name of the substance	NICKEL (MASSIVE)
Identification number	028-002-00-7 (Index number)
Registration number	01-2119438727-29-0030
Synonyms	Nickel Squares, SUPERELECTRO TM, Full Plate Cathode, Nickel Crowns, D-Crowns, Micro Crowns, Sundries, Ribs, Starting Sheets
SDS number	227019

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Manufacture and use of parts and products. Other registered uses, for this product, can be found in section 15 of this eSDS.
Uses advised against	Uses by workers in industrial setting: Design and manufacture of materials or articles which contain nickel, if they are intended for direct and prolonged contact with the skin where the release of nickel exceeds the limit set out in REACH Regulation 1907/2006 (Annex XVII). Manufacture of Ni-containing food contact materials (except Ni-Cr-plated materials) for which migration into foodstuff would exceed 0.14 mg/kg of Ni (according to Council of Europe and EDQM Guidelines on Metals and alloys used in food contact materials and articles, 2013). Manufacture of nickel-containing HIGH SULFUR stainless steel (AISI grade 303, or ISO 7153-1 reference grade N) for surgical implant applications. Manufacture of nickel or chromium-nickel plated heating coils in immersion kettles. Uses by professional workers: Use of nickel-containing HIGH SULFUR stainless steel (AISI grade 303, or ISO 7153-1 reference grade N) for surgical implant applications. Use of nickel in materials or articles intended for direct and prolonged contact with the skin where the release of nickel exceeds the limit set out in REACH Regulation 1907/2006 (Annex XVII). By consumer: Use of nickel in materials or articles intended for direct and prolonged contact with the skin where the release of nickel exceeds the limit set out in REACH Regulation 1907/2006 (Annex XVII). Use of Ni-containing food contact materials (with exception of Ni-Cr-plated materials) for which migration into foodstuff would exceed 0.14 mg/kg of Ni (according to Council of Europe and EDQM Guidelines on metals and alloys used as food contact materials and articles, 2013). Use of nickel or chromium-nickel plated heating coils in immersion kettles.

1.3. Details of the supplier of the safety data sheet

Company name	Glencore Import B.V.
Address	Prinses Beatrixlaan 582 2595 BM The Hague The Netherlands
Telephone	+31 70 222 8322
Email	product.safety@glencore.com
Contact person	product.safety@glencore.com

1.4. Emergency telephone number

+1 760 476 3961 (333085)

General in EU	112 (Available 24 hours a day. SDS/Product information may not be available for the Emergency Service.)
National Poisons Information Centre	353 (1) 809 2566 Healthcare Professionals: 24 hours, 7 days a week 353 (1) 809 2166 General Public: 8:00 a.m.to 10 p.m. (7 days a week)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The substance/mixture has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Regulation (EC) No 1272/2008 as amended

Health hazards

Skin sensitisation	Category 1	H317 - May cause an allergic skin reaction.
Carcinogenicity	Category 2	H351 - Suspected of causing cancer.
Specific target organ toxicity - repeated exposure	Category 1 (Lung, Respiratory system)	H372 - Causes damage to organs (Lung, Respiratory system) through prolonged or repeated exposure.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains: Nickel

Hazard pictograms



Signal word Danger

Hazard statements

H317	May cause an allergic skin reaction.
H351	Suspected of causing cancer.
H372	Causes damage to organs (Lung, Respiratory system) through prolonged or repeated exposure.

Precautionary statements

Prevention

P201	Obtain special instructions before use.
P260	Do not breathe fumes and dusts.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Response

P308 + P313	IF exposed or concerned: Get medical advice/attention.

Storage

P405	Store locked up.

Disposal

P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

Supplemental information on the label None.

2.3. Other hazards This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII. The substance is not included in the list established in accordance with REACH Article 59(1) for having endocrine disrupting properties. The substance is not considered to have endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Nickel	85-100 %	7440-02-0 231-111-4	01-2119438727-29-0030	028-002-00-7	

Classification: Skin Sens. 1;H317, Carc. 2;H351, STOT RE 1;H372

Composition comments This product is registered under the REACH Regulation 1907/2006 as a mono-constituent substance. The full text for all H-statements is displayed in section 16. All concentrations are in percent by weight. For more detailed chemical composition, refer to the certificate of analysis.

SECTION 4: First aid measures

General information

IF exposed or concerned: Get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Get medical attention/advice if you feel unwell. Seek medical attention for all burns, regardless how minor they may seem. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

4.1. Description of first aid measures

Inhalation

In case of exposure to fumes or particulates: Provide fresh air, warmth and rest, preferably in comfortable upright sitting position. If symptoms persist, get medical attention.

Skin contact

Contact with dust: Immediately remove contaminated clothing. Wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions. In case of contact with molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Removal of solidified molten material from skin requires medical assistance. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Eye contact

Do not rub eyes. Remove contact lenses, if present and easy to do. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.

Ingestion

Clean mouth with water and drink afterwards plenty of water. Do NOT induce vomiting. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

Dust may irritate the respiratory tract, skin and eyes. May cause an allergic skin reaction. Dermatitis. Rash. Prolonged exposure may cause chronic effects. Lung fibrosis. Respiratory system.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically. Symptoms may be delayed.

SECTION 5: Firefighting measures

General fire hazards

Dust may form explosive mixture with air. Do not use water on molten metal: Explosion hazard could result.

5.1. Extinguishing media

Suitable extinguishing media

Special powder against metal fires. Dry chemical, soda ash, lime or sand. Water spray, fog or mist.

Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Fire or high temperatures create: Metal oxides. Metal fumes. Dusts or fumes may form explosive mixtures in air. In a fire, ferronickel may form highly toxic substances: iron carbonyl and nickel carbonyl, a known carcinogen.

5.3. Advice for firefighters

Special protective equipment for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Use personal protective equipment as required.

Special fire fighting procedures

In case of fire and/or explosion do not breathe fumes. Keep unnecessary personnel away. Move containers from fire area if you can do so without risk.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Ensure adequate ventilation. Keep unnecessary personnel away. Do not breathe dust. Avoid contact with skin and eyes. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained.

For emergency responders

Keep unnecessary personnel away. Use personal protection recommended in Section 8 of the SDS.

6.2. Environmental precautions

Avoid release to the environment. Avoid spreading dust or contaminated materials.

6.3. Methods and material for containment and cleaning up

Prevent further leakage or spillage if safe to do so. Collect spillage. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. Collect dust or particulates using a vacuum cleaner with a HEPA filter. Following product recovery, flush area with water.

Never return spills in original containers for re-use. Ensure that waste and contaminated materials are collected and removed from the work area as soon as possible in a suitably labelled container.

6.4. Reference to other sections

For waste disposal, see section 13 of the SDS. For personal protection, see section 8 of the SDS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Access to work area should be restricted to people handling the product only. Should be handled in closed systems, if possible. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts. Provide adequate ventilation. Use appropriate tools. Avoid contact with sharp edges and hot surfaces. Avoid generation and spreading of dust. Do not breathe dust. Avoid contact with skin and eyes. Avoid prolonged exposure. Persons susceptible to allergic reactions should not handle this product. Pregnant women should not work with the product, if there is the least risk of exposure. Wear appropriate personal protective equipment. Avoid contact with molten material. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities

Store locked up. Store in a dry place. Store in a well-ventilated place. Store away from incompatible materials.

7.3. Specific end use(s)

Industrial use. For detailed information, see section 15.
Observe industrial sector guidance on best practices.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

Ireland. Occupational Exposure Limits

Material	Type	Value
Nickel (CAS 7440-02-0)	TWA	0.5 mg/m3

Biological limit values

No biological exposure limits noted for the ingredient(s).

Recommended monitoring procedures

Follow the schedule for work place measurements.

Derived no effect levels (DNELs)

General population

Product	Value	Assessment factor	Notes
Nickel (CAS 7440-02-0)			
Long-term, Local, Dermal	0.035 mg/cm2		
Long-term, Local, Inhalation	60 ng/m3		
Long-term, Systemic, Inhalation	60 ng/m3		
Long-term, Systemic, Oral	0.011 mg/kg bw/day		
Short-term, Local, Inhalation	0.8 mg/m3		
Short-term, Systemic, Oral	0.37 mg/kg bw/day		

Workers

Product	Value	Assessment factor	Notes
Nickel (CAS 7440-02-0)			
Long-term, Local, Dermal	0.035 mg/m3		
Long-term, Local, Inhalation	0.05 mg/m3		
Long-term, Systemic, Inhalation	0.05 mg/m3		
Short-term, Local, Inhalation	11.9 mg/m3		

Predicted no effect concentrations (PNECs)

Product	Value	Assessment factor	Notes
Nickel (CAS 7440-02-0)			
Freshwater	7.1 µg/l		
Intermittent releases	0 µg/l		
Marine water	8.6 ng/l		
Secondary poisoning	0.12 mg/kg		
Sediment (freshwater)	109 mg/kg		
Sediment (marine water)	109 mg/kg		
Soil	29.9 mg/kg		
STP	0.33 mg/l		

Exposure guidelines

No exposure standards allocated.

8.2. Exposure controls

Appropriate engineering controls	Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. Use explosion-proof equipment if high dust/air concentrations are possible.

Individual protection measures, such as personal protective equipment

General information	Use personal protective equipment as required. Keep working clothes separately. Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.
Eye/face protection	Wear dust-resistant safety goggles where there is danger of eye contact. In addition to safety glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles, during sawing, grinding, or machining. Eye protection should meet standard EN 166.
Skin protection	
- Hand protection	Wear suitable protective gloves to prevent cuts and abrasions. E.g. type of ¾ dipped natural latex, with steel, fiberglass and Kevlar liner and long knitted cuff, cut protection level 5. When material is heated, wear gloves to protect against thermal burns. Suitable gloves can be recommended by the glove supplier. The protective gloves to be used must comply with the specifications of Regulation (EU) 2016/425 and the related standard EN374.
- Other	Wear suitable protective clothing. Regular protective clothing with high visibility according to EN 471 Class 2 is recommended.
Respiratory protection	In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter (type P3). Follow guidance on selection, use, care and maintenance in accordance with EN 529. Check with respiratory protective equipment suppliers.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
Hygiene measures	Wash hands after handling. Do not eat, drink or smoke when using the product. Routinely wash work clothing and protective equipment to remove contaminants. Private clothes and working clothes should be kept separately. Handle in accordance with good industrial hygiene and safety practices. Follow up on any medical surveillance requirements.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels. Contain spills and prevent releases and observe national regulations on emissions. Notify relevant authorities if this material is released to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Solid.
Form	Solid forms such as: Pellets, Offcuts, Briquettes, Sheets, Cathodes, Cuts, Uncuts and Crowns.
Colour	Silver-grey
Odour	Odourless.
Odour threshold	Odourless.
Melting point/freezing point	1455 °C (2651 °F)
Boiling point or initial boiling point and boiling range	2730 °C (4946 °F)
Flammability	Non flammable.
Upper/lower flammability or explosive limits	
Explosive limit - lower (%)	Non flammable.
Explosive limit – upper (%)	Non flammable.
Flash point	Does not flash.
Auto-ignition temperature	Property has not been measured.
Decomposition temperature	Toxic gases and vapours (such as nickel carbonyl) may be released in the decomposition of nickel compound.
pH	Not applicable (the material is a solid).
Kinematic viscosity	Not applicable (the material is a solid).
Solubility	
Solubility (water)	Insoluble (in water).
Partition coefficient (n-octanol/water) (log value)	Not applicable for inorganic substances.
Vapour pressure	1 mm Hg (1810 °C / 3290 °F)

Density and/or relative density

Relative density 8.9 (25 °C / 77 °F)

Vapour density Not applicable (the material is a solid).

Particle characteristics

Particle size Solid forms.

9.2. Other information

9.2.1. Information with regard to physical hazard classes No relevant additional information available.

9.2.2. Other safety characteristics

Evaporation rate Property has not been measured.

SECTION 10: Stability and reactivity

10.1. Reactivity Massive metal is non reactive under normal conditions of use, storage and transport.

10.2. Chemical stability The product is stable under normal conditions of use, storage and transport.

10.3. Possibility of hazardous reactions Hazardous polymerisation does not occur. Hazardous reactions do not occur.

10.4. Conditions to avoid Contact with incompatible materials. Contact with acids will release flammable hydrogen gas.

10.5. Incompatible materials Oxidising materials. Strong acids.

10.6. Hazardous decomposition products Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and fumes of metal oxides.

SECTION 11: Toxicological information

General information Occupational exposure to the substance or mixture may cause adverse effects.

Information on likely routes of exposure

Inhalation Dust may irritate respiratory system. Suspected of causing cancer by inhalation. Causes damage to organs through prolonged or repeated exposure by inhalation.

Skin contact Dust or powder may irritate the skin. May cause an allergic skin reaction.

Eye contact Dust may irritate the eyes.

Ingestion Ingestion may cause irritation and malaise. However, ingestion is not likely to be a primary route of occupational exposure.

Symptoms Dusts may irritate the respiratory tract, skin and eyes. May cause an allergic skin reaction. Dermatitis. Rash. Prolonged exposure may cause chronic effects. Lung fibrosis. Respiratory system.

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity The acute oral toxicity of nickel metal has been determined in a well-performed animal study which concluded the acute oral LD50 was greater than >9000 mg/kg body weight. High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of metal fume fever. Data on acute toxicity in animals via dermal exposure have not been found. Dermal acute toxicity is expected to be low in view of the low oral toxicity and the negligible absorption via the skin.

Product	Species	Test Results
Nickel (CAS 7440-02-0)		
Acute		
Oral		
LD50	Rat	> 9000 mg/kg

Skin corrosion/irritation Not irritant in skin irritation study using the rabbit (animal number: 2, dose: 500mg/animal's ear, exposure period: 24 hours, observation period: 7 days).

Serious eye damage/eye irritation No studies of eye irritation by metallic nickel have been found. Toxicity data from water-soluble nickel compounds can be used to estimate the potential of nickel metal to cause eye irritation. No classification for eye irritation is proposed.

Respiratory sensitisation Based on available data, the classification criteria are not met.

Skin sensitisation May cause an allergic skin reaction. Sufficient data from human studies exists to warrant classification of Ni metal as a dermal sensitizer.

Germ cell mutagenicity Based on available data, the classification criteria are not met.

Carcinogenicity Suspected of causing cancer by inhalation.

IARC Monographs. Overall Evaluation of Carcinogenicity

Nickel (CAS 7440-02-0) 2B Possibly carcinogenic to humans.

Reproductive toxicity Based on available data, the classification criteria are not met.

Specific target organ toxicity - single exposure	Based on available data, the classification criteria are not met.
Specific target organ toxicity - repeated exposure	Causes damage to organs (Lung, Respiratory system) through prolonged or repeated exposure.
Aspiration hazard	Due to the physical form of the product it is not an aspiration hazard.
Mixture versus substance information	The product is a substance.

11.2. Information on other hazards

Endocrine disrupting properties	The substance is not included in the list established in accordance with REACH Article 59(1) for having endocrine disrupting properties. This substance does not have endocrine disrupting properties with respect to human health, as it does not meet the assessment criteria laid out in Regulations (EC) No 1907/2006, (EU) No 2017/2100 and (EU) 2018/605.
Other information	Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or pulmonary discomfort. UV radiation can cause skin erythema and welders flash.

SECTION 12: Ecological information

12.1. Toxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
Nickel (CAS 7440-02-0)			
Aquatic			
Algae	EC50	Pseudokirchneriella subcapitata	0.18 mg/l, 72 hours
			> 0.174 - < 0.311 mg/l, 96 hours Static
Crustacea	EC50	Water flea (Daphnia magna)	100 mg/l, 48 hours
			1 mg/l, 48 hours Static
Fish	LC50	Brachydanio rerio	100 mg/l, 96 hours
		Carp (Cyprinus carpio)	10.4 mg/l, 96 hours Static
			1.3 mg/l, 96 hours Semi-static

12.2. Persistence and degradability	The product is not biodegradable.
12.3. Bioaccumulative potential	Accumulates in soil and sediment. Potential to bioaccumulate is low.
Partition coefficient n-octanol/water (log Kow)	Not applicable for inorganic substances.

Bioconcentration factor (BCF)
270 mg/l
Species: Aquatic microorganisms

12.4. Mobility in soil	Nickel in massive forms is not mobile in the environment.
12.5. Results of PBT and vPvB assessment	This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII.
12.6. Endocrine disrupting properties	The substance is not included in the list established in accordance with REACH Article 59(1) for having endocrine disrupting properties. This substance does not have endocrine disrupting properties with respect to the environment, as it does not meet the assessment criteria laid out in Regulations (EC) No 1907/2006, (EU) No 2017/2100 and (EU) 2018/605.
12.7. Other adverse effects	Nickel in massive forms presents a limited hazard for the environment. Nickel in form of particles or dust is harmful to aquatic organisms and may cause long-term adverse effects in the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste	Dispose in accordance with local regulations. Recover and recycle, if practical. Solid metal and alloys in the form of particles may be reactive. Its hazardous characteristics, including fire and explosion, should be determined prior to disposal.
Contaminated packaging	Since emptied containers retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
EU waste code	06 04 05* The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Disposal methods/information	Dispose in accordance with all applicable regulations. This material and its container must be disposed of as hazardous waste.

SECTION 14: Transport information

ADR

14.1. UN number	Not regulated as dangerous goods.
14.2. UN proper shipping name	Not regulated as dangerous goods.
14.3. Transport hazard class(es)	
Class	Not assigned.
Subsidiary risk	-
Hazard No. (ADR)	Not assigned.
Tunnel restriction code	Not assigned.
14.4. Packing group	Not assigned.
14.5. Environmental hazards	No.
14.6. Special precautions for user	Not assigned.

RID

14.1. UN number	Not regulated as dangerous goods.
14.2. UN proper shipping name	Not regulated as dangerous goods.
14.3. Transport hazard class(es)	
Class	Not assigned.
Subsidiary risk	-
14.4. Packing group	Not assigned.
14.5. Environmental hazards	No.
14.6. Special precautions for user	Not assigned.

ADN

14.1. UN number	Not regulated as dangerous goods.
14.2. UN proper shipping name	Not regulated as dangerous goods.
14.3. Transport hazard class(es)	
Class	Not assigned.
Subsidiary risk	-
14.4. Packing group	Not assigned.
14.5. Environmental hazards	No.
14.6. Special precautions for user	Not assigned.

IATA

14.1. UN number	Not regulated as dangerous goods.
14.2. UN proper shipping name	Not regulated as dangerous goods.
14.3. Transport hazard class(es)	
Class	Not assigned.
Subsidiary risk	-
14.4. Packing group	Not assigned.
14.5. Environmental hazards	No.
14.6. Special precautions for user	Not assigned.

IMDG

14.1. UN number	Not regulated as dangerous goods.
14.2. UN proper shipping name	Not regulated as dangerous goods.
14.3. Transport hazard class(es)	
Class	Not assigned.
Subsidiary risk	-
14.4. Packing group	Not assigned.
14.5. Environmental hazards	
Marine pollutant	No.
EmS	Not assigned.
14.6. Special precautions for user	Not assigned.

14.7. Maritime transport in bulk according to IMO instruments	Not applicable. However, this product is a solid. When transported in bulk, it is not covered under Appendix I of the IMSBC Code.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended

Not listed.

Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Nickel (CAS 7440-02-0)

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Nickel (CAS 7440-02-0)

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.

Not listed.

Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended

Not listed.

Other regulations	The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended.
National regulations	Follow national regulation for work with chemical agents in accordance with Directive 98/24/EC, as amended. Follow national regulation on the protection of workers from the risks of exposure to carcinogens and mutagens at work, in accordance with Directive 2004/37/EC, as amended. Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work, as amended. According to Directive 92/85/EEC as amended, pregnant women should not work with the product, if there is the least risk of exposure.

15.2. Chemical safety assessment

Chemical Safety Assessment has been carried out.

Exposure scenarios relevant for this material are annexed and distributed as separate document to this eSDS.

Identified Uses:
Uses by workers in industrial settings
Production of nickel metal.
S4A: Stainless, special steels and special alloys manufacturing.
Integrated steel and iron manufacturing.
EAF carbon steel.
Powder Metallurgy.
Metal surface treatment (nickel electroplating and nickel electroforming technologies).
Production of nickel salts from nickel metal.
Manufacturing of batteries using positive nickel electrodes.
Production of catalyst.
Use pre-reduced nickel containing catalyst.
Production of magnets.
Production of nickel-containing products (e.g. electronics).
Production of brazing alloys.
Use of brazing alloys.
Production of silver-nickel contact material.
Use of silver-nickel contact material.
Sputter Deposition.
Thin film deposition by evaporation technique.

Uses by professional workers
Use of brazing alloys.
Use of silver-nickel contact material.

Uses by consumers.
Drinking water from nickel-containing kettles.
Coinage.
Direct and prolonged contact with skin.
Drinking water from nickel containing pipes and taps.
Food contact materials containing nickel.
Piercings post containing nickel.
Tools and other release surfaces containing nickel.

SECTION 16: Other information

List of abbreviations

PBT: Persistent, bioaccumulative and toxic.
vPvB: Very Persistent and very Bioaccumulative.
LD50: Lethal Dose, 50%.
LC50: Lethal Concentration, 50%.
EC50: Effective Concentration, 50%.
TWA: Time Weighted Average.
PEL: Permissible Exposure Limit.

References

IUCLID
IARC: International Agency for Research on Cancer.
Chemical safety report.
ECHA registered substances database

Information on evaluation method leading to the classification of mixture

Not applicable.

Full text of any statements, which are not written out in full under sections 2 to 15

H317 May cause an allergic skin reaction.
H351 Suspected of causing cancer.
H372 Causes damage to organs through prolonged or repeated exposure.

This SDS contains revisions in the following section(s):

All sections.

Training information

Follow training instructions when handling this material.

Disclaimer

This Safety Data Sheet is specifically designed to comply with the requirements of the EU Regulation called REACH - Registration, Evaluation and Authorisation of Chemicals (EC No. 1907/2006 of the European Parliament and of the Council of 18 December 2006) and the corresponding country law, and may not comply with the requirements of any other regulations for safe product handling. This data sheet and the health, safety and environmental information is considered to be accurate as of the date specified below. We have reviewed any information contained therein which we received from sources outside the Glencore group of companies. However, no warranty or representation, express or implied is made as to the accuracy or completeness of the data and information contained in this data sheet. Health and safety precautions and environmental advice noted in this data sheet may not be accurate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission, recommendation or authorization given or implied to practice any patented invention without a valid licence. Glencore shall not be responsible for any damage or injury resulting from abnormal use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material.