

## Chemical Safety Management Situation

In 2024, a total of 50 regulations related to hazardous substances were evaluated. Among these, 25 were new and 25 were revised. The primary changes involved amendments to Annex III and Annex IV exemption clauses of the EU Directive on the Restriction of the Use of Certain Hazardous Substances (RoHS) in electrical and electronic equipment. The 28th and 29th batches of Substances of Very High Concern (SVHC) of the EU Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) Regulation. Limit requirements for restricted substances in electronic and electrical products <<Amendment No. 1>> (referred to as China RoHS); In response to the update of laws and regulations as mentioned above, Zhen Ding has organized timely self-inspection of relevant suppliers, and the investigation results show that the raw materials used by Zhen Ding can meet the requirements of various laws and regulations.

The Material Declaration (IEC 62474) standard was developed by the International Electro technical Commission for the Environmental Standardization for Electrical and Electronic Products and Systems (IEC/TC 111). The Material Declaration specifies the conditions that must be met by manufacturers and suppliers for material declarations, the materials to be declared, and a standardized data exchange format to increase the acceptability of material declarations within the global supply chain. Zhen Ding incorporates the IEC 62474 Substance Declaration List into its management of hazardous substances, including both declared substances in products and future restricted substances. The control of hazardous chemicals aligns 100% with the substances listed in the IEC 62474 specification. Zhen Ding requires suppliers to provide a declaration if their products or materials contain any substances specified in the IEC 62474 list. Zhen Ding then shares the information regarding the presence of relevant substances with downstream customers as required, ensuring timely and accurate transmission of information on IEC 62474 declared substances throughout the supply chain. All products or materials provided by suppliers are 100% compliant with the substances specified in the IEC 62474 list.

## Chemical Safety Management Scope

As of September

Management category	Item quantity	Category examples	Management category	Item quantity	Category examples
Restricted substances in products	178 items	RoHS 2.0 Chlorine and its compounds Bromine and its compounds Arsenic and its compounds Beryllium and its compounds Antimony and its compounds Asbestos and its compounds Appendix XVII of REACH Azo dyes, aromatic amines, and aniline derivatives Short-chain, medium-chain, and longchain chlorinated paraffins Organotin compounds Perchlorate PFOA, PFOS, PFCA, and other perfluorinated organic compounds Polycyclic aromatic hydrocarbons (PAHs) Radioactive materials Musk compounds Persistent organic pollutants (POPs) Ozone-depleting substances (ODCs) Five TSCA substances PFAS Pigment Yellow 36:1 N,N-DMAC Dimethoxyethane Lead carbonate Tetraethyllead, etc.	Restricted substances in manufacturing	38 items (Some substance restrictions apply only to cleaning agents, degreasing agents, and demolding agents)	Benzene Toluene Ethylbenzene Xylene Ethanolamine n-hexane n-heptane Dichloromethane Carbon tetrachloride Trichloroethylene Tetrachloroethylene Cyclohexane Cyclohexanone Methanol N-Methylpyrrolidone (NMP) n-Propyl bromide (nPB) Ozone-depleting substances (ODCs) Brominated organic solvents Chlorinated organic solvents Fluorinated greenhouse gases Phthalates/salts Bis (chloromethyl) ether Tris (o-cresyl) phosphate or tricresyl phosphate 2-Methoxyethanol 2-Ethoxyethanol

Reported substances and future restricted substances in products	39 items	Additive phosphorous flame retardant SDPA Endocrine Disrupting Chemicals (EDCs) Skin sensitizers IEC62474 Substances Declaration List California Proposition 65 Chemicals List Dimethyl Sulfoxide (DMSO) Key raw materials and strategic raw materials	Reported substances and future restricted substances in manufacturing	20 items	Formaldehyde Hydrogen fluoride Ethylbenzene
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## Hazardous Substances Restriction List

1) Restricted substances in products: 178 items

As of September

Chemical	Threshold	Scope	References
Antimony Trioxide	700 ppm	All materials	IEC 62474
	100 ppm	All materials	Customer Requirement
Arsenic and its compounds	N.D.	All materials	REACH 1907/2006 and amendments
Asbestos and its compounds	Non-use	All materials	REACH 1907/2006 and amendments
Azocolourants,Arylamines,Anilines	N.D.	All materials	REACH 1907/2006 and amendments Bedarfsgegenstände Verordnung GB 18401-2003 China GB 20400-2006 China
Benzenamine,N-phenyl-reaction products with styrene and 2,4,4-trimethylpentene (BNST)	Non-use	All materials	Canadian Environmental Protection Act (1999)
Beryllium and its compounds	N.D.	All materials	Customer Requirement IEEE1680.1-2018 criterion 4.1.4.1
Bisphenol A	N.D.	All materials	Customer Requirement California Proposition 65
Bromine and its compounds	700 ppm · 900 ppm (Br+Cl)	All materials	Customer Requirement UL110.criterion 9.2.3
Cadmium and Its Compounds	5 ppm	All materials except plastics, rubber, coatings and inks	2011/65/EU GB/T 26572 Taiwan BSMI RoHS

	ND	All materials except plastics, rubber, coatings and inks	Customer Requirement
Short and Medium Chained Chlorinated Paraffins (SCCP&MCCP)	N.D.	All materials	REACH 1907/2006 and amendments EPA,SNUR 2070-AJ73,Dec.2014 IEEE 1680
Chlorine and its compounds	700 ppm · 900 ppm(Br+Cl)	All materials	Customer Requirement
	Non-use;Must be Elemental Chlorine Free(ECF), Totally Chlorine Free (TCF) or Process Chlorine Free (PCF)	Fiber-based packaging	IEEE 1680.1-2018 criteria 4.1.5.1&4.1.5.2 UL 110,criteria 9.2.3&12.7.1 Customer Requirement
Dimethylfumarate (DMFu)	0.1 ppm	All materials	2010/153/EC
Formaldehyde	N.D.	All materials	ChemVerbotsV GB 18401-2003/2005, China GB 20400-2006 · China
Halogenated Diphenyl Methanes	N.D.	All materials	REACH 1907/2006 and amendments
Hexabromocyclododecane (HBCDD)	N.D.	All materials	2004/850/EU
Heavy metals (Lead, Mercury, Cadmium, Hexavalent Chromium)	Packaging material: Cd+Pb+Hg+Cr <sup>6+</sup> < 50 ppm and Cd<5 ppm, Pb<45 ppm, Cr <sup>6+</sup> : N.D.	Packaging material	94/62/EC
	Cd<N.D., Hg<N.D.	Packaging material	Customer Requirement
Hexavalent chromium and its compounds	N.D.	All materials	2011/65/EU GB/T 26572 Taiwan BSMI RoHS GB/T 30512-2014
	1 ppm	All wearable products and accessories	REACH1907/2006 Entry 72
Lacey Act and Timber Regulation	Non-use	All materials	US Lacey Act (16 U.S.C.3371-3378) EU Timber Regulation

Lead and its compounds	No intentional use 30 PPM for incidentally present	Plastics, inks, surface coatings	IEEE 1680 CPSIA,2008 2011/65/EU GB/T 26572 Taiwan BSMI RoHS GB/T 30512-2014 Customer Requirement
	No intentional use 300PPMfor incidentally present Materialcontrol inRECOproducts90PPMS HICOHCoatingcontrol	Solder material	
	Coating control 500PPM	Solder material	
	No intentional use 90 PPM for incidentally present	General metals	
	No intentional use 800 PPM for incidentally present	All other materials except all exemptions in 2011/65/EU and its amendments	
Mercury and its compounds	N.D.	All materials	2011/65/EU GB/T 26572 Taiwan BSMI RoHS GB/T 30512-2014
Methyl-phenol compounds	Non-use	All materials	Canadian Environmental Protection Act, Customer Requirement
n-Hexane	Non-use	All materials	Customer Requirement
Nickel and its compounds	Frequently contacted or in prolonged contact with, the end user's skin:N.D. Other: report if contain	All materials	REACH 1907/2006 and amendments
Organic tin compounds	N.D.	All materials	REACH 1907/2006 and amendments
Perchlorates	N.D.	All materials	CA DTSC Perchlorate Pollution Prevention Act
Phthalates	ND	All materials except packaging	Customer Requirement REACH 1907/2006 and amendments California Proposition 65 2011/65/EU
	ND	Materials used in automotive products	
	800 PPM total content	Packaging material	
Polycyclic Aromatic	0.5 ppm individually,	All materials	EC/1272/2013

Hydrocarbons (PAHs)	10 ppm for sum of total PAHs		
Polybrominated Biphenyls (PBBs)	N.D.	All materials	2011/65/EU GB/T 26572 GB/T 30512-2014
Polybrominated Diphenyl Ethers (PBDEs)	N.D.	All materials	2011/65/EU GB/T 26572 GB/T 30512-2014
Polychlorinated Biphenyl (PCBs)	N.D.	All materials	2004/850/EU 85/467/EEC CRS 001/1983, Brazil
Polychlorinated Terphenyl (PCTs)	N.D.	All materials	REACH 1907/2006 and amendments
Polyvinyl Chloride (PVC) and compounds	Negative	All materials	85/467/EEC REACH 1907/2006 and amendments
Radioactive Substances	N.D.	All materials	Japan's laws on nuclear materials, fuel, and reactors
REACH Annex XVII	According to regulatory requirements	All materials	REACH 1907/2006 and amendments
REACH Candidate List of SVHCs(Including Appendix 14)	<1000 PPM	All materials	REACH 1907/2006 and amendments
Tetrabromobisphenyl A (TBBA、TBBPA)	N.D.	All materials	PoHS
Polychlorinated Naphthalene (PCNs)	N.D.	All materials	Japanese Chemical Evaluation Law
Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)-phenol	Non-use	All materials	REACH 1907/2006 and amendments
Alkyl phenol	N.D.	All materials	REACH 1907/2006 and amendments
Antimony and its compounds	100 PPM	All materials	IEC 62474
Cobalt dichloride	Non-use	All materials	REACH 1907/2006 and amendments
Chlorophenols	N.D.	All materials	Customer Requirement
Tris(2-chloroethyl)phosphate (TCEP)	N.D.	All materials	California Proposition 65
Tris(2-chloro-1-methylethyl)phosphate (TCPP)	N.D.	All materials	California Proposition 65

Tris(1,3-dichloro-2-propyl)phosphate (TDCPP)	N.D.	All materials	California Proposition 65
Trixylyl phosphate (TXP)	N.D.	All materials	California Proposition 65
Expanded polystyrene ( EPS )	Non-use	All materials	South Korean KC safety mark
Methylenediphenyl diisocyanate (MDI)	Non-use	All materials	REACH 1907/2006 and amendments
2-Butanone oxime	1000 ppm Material control in Cyntec products ND	All materials	Customer Requirement
Fragrance substance	Non-use	All materials	REACH 1907/2006 and amendments
Dioxins,furans	Non-use	All materials	REACH 1907/2006 and amendments
Natural rubber	Non-use	All materials	Customer Requirement
Originalwood	Packaging material: Not used	All materials	Customer Requirement
Yellow(White) /Red Phosphorus	Negative	All materials	Japan industry health and safety Act
Selenium and its compounds	100 ppm	All materials	IEC 62474
Halogenated benzeneones	N.D.	All materials	Customer Requirement
2-(2-methoxyethoxy)ethanol (DEGME)	1000 ppm	All materials	REACH 1907/2006 and amendments
	N.D.		Customer Requirement
2-(2-butoxyethoxy)ethanol (DEGBE)	1000 ppm	All materials	REACH 1907/2006 and amendments
	N.D.		Customer Requirement
2-(2-butoxyethoxy)ethanol and its acetate	1000 ppm	All materials	REACH 1907/2006 and amendments
	N.D.		Customer Requirement
Benzene	N.D.	All materials	REACH 1907/2006 and amendments
Toluene	N.D.	All materials	California Proposition 65
Cyclohexane	Non-use	All materials	REACH 1907/2006 and amendments
Adhesive monomers Group I & Group II	Must pass toxicological review for approval	Adhesives in wearable products UV-cured adhesives in earphones and headphones Includes oligomers and cross-linkers	Customer Requirement

Adhesive monomers Group II	Must pass toxicological review for approval	wearable products UV-cured adhesives in earphones and headphones Includes oligomers and cross-linkers	Customer Requirement
Chlorinated Organic Solvents	N.D.	All materials	Customer Requirement
2,4,6-Tri-tert-butylphenol	N.D.	All materials	USA<Toxic Substance Control Act,TSCA>
Deca BDE	N.D.	All materials	USA<Toxic Substance Control Act,TSCA>
Phenol, isopropylated, phosphate (3:1)	N.D.	All materials	USA<Toxic Substance Control Act,TSCA>
Pentachlorothiophenol (PCTP)	Non-use	All materials,Such as the rubber industry	USA<Toxic Substance Control Act,TSCA> Customer Requirement
Hexachloro-1,3-butadiene(HCBD)	N.D.	All materials	USA<Toxic Substance Control Act,TSCA>
Long-chain perfluorocarboxylic acids, their salts and their precursors (LC-PFCAs)	N.D.	All materials	SOR/2012-285
Nitrosodi phenylamine	N.D.	All materials	SOR/2012-285
2-Methoxyethanol and ethylene glycol monomethyl ether	N.D.	All materials	SOR/2012-285
Persistent Organic Pollutants (POPs)	N.D.	All materials	(EC) No 850/2004 (EU) No 519/2012 Customer Requirement
Endangered Species of Flora and Fauna	Non-use	All materials	US Lacey Act EU Timber Regulation
Ozone Depleting Chemicals (ODCs)	N.D.	All materials	Montreal Protocol; US Clean Air Act; Kigali Amendment Customer requirements
Bismuth (Bi) and its compounds	100 ppm	All materials	Customer Requirement
Chemical Substance Control Law (CSCL) Class I specified chemical substance	N.D.	All materials	Chemical Substance Control Law (CSCL)
Nitrogen trifluoride	Non-use	All materials	Customer Requirement
2-(2H-Benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	Non-use	All materials	Customer Requirement

Tetrafluoroethylene	Non-use	Paints, Adhesives, Cleaners	Customer Requirement
Ethylene glycol, and its ethers	No intentional use 1000 ppm	All materials	Customer Requirement
Ethane	Non-use	All materials	Customer Requirement
Ethylbenzene	1000 ppm	Solvents in paints, primers, coatings, inks, lubricants and adhesives	Customer Requirement
Acetaldehyde	3.7 µg/m³	Solvents in paints, primers, coatings, inks, lubricants and adhesives	VOC JEITA
4-Nitrobiphenyl and its salts	Non-use	All materials	Customer Requirement
Tritolyl Phosphate (TCP)	Non-use	All materials	Customer Requirement
Brominated Polystyrene	Non-use	Blister packaging	Customer Requirement
Octylphenol and its ethers (Ops)	Non-use	All materials	Customer Requirement
Hexachloroethane	N.D.	All materials	Customer Requirement
2,4-Dinitrotoluene ; 2,4-DNT	1000 ppm	All materials	REACH 1907/2006 and amendments
	N.D.		Customer Requirement
Dichloromethyl ether	N.D.	All materials	Customer Requirement
Triclosan	N.D.	All materials	Customer Requirement
Isocyanic acid	Non-use	All materials	Customer Requirement
Organophosphorus compounds	N.D.	All materials	Customer Requirement
Phenol and its compounds	Non-use	All materials	Customer Requirement
N-Nitrosodimethylamine (NDMA)	Non-use	All materials	Customer Requirement
Chlorinated paraffin (C18-28) (LCCPs)	N.D.	All materials	Customer Requirement

DechloranePlus (DCRP)	Non-use	All materials	Customer Requirement
Decabromodiphenyl Ethane (DBDPE)	Non-use	All materials	Customer Requirement
1, 4-Dioxane	Non-use	All materials	Toxic Substances Control Act (TSCA)
Pigment Violet 29	Non-use	All materials	Toxic Substances Control Act (TSCA)
Phosphine	Non-use	All materials	Germany. Chemicals Prohibition Ordinance. Denmark: Statutory Order No. 289. United States. Toxic Substances
Ethylenediaminetetraacetic acid (EDTA)	Non-use	All materials	Customer Requirement
2-(2-Aminoethylamino)ethanol (AEEA)	Non-use	All materials	Customer Requirement
Tri-(2,3-dibromo-propyl) phosphate	N.D.	All materials	Customer Requirement
Gallium	Non-use	All materials	Customer Requirement
Methoxyethanol	Non-use	All materials	Customer Requirement
Tri-(1-aziiridinyl) phosphinoxide	N.D.	All materials	Customer Requirement
Per- and Polyfluoroalkyl Substances (PFAS)	Non-use	All materials	<a href="https://comptox.epa.gov/dashboard/chemical-lists">https://comptox.epa.gov/dashboard/chemical-lists</a>
PFOA and compounds	ND	All materials	Norway FOR-2004-06-01-922 EU 2017/1000, POPs regulations, customer requirements

PFOS and compounds	ND	All materials	2004/850/EU, Customer Requirement
PFCAs (C9-C14), their salts and related substances	N.D.	All materials	<a href="https://echa.europa.eu/documents/10162/2ec5dfdd-0e63-0b49-d756-4dc1bae7ec61">https://echa.europa.eu/documents/10162/2ec5dfdd-0e63-0b49-d756-4dc1bae7ec61</a>
PFHxS, its salts and related substances	N.D.	All materials	<a href="https://echa.europa.eu/documents/10162/a22da803-0749-81d8-bc6d-ef551fc24e19">https://echa.europa.eu/documents/10162/a22da803-0749-81d8-bc6d-ef551fc24e19</a>
PFBS and related substances	1000 PPM total content	Flame retardant additive for plastic resins	<a href="https://www.miljodirektoratet.no/globalassets/publikasjoner/M759/M759.pdf">https://www.miljodirektoratet.no/globalassets/publikasjoner/M759/M759.pdf</a>
PFHxA, its salts and related substances	N.D.	All materials	Customer Requirement
MOAH (1-7 aromatic rings) aromatic hydrocarbon mineral oil	N.D.	Inks in printing and packaging materials	French Mineral Oil Ordinance
Saturated mineral oil MOSH (16-35 carbon atoms)	N.D.	Inks in printing and packaging materials	French Mineral Oil Ordinance
SF <sub>6</sub>	N.D.	All materials (except insulating gas in circuit breakers)	Customer Requirement
Sulfur and its compounds(Contains endosulfan)	N.D.	Materials in direct contact with the product (For example: gloves, nozzles, Interleaf paper and packaging panels) cannot detect sulfur (S)	Customer Requirement
Silicon and its compounds	N.D.	Materials in direct contact with the product (For example: gloves, nozzles, auxiliary materials used in the laminating station/Interleaf paper and board) Silicon (Si) cannot be detected	Customer Requirement
released sulfur compounds	0.5 PPM, released volatile sulfur compound emission levels	Polymer components used inside server chassis containers adjacent to PCBA or active	Customer Requirement

	measured using gas chromatography/mass spectrometry (GC/MS) thermal desorption or headspace sampling methods	metal leads or traces, such as foam pads, rubber seals, elastomers, anti-vibration pads, or thermal pads, etc.	
Fluorine and its compounds	50PPM	All materials (suppliers should declare the CAS number and content of chemical substances that lead to high F content when the content is higher than 50PPM)	Customer Requirement
Brominated flame retardant	Not intentionally added	All materials	Customer Requirement
Chlorine flame retardant	Non-use	All materials	Customer Requirement
Skin sensitizing substances in colorants, dyes, and pigments	Non-use	All materials in prolonged skin contact	Customer Requirement
Dimu-oxydibutyltin hydroxyborane (DBB)	Non-use	All materials	Customer Requirement
Halogenated diphenylmethane	Not intentionally added	All materials	Customer Requirement
N-Methylpyrrolidone (NMP)	Not intentionally added	All materials	Customer Requirement
Trichlorobenzene	Non-use	All materials	Customer Requirement
Low molecular siloxane, and silicone rubber, silicone resin, silicone grease, silicone oil containing Low molecular	Not intentionally added	All materials	Customer Requirement
Chlorinated benzene	Non-use	All materials	Customer Requirement

DHTDMAC, DODMAC/DSDMAC, DTDMAC (Surfactants and its compounds)	1000 PPM	All materials	Customer Requirement
4-[4,4'-bis(dimethylamino)-benzhydrylidene] cyclohexa-2,5-dien-1-ylidene] Dimethylammonium chloride (C.I. Basic Violet 3)	1000 PPM	All materials	Customer Requirement
Boron and its compounds (including boric acid and specific sodium borates)	Intentionally Added	All materials	Customer Requirement
Ethylene glycol methyl ether and its acetates/esters	N.D.	All materials	Customer Requirement
Halides	Intentionally Added	All materials	Customer Requirement
Non-halogenated organic compounds	Intentionally Added	All materials	Customer Requirement
Drugs in the list of Groups 1, 2A and 2B of the World Health Organization International Agency for Research on Cancer (IARC)	Intentionally Added	All materials	Customer Requirement
Substances specified in the GADSL list	According to regulatory requirements	All vehicle materials	GADSL
Chlorotol (benzyl chloride/benzyl chloride)	Non-use	All materials	Customer Requirement
Dimethyl sulfoxide (DMSO)	30000 PPM	All materials	Customer Requirement
Bis(2,3-propyl) acid salts	Non-use	All materials	Customer Requirement
Chlorinated hydrocarbons	Non-use	All materials	Customer Requirement

Basic violet 3 (also known as gentian violet) 4-[4,4'-	1000 PPM	All materials	Customer Requirement
Deuterated bis(2-methoxyethyl) ether	1000 PPM	All materials	Customer Requirement
Cyanide and its compounds	Non-use	All materials	Customer Requirement
Ammonium nitrate	Non-use	All materials	Customer Requirement
Dinitrotolualdehyde	Non-use	All materials	Customer Requirement
Polybutanediol	1000 PPM	All materials	Customer Requirement
Barium and barium compounds	100 PPM	All materials	Customer Requirement
Oxidatively degradable plastics	Non-use	All materials	Customer Requirement
Pigment red	1000 PPM	All materials	Customer Requirement
4-phenylcyclohexane Olefins	Non-use	All materials	Customer Requirement
Octylphenol (OP)	Non-use	All materials	Customer Requirement
Isopropyl nitrite	Non-use	Inks	Customer Requirement
Butyl nitrite	Non-use	Inks	Customer Requirement
Toluene diisocyanate	Non-use	Adhesives	Customer Requirement
Triethylene glycol dimethyl ether	Non-use	All materials	Customer Requirement
Polyhexamethyleneguanidine hydrochloride (PHMG)	N.D.	All materials	Customer Requirement
Polyhexamethylene biguanidine hydrochloride (PHMB)	N.D.	All materials	Customer Requirement
(Poly[2-(2-ethoxy)-ethoxyethyl]guanidine)PGH	N.D.	All materials	Customer Requirement
Isothiazolinone CMIT/MI	N.D.	All materials	Customer Requirement
4-Chlorophenyl propyl ketone (NCether)	N.D.	All materials	Customer Requirement
N,N' -dimethylbenzyl-p-phenylenediamine	N.D.	All materials	Customer Requirement

N-tolyl-N' -methylbenzyl-p-phenylenediamine or N,N' -dimethyl-p-phenylenediamine	Non-use	All materials	Customer Requirement
Diethylene glycol dimethyl ether	1000 PPM	All materials	Customer Requirement
	ND		
MDI	1000 PPM	All materials	Customer Requirement
Cobalt and its compounds	N.D.	All materials	Customer Requirement
Waste engine oil	N.D.	All materials	Customer Requirement
Tris(trimethylsilyl)phosphine/thiotepta	N.D.	All materials	Customer Requirement
Triphosphates	N.D.	All materials	Customer Requirement
Methylchloroisothiazolinone, methylisothiazolinone	Non-use	All materials	Customer Requirement
Zinc chromate hydroxide; pentazinc chromate octahydroxi	N.D.	All materials	Customer Requirement
N,N-Dimethylacetamide (DMAC)	N.D.	All materials	Customer Requirement
1,2-Dimethoxyethane	N.D.	All materials	Customer Requirement
Lead carbonates; Lead(II)carbonate basic Lead sulfates Sulfuric acid, lead salt	N.D.	All materials	Customer Requirement
tereaethyl lead	N.D.	All materials	Customer Requirement

2) Reported substances and future restricted substances in products: 39 items

Chemical	Threshold	Scope	References
Adhesive monomers Group I	1000 ppm	Adhesives in wearable products UV-cured adhesives in earphones and headphones Includes oligomers and cross-linkers	Customer Requirement

n-Propyl Bromide (nPB)	100 ppm	Cleaning solvent and used as an intermediate in the synthesis of quaternary ammonium compounds. Also used as a solvent in adhesive sprays	Customer Requirement
Parts/Components utilizing RoHS exemptions	Individual substance thresholds as per the RoHS directive	All materials	2011/65/EU
Volatile Organic Compounds (VOCs)	Report detectable levels. Vendors must meet all applicable VOC regulations in the areas in which they are operating	Paints, coatings, inks, adhesives, primers, cleaners, degreasers	Customer Requirement GB 38507-2020 GB 38508-2020 GB 33372-2020
Additive Phosphorous Flame Retardants	Non-use	Plastics, printed circuit boards	Sweden Chemical Tax(2016:1067)
Biocides	Detectable levels. Treated articles must use biocides that are approved or under review	Additive in polymers, leather, other coated materials	EU No 528/2012 (BPR)
Cobalt and its compounds	100 ppm	Moisture indicator, additive in rubber, cobalt alloys	REACH 1907/2006 and amendments
Diphenylamines, Substituted (SDPA)	Detectable levels	Antioxidants used in adhesives, resins, polymer coatings, paper products	Canadian Environmental Protection Act, 1999
Endocrine Disrupting Chemicals (EDCs)	Detectable levels	All materials	Customer Requirement
IEC 62474 Substances	Various, as required by standard	All materials	IEC 62474
Indium Phosphide	Detectable levels	Electronic components	Customer Requirement
Nanomaterials	Detectable levels	Silver nanoparticles, carbon nanotubes and graphene, nano-scale cerium dioxide, nano-titanium dioxide, nano-	France Decree No. 2012-232, Environmental Code Article L. 523-4—Annual declaration of substances in nanoparticle 2011/696/EU

		scale iron, nanometer-sized copper particles	
PFBS and related substances	1000 ppm total content	Flame retardant additive for plastic resins	<a href="https://www.miljodirektoratet.no/globalassets/publikasjoner/M759/M759.pdf">https://www.miljodirektoratet.no/globalassets/publikasjoner/M759/M759.pdf</a>
Toluene	1000 ppm	Paints, coatings, inks, adhesives, primers manufactured by the material supplier and in the finished good	Customer Requirement
Bisphenol chemicals	N.D.	All materials	Customer Requirement
Brominated Organic Solvents	N.D.	All materials	Customer Requirement
Formaldehyde-releasing substances	Formaldehyde released from substance exceeds a concentration of 0.124 mg/m <sup>3</sup> in the air of a test chamber used under the conditions prescribed in EN 717-1.	All materials	<a href="https://echa.europa.eu/documents/10162/13641/rest_formaldehyde_axvreport_en.pdf/">https://echa.europa.eu/documents/10162/13641/rest_formaldehyde_axvreport_en.pdf/</a>
Skin sensitizing substances	Report if contain	Only applicable to leather, textile, hide, and fur articles. Natural leather is exempt.	<a href="https://echa.europa.eu/de/registry-of-restriction-intentions-/dislist/details/0b0236e182446136">https://echa.europa.eu/de/registry-of-restriction-intentions-/dislist/details/0b0236e182446136</a>
Melamine	1000 ppm	Plastics	Customer Requirement
N-Ethyl-2-pyrrolidone	1000 ppm	Paints, coatings, inks, adhesives, primers manufactured by the material supplier and in the finished good	Customer Requirement
Proposition 65 list of chemicals	Detectable levels	All materials	California Proposition 65
Washington State's List of Chemicals of High Concern to Children (CHCC)	Practical quantification limit (PQL) if added intentionally	All materials	Children's Safe Products Act
	100 ppm if present as a contaminant		

Chromium(III) compounds	Report if contain	All materials	97/10/EC
Zinc and its compounds	Detectable levels	All materials	Customer Requirement
Palladium and its compounds	Detectable levels	All materials	Customer Requirement
Silver and its compounds	Detectable levels	All materials	Customer Requirement
Manganese and its compounds	1000 ppm	All materials	Customer Requirement
Magnesium and its compounds	1000 ppm	All materials	Customer Requirement
Fluorine and its compounds	Detectable levels	All materials	Customer Requirement
Butyl glycidyl ether	1000 ppm	All materials	Customer Requirement
SF <sub>6</sub>	1000 ppm	Insulating gas in circuit breaker	Future restrictions
Precious metals and their compounds (gold, gold, silver, platinum, palladium)	1mg	Surface treatment (if the product contains more than 1 mg of precious metals, it must be declared at least [X mg] precious metals (gold, silver, platinum and palladium))	Future restrictions
Rare earth metals (scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium)	1mg	Electronics, electrical vehicles, vehicles (if the product contains more than 1 mg of rare earth metals, it must be declared that it contains at least [X mg] rare earth metals (scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium))	Future restrictions

		(lutetium))	
Perfluorinated and Polyfluoroalkyl Substances (PFAS)	25 ppb for non-aggregated PFAS 50 ppm for aggregated PFAS	All materials	Phase-out begins immediately, with all restrictions except for essential-use exemptions approved by the EU by October 2025
Perfluorohexanoic acid (PFHxA)	The total content of PFHxA and its salts is 25ppb The total content of PFHxA related substances is 1000ppb	All materials	Restricted (see Ref.1)
REACH Candidate List of SVHCs (REACH SVHC shortlist)	1000 ppm	All materials	Elimination starts immediately, future restrictions to be determined
Isopropylated Triphenyl Phosphate (PIP (3:1))	any intentional use	All materials	Restricted (see Ref.1)
Dimethyl sulfoxide (DMSO)	1000ppm	All materials	Future restrictions
Key raw materials and strategic raw materials	any intentional use	All materials	Future restrictions

### 3) Restricted substances in manufacturing: 38 items

Chemical	Threshold	Scope	References
Benzene	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	NIOSH
Beryllium Dust and Fumes	Non-use	Connector contacts, EMI finger (beryllium-copper alloys), transceivers (beryllium oxide)	California OSHA PEL (2006); GBZ 2.1 2007
Brominated Organic Solvents	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	Customer Requirement
Chlorinated Organic Solvents	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	Customer Requirement
n-Hexane	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	GBZ 2.1 2007; ACGIH
N-methylpyrrolidone (NMP)	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	AIHA TWA; California OSHA

n-Propyl Bromide (nPB)	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	Customer Requirement
Ozone Depleting Chemicals (ODC)	No intentional use	All manufacturing processes	Montreal Protocol; EC No. 2037/2000
Toluene	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	ACGIH(2015)
Xylene	Non-use	All manufacturing processes	NIOSH
m-xylene	Non-use	All manufacturing processes	NIOSH
p-xylene	Non-use	All manufacturing processes	NIOSH
o-xylene	Non-use	All manufacturing processes	NIOSH
Ethylbenzene	Non-use	All manufacturing processes	NIOSH
Trichloroethylene	Non-use	All manufacturing processes	NIOSH
Tetrachloroethylene	Non-use	All manufacturing processes	NIOSH
Fluorinated greenhouse gases (CFCs, HCFCs, HFCs, PFCs, SF <sub>6</sub> )	Non-use	All manufacturing processes	(EC) No 842/2006; (EC) No.1005/2009
Ethanolamine	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	ACGIH; GBZ 2.1 2007; Customer Requirement
2-Ethoxyethanol	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	ACGIH; GBZ 2.1 2007; Customer Requirement
2-Ethoxyethyl acetate	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	ACGIH; GBZ 2.1 2007; Customer Requirement
Cyclohexanone	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	ACGIH; GBZ 2.1 2007; Customer Requirement
N, N Dimethylformamide	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	ACGIH; GBZ 2.1 2007; Customer Requirement
Methanol	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	ACGIH; GBZ 2.1 2007; Customer Requirement

Methylene Chloride	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	ACGIH; GBZ 2.1 2007; Customer Requirement
Carbon Tetrachloride	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	ACGIH; GBZ 2.1 2007; Customer Requirement
2-Butoxy ethanol	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	ACGIH; GBZ 2.1 2007; Customer Requirement
Heptane	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	Customer Requirement
Cyclohexanone	Non-use	Cleaning agents, degreasers, demolder solutions in all manufacturing processes	Customer Requirement
Phthalates	1000 ppm total content	The tools, auxiliary materials, packaging materials, work surfaces, equipment surfaces of contact, etc. that are in contact with product production, including but not limited to the objects listed in Appendix T.	California Proposition 65 REACH 1907/2006 and amendments 2011/65/EU Customer Requirement
2-Butoxyethanol	Non-use	Paints, coatings, thinners, etc.	Customer Requirement
Phosphine	Non-use	All manufacturing processes	Customer Requirement
Isopropylated Triphenyl Phosphate (PIP3:1)	N.D.	All manufacturing processes	Customer Requirement
Chloromethyl methyl ether (CMME)	No intentional use	cleaners, solvents	Customer Requirement
PFOS and its compounds	Restricted breathing zone < 0.005 mg/m <sup>3</sup>	Including but not limited to cleaning agents, degreasers and mold release agents	Stockholm Convention on Persistent Organic Pollutants EU Regulation 850/2004 (as amended) Canadian Regulation SOR/2008-177
Dichloromethyl ether	No intentional use (<100PPM)	Including but not limited to cleaning agents, degreasers and mold release agents	IARC California OSHA PEL ACGIH

Tri-o-cresol phosphate or tricresol phosphate	Non-use	All manufacturing processes	Customer Requirement
2-Methoxyethanol (Ethylene glycol monomethyl ether)	Non-use	All manufacturing processes	Customer Requirement
2-Ethoxyethanol (Ethylene glycol monoethyl ether)	Non-use	All manufacturing processes	Customer Requirement

4) Reported substances and future restricted substances in manufacturing : 20 items

Chemical	Threshold	Scope	References
Benzene	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	NIOSH
Brominated Organic Solvents	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	Customer Requirement
Chlorinated Organic Solvents	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	Customer Requirement
n-Hexane	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	ACGIH; GBZ 2.1 2007
N-methylpyrrolidone (NMP)	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	AIHA TWA; California OSHA
n-Propyl Bromide (nPB)	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	Customer Requirement
Toluene	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	NIOSH
2-Ethoxyethanol	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	ACGIH; GBZ 2.1 2007; Customer Requirement

2-Ethoxyethyl acetate	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	ACGIH; GBZ 2.1 2007; Customer Requirement
Cyclohexanone	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	ACGIH; GBZ 2.1 2007; Customer Requirement
N, N Dimethylformamide	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	ACGIH; GBZ 2.1 2007; Customer Requirement
Methanol	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	ACGIH; GBZ 2.1 2007; Customer Requirement
Methylene Chloride	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	ACGIH; GBZ 2.1 2007; Customer Requirement
Carbon Tetrachloride	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	ACGIH; GBZ 2.1 2007; Customer Requirement
2-Butoxy ethanol	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	ACGIH; GBZ 2.1 2007; Customer Requirement
Ethanolamine	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	ACGIH; GBZ 2.1 2007; Customer Requirement
Xylenes	Detectable levels (Content)	All manufacturing processes (except Cleaning agents, degreasers, demolder solutions)	ACGIH; GBZ 2.1 2007; Customer Requirement
Formaldehyde	Detectable levels (Content)	All manufacturing processes	Customer Requirement
Hydrogen Fluoride (HF)	Detectable levels (Content)	All manufacturing processes	Customer Requirement
Ethylbenzene	Detectable levels (Content)	All manufacturing processes	Customer Requirement