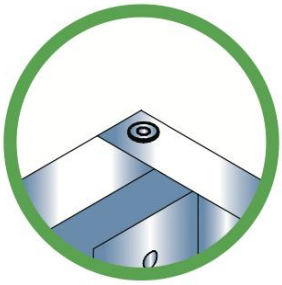
The Non-Combustible Structural Panelok Floor Sheeting System

Introducing the ground breaking Panelok Floor Sheeting (PFS) System, a cutting-edge fire-rated structural subfloor sheathing panel revolutionizing the construction industry. Utilizing an innovative BMSC (Basic Magnesium Sulfate Cementitious) chlorine-free formulation, this system represents a significant advancement in fire resistance and structural integrity. Ideal for modular and offsite constructions, it offers unparalleled durability, eco-friendliness, and swift installation.

Compliant with ASTM E136 non-combustible grade, our PFS panels can be seamlessly integrated with other non-combustible materials to construct fire-rated floor-ceiling assemblies lasting 1, 2, or even 3 hours. Lightweight yet robust, these panels boast dimensional stability, ensuring they remain free from buckling or warping common with traditional wood sheeting. Installation mirrors that of wood sheeting, with straightforward cutting and fastening using screws.

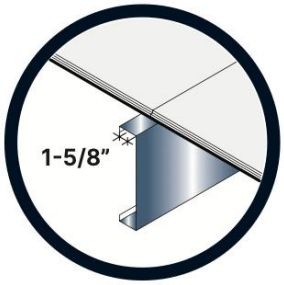
Engineered with tongue and groove edges along their length, Panelok Floor Sheeting (PFS) panels are mechanically fastened directly to steel or wood framing joists, capable of bearing both gravity and lateral loads. Once installed as the structural subfloor panel, they can be finished with vinyl tile, ceramic tiles, hardwood, or carpets, providing a versatile and resilient flooring solution.

Metal framing must be a minimum of 16 gauge and spaced no greater than 24” (610mm) o.c. when installing a 3/4” thick board. Use low profile fastener on supporting flange, no hex screw on top flange.



Flat head fastener

Hex head fastener

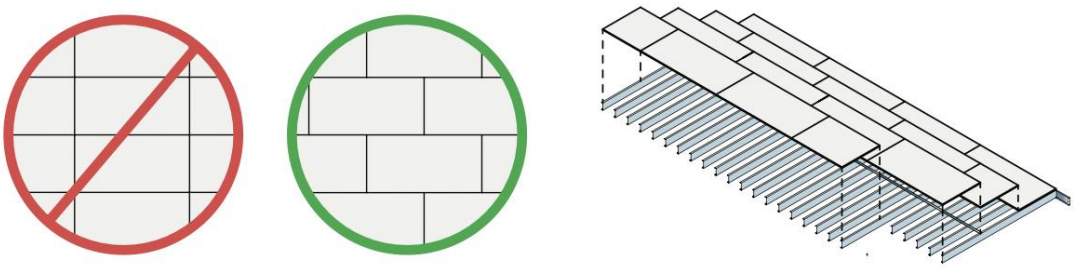


Flange width
min. 1-5/8” wide

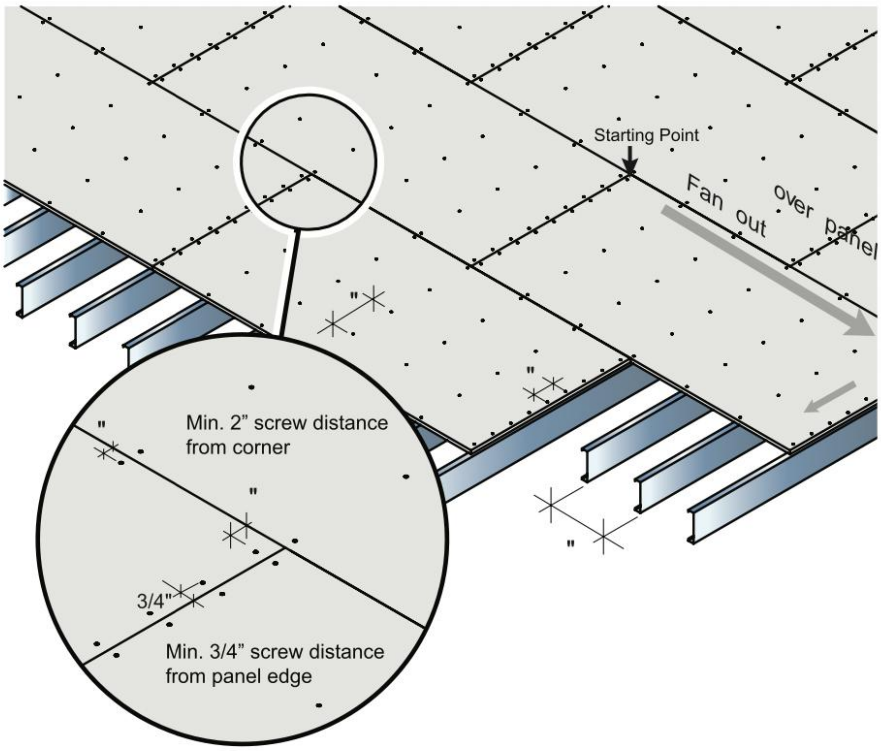
The steel framing must be engineered to adhere to the strength and deflection requirements outlined in the contract documents. Each panel end must be supported by a bearing flange with a minimum width of 20mm, while the flange itself must measure at least 40mm in width.

During installation, it's crucial to orient the subfloor sheathing panel perpendicular to the joists in a running bond pattern. This ensures that end joints align with the center of framing members and are staggered appropriately. The panel can be placed with its smooth surface against the framing (with the smooth side facing downwards). As panels are fitted together, ensure that the tongue of the panel being installed interlocks seamlessly with the groove of the previously installed panel.

Commence fastening at one end of the panel and gradually work across its length, avoiding the temptation to fasten all corners simultaneously. Drive fasteners in such a way that their heads sit flush with the surface of the board, ensuring a secure and even installation.



Screws shall fan out over the panel, a minimum of 20mm from the edge minimum of 50mm screw distance from the panel edge.



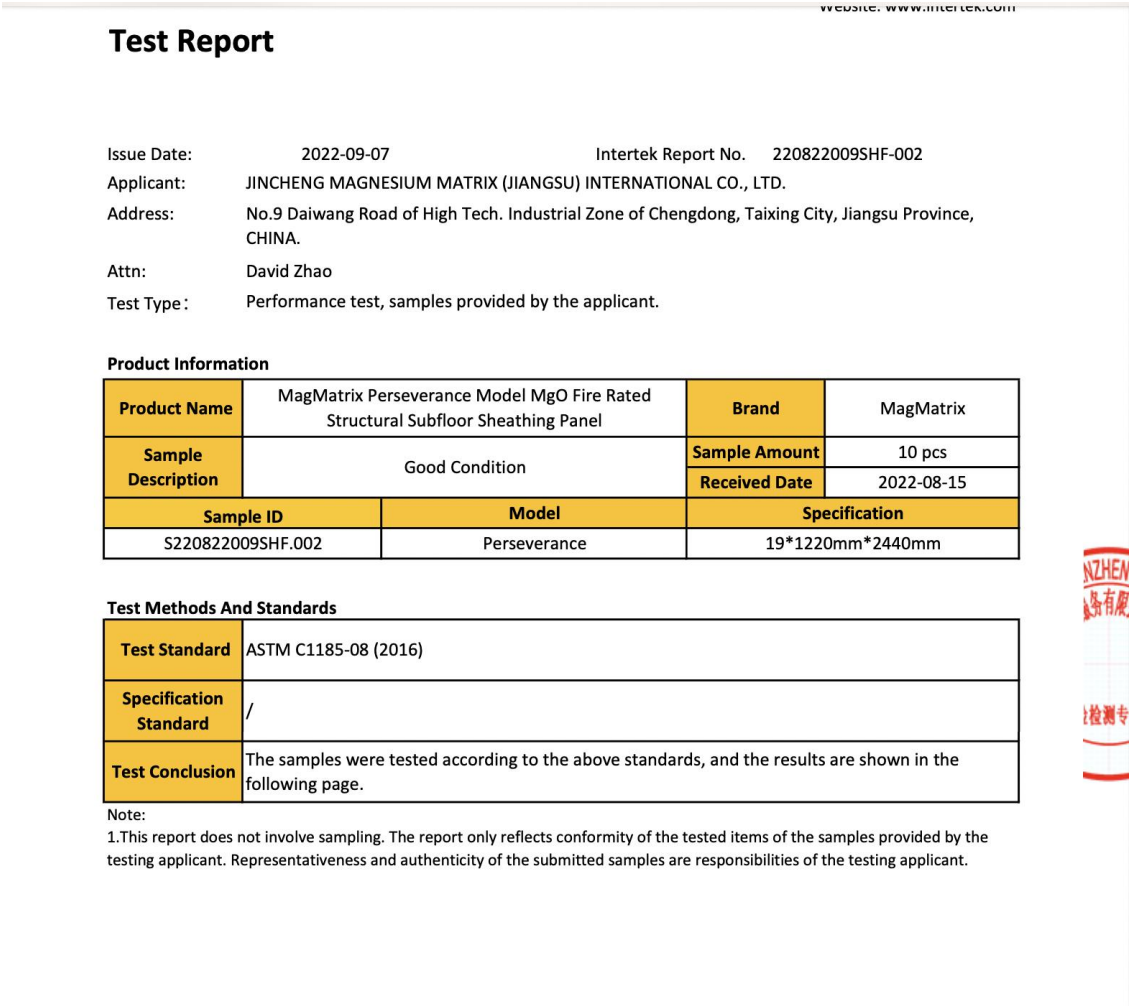
Panelok Floor Sheeting System

The Panelok Floor Sheeting (PFS) System panel fully complies with ASTM E136 non-combustible standards, making it suitable for a wide range of non-combustible construction projects. Additionally, it boasts inorganic properties and is resistant to mold, moisture, and termites. These panels undergo factory curing and maintain dimensional stability, making them ideal for subfloor assemblies accommodating various floor finishes.

With options for 1-, 2-, and 3-hour fire-rated designs, our panels cater to modular, panelised, and conventionally constructed buildings, ensuring compliance with non-combustible floor-ceiling assembly requirements across diverse applications. Installation is straightforward, as the panels can be easily cut using standard framing tools, swiftly applied using mechanical fasteners, and require no adhesive.

Flexural Strength (MOR) of 19.2MPAaround 2779 psi

The Panelok Floor Sheeting (PFS) System, featuring tongue and groove edges, is engineered to fulfill the requirements of various non-combustible construction projects. It meets the stringent ASTM E136 non-combustible standards and exhibits impressive flexural strength. In dry conditions, it achieves a modulus of rupture of 19.2 MPa (approximately 2779 psi), as confirmed by testing conducted in accordance with ASTM C1185-08 section 5. This test report serves as valuable information for dissemination within the market.



Website: www.intertek.com

Test Report

Issue Date: 2022-09-07 Intertek Report No. 220822009SHF-002

Applicant: JINCHENG MAGNESIUM MATRIX (JIANGSU) INTERNATIONAL CO., LTD.

Address: No.9 Daiwang Road of High Tech. Industrial Zone of Chengdong, Taixing City, Jiangsu Province, CHINA.

Attn: David Zhao

Test Type: Performance test, samples provided by the applicant.

Product Information

Product Name	MagMatrix Perseverance Model MgO Fire Rated Structural Subfloor Sheathing Panel	**Brand**	MagMatrix
Sample Description	Good Condition	**Sample Amount**	10 pcs
		Received Date	2022-08-15

Sample ID	**Model**	**Specification**
S220822009SHF.002	Perseverance	19*1220mm*2440mm

Test Methods And Standards

Test Standard	ASTM C1185-08 (2016)
Specification Standard	/
Test Conclusion	The samples were tested according to the above standards, and the results are shown in the following page.

Note:

1.This report does not involve sampling. The report only reflects conformity of the tested items of the samples provided by the testing applicant. Representativeness and authenticity of the submitted samples are responsibilities of the testing applicant.

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Test Report

Issue Date: 2022-09-07 Intertek Report No. 220822009SHF-002

Test Items, Method and Results:

Test Item: Flexural Strength (Modulus of Rupture)
Test Method: ASTM C1185-08(2016) section 5
Test Span: 254 mm

Equilibrium Conditioning: Place the test specimens for at least 7 days in a controlled atmosphere of 23 ± 2°C and 50 ± 5 % relative humidity.

Test Result:

	Flexural Strength	
	(MPa)	(Psi)
Machine Direction	19.2	2779

Wet Conditioning: Immerse specimens to be tested in wet condition in water at a temperature of 23 ± 4°C for a period of 48 h minimum. Test the specimens immediately upon removal from the water.

Test Result:

	Flexural Strength	
	(MPa)	(Psi)
Machine Direction	13.5	1964

Note: Only machine direction specimen was provided and tested as per applicant's requirement.

How Panelok Floor Sheeting (PFS) System is Different?

Basic Magnesium Sulfate Cement (BMS) emerges as an innovative magnesium-based cement material, evolving from extensive research into magnesium oxychloride cement (MOC) and magnesium oxysulfate cement (MOS). Unlike its predecessors, BMS introduces a novel hydration product characterized by needle and rod phases, specifically the 5Mg(OH)2•MgSO4•7H2O phase (5•1•7 phase).

With its inherent chemical bonding strength, the crystal structure of magnesium sulfate renders it an optimal construction material suitable for diverse applications. BMS finds utility akin to traditional cement boards, OSB, and plywood, offering enhanced attributes such as improved fire resistance, weather durability, strength, and resistance to mold and mildew.

This versatility positions magnesium sulfate as a preferred option for floor or wall sheeting, resembling drywall or cement board, yet surpassing them with superior performance characteristics.

Fire-Rated, Structural, Eco-Friendly, Low Carbon: Elevating the standard of human habitation, Panelok Floor Sheeting (PFS) System epitomizes excellence in construction. Crafted from edible mineral components and water, it boasts a composition free from Volatile Organic Compounds (VOCs), heavy metal salts, crystalline silica, hexavalent chromium, asbestos, and toxic antifungal additives. Waste management is simplified with our zero-wastage policy; any surplus materials are recycled within the manufacturing process. Additionally, the sawdust generated can be safely disposed of in landfills without harming the environment.

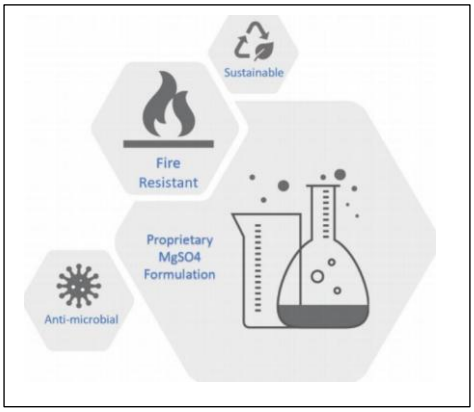
Manufactured at room temperature, our process significantly reduces energy consumption compared to conventional cement-based products. Notably, our Panelok Floor Sheeting (PFS) holds a patent-pending status, complying with industry standards while introducing chlorine-free magnesium panels that excel in fire resistance, structural integrity, sustainability, and ease of installation.

Panelok Floor Sheeting (PFS) System Fire-rated Structural sheathing emerges as a versatile solution, ideal for steel-frame applications and off-site construction methods, providing cost-effective fire-resistant panels. Our panels offer a comprehensive range of benefits, from superior strength and moisture management to flame resistance and radiant barriers, fortifying building envelopes for enhanced resilience.

Engineered for excellence, Panelok Floor Sheeting (PFS) System delivers outstanding shear strength, fire resistance, and structural performance in a single layer, surpassing 3,500 PLF nominal shear capacity to withstand seismic and lateral wind forces. Tailored to meet the demands of modern construction sites, our panels cater to diverse applications, particularly in low and mid-rise multi-family residential buildings.

Furthermore, our Subfloor panel serves as a comprehensive solution for developers, designers, and contractors engaged in wood-framed construction across Australia & the Asia Pacific. Through innovative technologies and materials, including fire-rated, non-toxic, low-carbon cementitious building materials, prefabricated panels, and coatings, Panelok Floor Sheeting (PFS) System fosters accelerated construction timelines, cost certainty, reduced building operating costs, resilience, and healthier structures.

Certification



- ICC-ES AC386 & AC376
- ASTM G21 Mold Resistance
- 25 Cycle Frost Test – Intertek
- ASTM E84 Surface Burning Characteristics
- Code Mark Certification
- ETA （European Technical Assessment）
- HETI (Miami-Dade) Hurricane Testing
- Chloride Free Substance Inspection – Intertek
- Code Compliance Research Reports (CCRR) - Intertek
- ASTM E119/UL263 & CAN/ULC S101 Fire Rated Walls
- ASTM E136 Test of Building Materials in Vertical Tube Furnace at 750c
- Seismic D – U.S. Engineering (Reid Middleton)
- NFPA 285 Walls With Combustible Components
- CCMC (Canadian Construction Materials Center) – traditional OSB SIPs (IPB Systems Listing)

Technical Datasheet

Property	Test Standard	Result	Requirement	Verdict
Density	ASTM C1185	67.5 lbs/ft³	Reported	N/A
Flexural Strength	ASTM C1185	Dry: 2685 psi Wet: 1496 psi	≥ 580 psi	Pass
Freeze / Thaw Cycling	ASTM C666	The test samples showed no disintegration following 25 cycles	The test samples show no disintegration following 25 cycles	Pass
Dimensions and Tolerances	ASTM C1185	Length: 96.11 in. Max. variation: 0.11 in.	96 ± 0.48 in. Max. variation ± 1/4 in.	Pass
		Width: 48.06 in. Max. variation: 0.06 in.	48 ± 0.24 in. Max. variation ± 1/4 in.	Pass
		Thickness: 0.467 in. Extreme value: 1.1%	0.472 ± 0.05 in. Extreme value ≤ 15%	Pass
Moisture Movement	ASTM C1185	Linear change 0.18% (Machine Direction) 0.17% (Cross Direction)	Reported	N/A
Water Absorption	ASTM C1185	26.2% by mass	Reported	N/A
Nail-head Pull Through	ASTM D1037	437 lbf	≥ 125 lbf	Pass
Falling Ball Impact	ASTM D1037	No damage at a 12-inch drop	No damage at a 12-inch drop	Pass
Shear Bond Strength Dry-set Portland Cement	ANSI A 118.4	95 psi	≥ 50 psi	N/A
Shear Bond Strength Later-Portland Cement Mortar	ANSI A 118.4	108 psi	≥ 50 psi	Pass
Humidified Deflection	ASTM C473	0.008 in.	When used as a base for tile ≤ 0.0639 in.	Pass
Flame-Spread Characteristics	ASTM E84	Flame Spread Index: 0 Smoke Developed Index: 0	Flame Spread Index ≤ 10 Smoke Developed Index ≤ 5	Pass

Technical Datasheet

Property	Test Standard	Result	Acceptance
Noncombustible Construction	ASTM E136	Meet the requirement of ASTM E136	Meet the requirement of ASTM E136.
Fire Resistance Rated Construction	ASTM E119		Tests shall be conducted in accordance with ASTM E119.
Racking Shear Resistance-on a Standard wood frame	ASTM E72	Dry condition: Ultimate load: 3026 lbf Failure appeared at the vertical joint. Allowable racking shear: 126 lbf	Allowable loading shall be based on a factor of sfety of 3.
		Wet condition: Ultimate load: 3093 lbf Failure appeared at the vertical joint. Allowable racking shear: 129 plf	
Exterior Wall Sheathing Resistance to Transverse Loads	ASTM E72	Positive: Ultimate uniform load: 159 psf Failure: Crack in panel. Allowable load: 53 psf	Allowable loading shall be based on a factor of sfety of 3.
		Negative condition: Ultimate uniform load: 65 psf Failure: Crack in panel. Allowable load: 22 psf	

DIMENSIONS

MagMatrix Green Fire-rated Structural Panel

Length: 2440, 2740, 3050 mm

Width: 1220 mm

Thickness: 3mm - 20 mm

TOLERANCES

Length and Width: + / - 2mm

Thickness: + / - 0.2mm

Edge Straightness: 1mm / metre

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Issue Date: 2021-07-20 Intertek Report No. 210706008SHF-001

Test Items, Method and Results:

Test method: By a combination of Inductively Coupled Argon Plasma Spectrometry, Gas Chromatography – Mass Spectrometry, Liquid Chromatography - Mass Spectrometry, UV-VIS Spectrophotometer, Gas Chromatography - Electron Capture Detector, Headspace Gas Chromatography - Mass Spectrometry and High-Performance Liquid Chromatography.

219 SVHCs Testing Results:

(a) The First List (15 SVHC Released in Oct, 2008)

No.	Chemical Substance	CAS No.	Results %(w/w)
1	Cobalt Dichloride Δ	7646-79-9	ND
2	Diarsenic Pentaoxide Δ	1303-28-2	ND
3	Diarsenic Trioxide Δ	1327-53-3	ND
4	Lead Hydrogen Arsenate Δ	7784-40-9	ND
5	Triethyl Arsenate Δ	15606-95-8	ND
6	Sodium Dichromate Δ	7789-12-0, 10588-01-9	ND
7	Bis (Tributyltin) Oxide (TBTO) Δ	56-35-9	ND
8	Anthracene	120-12-7	ND
9	4,4'-Diaminodiphenylmethane (MDA)	101-77-9	ND
10	Hexabromocyclododecane (HBCDD) and All Major Diastereoisomers Identified (α-HBCDD, β-HBCDD, γ-HBCDD)	25637-99-4 and 3194-55-6 (134237-50-6, 134237-51-7, 134237-52-8, 25637-99-4)	ND
11	5-Tert-Butyl-2,4,6-Trinitro-m-Xylene (Musk Xylene)	81-15-2	ND
12	Bis (2-Ethylhexyl) Phthalate (DEHP)	117-81-7	ND
13	Dibutyl Phthalate (DBP)	84-74-2	ND
14	Benzyl Butyl Phthalate (BBP)	85-68-7	ND
15	Short Chain Chlorinated Paraffins (C_{10-13})	85535-84-8	ND

(b) The Second List (13 SVHC Released in Jan, 2010 and Mar, 2010)

No.	Chemical Substance	CAS No.	Results %(w/w)
16	Lead Chromate Δ	7758-97-6	ND
17	Lead Chromate Molybdate Sulphate Red (C.I. Pigment Red 104) Δ	12656-85-8	ND
18	Lead Sulfochromate Yellow (C.I. Pigment Yellow 34) Δ	1344-37-2	ND

19	Tris (2-Chloroethyl) Phosphate	115-96-8	ND
20	2,4-Dinitrotoluene	121-14-2	ND
21	Diisobutyl Phthalate (DIBP)	84-69-5	ND
22	Coal Tar Pitch, High Temperature	65996-93-2	ND
23	Anthracene Oil	90640-80-5	ND
24	Anthracene Oil, Anthracene Paste, Distn. Lights	91995-17-4	ND
25	Anthracene Oil, Anthracene Paste, Anthracene Fraction	91995-15-2	ND
26	Anthracene Oil, Anthracene-low	90640-82-7	ND
27	Anthracene Oil, Anthracene Paste	90640-81-6	ND
28	Acrylamide	79-06-1	ND

(c) The Third List (8 SVHC Released in Jun, 2010)

No.	Chemical Substance	CAS No.	Results %(w/w)
29	Boric Acid Δ	10043-35-3, 11113-50-1	ND
30	Disodium Tetraborate, Anhydrous Δ	1330-43-4, 12179-04-3, 1303-96-4	ND
31	Tetraboron Disodium Heptaoxide, Hydrate Δ	12267-73-1	ND
32	Sodium Chromate Δ	7775-11-3	ND
33	Potassium Chromate Δ	7789-00-6	ND
34	Ammonium Dichromate Δ	7789-09-5	ND
35	Potassium Dichromate Δ	7778-50-9	ND
36	Trichloroethylene	79-01-6	ND

(d) The Fourth List (8 SVHC Released in Dec, 2010)

No.	Chemical Substance	CAS No.	Results %(w/w)
37	2-Methoxyethanol	109-86-4	ND
38	2-Ethoxyethanol	110-80-5	ND
39	Cobalt Sulphate Δ	10124-43-3	ND
40	Cobalt Dinitrate Δ	10141-05-6	ND
41	Cobalt Carbonate Δ	513-79-1	ND
42	Cobalt Diacetate Δ	71-48-7	ND
43	Chromium Trioxide Δ	1333-82-0	ND
44	Chromic Acid Δ Dichromic Acid Δ Oligomers of Chromic Acid and Dichromic Acid Δ	7738-94-5 13530-68-2 --	ND

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(e) The Fifth List (7 SVHC Released in Jun, 2011)

No.	Chemical Substance	CAS No.	Results %(w/w)
45	Strontium Chromate Δ	7789-06-2	ND
46	2-ethoxyethyl acetate (2-EEA)	111-15-9	ND
47	1,2-Benzenedicarboxylic acid, di-C_{7-11}-branched and linear alkyl esters (DHNUP)	68515-42-4	ND
48	Hydrazine	7803-57-8, 302-01-2	ND
49	1-methyl-2-pyrrolidone	872-50-4	ND
50	1,2,3-trichloropropane	96-18-4	ND
51	1,2-Benzenedicarboxylic acid, di-C_{6-8}-branched alkyl esters, C_7-rich (DIHP)	71888-89-6	ND

(f) The Sixth List (20 SVHC Released in Dec, 2011)

No.	Chemical Substance	CAS No.	Results %(w/w)
52	Lead dipicrate Δ	6477-64-1	ND
53	Lead styphnate Δ	15245-44-0	ND
54	Lead azide; Lead diazide Δ	13424-46-9	ND
55	Phenolphthalein	77-09-8	ND
56	2,2'-dichloro-4,4'-methylenedianiline (MOCA)	101-14-4	ND
57	N,N-dimethylacetamide (DMAC)	127-19-5	ND
58	Trilead diarsenate Δ	3687-31-8	ND
59	Calcium arsenate Δ	7778-44-1	ND
60	Arsenic acid Δ	7778-39-4	ND
61	Bis(2-methoxyethyl) ether	111-96-6	ND
62	1,2-Dichloroethane	107-06-2	ND
63	4-(1,1,3,3-tetramethylbutyl)phenol, (4-tert-Octylphenol)	140-66-9	ND
64	2-Methoxyaniline; o-Anisidine	90-04-0	ND
65	Bis(2-methoxyethyl) phthalate (DMEP)	117-82-8	ND
66	Formaldehyde, oligomeric reaction products with aniline (technical MDA)	25214-70-4	ND
67	Pentazinc chromate octahydroxide Δ	49663-84-5	ND
68	Potassium hydroxyoctaoxodizincate di-chromate Δ	11103-86-9	ND
69	Dichromium tris(chromate) Δ	24613-89-6	ND
70	Aluminosilicate Refractory Ceramic Fibres Δ	(Index No. 650-017-00-8)	ND
71	Zirconia Aluminosilicate Refractory Ceramic Fibres Δ	(Index No. 650-017-00-8)	ND

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(g) The Seventh List (13 SVHC Released in Jun, 2012)

No.	Chemical Substance	CAS No.	Results %(w/w)
72	1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	112-49-2	ND
73	1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4	ND
74	Diboron trioxide Δ	1303-86-2	ND
75	Formamide	75-12-7	ND
76	Lead(II) bis(methanesulfonate) Δ	17570-76-2	ND
77	TGIC (1,3,5-tris(oxiranylmethyl)-1,3,5-triazine-2,4,6(1H,3H,5H)-trione)	2451-62-9	ND
78	β-TGIC (1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione)	59653-74-6	ND
79	4,4'-bis(dimethylamino)benzophenone (Michler's ketone)	90-94-8	ND
80	N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	101-61-1	ND
81	[4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Violet 3) [with ⩾ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	548-62-9	ND
82	[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26) [with ⩾ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	2580-56-5	ND
83	α,α-Bis[4-(dimethylamino)phenyl]-4 (phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4) *[with ⩾ 0.1% of Michler's ketone (EC No. 202-027-5) or Michl* er's base (EC No. 202-959-2)]	6786-83-0	ND
84	4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol *[with ⩾ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]*	561-41-1	ND

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Issue Date: 2021-07-20 Intertek Report No. 210706008SHF-001

(h) The Eighth List (54 SVHC Released in Dec, 2012)

No.	Chemical Substance	CAS No.	Results %(w/w)
85	Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	1163-19-5	ND
86	Pentacosafluorotridecanoic acid	72629-94-8	ND
87	Tricosafluorododecanoic acid	307-55-1	ND
88	Henicosafluoroundecanoic acid	2058-94-8	ND
89	Heptacosafluorotetradecanoic acid	376-06-7	ND
90	Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	123-77-3	ND
91	Cyclohexane-1,2-dicarboxylic anhydride [1] cis-cyclohexane-1,2-dicarboxylic anhydride [2] trans-cyclohexane-1,2-dicarboxylic anhydride [3] [The individual cis- [2] and trans- [3] isomer substances and all possible combinations of the cis- and trans-isomers [1] are covered by this entry].	85-42-7 13149-00-3 14166-21-3	ND
92	Hexahydromethylphthalic anhydride [1], Hexahydro-4-methylphthalic anhydride [2], Hexahydro-1-methylphthalic anhydride [3], Hexahydro-3-methylphthalic anhydride [4] [The individual isomers [2], [3] and [4] (including their cis- and trans- stereo isomeric forms) and all possible combinations of the isomers [1] are covered by this entry]	25550-51-0 19438-60-9 48122-14-1 57110-29-9	ND
93	4-Nonylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	--	ND
94	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues]	--	ND
95	Methoxyacetic acid	625-45-6	ND
96	N,N-dimethylformamide	68-12-2	ND
97	Dibutyltin dichloride (DBTC) Δ	683-18-1	ND
98	Lead monoxide (Lead oxide) Δ	1317-36-8	ND
99	Orange lead (Lead tetroxide) Δ	1314-41-6	ND
100	Lead bis(tetrafluoroborate) Δ	13814-96-5	ND

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101	Trilead bis(carbonate)dihydroxide Δ	1319-46-6	ND
102	Lead titanium trioxide Δ	12060-00-3	ND
103	Lead titanium zirconium oxide Δ	12626-81-2	ND
104	Silicic acid, lead salt Δ	11120-22-2	ND
105	Silicic acid ($H_2Si_2O_5$), barium salt (1:1), lead-doped Δ [with lead (Pb) content above the applicable generic concentration limit for 'toxicity for reproduction' Repr. 1A (CLP) or category 1 (DSD); the substance is a member of the group entry of lead compounds, with index number 082-001-00-6 in Regulation (EC) No 1272/2008]	68784-75-8	ND
106	1-bromopropane (n-propyl bromide)	106-94-5	ND
107	Methyloxirane (Propylene oxide)	75-56-9	ND
108	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	ND
109	Diisopentylphthalate (DIPP)	605-50-5	ND
110	N-pentyl-isopentylphthalate	776297-69-9	ND
111	1,2-diethoxyethane	629-14-1	ND
112	Acetic acid, lead salt, basic Δ	51404-69-4	ND
113	Lead oxide sulfate Δ	12036-76-9	ND
114	[Phthalato(2-)] dioxotrilead Δ	69011-06-9	ND
115	Dioxobis(stearato)trilead Δ	12578-12-0	ND
116	Fatty acids, C16-18, lead salts Δ	91031-62-8	ND
117	Lead cyanamidate Δ	20837-86-9	ND
118	Lead dinitrate Δ	10099-74-8	ND
119	Pentalead tetraoxide sulphate Δ	12065-90-6	ND
120	Pyrochlore, antimony lead yellow Δ	8012-00-8	ND
121	Sulfurous acid, lead salt, dibasic Δ	62229-08-7	ND
122	Tetraethyllead Δ	78-00-2	ND
123	Tetralead trioxide sulphate Δ	12202-17-4	ND
124	Trilead dioxide phosphonate Δ	12141-20-7	ND
125	Furan	110-00-9	ND
126	Diethyl sulphate	64-67-5	ND
127	Dimethyl sulphate	77-78-1	ND
128	3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	143860-04-2	ND
129	Dinoseb (6-sec-butyl-2,4-dinitrophenol)	88-85-7	ND
130	4,4'-methylenedi-o-toluidine	838-88-0	ND
131	4,4'-oxydianiline and its salts	101-80-4	ND
132	4-aminoazobenzene	60-09-3	ND

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133	4-methyl-m-phenylenediamine (toluene-2,4-diamine)	95-80-7	ND
134	6-methoxy-m-toluidine (p-cresidine)	120-71-8	ND
135	Biphenyl-4-ylamine	92-67-1	ND
136	o-aminoazotoluene [(4-o-tolylazo-o-toluidine])	97-56-3	ND
137	o-toluidine	95-53-4	ND
138	N-methylacetamide	79-16-3	ND

(i) The Ninth List (6 SVHC Released in Jun, 2013)

No.	Chemical Substance	CAS No.	Results %(w/w)
139	Cadmium Δ	7440-43-9	ND
140	Cadmium oxide Δ	1306-19-0	ND
141	Dipentyl phthalate (DPP)	131-18-0	ND
142	4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]	--	ND
143	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1	ND
144	Pentadecafluorooctanoic acid (PFOA)	335-67-1	ND

(j) The Tenth List (7 SVHC Released in Dec, 2013)

No.	Chemical Substance	CAS No.	Results %(w/w)
145	Cadmium sulphide Δ	1306-23-6	ND
146	Lead di(acetate) Δ	301-04-2	ND
147	Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)	1937-37-7	ND
148	Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)	573-58-0	ND
149	Dihexyl phthalate	84-75-3	ND
150	Imidazolidine-2-thione; (2-imidazoline-2-thiol)	96-45-7	ND
151	Trixylyl phosphate	25155-23-1	ND

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(k) The Eleventh List (4 SVHC Released in Jun, 2014)

No.	Chemical Substance	CAS No.	Results %(w/w)
152	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4	ND
153	Cadmium chloride Δ	10108-64-2	ND
154	Sodium perborate; perboric acid, sodium salt Δ	15120-21-5, 11138-47-9	ND
155	Sodium peroxometaborate Δ	7632-04-4	ND

(l) The Twelfth List (6 SVHC Released in December, 2014)

No.	Chemical Substance	CAS No.	Results %(w/w)
156	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	25973-55-1	ND
157	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	3846-71-7	ND
158	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	15571-58-1	ND
159	Cadmium fluoride Δ	7790-79-6	ND
160	Cadmium sulphate Δ	10124-36-4; 31119-53-6	ND
161	Reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)	--	ND

(m) The Thirteenth List (2 SVHC Released in June, 2015)

No.	Chemical Substance	CAS No.	Results %(w/w)
162	1,2-Benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ⩾ 0.3% of dihexyl phthalate (EC No. 201-559-5)	68515-51-5; 68648-93-1	ND
163	5-Sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-Sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual isomers of [1] and [2] or any combination thereof]	--	ND

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(n) The Fourteenth List (5 SVHC Released in December, 2015)

No.	Chemical Substance	CAS No.	Results %(w/w)
164	1,3-Propanesultone	1120-71-4	ND
165	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl) phenol (UV-327)	3864-99-1	ND
166	2-(2H-Benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350)	36437-37-3	ND
167	Nitrobenzene	98-95-3	ND
168	Perfluorononan-1-oic-acid and its sodium and ammonium salts	375-95-1; 21049-39-8; 4149-60-4	ND

(o) The Fifteenth List (1 SVHC Released in June, 2016)

No.	Chemical Substance	CAS No.	Results %(w/w)
169	Benzo[def]chrysene (Benzo[a]pyrene)	50-32-8	ND

(p) The Sixteenth List (4 SVHC Released in January, 2017)

No.	Chemical Substance	CAS No.	Results %(w/w)
170	4,4'-isopropylidenediphenol (bisphenol A)	80-05-7	ND
171	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts Nonadecafluorodecanoic acid EC no.: 206-400-3 | CAS no.: 335-76-2 Ammonium nonadecafluorodecanoate EC no.: 221-470-5 | CAS no.: 3108-42-7 Decanoic acid, nonadecafluoro-, sodium salt EC no.: -- | CAS no.: 3830-45-3	--	ND
172	4-Heptylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 7 covalently bound predominantly in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	--	ND
173	p-(1,1-dimethylpropyl)phenol	80-46-6	ND

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(q) The Seventeenth List (1 SVHC Released in July, 2017)

No.	Chemical Substance	CAS No.	Results %(w/w)
174	Perfluorohexane-1-sulphonic acid and its salt (PFHxS)	--	ND

(r) The Eighteenth List (7 SVHC Released in Jan, 2018)

No.	Chemical Substance	CAS No.	Results %(w/w)
175	Benz[a]anthracene	56-55-3	ND
176	Cadmium nitrateΔ	10325-94-7	ND
177	Cadmium carbonateΔ	513-78-0	ND
178	Cadmium hydroxideΔ	21041-95-2	ND
179	Chrysene	218-01-9	ND
180	1,6,7,8,9,14,15,16,17,17,18,18-Dodecachloropentacyclo[12.2.1.16,9.02,13.05,10]octadeca-7,15-diene ("Dechlorane Plus"TM) [covering any of its individual anti- and syn-isomers or any combination thereof]	--	ND
181	Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) [with ⩾0.1% w/w 4-heptylphenol, branched and linear]	--	ND

(s) The Nineteenth List (10 SVHC Released in Jun, 2018)

No.	Chemical Substance	CAS No.	Results %(w/w)
182	Octamethylcyclotetrasiloxane (D4)	556-67-2	ND
183	Decamethylcyclopentasiloxane (D5)	541-02-6	ND
184	Dodecamethylcyclohexasiloxane (D6)	540-97-6	ND
185	Lead	7439-92-1	ND
186	Disodium octaborateΔ	12008-41-2	ND
187	Benzo[ghi]perylene	191-24-2	ND
188	Terphenyl hydrogenated	61788-32-7	ND
189	Ethylenediamine (EDA)	107-15-3	ND
190	Benzene-1,2,4-tricarboxylic acid 1,2-anhydride (Trimellitic anhydride) (TMA)	552-30-7	ND
191	Dicyclohexyl phthalate (DCHP)	84-61-7	ND

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(t) The Twentieth List (6 SVHC Released in Jan, 2019)

No.	Chemical Substance	CAS No.	Results %(w/w)
192	2,2-bis(4'-hydroxyphenyl)-4-methylpentane	6807-17-6	ND
193	Benzo[k]fluoranthene	207-08-9	ND
194	Fluoranthene	206-44-0	ND
195	Phenanthrene	85-01-8	ND
196	Pyrene	129-00-0	ND
197	1,7,7-trimethyl-3-(phenylmethylene)bicyclo[2.2.1]heptan-2-one (3-benzylidene camphor)	15087-24-8	ND

(u) The Twenty-first List (4 SVHC Released in July, 2019)

No.	Chemical Substance	CAS No.	Results %(w/w)
198	4-tert-butylphenol (PTBP)	98-54-4	ND
199	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propionic acid, its salts and its acyl halides (covering any of their individual isomers and combinations thereof)	--	ND
200	2-methoxyethyl acetate	110-49-6	ND
201	Tris(4-nonylphenyl, branched and linear) phosphite (TNPP) with ⩾ 0.1% w/w of 4-nonylphenol, branched and linear (4-NP)	--	ND

(v) The Twenty-second List (4 SVHC Released in Jan, 2020)

No.	Chemical Substance	CAS No.	Results %(w/w)
202	2-benzyl-2-dimethylamino-4'-morpholinobutyrophenone	119313-12-1	ND
203	2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5	ND
204	Diisohexyl phthalate	71850-09-4	ND
205	Perfluorobutane sulfonic acid (PFBS) and its salts	--	ND

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(w) The Twenty-third List (4 SVHC Released in Jun, 2020)

No.	Chemical Substance	CAS No.	Results %(w/w)
206	1-vinylimidazole	1072-63-5	ND
207	2-methylimidazole	693-98-1	ND
208	Butyl 4-hydroxybenzoate	94-26-8	ND
209	Dibutylbis(pentane-2,4-dionato-O,O')tin	22673-19-4	ND

(x) The Twenty-fourth List (2 SVHC Released in Jan, 2021)

No.	Chemical Substance	CAS No.	Results %(w/w)
210	bis(2-(2-methoxyethoxy)ethyl) ether	143-24-8	ND
211	Dioctyltin dilaurate, stannane, dioctyl-, bis(coco acyloxy) derivs., and any other stannane, dioctyl-, bis(fatty acyloxy) derivs. wherein C12 is the predominant carbon number of the fatty acyloxy moiety Δ	-	ND

(y) The Twenty-fifth List (8 SVHC Released in Jul, 2021)

No.	Chemical Substance	CAS No.	Results %(w/w)
212	1,4-dioxane	123-91-1	ND
213	2,2-bis(bromomethyl)propane1,3-diol (BMP); 2,2-dimethylpropan-1-ol, tribromo derivative/3-bromo-2,2-bis(bromomethyl)-1-propanol (TBNPA); 2,3-dibromo-1-propanol (2,3-DBPA)	3296-90-0 36483-57-5 1522-92-5 96-13-9	ND
214	2-(4-tert-butylbenzyl)propionaldehyde and its individual stereoisomers	-	ND
215	4,4'-(1-methylpropylidene)bisphenol; (bisphenol B)	77-40-7	ND
216	Glutaral	111-30-8	ND
217	Medium-chain chlorinated paraffins (MCCP) [UVCB substances consisting of more than or equal to 80% linear chloroalkanes with carbon chain lengths within the range from C14 to C17]	-	ND
218	Orthoboric acid, sodium saltΔ	13840-56-7	ND
219	Phenol, alkylation products (mainly in para position) with C12-rich branched or linear alkyl chains from oligomerisation, covering any individual isomers and/ or combinations thereof (PDDP)	-	ND

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Note:

Reporting limit = 0.010% (w/w)

SVHC = Substance of very high concern

ND = Not detected (the result is less than the reporting limit)

Reporting limit = Quantitation limit of analyte in sample

Δ = Determination was based on elemental analysis. The content was calculated based on assumption of worst-Case

Test location: Central Chemical Lab of Intertek Testing Services Ltd., Shanghai
Address: Block B, Jinling Business Square, No.801, Yi Shan Road, Shanghai, China

REACH requirement:

1 Substances of very high concern (SVHC) are classified as:
(a) Carcinogenicity category 1A or 1B;
(b) Germ cell mutagenicity category 1A or 1B;
(c) Reproductive toxicity category 1A or 1B, adverse effects on sexual function and fertility or on development;
(d) Persistent, bioaccumulative and toxic (PBT)
(e) Very persistent and very bioaccumulative (vPvB)
(f) Other substances for which there is scientific evidence of probable serious effects to human health or the environment which give rise to an equivalent level of concern, such as endocrine disrupters

2. As per Article 7 of Regulation (EC) No 1907/2006 (REACH) as amended, if a substance of very high concern (SVHC) on the Candidate List for Authorisation is present in articles above a concentration of 0.1% weight by weight (w/w) and the substance is present in those articles in quantities totalling over 1 tonne per producer or per importer per year, then the producer or importer shall notify the European Chemicals Agency (ECHA). The notifications have to be submitted no later than 6 months after the inclusion in the Candidate List. The information to be notified shall include the following:
(a) Identity and contact details of the producer or importer;
(b) Registration number(s), if available;
(c) Identity of the substance;
(d) Classification of the substance(s);
(e) Brief description of the use(s) of the substance(s) in the article and of the uses of the article(s);
(f) Tonnage range of the substance(s).

3. As per Article 31 of Regulation (EC) No 1907/2006 (REACH) as amended, the supplier of mixture not classified as hazardous according to Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP), shall provide the recipient at his request with a safety data sheet, where a mixture contains at least one substance on the SVHC list (Candidate List of substances of very high concern for Authorisation) and its individual concentration is of 0.1% or above by weight for non-gaseous mixtures.

4. As per Article 33(1) of Regulation (EC) No 1907/2006 (REACH) as amended, any supplier of an article containing a substance of very high concern (SVHC) on the Candidate List for Authorisation in a concentration above 0.1% weight by weight (w/w) shall provide the recipient of the article with information of safe use of the article. An article meets the requirement of Article 33(1) by default when no SVHC exceeds 0.1% weight by weight (w/w).

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5. As per Article 33(2) of Regulation (EC) No 1907/2006 (REACH) as amended, any supplier of an article containing a substance of very high concern (SVHC) on the Candidate List for Authorisation in a concentration above 0.1% weight by weight (w/w) shall provide the consumer on request with information of safe use of the article, within 45 days of receipt of the request.

6. As per Court of Justice of the European Union Judgment in Case C-106/14, Press Release No 100/15 dated 10 September 2015, each of the articles incorporated as a component of a complex product is covered by the relevant duties to notify and provide information when they contain a substance of very high concern in a concentration above 0.1% of their mass.

Waste Framework Directive (WFD) Requirement:

As per Article 9(1)(i) of Directive 2008/98/EC on waste (WFD, Waste Framework Directive) as amended, Member States shall take measures to ensure that any supplier of an article as defined in point 33 of Article 3 of Regulation (EC) No 1907/2006 (REACH) provides the information pursuant to Article 33(1) of Regulation (EC) No 1907/2006 (REACH) to the European Chemicals Agency (ECHA) as from 5 January 2021. Any supplier of an article containing a substance of very high concern (SVHC) on the Candidate List for Authorisation in a concentration above 0.1% weight by weight (w/w) on the EU market is required to submit a SCIP Notification on that article to ECHA, as from 5 January 2021.

Conclusion:

Tested Samples	Standard	Result
Submitted sample	EU REACH Regulation No 1907/2006 Article 33(1) Obligation to provide information of safe use (see REACH requirement and Waste Framework Directive (WFD) Requirement in report for details)	Meet Requirement

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Revision:

NO.	Date	Changes
210706008SHF-001	2021-07-20	First issue